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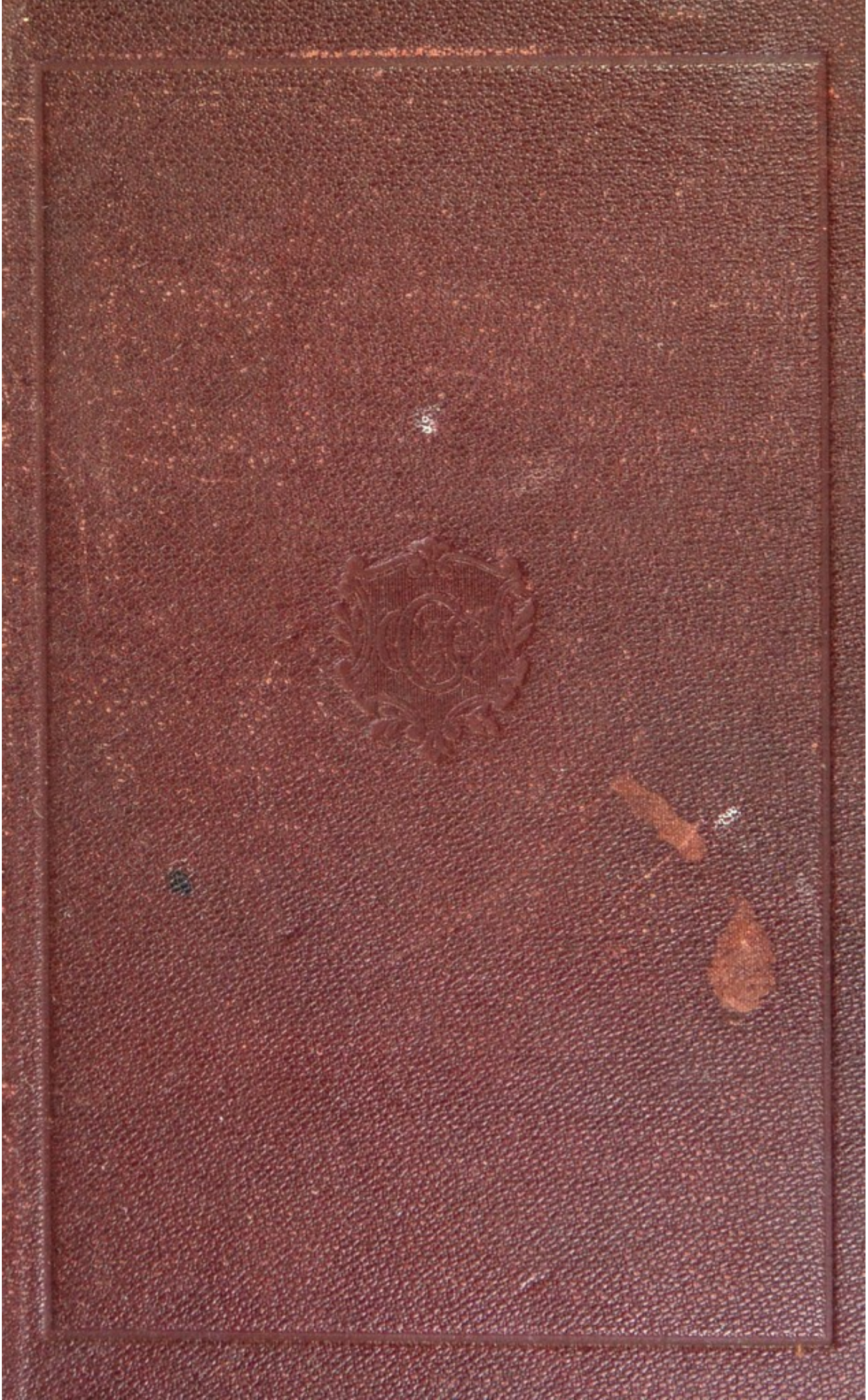


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PUBLISHERS' NOTE.

THE THIRTY-FOURTH EDITION of DRS. THOMSON and STEELE'S DICTIONARY OF DOMESTIC MEDICINE AND HOUSEHOLD SURGERY has been subjected to a thorough revision, and neither pains nor expense spared to maintain the high reputation for PRACTICAL USEFULNESS which the work has hitherto enjoyed.

The Publishers feel assured that the able monograph on the *Maintenance of Health and the Management of Disease in Warm Climates*, by Dr. James Cantlie, will be appreciated by the many readers whose avocations necessitate their residing, often for years, within the latitudes of which it treats. To quote the words of Dr. Thomson's original Preface—"Even to the resident in the midst of civilisation, the 'Knowledge is Power' to do good; to the settler and emigrant it is **invaluable.**"

Finally, the Publishers desire to express their thanks to the Editors for the extreme care with which the revision has been carried out.

LONDON, *January*, 1899

with the various forms of disease and casualty, together with the most approved methods of dealing with them, may prove of the greatest service, perchance may save life; and this, the second great aim of the work, *Remedial Medicine*—comprising the Treatment of Disease and the Measures necessary for Restoration to Health—has been amply considered from a domestic stand-point. In this the Editor has kept specially in view the circumstances of those to whom in time past the book has proved of the greatest utility; and the needs of colonists and emigrants from the mother country, of missionaries and the clergy in remote districts, and of many others whose lot is cast far away from professional assistance—have been fully considered.

Many new engravings have been introduced—illustrating subjects connected with the anatomical and physiological relations of the body—and designs of improved Surgical and Sanitary appliances.

To render the information more readily accessible, a Table of Contents, with references to articles bearing on kindred subjects, has been prefixed. A Glossary is further appended of such medical terms in frequent use as have not found a place among the alphabetical headings of the Dictionary; and Dr. Anderson's excellent Monograph on the *Management of the Sick-Room*, contributed to a former edition, appears again with slight abridgment.

In conclusion, the Editor can but express his sincere hope, in which the Author unites, that in its New Form the work may enter once more on a fresh and prolonged career of usefulness, and be found, as heretofore, a trustworthy counsellor and guide, and a ready help in the emergencies of daily life.

Guy's Hospital, *December* 1882.

AUTHOR'S ORIGINAL PREFATORY ADDRESS.

THAT works professing to afford popular information on medical subjects may thoroughly answer the purpose for which they are designed, one especial point requires ever to be kept in view—the information given must be safely usable by those who are put in possession of it. It is an objection frequently adduced against such works, that they place a little dangerous knowledge in the hands of the public, in a form so apparently simple as to make it a source rather of evil than of benefit, and undoubtedly the allegation has in some respects been correct. But is it necessary, in preparing a work on domestic health, to incur this hazard? I think not. For without entering upon that difficult ground which correct professional knowledge and educated judgment can alone permit to be safely trodden, there is a wide and extensive field for exertion and for usefulness open to the unprofessional, in the kindly offices of a *true* Domestic Medicine; the timely help and solace of a simple Household Surgery; or, better still, in the watchful care, more generally known as "Sanitary Precaution," which tends rather to preserve health than to cure disease. "The touch of a gentle hand" will not be less gentle because guided by knowledge, nor will the *safe* domestic remedies be less anxiously or carefully administered. Inseparably connected with the intelligent use of these remedies, there must be correct *general* ideas respecting the anatomical arrangements and physiological requirements of the human frame. This also has been objected to. I hesitate not to say, that it is such knowledge as ought to be in the possession of every responsible man. Making apparent the importance and rational foundation of the means of preserving or of invigorating health, or of restoring it when impaired, it renders submission to the requirements of those means a more sure and cheerful service, when rendered to the conviction of the understanding rather than to the dictum of an adviser. Amid the humbler classes especially, the diffusion of such knowledge is highly requisite as a counter-agent to the impudent quackery which preys upon the credulity and the lamentable ignorance of the simplest principles of health, which pervade the mass of the people.

But health *will* fail, either in old or young, and accidents *will* happen, in spite of the most careful precaution; it then becomes a question, how far non-professional interference may go. In many of the emergencies and accidents of daily life, even in a settled country, but more especially in the thinly peopled colonies, ready information respecting what is best to be done, possessed by a neighbour or a bystander, is often of the most essential service; indeed, every medical man must have witnessed how much mischief may result, either actively or passively, and in a very short time, from ignorance of even the most obvious and common-sense modes of treatment. The information upon these points, given in a popular work, can scarcely be too full or too accurate. In the requirements of Household Surgery, or of sudden emergency, such as Poisoning, Burning, &c., the question is, "What must be done?" Generally speaking, little or no skill is requisite to determine the nature of the case, or of the injury, which is often too apparent—the anxious question "What must we do?" is that which calls for answer; and if, sometimes, it happens that the exact nature of the accident be not sufficiently evident, that is no reason why knowledge on the subject generally, aided by common sense, may not do much to relieve. Life may be saved, suffering may always be

alleviated. Even to the resident in the midst of civilisation, the "Knowledge is Power" to do good; to the settler and the emigrant, it is invaluable.

We come to a point more liable to cavil—the actual treatment of disease, properly so called, by the unprofessional, and how far it is well to afford information which may tempt the rash to use that which education only can safely employ. It may be trite, but it is true, that in order to treat a disease safely, and with benefit, we must learn its nature. Now, when it is remembered how the nicest judgment that observation and experience can form, the most patient attention, aided by practised ear and eye, by microscope and test tube, are frequently necessary to enable the conscientious physician to judge of his case before he can apply the remedy, it is evident how great must be the responsibility of those who, in rashness or ignorance, venture upon the treatment of serious disease, either in their own persons or in those of others; incapable of judging of its nature, still less capable are they of selecting the appropriate treatment. There is, however, a vast difference between the management of real disease and of ordinary ailment—between endeavouring to strike at the root, or only to relieve the symptoms. Any unprofessional man, or woman either, in this kingdom, who, with all facility that there is for procuring skilled advice, ventures to take the medical management of a case of real illness, acts most unwarrantably; but there are numbers of lesser ailments, many of the more painful incidents and symptoms, simply and easily removable by means which all may employ, and with which it is most important that all should be acquainted; which the parent may use to the child, or the pastor recommend to his parishioners, without fear.

One step further. If danger may result from rash treatment, none can arise from a general acquaintance with the most prominent symptoms which herald the approach of dangerous sickness; these, I think, should be made known; whilst all remarks upon the management, whether limited as for use in this country, or more extended for the sake of the dweller in remote or unsettled districts, I trust so to guard as to make them safe and useful guides.

I know well what is said by a few about injuring the medical profession, by making the public their own doctors. Nothing will be so likely to make "long cases," as for the public to attempt any such folly; but people of moderate means—who, so far as medical attendance is concerned, are worse off than the pauper—will not call in and fee their medical adviser for every slight matter, and in the absence of a little knowledge, *will* have recourse to the prescribing druggist, or to the patent quackery which flourishes upon ignorance, and upon the mystery with which some would invest their calling. And not patent quackery alone, but professional quackery also, is less likely to find footing under the roof of the intelligent man, who, to common-sense and judgment, adds a little knowledge of the "whys and wherefores" of the treatment of himself and family. Against that knowledge which might aid a sufferer from accident, or in the emergency of sudden illness, no humane man could offer or receive an objection.

SPENCER THOMSON.

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N.B.—*The references are to articles which may also be consulted.*

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COCCULUS INDICUS. Adulteration.
COCOA. Chocolate.
COCOA-NUT.
CODEIA. [Scrofula.
COD-LIVER OIL. Consumption—
COFFEE. Diet—Tea.
COLCHICUM. Gout—Opium.
COLD. Animal Heat—India Rubber.
COLD IN THE HEAD. Catarrh.
COLIC. Lead—Water.
COLLAPSE.
COLLAR BONE. Clavicle—Fracture.
COLLIERS. Artisan—Consumption.
COLLIQUATIVE.
COLLODION.
COLLYRIUM. Eye.
COLOCYNTH. Pill—Purgative.
COLON. Alimentary Canal—Intestine.
COLOTOMY.
COMA. Apoplexy.
COMPLEXION. Countenance—Diathesis—Skin.
CONCRETIONS. Biliary and Urinary Calculi.
CONCUSSION. Brain—Spine.
CONDIMENTS. Aromatics—Salt.
CONDYLE. [Senna.
CONFECTION. Almond — Rose —
CONFECTIONERY.
CONGESTION. Inflammation.
CONJUNCTIVA. Cornea—Eye.
CONSERVE.
CONSTIPATION. Alimentary Canal — Aloes— Enema — Digestion — Aperients—Laxatives.
CONSUMPTION. Chest—Children—Lungs—Respiration—Respirator—Scrofula—Temperament.
CONTAGION. Air — Bed-Room — Disinfectants—Antiseptics.
CONTUSION. Bruises.
CONVALESCENCE. Air—Bed-Room—Clothing—Cookery—Diet.
CONVULSIONS. Apoplexy—Bath—Children—Enema—Croup—Head—Spasm—Teeth—Worms.
COOKERY. Food.
COPAIBA. Balsam.
COPPER. Arsenic.
CORDIALS. Excitants.
CORIANDER SEEDS.
CORN. Skin.
CORNEA. Eye.
CORROSION.
CORROSIVE SUBLIMATE. Mercury.
COSMETICS.
COTTAGE HOSPITALS. Hospitals.
COTTON WOOL. Burns — Rheumatism.
COTYLEDON UMBILICUS.
COUCHING. Eye—Cataract.
COUGH. Catarrh—Cold—Counter-irritation—Expectorants.
COUNTER IRRITATION. Antimony—Blister—Cantharides—Mustard.
COUNTENANCE. Complexion.
COUP DE SOLEIL. Heat—Sunstroke
COW POX. Vaccination.
CRAB, and CRAB LOUSE. [Spasm
CRAMP. Cholera—Convulsions—
CRADLE. Child.

N.B.—*The references are to articles which may also be consulted.*

CRANIUM. Skull.
CREAM. Cheese—Milk.
CREAM OF TARTAR. Potash.
CREASOTE. Inhalers—Teeth.
CREATINE.
CRESSES.
CRETINS.
CRISIS. Fevers—Periodicity.
CROTON OIL.
CROUP. Antimony — Children—Diphtheria — Larynx — Trachea.
CROUP, SPASMODIC. Convulsions—Glands.
CRYSTALLINE LENS. Eye.
CUBEBS. [Hospitals.
CUBIC SPACE. Ventilation —
CUCUMBER.
CUMIN.
CUPPING. Bleeding—Leech.
CURD. Cheese.
CURRANTS.
CURRY.
CUTS. Wounds.
CUT THROAT. Artery—Hæmorrhage.
CUTICLE. Skin. CUTANEOUS.
CYANOSIS. Blue Disease—Heart.
CYCLING.
CYNANCHE. Sore Throat.
CYST.
CYSTITIS. Bladder—Urine—

DALBY'S CARMINATIVE. Opium—Quack Medicine.
DAMP. Ague—Drainage—House—Neuralgia—Rheumatism.
DAMSON.
DANCING. Gymnastics—School.
DANDELION. Broom—Liver—Kidneys.
DANDRIFF.
DANGER.
DARNEL GRASS.
DATE.
DATURA STRAMONIUM.
DAWLISH.
DEAD. Disposal of. [donna.
DEADLY NIGHTSHADE. Bella-
DEAFNESS. Ear—Glycerine.
DEATH. Apoplexy — Drowning — Emergencies—Hanging—Inquest.
DEATH RATE. Age.
DEBILITY. Animal Heat—Bilious Cholera—Blood—Convalescence.
DECAY. Old Age.
DECIDUA.
DECLINE. Consumption.
DECOCTION.
DECOMPOSITION. Antiseptics — Fermentation—Putrefaction.
DEFORMITY. Club Foot—Neck—Rickets—Spine.
DELIRIUM. Insanity—Management of Sick-Room.
DELIRIUM TREMENS. Alcohol — Dipsomania—Intemperance.
DELIVERY. Child-Birth.
DEMULCENTS
DENGUE or DANDY FEVER.
DENTIFRICE. Teeth.
DENTITION. Teeth.
DEOBSTRUENTS. [fectants.
DEODORANTS. Antiseptics—Disin-
DEPILATORY.
DERBYSHIRE NECK. Bronchocele.
DERIVATIVE. Blood - Letting — Blister—Counter Irritation.
DESQUAMATION. Scarlet Fever.
DIABETES. Fermentation — Sugar—Urine.
DIACHYLON PLASTER. [Disease.
DIAGNOSIS. Advice, Medical —
DIAPHORETICS. Skin.
DIAPHRAGM. Chest—Lungs—Respiration—Trunk.
DIARRHŒA. Alimentary Canal—Astringents—Biliary Disorder.
DIASTOLE. Circulation—Heart.
DIATHESIS. Hereditary—Temperament.
DIET AND DIETARIES. Foods.
DIGESTER. Heat—Gelatin.
DIGESTION. Absorbents—Alimentary Canal—Chyle—Food—Indigestion.
DIGITALIS.
DILL.
DILUENTS. Cold—Cookery—Heat—Thirst—Water.
DINNER. Digestion—Food.
DIPHTHERIA. Croup.
DIPLOE. Skull.
DIPSOMANIA. Delirium Tremens—Intoxication—Stimulants.
DISCHARGE.
DISEASE.
DISINFECTANTS. Contagion — Enteric Fever—Small-pox.
DISLOCATIONS. Anæsthetics—Joints—Muscles.
DISORDERED FUNCTION. Disease.
DISTILLED WATER.
DIURETICS. [cuanha.
DOVER'S POWDER. Opium—Ipeca-
DOUCHE. Bath.
DRAINAGE. House—Public Health — Traps — Ventilation — Water Closets.
DRASTIC. Purgatives.
DREAMING. Sleep.
DRESS. Clothing.
DRESSING. Adhesion—Bandage—Burns—Carbolic Acid—Ulcers.
DRINKS.
DRIPPING.
DROPPED WRIST. Lead.
DROPSY. Blood—Diuretics—Urine.
DROWNING. Death—Respiration—Lungs—Suffocation.
DRUGS. Medicines.
DRUM OF THE EAR.
DRUNKENNESS.
DRY CUPPING.
DUCT.
DUGONG OIL.
DULCAMARA. Diaphoretics.
DUMBNESS. Deafness.
DUODENUM. Alimentary Canal.
DURA MATER. Brain—Spine.
DWELLINGS.
DYSENTERY. Castor Oil—Diarrhœa—Enema—Suppository.
DYSMENORRHŒA. Menstruation.
DYSPEPSIA. Indigestion. [Throat.
DYSPHAGIA. Gullet—Swallowing—
DYSPNŒA. Respiration.
DYSURIA. Bladder—Urine.

EAR. Cerumen —Head.
EARLY RISING. Bed.
EARTH CLOSETS.
EATING.
ECCHYMOSIS. Bruise—Contusion.
ECTHYMA. Skin.
ECZEMA.
EDUCATION. Child—School.
EEL.
EFFERVESCENCE. Carbonic Acid—Citrates of Ammonia—Magnesia—Potash—Soda. [fectants.
EFFLUVIUM. Deodorants — Disin-
EFFUSION.
EGG.
ELASTICITY. India Rubber.
ELATERIUM.
ELECTRICITY and GALVANISM.
ELECTUARY. Confection.
ELEPHANTIASIS. Barbadoes Leg.
ELM BARK.
EMACIATION. Atrophy—Consumption—Starvation.
EMBROCATION. Liniment.
EMERGENCIES. Ambulance—Burns—Fractures — Fits — Emetics — Hæmorrhage.
EMETICS.
EMIGRATION. Ship.
EMMENAGOGUES. Menstruation.
EMOLLIENTS.
EMPHYSEMA. Asthma—Bronchitis—Fractured Ribs. [tion.
EMPYEMA. Aspirator—Inflamma-
EMPYREUMA. Baking.
EMULSION. Camphor—Castor Oil—Turpentine.
ENAMEL. Teeth.
ENCEPHALON. Brain.
ENDEMIC. Climate—Epidemic.
ENDERMIC. Hypodermic.
ENEMA.
ENTERIC FEVER. Disinfectants.
ENTERITIS.
ENTOZOA. Worms.
ENURESIS. Incontinence—Urine.
EPHEMERA. Fever.
EPIDEMIC. Contagion—Endemic.
EPIDERMIS. Skin.
EPIGASTRIUM. Abdomen.
EPIGLOTTIS. Larynx.
EPILEPSY. Emergencies Child—Convulsion.
EPIPHYSIS. Bone.
EPISPASTICS.
EPISTAXIS. Hæmorrhage. [Skin
EPITHELIUM. Mucous Membrane—
EPSOM SALTS.
ERGOT OF RYE.
ERRHINES. [Brash.
ERUCTATION. Flatulence — Water
ERUPTION. Skin.
ERYSIPELAS. Silver, Nitrate of—Skin Diseases.
ERYTHEMA. Skin diseases.
ESCHAR. Escharotics.
EUCALYPTUS. Disinfectants.
EUONYMIN.
EUSTACHIAN TUBE. Ear.
EXANTHEMATA. Measles—Scarlatina—Small-Pox.
EXCITEMENT. Stimulants.
EXCORIATION.
EXCRETION. Alimentary Canal — Bile—Blood—Lungs—Skin.
EXHALATION.
EXHAUSTION. Alcohol — Blood—Brain—Food.
EXPECTORANTS AND EXPECTORATION. Catarrh—Cough.
EXPIRATION. Respiration.
EXTRACTS. [Vision.
EYE. Amaurosis — Cataract —

FACE. Countenance—Complexion.
FACEACHE. Neuralgia.
FÆCES. Alimentary Canal.
FAHRENHEIT. Thermometer.
FAINTING. Emergencies—Hæmorrhage—Death.
FAITH.
FALLING SICKNESS. Epilepsy.
FAMINE. Starvation—Fever.
FARCY. Glanders.
FARINA. Fecula.
FARINACEOUS FOOD. Cookery — Food—Gluten—Grains.
FASTING. Abstinence — Animal Heat—Blood—Digestion—Food.
FAT. Axunge—Bacon—Banting—Digestion—Food.
FATUITY. Idiocy.
FAVUS. Skin Disease.
FEAR.
FEBRICULA. Fever.

N.B.—*The references are to articles which may also be consulted.*

FEBRIFUGE.
FECULA. Blood—Digestion—Food.
FEMORAL ARTERY.
FEMUR. Thigh Bone—Skeleton.
FERMENTATION. Alcohol— Antiseptic—Germs of Disease.
FERN. Kousso—Worms.
FETOR. Deodorants — Chlorine — Mercury. [themata.
FEVERS. Ague — Enteric — Exan-
FIBRINE. Albumen—Blood—Digestion—Food.
FIBULA.
FIGS.
FILBERTS.
FILTER. Water.
FINGERS.
FISH. Food—Poison
FISTULA. Rectum. [Hysteria.
FITS. Convulsions — Epilepsy —
FLANNEL. [digestion.
FLATULENCE. Child—Enema—In-
FLESH. Beef—Fibrine—Food.
FLOODING. Abortion — Child-Bed —Menstruation.
FLUCTUATION. Abscess.
FLUOR ALBUS. Menstruation.
FŒTUS. [Poultice.
FOMENTATION. Bran — Heat —
FOOD. Dietaries.
FORCEPS. Artery — Dressing — Hæmorrhage—Teeth.
FOREARM. Fracture—Skeleton.
FOX GLOVE. Digitalis.
FRACTURES. Ambulance—Dressing —Emergencies.
FRECKLES.
FRICTION. Liniment—Shampooing.
FRIGHT.
FRUITS.
FRYING.
FUMIGATION. Skin— Bath —Bed Contagion — Disinfectants — Sulphur.
FUNCTIONAL DISORDER. Disease.
FUNGI.
FUNIS.
FUR. Clothing.
FURUNCLE. Boil.

GALL BLADDER. Liver.
GALL STONES.
GALLS. Tannin.
GALVANISM. Electricity.
GAMBOGE. Cathartics—Dropsy.
GAME.
GANGLION.
GANGRENE. Mortification.
GARGLES. Sore Throat.
GARLIC.
GAS.
GASTRIC JUICE. Digestion—Food.
GASTRITIS. Stomach Inflammation.
GELATINE. Cookery—Food.
GENTIAN ROOT.
GERMS OF DISEASE. Fermentation.
GESTATION. Pregnancy — Child Birth.
GIDDINESS.
GIN. Alcohol.
GINGER.
GLACIAL ACETIC ACID.
GLANDERS.
GLANDS. Absorbents—Excretion—Digestion—Secretion.
GLAUBER SALT. Soda.
GLOBUS HYSTERICUS. Hysteria.
GLOTTIS. Larynx.
GLUTEN. Food—Grains.
GLYCERINE. Cerumen—Ear.
GODFREY'S CORDIAL. Opium — Quackery.
GOITRE. Bronchocele.
GOULARD EXTRACT. Lead.
GOUT. Chalk Stone—Colchicum—Gravel—Rheumatism—Urine.
GRAINS. Farina—Fecula—Food.
GRANULATION. Ulcers—Wounds.
GRAPE. Fermentation—Wine.
GRAVEL. Urine.
GREEN SICKNESS. Chlorosis.
GREGORY'S POWDER.
GRIPPE.
GROATS.
GROWTH. Age—Child—Digestion.
GRUEL.
GUAIAC.
GUARANA.
GUINEA WORM. [Digestion.
GULLET. Alimentary Canal —
GUM ARABIC.
GUMS. Child.
GUM-BOIL.
GUNSHOT WOUNDS. Wounds.
GUTTA PERCHA. Dressing — Wounds. [—Training.
GYMNASTICS. Education — School

HABIT.
HÆMATEMESIS. Hæmorrhage.
HÆMATURIA. Hæmorrhage.
HÆMOPTYSIS. Consumption — Hæmorrhage.
HÆMORRHAGE. Abortion—Artery — Child-Birth — Emergencies — Piles—Veins—Wounds.
HAIR. Baldness—Skin.
HAMMOCKS. Ambulance.
HAND. Artery—Bandage—Dislocation—Wounds.
HANGING. Animation suspended—Death—Respiration.
HARE.
HARE LIP.
HARROGATE.
HARTSHORN. Ammonia. [sema.
HAY ASTHMA. Asthma—Emphy-
HAZELINE. Piles. [Wounds.
HEAD. Brain—Giddiness—Skull—
HEADACHE. Brain— Fever—Indigestion.
HEALTH. General Health.
HEALTH RESORTS.
HEART. Angina Pectoris—Carditis —Circulation—Hysteria—Palpitation.
HEART-BURN. Indigestion.
HEAT. Animal Heat—Fomentation —Poultice.
HECTIC. Consumption—Collapse.
HELLEBORE. [ralgia.
HEMICRANIA. Headache — Neu-
HEMIPLEGIA. Paralysis.
HEMLOCK. Poultice.
HEMP, INDIAN.
HENBANE. Pill.
HEPATITIS. Liver. [—Marriage.
HEREDITARY TENDENCY. Diathesis
HERNIA. Rupture.
HERPES. Skin.
HERRING.
HICCUP. Hysteria.
HIP-JOINT.
HIP-JOINT DISEASE.
HOME SICKNESS.
HOMŒOPATHY.
HONEY.
HOOPING COUGH. Bronchitis—Catarrh—Convulsion—Expectorants.
HOPS.
HOREHOUND.
HORSE-RADISH. Aconite.
HOSPITALS. Bed—Drainage—Nursing—Sick-Room Management.
HOUSES. Bed-Room—Drainage——Public Health—Ventilation.
HOUSEMAID'S KNEE. Bursæ.
HUMERUS. Forearm—Skeleton.
HUNGER. Animal Heat —Appetite —Digestion—Fasting—Food.
HYDATIDS.
HYDRAGOGUE. Purgatives.
HYDRARGYRUM. Mercury.
HYDROCELE.
HYDROCEPHALUS. Brain.
HYDROCYANIC ACID. Prussic Acid.
HYDROGEN GAS. [Water.
HYDROPATHY. Ablution — Bath —
HYDROPHOBIA.
HYDROSTATIC BED. Bed.
HYDROTHORAX. Dropsy.
HYGIENE. Air—Bed-Room—Climate —Drainage—Food—Public Health —Traps—Ventilation—Water.
HYOSCYAMUS. Henbane.
HYPOCHONDRIA. Abdomen.
HYPOCHONDRIASIS. Indigestion.
HYPODERMY.
HYPOGASTRIUM. Abdomen.
HYSTERIA. Imitation.

ICE. Cold.
ICED DRINKS. Indigestion
ICELAND MOSS.
ICHOR. Ulcers. [Cretin—Insanity.
IDIOCY AND IMBECILITY. Brain—
IDIOPATHIC.
IDIOSYNCRASY. Diathesis.
IMITATION. Hysteria.
IMPERIAL.
IMPETIGO. Skin.
INCONTINENCE OF URINE. Urine.
INCUBUS. Sleep.
INDIA RUBBER.
INDIGESTION. Alimentary Canal—Digestion — Dinner — Drinks — Exercise—Food—Meals.
INFANTS. Child. [tants.
INFECTION. Contagion—Disinfec-
INFLAMMATION.
INFUSION. [tors.
INHALATION-INHALERS. Respira-
INJECTION. Clyster — Enema — Hypodermy.
INOCULATION. Small-Pox—Poison.
INQUEST. Death — Drowning — Hanging—Poison.
INSANITY. Delirium — Delirium Tremens—Dipsomania—Intoxication—Monomania—Stimulants.
INSPIRATION. Respiration.
INSTRUMENTS. [lants.
INTEMPERANCE. Alcohol— Stimu-
INTERMARRIAGE. Marriage.
INTERMITTENT. Ague.
INTESTINES. Abdomen — Alimentary Canal—Constipation.
INTOXICATION. Alcohol — Dipsomania—Stimulants.
INUNCTION.
INVERSION. Womb.
IODINE.
IPECACUANHA. Emetics.
IRIDIN. Liver.
IRIS. Eye.
IRON. Chalybeate.
IRRITABILITY.
IRRITATION. Convulsion.
ISINGLASS. Gelatine.
ISLE OF WIGHT.
ISSUE. Counter Irritation.
ITCH. Sulphur.

JALAP.
JAMES' POWDER. Antimony.
JAUNDICE. Bile—Fever, Yellow—Gall Bladder—Liver.
JAW. Fracture—Skull.
JEJUNUM. Intestines.
JELLY. Cookery—Gelatine.
JELLY-FISH. Stings.
JESUITS' BARK. Bark

N B.—The references are to articles which may also be consulted.

JOINTS. Ankle—Hip—Knee.
JOY.
JUGULAR VEINS. Neck—Veins.
JULEP.
JUNIPER. Gin.

KALI. Potash.
KAMELA.
KIDNEY. Bright's Disease—Urine.
KING'S EVIL. Scrofula.
KING'S YELLOW. Arsenic.
KINO. Catechu.
KNEE. Leg — Patella — Joints — Housemaid's Knee—Synovia.
KOUMISS. Milk.
KOUSSO. Fern—Worms.

LABOUR. Child-Birth.
LABURNUM.
LACERATION. Wounds.
LACTATION. Breast— Child— Milk —Nipple. [Villi.
LACTEAL. Absorbents — Digestion
LAMB.
LAMENESS. Ankle—Deformity
LANCET. Blood-letting.
LANGUOR. Debility.
LARCH.
LARD. Petroleum.
LARYNGITIS. Croup—Throat.
LARYNGOSCOPE.
LARYNX. Lungs.
LAUDANUM. Opium.
LAUGHTER. Convulsion.
LAUREL.
LAVEMENT. Enema.
LAXATIVE. Purgative.
LEAD. Artisan—Colic — Constipation — Litharge — Paralysis — Water.
LEAMINGTON. [mation.
LEECHES. Blood-letting—Inflam-
LEEK.
LEG. Fracture—Skeleton.
LEG, SWELLED.
LENS. Eye.
LENTILS.
LEPROSY. Skin Diseases.
LETHARGY. Apoplexy — Biliary Disorder—Debility—Languor.
LETTUCE.
LEUCORRHŒA. Whites.
LICE. Pediculi.
LICHEN. Skin Diseases.
LICHEN ISLANDICUS.
LIFE. Age—Death Rate.
LIFE ASSURANCE.
LIFTING CHILDREN.
LIGAMENTS.
LIGHT. Blindness—Eye—House.
LIGHTNING. [Water.
LIME. Carbonic Acid — Chalk—
LINIMENT. Embrocation.
LINSEED. Poultice.
LINT.—Dressing—Wounds.
LIP. Hare Lip—Skin.
LIQUORICE.
LIQUORS. Alcohol—Beer—Wine.
LITHARGE. Lead.
LITHIA.
LITHONTRIPTIC. Urine.
LITHOTOMY.
LIVER. Biliary Disorder—Climate —Digestion— Gall Stone— Jaundice.
LOBSTER. Fish—Food.
LOCHIA. Child-Birth.
LOCK JAW. Convulsion—Wound.
LOINS. Lumbar.
LONGEVITY. Age—Old Age—Life.
LONGING. Home Sickness—Pregnancy.
LOSS OF BLOOD. Hæmorrhage.
LOTIONS. Dressing—Lead—Zinc.
LOW DIET. Fasting — Hunger — Dietaries.
LOZENGE.
LUMBAGO. Rheumatism.
LUMBAR.
LUMBRICUS. Worms.
LUNACY. Delirium—Insanity.
LUNAR-CAUSTIC. Silver.
LUNCHEON. Breakfast—Dinner.
LUNGS. Aeration—Blood—Chest—Circulation—Trunk.
LUPUS.
LUXATION. Dislocation.
LYMPH. Absorbents—Wounds.

MACE. Nutmeg.
MADEIRA.
MADEIRA WINE.
MADNESS. Insanity.
MAGNESIA. Children—Indigestion.
MALARIA. Ague—Fever.
MALE FERN.
MALIC ACID.
MALIGNANT.
MALT LIQUOR. Beer—Porter.
MAMMA. Breast.
MANNA.
MARASMUS. Atrophy.
MARMALADE.
MARRIAGE. Hereditary Tendency.
MARROW.
MARSH MALLOW.
MASTICATION. Digestion—Teeth.
MATERIA MEDICA. Medicines.
MATICO.
MAW WORM. Worms.
MEALS. Breakfast — Dietaries — Dinner—Food.
MEASLES. Catarrh—Inflammation —Sick-Room Management.
MEASURES. Drugs.
MEAT. Beef—Food—Dietaries.
MECONIUM. Child.
MEDICINE. Diagnosis—Disease.
MEDICINES.
MEGRIM.
MELON.
MEMBRANE. Mucous Membrane.
MEMORY.
MENORRHAGIA. Menstruation.
MENSTRUATION. Abortion — Hæmorrhage—Pregnancy.
MERCURY—Artisan—Salivation.
MESENTERY. Digestion — Intestines.
METASTASIS.
MEZEREON.
MIASMA. Ague—Fever.
MICROSCOPE.
MIDRIFF. Diaphragm.
MILIARY. [—Food.
MILK. Breast—Cheese—Childhood
MILK FEVER. Child-Birth.
MIND. Insanity.
MINERAL ACIDS.
MINERAL WATER.
MINIM. Measures.
MINT. Carminative.
MISCARRIAGE. Abortion.
MIXTURES. Medicines.
MOLES.
MONKSHOOD. Aconite.
MONOMANIA. Insanity. [ation.
MONTHLY DISCHARGE. Menstru-
MORBUS COXARIUS. Hip-Joint Disease.
MORPHIA. Opium.
MORTAR and PESTLE.
MORTIFICATION. Bed-Sore — Inflammation—Slough.
MOTHER. Child-Bed—Childhood—Hereditary.— Nurse—Sick-Room Management. [Nævus.
MOTHER'S MARK. Childhood —
MOTION AND MOTOR CHANGE. Animal Heat—Blood—Food.
MOUTH. Aphtha—Palate—Saliva.
MOXA. Counter Irritation.
MUCILAGE. Gum.
MUCOUS MEMBRANE. Catarrh—Diarrhœa—Skin.
MUCUS. Pus.
MUMPS. Parotid Gland—Saliva.
MUSCLES and MUSCULAR FIBRE Beef—Food—Motion—Tendons.
MUSHROOMS. Belladonna.
MUSSEL. Fish.
MUSTARD. Counter Irritation
MUSTARD LEAVES.
MUTTON. Broiling—Cookery
MYRRH.

NÆVUS. Mother's Mark
NAILS. Skin.
NAPHTHA. Petroleum.
NARCOTICS.
NAUSEA. Pregnancy. [Rupture.
NAVEL. Child-Bed—Childhood —
NECK. Throat—Wry Neck.
NECROSIS. Bone.
NERVES and NERVOUS SYSTEM. Brain—Neuralgia—Spine.
NERVOUS DISEASE. Debility—Hysteria—Indigestion.
NETTLE.
NETTLE-RASH.
NEURALGIA. Headache — Hemicrania-Nervous Disease-Sciatica.
NEUTRAL SALTS.
NIGHT. Sleep. [Eye.
NIGHT BLINDNESS. Amaurosis—
NIGHTMARE. Sleep.
NIGHTSHADE. Belladonna.
NIPPLES. Breast—Child.
NITRATES.
NITRIC ACID.
NITROGEN. Air—Aliment—Food.
NITRO-HYDROCHLORIC ACID.
NITROUS ETHER.
NITROUS OXIDE. Anæsthetics.
NOCTURNAL DISCHARGES.
NODE.
NOLI ME TANGERE. Lupus.
NOSE. Hæmorrhage—Polypus.
NOSOLOGY.
NOSTALGIA. Home Sickness.
NOSTRUM. Quackery. [tion.
NOURISHMENT. Aliment — Diges-
NURSE. Breast—Child-Bed—Childhood—Milk.
NURSES for the SICK. Childhood—Cookery — Hospital — Management of the Sick-Room.
NUTMEGS. Mace—Spices.
NUTS. Chestnuts—Filberts.
NUX VOMICA. Poison.

OAK BARK. Galls.
OATS. Grains—Groats—Poultice.
OBESITY. Banting—Fat.
OBSTETRICS. Child-Bed.
OCCIPUT.
OCCUPATION. Artisan.
ŒDEMA. Anasarca—Dropsy.
ŒSOPHAGUS. Gullet — Alimentary Canal.
OIL. [—Wounds.
OINTMENT. Dressing — Petroleum
OLD AGE. Age—Childhood—Life.
OLIVES. Ammonia—Camphor.
OMENTUM. Intestines.
ONANISM.
ONION and GARLIC.
ONYCHIA. Abscess.
OPHTHALMIA. Eye—Vision.
OPINION, MEDICAL. Diagnosis.
OPIUM. Anodynes—Poppy—Hypodermy—Narcotics—Sedatives.

N.B.—*The references are to articles which may also be consulted.*

OPODELDOC. [Colour.
OPTICAL ILLUSIONS. Blindness,
ORANGE.
ORBIT.
OSMAZOME.
OSSIFICATION. Bone—Cartilage.
OVARIOTOMY.
OVARY.
OVERCROWDING. Cubic Space—Public Health.
OVUM. Egg.
OXALIC ACID. Poison.
OXALURIA. Urine.
OX-GALL.
OXIDE OF BISMUTH. Bismuth.
OXYGEN GAS. Air—Blood Circulation.
OXYGEN WATER.
OXYMEL.
OYSTERS.
OZONE.

PAIN. Anæsthetics — Nerves — Neuralgia—Opium—Narcotics.
PAINTER'S COLIC. Colic—Lead.
PAINTER'S PARALYSIS. Lead Palsy—Dropped Wrist.
PAINTS and PAINTING. Arsenic.
PALATE. Mouth—Nose—Throat—Tonsils—Uvula.
PALLIATIVES. Opium—Pain.
PALPITATION of the Heart.
PALSY. Paralysis.
PANACEA.
PANADA. Childhood.
PANCAKES.
PANCREAS. Alimentary Canal.
PAPILLA. Skin.
PAPULE. Skin Diseases.
PARALYSIS. Apoplexy — Brain—Nervous System.
PARALYSIS, INFANTILE. Electricity.
PARAPLEGIA. Paralysis.
PAREGORIC. Opium.
PAREIRA. [Idiocy—Marriage.
PARENT. Child-Bed—Hereditary—
PARIETAL BONE. Skull.
PAROTID GLAND. Mumps—Saliva.
PAROXYSM.
PARSNIPS.
PARTURITION. Child-Bed.
PASSION.
PASSION ILIAC. Colic.
PASTILLES.
PASTRY. Confectionery.
PATELLA. Knee—Fracture.
PATENT MEDICINE. Quackery.
PATHOLOGY.
PEA. Diarrhœa—Food—Grains.
PEACH.
PEARL ASH.
PEARL-BARLEY. Barley.
PEARS.
PEDICULI. Crab-louse.
PELVIS. Abdomen—Bladder—Hip.
PEMMICAN.
PENNY-ROYAL.
PEPPER. Capsicum—Cubebs.
PEPPERMINT. Mints.
PEPSIN. Pancreas—Digestion.
PERCUSSION. Auscultation.
PERFORATION. Enteric Fever.
PERICARDIUM. Carditis—Heart.
PERICRANIUM.
PERINEUM.
PERIODICITY.
PERIOSTEUM. Bone—Node.
PERISTALTIC. Intestines.
PERITONEUM. Abdomen—Inflammation.
PERMANGANATE OF POTASH. Antiseptics—Disinfectants—Potash.
PERSONS FOUND DEAD. Death—Drowning—Hanging—Inquest.
PERSPIRATION. Skin.
PERUVIAN BARK. Bark—Ague—Fever Remittent.
PESSARY. Womb.
PESTILENCE. Endemic—Epidemic.
PETECHIÆ. Fever, Typhus.
PETROLEUM.
PHAGEDENIC. Mortification.
PHARMACOPŒIA. Medicines—Measures—Weights.
PHARYNX. Gullet—Throat.
PHENACETINE.
PHLEBITIS. Pyæmia—Veins.
PHLEBOTOMY. Blood-letting.
PHLEGM. Mucus.
PHLEGMASIA DOLENS. Leg, swelled.
PHLEGMON. Abscess—Erysipelas.
PHOSPHATES. Phosphorus—Soda.
PHOSPHORUS.
PHRENITIS.
PHTHISIS. Consumption—Cod Liver Oil—Hectic—Scrofula.
PHYSIC.
PHYSICIAN. Medicine—Practitioner General—Surgeon.
PHYSIOGNOMY. Complexion—Countenance—Face.
PHYSIOLOGY.
PICKLES. Vinegar.
PILES. Rectum—Hazeline—Veins.
PILL. Medicines.
PIMENTO. Pepper.
PIMPLES. Ague—Skin—Sebaceous.
PINE APPLES.
PINS and NEEDLES.
PITCH. Tar.
PLACENTA. After-birth—Child-Bed.
PLAGUE. Contagion. [Spine.
PLASTER OF PARIS. Fracture—
PLASTER. Blister—Dressing.
PLEASURE. Dancing—Excitants.
PLETHORA. Apoplexy — Debility—Blood-letting.
PLEURA. Lungs—Pleurisy.
PLEURISY. Inflammation—Lungs.
PLEURODYNIA.
PLICA. Hair.
PLUMMER'S PILL. Mercury—Pill.
PNEUMONIA. Inflammation.
PODOPHYLLUM.
POISON. Inquest—Wounds.
POLYPUS. Nose—Womb.
POMEGRANATE.
POOR. Bed-Room — Drainage — House—Water—Public Health.
POPLITEAL SPACE. Knee.
POPPY. Opium.
PORK. Bacon—Food—Trichina.
PORRIGO. Scalp.
PORTER. Beer—Stimulants.
PORT WINE. Alcohol—Wine.
POSITION. Ambulance—Fracture—Hammock—Sleep—Wounds.
POSSET.
POTASH.
POTATO. Fecula—Food.
POTENTILLA. Tormentilla.
POULTICE. Dressing—Heat.
POULTRY. Food.
POWDER. Medicines.
PRACTICE.
PRACTITIONER GENERAL. Advice, Medical—Physician—Surgeon.
PRECIPITATE.
PRECOCITY. Education.
PRECORDIAL REGION. Chest.
PREDISPOSITION. Disease—Hereditary Tendency—Marriage.
PREGNANCY. Abortion—Child-Bed—Pelvis.
PREMATURE BIRTH. Child-Bed.
PRESCRIPTION. Medicines.
PRESERVED PROVISIONS. Antiseptics—Pemmican.
PRESSURE. Air—Artery—Bed. Bed-Sore—India Rubber.
PRICKLY HEAT.
PRIVIES. Drainage—Earth Closet—Public Health—Water-Closet.
PROGNOSIS. Advice, Medical—Death—Diagnosis. [Womb.
PROLAPSUS. Piles — Rectum —
PROSTATE GLAND. Bladder.
PROTEINE. Food.
PROTRUSION. Prolapsus—Rupture.
PROUD FLESH. Granulation—Ulcer.
PROXIMATE CAUSE.
PRUNES.
PRURIGO. Skin Disease.
PRURITUS. Nettle Rash—Skin.
PRUSSIC ACID. Indigestion.
PSORA. Itch—Scabies.
PSORIASIS. Skin Disease.
PTISAN. Diluents—Drinks.
PTYALISM. Mercury—Salivation.
PUBERTY. Age—Menstruation.
PUBLIC HEALTH. Air—Drainage—Damp—House-Traps—Vaccination—Water—Water-Closets.
PUDDINGS. Cookery.
PUERPERAL. Child-Bed.
PULMONARY. Lungs. [Heart.
PULSE. Artery — Circulation —
PUMP, STOMACH.
PUMPS. Lead—Water.
PUNCTURED WOUNDS. Wounds.
PUPIL. Eye—Vision.
PURGATIVES. Biliary Disorder—Constipation — Digestion — Indigestion.
PURGING FLAX.
PURPURA. Scurvy.
PUS. Abscess — Inflammation — Ulceration. [Pox.
PUSTULE. Skin Disease—Small-
PUSTULE, MALIGNANT. Carbuncle.
PUTREFACTION. Antiseptics—Fermentation—Germs of Disease.
PYÆMIA. Antiseptics — Carbolic Acid—Phlebitis.
PYLORUS. Stomach.
PYROLIGNEOUS ACID. Acetic Acid.
PYROSIS. Water-Brash.

QUACK. Quackery and Quack Medicines—Advice, Medical.
QUARANTINE.
QUARTAN. Ague.
QUASSIA.
QUICKENING. Pregnancy.
QUICKLIME. Lime.
QUICKSILVER. Mercury.
QUINCE SEEDS.
QUININE. Bark.
QUINSY. Sore Throat.
QUOTIDIAN. Ague.

RABIES. Hydrophobia.
RADISH.
RADIUS. Forearm.
RAISIN.
RANULA.
RANUNCULUS.
RASH. Exanthemata—Skin Disease.
RASPBERRY ACID.
REACTION.
READING ALOUD.
RECREATION. Exercise—Dancing.
RECTUM. Alimentary Canal—Fistula—Intestines.
REFRIGERANTS. Cold—Fever—Ice—India Rubber. [Training.
REGIMEN. Dietaries — Food —
RELAXATION. Recreation.
REMITTENT FEVER. Climate—Fever.
RENAL. Kidneys.
RESINS. Basilicon—Plaster.

N.B.—*The references are to articles which may also be consulted.*

RESOLUTION. Inflammation.
RESPIRATION. Æration — Chest—Circulation—Lungs. [halers.
RESPIRATORS. Consumption — In-
REST. Sleep.
RESUSCITATION. Animation, Suspended — Drowning — Hanging—Carbonic Acid—Cold.
RETE MUCOSUM. Skin.
RETENTION OF URINE.
RETINA. Eye—Vision.
RHEUMATISM. Acupuncture—Carditis — Electricity — Gout — Salicine. [Pill.
RHUBARB. Gregory's Powder —
RHUBARB, GARDEN. Oxalic Acid.
RIBS. Chest—Skeleton—Trunk.
RICE. Grains. [Deformity.
RICKETS. Scrofula — Childhood —
RIGOR. Shivering.
RING, FIXED. Finger.
RINGWORM. Scalp—Microscope.
ROASTING. Boiling—Broiling.
ROCHELLE SALT. Potash.
ROLLER. Bandage—Disinfectants.
ROSE. Erysipelas.
ROSEMARY.
ROSE PETALS.
ROSE-RASH.
RUBEFACIENT. Counter Irritation.
RUE. [Meals.
RULE, LIVING BY. Indigestion—
RUM. Alcohol—Colic—Head.
RUPTURE. Abdomen—Intestines.
RYE. Ergot.

SACCHARINE. Diabetes—Sugar.
SACRUM. Pelvis—Spine.
SAFFRON.
SAGE.
SAGO. Cookery—Starch. [las.
SAINT ANTHONY'S FIRE. Erysipe-
SAINT VITUS'S DANCE. Convulsion —Nervous System.
SALADS.
SALEP.
SALICINE. Rheumatism.
SALINES.
SALIVA. Parotid.
SALIVATION. Mercury.
SALMON.
SAL PRUNELLE.
SALT. Food—Preserved Provisions.
SALT MEAT. Preserved Provisions.
SALT OF TARTAR. Potash.
SALTPETRE. Potash.
SAL VOLATILE. Ammonia.
SAMPHIRE. Pickles.
SANATORIUM. Convalescent Homes —Hospitals.
SANITAS. Terebene.
SANITATION. Air — Antiseptics — Bed and Bed-Room—Chimney—Climate — Clothing — Cold — Contagion — Damp — Disease — Disinfectants—Drainage — Education—Exercise — Food — Graveyards — Heat — Houses — Light — Life — Public Health — Putrefaction — Recreation — Skin — Sleep—Temperance—Town—Training—Traps — Ventilation — Water — Water-Closets.
SANTONINE.
SARCINÆ VENTRICULI.
SARDONIC SMILE. Countenance.
SARSAPARILLA.
SAUSAGES. Putrefaction.
SAVIN. Juniper.
SCABIES. Itch.
SCALD. Burn—Cotton—Wounds.
SCALD HEAD. [—Wound.
SCALP. Erysipelas—Bandage—Skull
SCAMMONY. —
SCAPULA. Shoulder—Skeleton.
SCARF-SKIN. Skin.
SCARIFICATIONS. Blood-letting — Childhood—Gums. [infection.
SCARLET FEVER. Contagion—Dis-
SCHOOL. Air — Childhood — Education—Ventilation. [algia.
SCIATICA. Nervous System—Neur-
SCIRRHUS. Cancer.
SCLEROTIC. Eye.
SCREAMING. [Rickets.
SCROFULA. Damp—Consumption—
SCURF. Dandriff.
SCURVY. Purpura.
SCYBALÆ.
SEA AIR. Climate—Convalescence.
SEA BATHING. Bath.
SEASONING. Acclimation.
SEASONS. Acclimation — Climate—Clothing—Cold—Heat.
SEBACEOUS. Skin.
SECALE CORNUTUM. Ergot.
SECONDARY.
SECRETION. Excretion—Glands.
SECUNDINES. After-birth — Child-Bed.
SEDATIVES. Anodynes—Narcotics.
SEDENTARY.
SEIDLITZ.
SELTZER WATER.
SEMOLINA. [Medical.
SENDING FOR THE DOCTOR. Advice,
SENNA. Purgatives.
SENSATION AND SENSIBILITY. Nerves and Nervous System.
SEROUS MEMBRANES.
SERUM. Blood.
SETON. Counter Irritation.
SEWER. Drainage.
SEX. Age. [tion.
SHAMPOOING. Circulation — Fric-
SHELL FISH. Crab—Oysters.
SHERRY. Alcohol—Wine.
SHINGLES. Herpes—Skin Disease.
SHIP. Emigration—Sickness, Sea.
SHIVERING. Rigor.
SHOCK. Pain—Stimulants.
SHORT SIGHT. Vision.
SHOULDER. Axilla—Clavicle—Dislocation—Fracture—Joint.
SIALOGOGUES. Saliva.
SICKNESS. Vomiting.
SICKNESS, SEA. Chloroform—Sea.
SICK-ROOM. Appendix.
SIDE, PAIN IN. Pleurodynia.
SIGHT. Vision. SILK.
SILVER. Caustic—Nitrates.
SINAPISM. Counter Irritation — Mustard Poultice.
SINAPINE TISSUE. Mustard Leaves.
SINGING.
SINKING. Indigestion.
SINUS. Fistula—Wounds.
SKELETON, HUMAN. Bones.
SKIN. Ablution—Absorption—Bath.
SKULL. Brain—Fracture—Nervous System.
SLEEP. Breakfast—Dreams—Early Rising—Night.
SLOUGH. Bed-Sore—Mortification.
SMALL-POX. Pustule—Vaccination.
SMELL. Nose.
SMOKE NUISANCE AND ABATEMENT. Stoves—Ventilation.
SMOKING. Tobacco.
SMOTHERING. Suffocation.
SNAKE POISON.
SNEEZING.
SNUFF. SNUFFLES.
SOAP. Castile Soap—Eczema.
SODA. Borax—Rochelle Salt—Salt.
SOLANUM. Dulcamara.
SOLUTION.
SOMNAMBULISM. Sleep.
SORE THROAT. Croup Throat.
SOUND. Deafness.
SOUP. Broth, Beef.
SPASM. Colic—Cramp—Urine.
SPASMODIC DISEASE. Lock Jaw—St Vitus' Dance—Nervous Disease.
SPATHULA.
SPECIFIC.
SPECTACLES. Eye Vision.
SPECULUM.
SPEECH. Aphasia—Aphonia.
SPERMACETI. Ointment. [tum.
SPHINCTER MUSCLE. Anus — Rec-
SPICES. Cinnamon—Pepper.
SPINACH. [Position—School.
SPINE. Education — Gymnastics—
SPIRITS. Alcohol—Brandy—Gin—Stimulants. [Indigestion.
SPIRITS, LOW. Hypochondriasis—
SPITTING OF BLOOD. Hæmorrhage—Lungs.
SPLEEN. Abdomen—Trunk.
SPLINT. Fractures.
SPONGE. Bronchocele — Iodine — Management of Sick-Room.
SPONGIO-PILINE. Poultice.
SPORADIC DISEASES.
SPRAIN.
SPRUCE BEER.
SQUILL. Expectorants—Pill.
SQUINT. Eye—Vision.
STAB. Wounds.
STAMMERING. Speech.
STARCH. Fecula.
STARVATION. Abstinence—Food.
STAYS. Education.
STEAM. Bath—Heat—Inhalation.
STEEL. Iron.
STERNUM. Chest—Trunk.
STERTOR.
STETHOSCOPE. Auscultation.
STEWING. [Dressing—Plaster.
STICKING PLASTER. Adhesive —
STIFF JOINT, Anchylosis.
STILL-BORN. Child-Bed.
STIMULANTS. Alcohol—Fever—Intemperance.
STIMULANTS, GENERAL. Excitants.
STINGS. Jelly Fish — Wounds, Poisoned. [Wounds.
STITCHES. Dressing—Pain—Side—
STOMACH. Alimentary Canal—Gastritis—Poison.
STOMACH PUMP. [—Urine.
STONE. Gall Stone—Biliary Calculi
STONE FRUIT. Biliary—Disorder.
STONE POCK.
STOOLS. Management of Sick-Room —Prolapsus—Rectum.
STOVES. Chimney—Smoke Abatement—Ventilation.
STRAINING. Stools.
STRAMONIUM. Thorn Apple.
STRANGULATION. Hanging — Rupture.
STRANGURY. Bladder—Blister.
STRAWBERRY.
STRICTURE. Urethra.
STRUMA. Scrofula.
STRYCHNINE. Nux Vomica.
STUN. Brain, Concussion of.
STUPOR. Coma.
STYE. Eye.
STYPTICS. Hæmorrhage.
SUBSULTUS.
SUCKLING. Child—Nurse.
SUDDEN DEATH. Death.
SUDORIFIC. Diaphoretic.
SUFFOCATION. Death—Hanging.
SUFFUSION. [Food—Milk—Syrup.
SUGAR. Diabetes—Fermentation—
SUGAR OF LEAD. Astringents—Lead.
SUICIDE. Insanity—Inquest. [Zinc.
SULPHATES. Copper — Magnesia—

N.B.—*The references are to articles which may also be consulted.*

SULPHUR. Disinfectants—Itch.
SULPHURIC ACID.
SUMBUL.
SUMMER. Heat — Periodicity — [Season.
SUNSTROKE.
SUPPER. Breakfast—Dinner—Food.
SUPPOSITORY.
SUPPRESSION.
SUPPURATION. Abscess—Inflammation—Pus.
SURGEON. Physician—Practitioner, [General.
SUSPENDED ANIMATION. Carbonic Acid—Death—Drowning — Hanging—Suffocation.
SUTURE. Wounds.
SWALLOWING. Gullet—Throat.
SWEAT. Diaphoretics—Skin.
SWEETMEATS. Confectionery.
SWEET SPIRITS OF NITRE. Nitrous Ether.
SWELLED LEG. Leg.
SWELLING. Tumour.
SWINE POX. Chicken Pox.
SWING. Fracture.
SWOON. Fainting.
SYMMETRY. Deformity—Spine.
SYMPATHETIC NERVE. Nervous System.
SYMPATHY. Derivatives — Imitation.
SYMPTOMS. Diagnosis.
SYNOVIA. Knee.
SYPHILIS.
SYRINGE. Ear—Enema.
SYRUP.
SYSTOLE. Diastole—Heart.

TABES. Atrophy — Digestion — Scrofula.
TAMARINDS.
TANNIN and GALLIC ACID. Galls.
TAPEWORM. Worms.
TAPIOCA. Fecula.
TAPPING. Hydrocele—Dropsy.
TAR and PITCH. Eczema—Piles.
TARANTULA.
TARAXACUM. Dandelion.
TARTAR ON TEETH. Teeth.
TARTAR EMETIC. Antimony.
TARTARIC ACID. Effervescing.
TASTE. Tongue.
TAXIS. Rupture.
TEA. Adulteration — Breakfast—Coffee—Opium.
TEARS. Eye.
TEETH. Child—Gum-Boil — Indigestion—Nervous System.
TEETOTALISM. Intoxication — Stimulants.
TEMPER. Passion.
TEMPERAMENT. Complexion.
TEMPERANCE. Stimulants.
TEMPLES.
TENACULUM. Artery—Instruments.
TENDERNESS.
TENDO ACHILLIS. Wounds.
TENDONS. Ganglion.
TENESMUS. Diarrhœa—Dysentery.
TENT.
TEREBENE. Sanitas.
TERTIAN. Ague.
TESTICLES. Hydrocele.
TETANUS. Lock Jaw.
TETTER. Skin Disease.
THEINE. Tea.
THEOBROMINE. Cocoa.
THERAPEUTICS. Medicines.
THERMOMETER. Bath — Bedroom.
THIGH. Fracture — Hip — Knee.
THIRST. Diluents.
THORAX. Chest—Trunk.
THORN APPLE. Asthma.
THREAD WORM. Worms.
THROAT. Cut-Throat—Digestion—Gullet—Larynx—Mouth—Neck—Palate—Sore Throat — Tongue.
THROMBUS.
THRUSH. Aphtha.
THYMOL. Disinfectants.
THYMUS GLAND.
TIC DOULOUREUX. Neuralgia
TIGHT LACING. Education.
TINCTURES.
TOAD. Stings.—Wounds Poisoned.
TOASTED BREAD.
TOAST WATER. Cookery.
TOBACCO. Smoking.
TOES. Bunion—Corn—Fracture.
TOLU. Balsam.
TONGUE.
TONICS. Excitants—Stimulants.
TONSILS. Debility—Sore Throat.
TOOTH-ACHE. Tooth.
TORMENTILLA.
TORPOR.
TORQUAY. Health Resorts.
TOTAL ABSTINENCE. Stimulants.
TOURNIQUET. Artery—Emergencies—Hæmorrhage.
TOUS-LES-MOIS. Fecula.
TOW.
TOWN. Public Health—Sanitation.
TOXICOLOGY. Poison.
TRACHEA. Bronchi—Lungs.
TRAGACANTH. Gum.
TRAINING. Dietaries—Food.
TRANCE. Catalepsy.
TRAPS. Cisterns — Drainage — Water-Closets.
TRAVELLING. Recreation.
TREMOR. Delirium Tremens—Nervous Disease.
TREPHINE.
TRICHINIASIS. Pork.
TROCHAR.
TROCHES. Lozenges.
TROPICAL DISEASES. Appendix on. Fever—Liver. Canal—Digestion.
TRUNK. Abdomen — Alimentary.
TRUSS. Rupture.
TUBERCLE. Consumption — Scrofula.
TUMOUR. Cancer—Cyst—Polypus.
TUNBRIDGE WELLS. Chalybeate—Iron—Health Resorts.
TURMERIC.
TURN of LIFE. Menstruation.
TURNIPS. [Purpura.
TURPENTINE. — Bath — Enema—
TYMPANITIS. Enema — Enteric Fever—Mineral Acids.
TYMPANUM. Ear.
TYPE of DISEASE.
TYPHOID FEVER. Enteric Fever.
TYPHUS FEVER.

ULCER and ULCERATION. Bandage—Dressing—Veins—Wounds.
UMBILICUS. Children—Rupture.
URETER. Kidney.
URETHRA. Bladder.
URINE. Bladder—Bright's Disease — Diuretics — Dropsy — Gout — Indigestion—Kidney—Urethra.
UTERUS. Womb.
UVA URSI.
UVULA. Mouth—Palate—Throat.

VACCINATION. Small-Pox.
VALERIAN.
VALETUDINARIAN.
VALVES. Heart—Veins.
VAPOUR BATH. Bath.
VARIOLA. Small-Pox.
VEAL.
VEGETABLES. Food—Grains.
VEINS. Circulation—Phlebitis.
VENEREAL. Syphilis.
VENESECTION. Blood-letting.
VENISON.
VENTILATION. Air—Cubic Space—Overcrowding—Public Health.
VENTRICLE. Circulation—Heart.
VERDIGRIS. Copper.
VERTEBRA. Spine.
VERTIGO. Giddiness—Indigestion.
VESICATION. Blister—Skin.
VESICLE. Chicken Pox — Skin Disease.
VICARIOUS ACTION. Menstruation.
VILLI. Digestion—Intestines.
VINEGAR. Acetic Acid—Pickles.
VIOLET.
VIPER. Wounds, Poisoned.
VIS MEDICATRIX.
VISION. Squint Eye. Amaurosis.
VITRIOL. Sulphuric Acid.
VOICE. Aphonia—Children—Reading Aloud.
VOMITING. Creasote — Emetics — Nausea—Poison—Sea Sickness.

WAISTCOATS, UNDER. Clothing—Flannel—Wash Leather.
WAKEFULNESS. Old Age—Sleep.
WALKING. Exercise—Recreation.
WALLS and WALL PAPERS. House—Arsenic.
WALNUTS.
WARM FLUIDS. Diluents—Drinks.
WARTS. Skin.
WASHING. Ablution.
WASH LEATHER. Rheumatism.
WASPS. Stings.
WASTING. Atrophy—Tabes.
WATER. Diluents—Baths—Cold—Heat.
WATER BEDS AND CUSHIONS. Bed—India Rubber.
WATER-BRASH. Indigestion.
WATER-CLOSETS. Drainage—House—Traps.
WATER DRESSING. Dressing. — [Wounds.
WATER IN THE CHEST. Dropsy—Hydrothorax — Inflammation — Pleurisy—Serous Membranes.
WATER IN THE HEAD. Brain — Hydrocephalus.
WATERS, Mineral. Health Resorts.
WATERSTROKE.
WAX. Cerumen—Ointments.
WEANING. Childhood—Nurse.
WEATHER. Climate—Season.
WEEPING EYE. Eye.
WEIGHTS AND SCALES.
WEN. Tumour.
WHEAT. Bread—Grains.
WHEY. Milk.
WHITE LEG. Leg.
WHITES. Menstruation.
WHITE SWELLING. Knee.
WHITEWASHING. House—Light.
WILLOW BARK. Salicine.
WIND. Flatulence.
WINDPIPE. Lungs.
WINE. Alcohol—Stimulants.
WISDOM TEETH. Teeth.
WOMB.
WOOD SORREL. Oxalic Acid.
WOOL. Burns—Clothing.
WORMS. Fern — Kousso — Pomegranate—Turpentine.
WORMWOOD.
WOUNDS. Antiseptics—Bandage—Carbolic Acid—Dressing—Scalp—Ulcers.
WRIST DROP. Dropped Hand.
WRY NECK.

YAWNING. Gaping.
YAWS.
YEAST. Diabetes—Fever—Poultice.
YELLOW FEVER. Fever.
YEW BERRIES.

ZINC. Burnett's Solution — Copper Disinfectants. [Disease.
ZYMOTIC. Fermentation—Germs of

N.B —*The references are to articles which may also be consulted.*

DICTIONARY OF DOMESTIC MEDICINE.

ABDOMEN (figs. 1 and 2).—The abdomen is the name given to that large cavity containing the alimentary and other organs, which extends from the lower part of the walls of the chest to the bones of the pelvis. It is bounded above by a strong muscle called the diaphragm, which separates the organs contained in the chest from those of the abdomen, and below by the bones of the pelvis. The cavity is partially divided into two anatomical parts by the brim or crest of the pelvis, but the divisions are so incomplete that they are better treated as one cavity. The enclosing walls of the abdomen are formed by muscles, tendons, and strong membranes, which, along with the support of the spinal column, furnish a means of protection from injury, while allowing freedom of action for the bowels. To facilitate description medically, the abdomen is mapped out into regions by horizontal and vertical lines; the intermediate spaces corresponding with, and consequently indicative of, the position of the internal organs, are represented in the illustration (fig. 1). The two cross lines divide the cavity into three zones, an upper, middle, and a lower, and with the two perpendicular lines, it is further subdivided into nine regions, viz., 1, epigastric, over the stomach; 2, umbilical or navel portion; 3, hypogastric; 4, 4, right and left hypochondriac; 5, 5, right and left lumbar; and 6, 6, right and left iliac.

When the abdomen is opened the organs or viscera, as they are often termed, are seen to consist of two groups, an upper and lower, occupying the greater part of the cavity. The upper group comprises the liver, stomach, and spleen, and the first part of the small intestine; the lower includes the remaining portion of the small, and is surrounded by the large intestine, which, dipping into the pelvis, has its termination in the rectum. The bladder, the womb in the female, and the kidneys and large blood-vessels situated behind, make up the principal remaining organs placed in the cavity.

The liver and gall bladder (1) (fig. 2), inverted in the drawing, are situated in the upper zone, and extend from under the ribs of the right side across to the left; the stomach (2) is also

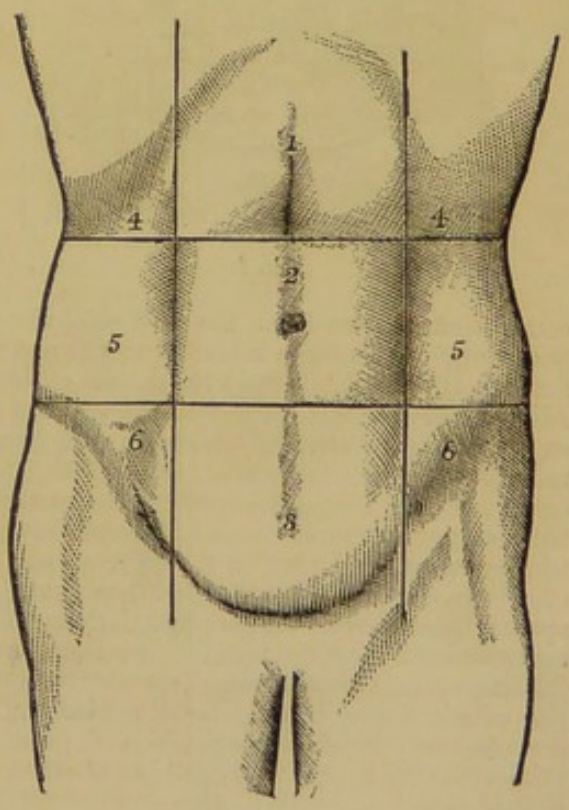


Fig. 1.

situated in the same zone, with its small end in the centre or epigastric, and its large end in the left hypochondriac region, where it is in contact with the spleen or milt (3); the pancreas or sweetbread (4) lies behind the stomach. The middle zone is the site of the large bowel or colon (5), the omentum or caul, and a portion of the small intestine (6), and lower portion of the kidneys; the remaining parts being situated in the upper zone, but too deep-seated to be shown in the figure.

The lower zone also indicates the position of numerous convolutions of the small intestine centrally (7), as well as on the right side, the

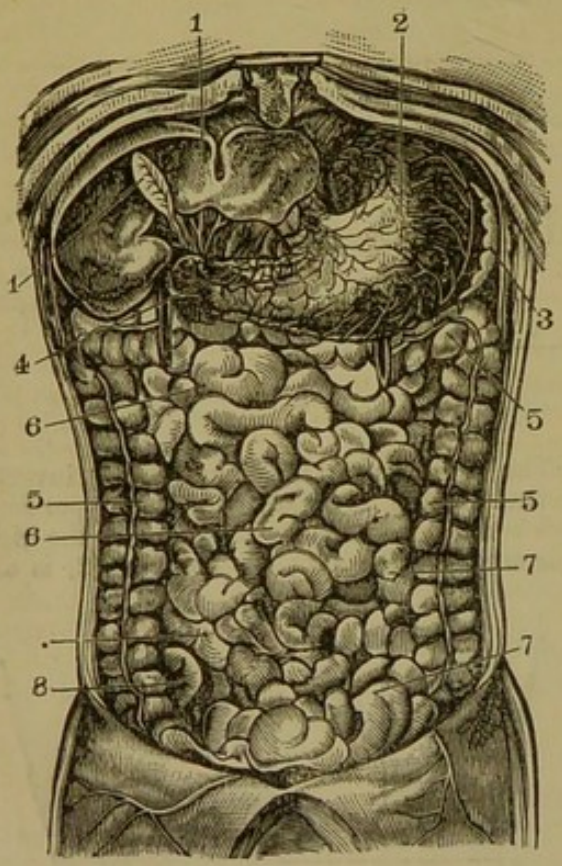


Fig. 2.

commencement, and on the left side the termination, of the large intestine in the sigmoid flexure, and the bladder in the case of children. All the parts or viscera named are covered and supported by a smooth, glistening, and moist membrane, the peritoneum, by far the most extensive and complex investing membrane of the body. It is continuous throughout its whole extent, and may be traced from one end of the cavity to the other, dipping into the spaces between the organs, and forming folds or ligaments to keep them in position, or to facilitate their movements. It also traverses the pelvic cavity, investing the bladder and rectum, and in the case of the female, the womb and its appendages. Both bladder and womb, when distended, rise from their own proper cavity into that of the abdomen. The viscera of the abdomen are divided into solid and hollow; of the former, the liver is an example; of the latter, the intestines and bladder. These, of course, give different sounds, when the covering of the abdomen, beneath which they lie, is slightly struck with the finger—a fact of great importance to the physician, in his examination of this cavity. The contents of the abdomen shift their position considerably according to posture. The diseases to which they are liable will be noticed under their respective heads. One of the most important accidents to which this cavity is subject, is protrusion of a portion of its contents through its walls, constituting hernia, or rupture. Accidental wounds *penetrating* the cavity of the belly are very generally fatal, and if they pierce any of the viscera, almost necessarily so. Within the last few years, however, surgeons have had much less hesitation than formerly in performing operations which required the abdominal cavity to be opened. The employment of antiseptics has of course aided this.

Refer to—*Diaphragm — Liver — Stomach— Peritoneum—Rupture—Intestines.*

ABLUTION.—Washing the surface of the body regularly, is, happily, in this country at least, becoming daily more common, but it is far from being so general a habit as it ought, particularly among the working-classes, who stand most in need of it; many go from January to December without even thinking it necessary to wash more than the face or hands. The skin ought continually to be throwing off, or excreting, gaseous, saline, and greasy matter, which it is necessary for the health of the body should be thrown off; but the skin cannot do this properly if caked over with perspiration and dirt, either its own or the dust to which many are exposed in the performance of their employments. The consequence of neglect is, that much is retained in the system which ought not to be there; an additional load of duty is thrown upon other excreting organs, as the liver and kidneys, and if they have not the power to compensate for man's own carelessness, languor, low spirits, headaches, local accumulations of blood, gout, gravel, and other diseases are the result. Fortunately, complete neglect cannot entirely stop the skin's functions, otherwise death itself must result. For the purpose of cleansing the skin, soft water ought to be used, if possible, with soap,—good brown is quite the most effectual,—and a thorough purification of the entire surface of the body should be effected once a week, at least, with these materials; along with this, washing over the surface with simple water, and rubbing well with a rough towel, every night or morning, as most convenient, will suffice to preserve a healthy state of skin. Those who are robust, and wash in the morning, ought to use cold water immediately on rising, while heat is abundant; but delicate persons cannot sustain the depression and subtraction of animal heat which this occasions; it leaves them chilled, languid, and with impaired digestion. There are some individuals, in whom cold sponging in the morning invariably produces heartburn and indigestion after breakfast; such ought to try the water slightly warm, or content themselves with washing only a portion of the skin each morning; if even this cannot be borne, dry friction with a rough towel or hair-glove may be substituted. It is certainly

a fact, that in many persons, and especially those of gouty habit, the use of the cold bath, in the morning, is injurious, unless it be followed by active exercise, which thoroughly restores the excretory functions of the skin. After washing, it is always desirable to rub the surface thoroughly with a towel till a warm glow is produced. For washing at night, water slightly warm is always to be preferred. The feet require very frequent washing. It is surprising how insensible individuals, even otherwise respectable, are upon this point; were it not so, they would never expose themselves to medical men in the disgusting state of dirt they frequently do. Happy are those who can have the use of baths for the purposes of ablution, but any man who can command water and a towel need not dispense with the luxury. For the aged, frequent and thorough ablution is most requisite; the often shameful neglect of this by those who have the care of old people, is visited upon them in querulousness, and troublesome bodily ailments, which attention to the duty would have prevented. When patients are confined to bed, it is very necessary that they should be washed or sponged daily, and afterwards carefully dried with a towel, well aired. This is the best preventive for bed sores, which are most liable to occur on the backs of dirty and neglected patients.

Refer to—*Bath—Children—Skin.*

ABORTION—MISCARRIAGE.—The terms abortion and miscarriage are applied to the expulsion of the human fœtus from the womb of the mother, previous to the sixth month of pregnancy, that is, before it is sufficiently developed to maintain its own independent existence; when the process occurs after that period, it is named premature labour. Miscarriage involves pain and weakness, in addition to the loss of offspring, and is often a severe trial to the maternal constitution. It may occur at any period of pregnancy, but particular stages are more liable to the accident than others; these are generally considered to be at the times at which menstruation would have occurred if conception had not taken place, more especially from three to five months after conception. When abortion has once taken place, it is more liable to occur again, and some have so strong a tendency to it, that they never go beyond a certain stage, at which they invariably miscarry. The cause of abortion may exist in the constitution of the female herself, and be the result of weakness and irritability, of over full habit, or of a diseased condition of the womb; the fœtus may die, or be deficient in development, when it is cast off like a blighted fruit. Suckling after conception has taken place, is not unfrequently a cause of miscarriage. Active disease occurring during pregnancy, such as severe inflammation, fevers, eruptive fevers, &c., is almost certain to occasion expulsion of the uterine contents. Continued diarrhœa, and the action of strong purgatives, particularly of the aloetic kind, are dangerous. This is a very cogent reason, for those who are pregnant, avoiding all quack aperient medicines; they almost all contain aloes, and may be very injurious. All undue exertion or agitation of body or mind, sudden jerks or jumps, riding on horseback in the early, or in a shaking carriage in the later, stages of pregnancy, may any of them bring on the mishap; to these may be added, exertion of the arms in doing anything on a level above the head; costive bowels and straining consequent thereon, sensual indulgences, and luxurious habits. Those who have once aborted ought to be extra careful in succeeding pregnancies, and all ought to bear in mind the possibility of the occurrence. The symptoms of threatened abortion vary with constitution; in the strong and plethoric, it is often preceded by shivering and febrile symptoms, and by feeling of weight in the lower bowels; in the weak, there is languor and faintness, flaccidity of the breasts, and general depression, and pains in the back and loins. Intermittent pains, and discharge of blood from the passage, tell that the process has begun. If miscarriage occurs within the first month or two after conception, the process may be accomplished with so little inconvenience as to escape notice, and to be mistaken for a menstrual period; more generally, however, the severity of the pain, and unusual clotted discharge, render the case evident. The pain, the discharge, and at the same time the danger of an abortion, are in proportion to the advancement of the pregnancy. When miscarriage goes on, the pains increase in force and frequency, and continue with discharge of blood, fluid, or in clots, until the ovum is expelled; after which, both become moderated, till they cease altogether, and the red flow gives place to a colourless one. It is very important that those in attendance upon the patient should examine every clot which comes away,—if large, tear it in pieces,—that they may ascertain whether the contents of the womb are expelled or not, for there is no safety or rest where miscarriage is progressing, till this has taken place, and everything cast off. When a medical man is in attendance, and in such cases he ought to be, all should be reserved for his inspection.

As soon as a woman experiences threatenings of abortion, she ought at once to retire to bed, upon a mattress, and keep perfectly quiet till every symptom has disappeared: sometimes this simple measure, *promptly adopted*, is sufficient to avert the threatened evil. If there is much feeling of fulness, and the patient is of full habit generally, eight or a dozen leeches may be applied to the lower part of the bowels; if there is fever, salines may be given, such as the common effervescing draught of carbonate of soda and tartaric acid, or lemon

juice; or if the bowels are much confined, Seidlitz powders or Epsom salts, assisting the action by cold injections if necessary. When the pains are severe, particularly in the weak and irritable, twenty or thirty drops of laudanum should be given, and may be repeated in a few hours if the symptom is unabated. In the case of profuse discharge, the patient should be kept very lightly covered, movement avoided, and every article of food or drink given cold, iced if possible, provided the vital powers are not excessively reduced, cloths dipped in cold or iced water should be applied to the lower part of the body, and frequently changed; acid drinks, with cream of tartar, may be given freely. Ten or fifteen drops of *diluted* sulphuric acid, or of aromatic sulphuric acid, may be given in a wine-glassful of water every two or three hours. Should slight faintness come on, it is better not interfered with, it may be salutary; if it goes to an extent to threaten life, stimulants, sal volatile, or brandy and water must be had recourse to. But long before matters go to this extent, proper medical assistance should be sought. Profuse and continued discharge, though it may not threaten life, must occasion weakness which is long of being overcome, and which may ultimately favour the development of fatal disease. The discharge may be kept up, solely, by a state of matters beyond the offices of domestic management, but to be speedily rectified by a little manual interference on the part of the medical man, who, by assisting the womb to cast off the already partially expelled contents, at once puts an end to further loss of blood. But even if matters be not sufficiently advanced to admit of this interference, the use of measures or remedies which the unprofessional cannot or ought not to employ, may save life, must save strength. Let no one think lightly of loss of blood; it saps the foundations of health. Circumstances may occur in which medical assistance is not to be obtained, at least not speedily, and flooding is profuse, and uncontrolled by the means already mentioned; in such a case, one grain and a half of sugar of lead made into a pill with crumb of bread, may be given every two hours, and washed down with a draught of vinegar and water, to which, if there is much pain, from five to ten drops of laudanum are to be added; in addition, pieces of linen or calico, soaked in a strong solution of alum, or decoction of oak-bark, and oiled, are to be used to plug the passage, or the astringent fluid may be thrown up with a syringe. It is repeated, the unprofessional should never adopt these measures, if professional advice is to be had; if not, it is better they should do so than matters go on uncontrolled. Both during the time, and after miscarriage, the general strength must be supported; this is better done by strong animal soups, milk preparations, with eggs, and meat, when it is proper, than by much stimulant; nevertheless, wine or malt liquor may be requisite. Convalescence is to be assisted by tonic medicines, those containing mineral acid, bark, or iron, are generally the most appropriate. The bowels, as indeed they do throughout, will require attention. Castor oil is very suitable; the cold or very cool water *enema* is most useful: a drachm of Epsom salts, dissolved in half a pint of water, either cold or slightly warmed, and fifteen drops of dilute sulphuric acid added, forms a most appropriate aperient, which should be taken before breakfast.

Three principles of treatment are to be kept in mind in the management of miscarriage.

The first, to prevent it, if possible, by rest, opiates, &c.

The second, to allay pain; to moderate the discharge of blood; save and support strength.

The third, when abortion must take place, to expedite the separation of the ovum.

The two first may be much assisted by judicious domestic management, the third must be done by the medical attendant only.

Refer to—*Pregnancy—Hœmorrhage.*

ABRASION.—An abrasion, by which the outer or scarf skin, or cuticle, is forcibly removed, and the sensitive surface of the under true skin or cutis exposed, is a trifling, but sometimes a painful accident, and it may be, where the hands are necessarily subjected to the action of poisonous or irritating fluid, a dangerous one. The protecting cuticle is quickly restored; in the meantime it is necessary to provide a substitute. It must be an unirritating one. Persons often err by putting the common diachylon-plaster on abrasions, and frequently much irritation and pain, and sometimes ulceration, is produced by it. Court-plaster does not irritate, but is not useful for a large surface, in which case gold-beater's leaf is quite the best application, if not exposed to moisture. Collodion has been used of late; it is not soon acted upon by water, but it causes severe smarting when first put on; this may be prevented by putting gold-beater's leaf next the sore, and collodion over. In the absence of the above, a little strong gum mucilage with a piece of tissue paper over, is a good substitute. Isinglass plaster is used; those who are not in the habit of applying it find a difficulty in making it adhere. The principle in treating an abrasion is to protect the sensitive true skin by some light, *perfectly unirritating, dry* application, till nature restores the natural covering. A mixture of one part of collodion with two parts of castor oil applied over an abrasion or burn, forms a smooth elastic covering or artificial cuticle. The smarting caused by the first application soon goes off.

Refer to—*Plasters—Skin—Wounds.*

ABSCESS.—A collection of purulent fluid in a cavity, formed in the substance of any of the bodily tissues, is named an abscess. The

contained matter or pus may be either of a healthy or of an unhealthy character; if the former, it is of a yellowish-white colour, cream-like in consistence, and possessing a faint sickly odour; in the latter case it may resemble whey, with bits of curdy substances floating in it, or it may be bloody, fœtid, &c.

Abscesses are either acute or chronic, and may occur in nearly every tissue of the body. The first symptoms of an acute abscess are heat and tenderness of the part, followed by throbbing pain. If the matter is deeply seated, no external marks may be visible for a time; when it is near the surface, the skin quickly exhibits inflammatory swelling; this continuing, it becomes thinner with more or less rapidity, until. at last, it gives way, and permits the matter to escape. Such is the natural course of what we may call a healthy abscess; but that course is necessarily modified by the position and coverings of the collection of matter. Abscesses do not always discharge through the skin, they may do so internally. Generally, as soon as the contents of an abscess are discharged, the pain which has previously been severe, ceases. Boils may be classed as abscesses; they contain a distinct core or slough. Chronic abscesses may continue for weeks or months without change, but give comparatively little pain; they occur in weak or scrofulous subjects, and very generally in glandular tissues. In addition to pain and swelling, the sense of fluctuation, as of fluid contained in a bag, which an abscess conveys to the finger, is a symptom valuable in obscure cases; but when it is most valuable, it requires the educated touch of the surgeon to discover it. On the first suspicion of an acute abscess, frequent fomentation with water as hot as it can be borne, may succeed, if purgative medicine be given at the same time, in preventing its formation; but if it does not do this, it will then assist and hasten its progress, while it soothes pain. When it is tolerably certain that matter is formed, thick, warm, soft poultices must be continually applied to the part, the *position of which should be regulated with as much regard to ease as possible.* It is sometimes the popular custom to apply irritants, such as honey, soap-and-sugar, and such like, to boils or abscesses, with the view of assisting or "breaking" them; the practice is both hurtful and cruel, and ought never to be followed. For fomentation, simple water; and for poultice, bread or linseed, are most generally applicable; when there is much pain, decoction of poppy-heads may be used for either, with advantage. Medical men are in the habit of opening abscesses, or boils, with the lancet or knife, but as to do this safely in every case requires anatomical knowledge, the unprofessional should be content with simply relieving and assisting the painful progress by the means mentioned, till the matter is discharged naturally. After this happens, poulticing ought to be persevered in for a few days, and then exchanged for simple water-dressing, which must be continued till the part is well. A little opening medicine should at the same time be given. Many persons are in the habit of squeezing abscesses after the matter discharges; the practice is useless and painful; very gentle pressure only is admissible. A chronic abscess is serious, from the indication it gives of a weak and unhealthy condition of body, and may also be so from size or position. The formation of an acute abscess is generally accompanied with more or less general inflammatory fever. In a chronic abscess, when there is fever, it has more of the hectic character, and is accompanied with night perspirations. A chronic abscess usually requires speedy evacuation artificially, and constitutional treatment is always called for: the first ought always to be done by a medical man, and the latter also, to be effectually carried out. Good light nourishment, with a due proportion of animal food, is indispensable; milk, if it agrees; wine or malt liquor, if there is not much fever. Regulation of the bowels by simple aperients—iron, mineral acid, with infusion of bark, and cod-liver oil, are the most generally applicable remedies in the constitutional treatment of chronic abscess.

Refer to — *Suppuration — Poultice — Water-dressing — Fever-hectic — Spine.*

ABSINTHE or **ABSINTHIUM** — wormwood—has long been used as a bitter tonic and as a worm remedy, both in this country and on the continent. It is omitted from the British Pharmacopœia, and its place is very properly taken by the active principle called *santonin*, which is one of the most valuable additions to our stock of medicines. There are various species of *Artemisia absinthium*, the unexpanded flower heads of which constitute santonica, from which santonin is prepared. Absinthe is also the name given to an intoxicating drink, much used in France, Algiers, &c.; its effects are thus described:—

Absinthism. — According to Dr. Emile Decaisne, the consumption of absinthe has of late years increased to an enormous extent in France. It is made by infusing in alcohol ends of wormwood, both major and minor (*sommittés d'absinthe*, from which the liquor takes its name), angelica root, *Calamus aromaticus*, aniseed, dittany seeds, and common marjoram. Some distillers, however, vary the recipe, and use fennel, mint, and balm. The concentration of the degree of the alcohol is generally very high. Indigo, tincture of turmeric, juice of hyssop, and nettles, are called to aid to improve the colour and appearance of the pernicious draught. The effect of absinthe is to produce a superabundant activity of the brain, a cerebral excitement which at first is agreeable. The intoxication "comes on rapidly, the head swims, and the effect produced is nearly the same as that of poisoning by a narcotic, which certainly does not occur with an equal dose of brandy. With the

absinthe-drinker, as with the brandy-drinker, the excitement the liquor produces diminishes daily in intensity. Each day he is obliged to augment the dose, in order to screw himself up to the right pitch." The diseases brought on by drinking brandy are produced much more rapidly by the use of absinthe. One of the greatest dangers of absinthe, says Dr. Decaisne, consists in its adulteration. Dr. Decaisne has observed more than 150 cases of chronic absinthism, and concludes that absinthe ought to be prohibited. He has convinced himself that absinthe, even of good quality and in moderate doses, sooner or later invariably produces disorders in the human economy. He considers that the extent to which it is now consumed in France demands the intervention of Government. He declares that the pale green demon has invaded all classes of society, the idler and the workman, the soldier and his officer; all professions, those who work with the brain, and those who work with the hand, swallow it with frenzied eagerness.

ABSORBENTS.—Absorbents are minute vessels distributed throughout the body, the office of which is to take up nutritive material, and convey it into the current of the general circulation. The lacteal absorbents are those which take up the nutrient portion of the food, named chyle, from the alimentary canal; they unite in one common trunk, which runs up in front of the spine, and joins the large veins going directly to the heart. (See *Digestion.*) Soon after a full meal, these lacteal absorbent vessels become distended with the milky-looking chyle, the essential nutriment, separated from the food by the first process of digestion. As this chyle has to pass through a set of small glands—the mesenteric—before it can reach the blood, it must be evident how much the health of the latter fluid, and the nutrition of the body generally must be interfered with, when these glands become diseased, as they frequently do in children.—See *Tabes.*

The lymphatic absorbents are distributed throughout the body, and take up and convey back to the general circulation whatever nutrient matter is fit to re-enter the blood. The accompanying illustration (fig. 3) represents the superficial absorbents of the fore-arm and palm of the hand. The lymphatic absorbents also pass through glands, which are more particularly observable on the sides of the neck, in the arm-pits, groins, and insides of the thighs. These lymphatic glands are very apt to become enlarged, inflamed, and even to suppurate, particularly in weak constitutions, or when there happens to be a sore on a part of the body more distant from the heart than the gland. In some persons, even scratching the head with the comb will occasion the glands of the neck to become swollen and painful. Popularly these enlarged glands go by the name of "waxen kernels." When any of the lymphatic glands exhibit symptoms of irritation, the first thing is to ascertain whether this be owing to some scratch, wound, or sore on the body; if the glands of the groin inflame, the

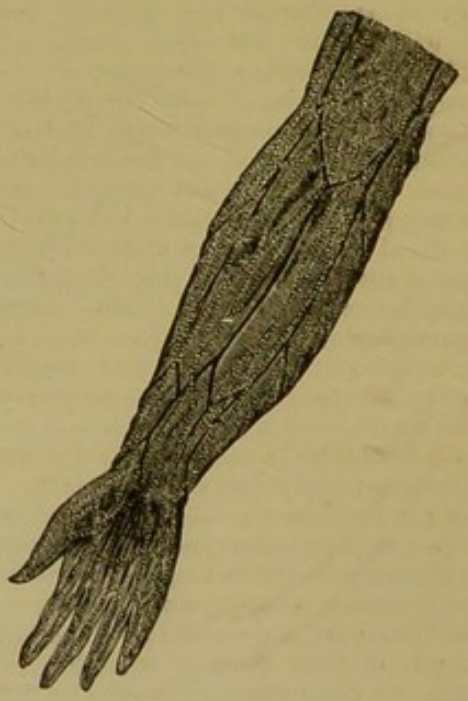


Fig. 3.

genital organs and the whole lower extremity must be examined, even between the toes; if the glands of the neck, the head must be well looked over, for it is evidently useless to be treating the secondary effect, while the cause, such as an irritable or irritated wound, continues, for they generally are, even though very small, irritable sores, which cause inflamed glands. If the exciting sore be soothed by rest, fomentations, poultices, &c., and a little simple opening medicine given, the irritated gland will generally resume its healthy condition; if it seems inclined to continue inflamed, it, too, must be soothed by the same means, and, if need be, one or more leeches applied, and the bowels more freely acted upon. Suppuration ought, if possible, to be prevented, in the neck especially, where it leaves an unseemly scar. In this situation, when matter has actually formed, the visible after-traces of the occurrence will be much less evident if the abscess be opened at the proper time, and in a proper manner, by the surgeon. The lymphatic glands, especially in weak or scrofulous persons, are apt to assume a state of chronic enlargement and slow suppuration. As the root of the evil is in the constitution, this must be invigorated in every possible way by nourishing animal diet, with probably wine or malt liquor, by early hours, regular exercise, and change of air, to the coast, if possible. Cod-liver oil, half nutriment, half medicine, is most useful, and may also be rubbed on the enlarged glands with advantage. Iron, iodide of iron, bark, and tonic medicines generally, are all indicated. Parrish's Chemical Food and Easton's Com-

pound Syrup are both excellent forms of tonic in appropriate doses. To these may be added Burrough's Beef and Iron Wine, and the various preparations of Maltine.

Refer to — *Mesentery — Tabes — Glands— Scrofula—Digestion—Villi.*

ABSORPTION.—Absorption is not performed by the "absorbents" alone; the blood-vessels take a considerable share, more particularly in the case of fluids; neither is the process confined to the interior of the body; it may take place through the skin, and thus a person who, from disease or accident, is disabled from swallowing fluids, may have his distress partly relieved by warm or tepid baths. In cases of shipwreck, or want of fresh water, fluid may, without injury, be supplied through the skin, by wrapping the body in clothes soaked with the sea-water.

ABSTINENCE.—Abstinence from food may be either compulsory or voluntary, the former depending on want and famine, the latter employed as a remedial measure in sickness, or with the view of combating a tendency to obesity. It is not so easy to deal with the effects of the first as with the last. Plague and pestilence follow in the wake of famine. We have forcible illustrations of this in every quarter of the globe. Death from absolute starvation is happily not a common occurrence in this country; but we have not unfrequently a condition of the body due to insufficient food, which renders it very susceptible to the influence of disease. This is exemplified by the general emaciation, sallow complexion, and feeble circulation of the sufferers, and their rapid return to health and activity when the conditions are reversed. On the other hand, more harm, it is often remarked, is done by over-abundance, than by a moderate deficiency in food. There are numbers of people who eat and drink less to the glory of God than to the gratification of their own morbid cravings, and who, if they persist in their indulgence, are carried off sooner or later by one or other of the numerous diseases which attack the intemperate eater as well as the drunkard—fatty heart, Bright's disease of the kidneys, and enlargement of the liver. Abstinence, moderate abstinence, in such cases is a real necessity, and it is fortunate that our knowledge of the physiological action of various kinds of food should render this by no means irksome, even to the *bon vivant*. He may partake with impunity of almost any kind of food, provided he eschews sweets and fats, and substitutes bran bread and green vegetables for white bread and potatoes, and takes pure or aerated water in preference to wines and malt liquors. But many persons suffer from forced abstinence with abundance of food at command. These are usually the subjects of irritable stomach and weak digestion, who, after trying every conceivable kind of food, find that nothing agrees with them, and in despair are reduced to living on an amount of nourishment insufficient to maintain health. These are cases requiring much medical skill to grapple with. Extreme habits of economy have been frequently known to foster abstinence, and it is a well-known fact that many persons live and fast without any serious injury to their bodies; but, to maintain the health-standard, a tolerably liberal supply of food is essential, alike for physical as for intellectual exertion. This is absolutely necessary in the young, who, when placed in schools and beyond the maternal care, may not have the same inducements in the way of food as when surrounded by home influences. Abstinence may become a habit and a very pernicious one, and it must be guarded against. The effect on those who practise it on religious grounds is frequently very injurious, and has been known to induce organic disease of the stomach.—See *Digestion —Diet—Obesity—Starvation—Fasting.*

ACARUS.—A genus of minute insects, two varieties of which are found on man,—(1) *Acarus autumnalis*, the harvest-bug; (2) *Acarus scabiei*, or itch insect.—See *Itch.*

ACCLIMATION or **ACCLIMATISATION.**—These terms are employed to denote the powers of the constitution to accommodate itself to different climates and new surroundings. The inhabitants of temperate climates possess this facility to a larger extent than those indigenous to the tropics or the arctic regions, and hence they make the best Colonists, though their powers of endurance are sorely tried by a protracted residence in hot climates. Health is best preserved in a latitude above 40 or 45 degrees. The change from a temperate to a warm climate is usually attended at first with considerable febrile disturbance, but under judicious management this result is easily surmounted. Although the influence of hot climates on the white races is notoriously prejudicial, much can be done to moderate the effects by care and sanitary precautions. These are rendered absolutely imperative by the malaria which are always more or less present in the tropics. The ignorance and inattention which prevail upon the subject of acclimation are truly lamentable; great numbers of young men yearly leave this country for hot climates, without one word being said, or idea given them, as to the reasons for, and importance of, certain rules for preserving health: under the change of circumstances, the habits of their colder fatherland are continued, and fever or cholera puts an end to many a promising life, which a little rational information and advice might have preserved.

The air and its temperature are largly concerned in the process of acclimation; the former is so much more rarefied in hot than in cold climates, that in the vital process of respiration a comparatively much smaller quantity is habitually consumed; less oxygen is taken in, and the process of oxidation or combustion, which is continually going on

within the body, is slower; we reasonably conclude, that by this process of combustion, the animal heat, in part at least, is maintained, but, of course, in a hot climate, a less active condition is sufficient to keep up the average temperature. The process of oxidation or combustion effected on the one hand by the oxygen inspired, is supported on the other by some of the elements—carbon and hydrogen—of the food. It is evident, therefore, that if an individual who has become resident in a hot climate, makes a practice of consuming as much nutriment as he used to do, without injury to health in a cold one, he must take more than is requisite, consequently the blood becomes overcharged with a load of noxious matter, which the rarefied air and inactive habits of warm countries do not tend to remove; and if the course be continued, an attack of illness, probably of a biliary nature, is the consequence. Even in temperate climates, the difference between the consumption of oxygen in winter and in summer is considerable. In Germany it has been calculated by Liebig at one-eighth less in the latter. How great must be the difference to those who permanently settle in tropical heats! certainly, sufficient to require much alteration in habits of living. The abundant animal diet, the fats and alcoholic drinks of the colder climes, all of which contain carbon and hydrogen in abundance, and assist materially to sustain temperature, must give place to the farinaceous and watery fruits of warmer regions; *vice versâ*, on going from a warm or temperate country to a colder—as the experience of all arctic travellers testifies—a larger proportion of animal diet, and that of a more fat or oily character, is requisite to maintain health and strength, and those only who are capable of consuming and digesting this full allowance, are fit for encountering the cold of the north.

The great increase of the functions of the skin, which takes place on removal to a warm climate requires attention; it renders the constitution more susceptible to the influences of a damp or chill air, such as frequently occurs in the evening. The above remarks apply to our own climate in summer. The best preservative is woollen clothing of some kind, be it ever so thin, worn next the skin. Persons who from a warm climate, of which they are either natives, or to which they have become accustomed, come to reside in a variable or cold country like that of Britain, are peculiarly liable to affections of the chest or lungs, and not unfrequently become the subjects of consumption.

Refer to—*Appendix B., Maintenance of Health in the Tropics—Air—Respiration—Diet—Climate.*

ACID.—The general characters of an acid are, that it has a sour taste, reddens vegetable blues, and neutralises alkalies. Acids are vegetable or mineral. Their main uses in medicine are due to their astringent properties, arresting hæmorrhage and checking excessive discharges, either internal from mucous membranes, or from the skin. The principal vegetable acids used in medicine are, acetic acid or vinegar, benzoic acid, citric acid, gallic, tannic, and tartaric acids, and hydrocyanic or prussic acid; the mineral acids are, hydrochloric acid, nitric acid or aqua fortis, nitro-muriatic acid or aqua regia, and sulphuric acid or oil of vitriol, also phosphoric and carbolic acids. They may be referred to under their respective heads. See *Lemon—Tannin.*

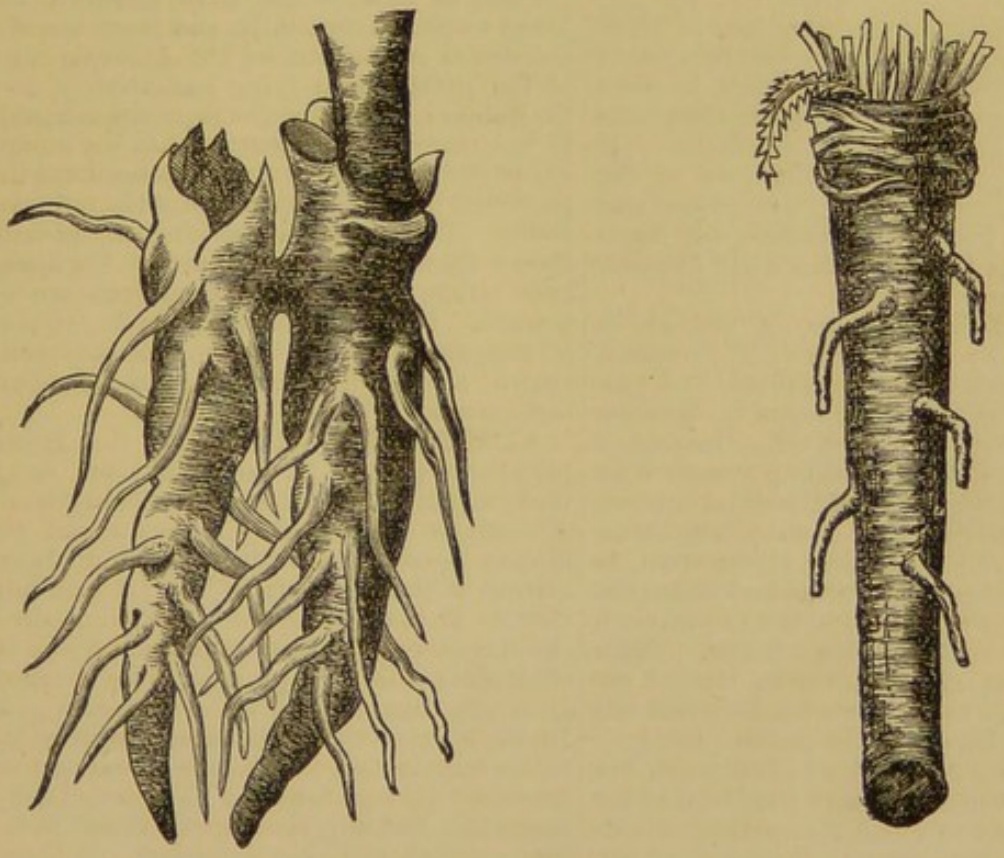
Acetic Acid.—The acetic acid (prepared by Messrs. Coutts) is often found efficacious as a reviving tonic for sponging the head (in cases of headache) and the spine. Care must be taken not to use the glacial acetic acid (see article *Glacial*), which is much stronger, and might do much injury.

ACNE.—This is a disease of the skin, taking the form of what is generally called a pimple. It is due to an accumulation of secretion in the glands which produce the oily matter. In its simplest form, small white points are seen in the skin, or if, as is commonly the case, a little dirt collects in the orifice of the gland,—as black points, called "black heads." On squeezing these the accumulated secretion is removed as a little maggot-like body. Usually the skin becomes red and painful round these collections, and matter forms and is discharged. In others the part becomes hard and indurated, but still red and irritable. Acne occurs chiefly upon the face and over the shoulders, also on the chest. It rarely occurs in children; it is most common about puberty, and from that time onward to two or three-and-twenty. It is frequently met with for the first time at the age of forty or later.

It sometimes makes it appearance as large red pimples, upon the nose of those who have indulged too freely in the pleasures of the table. This form is called *Acne rosacea*—in common parlance "grog blossom." To prevent the disease, frequent and thorough washing with soap and warm water, followed by friction with a rough soft towel is a good plan. All black spots should be removed, either by squeezing between the nails or by pressing down upon them a ring a little larger than the black spot, such as a watch-key. The digestive organs must be regulated, and exercise in the open air taken. The former is especially necessary in Acne rosacea. As a local application, the iodide of sulphur ointment will be found the most useful, or a lotion containing two tea-spoonfuls of milk of sulphur rubbed up in a pint of water. Irritation is allayed by Goulard water. An infusion of an ounce of horse radish, in twenty ounces, of hot, not boiling, water, is said to prevent or cure acne, the dose being a small wine-glassful night and morning. A small tea-spoonful of carbonate of magnesia taken in water at bedtime will often relieve, and as an external lotion the following may be recommended:—an emulsion made with a dozen bitter almonds, one ounce of glycerine, seven ounces of water and one drachm of alcoholic solution of coal-tar.

ACONITE.—Monkshood—Wolfsbane—Bluerocket.—This plant grows on hilly ground in many parts of Europe, and is frequently cultivated as a garden flower. All parts of the plant are poisonous, and its active principle, *Aconitia*, is probably the most deadly poison in existence. As its root has more than once been scraped and used as horse-radish, it is important to be acquainted with the distinctive character of the plant. It grows from two to six feet in height, with dark green leaves, and a terminal spike of rich blue flowers. The leaves are completely divided to the base into five wedge-shaped lobes, which are again divided into three.

As shown in the annexed engraving (fig. 4), the root of aconite (*a*) differs entirely from that of horse-radish (*b*), though both are white on section. That of monkshood is conical, and has a large number of curling fibres, and frequently one or more pear-shaped tubers attached to the upper part of the root. On the other hand, the root of the horse-radish is cylindrical, and throws off straight rootlets. The root of the monkshood, when chewed,



(*a*) Aconite. Fig. 4. (*b*) Horse-radish.

causes a peculiar tingling and numbing sensation in the lips, with a feeling of enlargement, and this continues for several hours. The taste of the horse-radish is pungent and sweet, causing profuse lachrymation, without being very persistent. The symptoms of poisoning by aconite, besides the peculiar sensation experienced in the mouth and throat, are pain and tenderness of the epigastrium, followed by nausea and vomiting. The numbness and tingling become general, with diminished sensibility of the surface, and giddiness and difficulty of breathing ensue. The pulse is feeble and the skin becomes cold and clammy. In the majority of cases death occurs within three hours. The treatment consists in the prompt administration of an emetic of mustard and water or sulphate of zinc, followed by a full dose of castor oil. Stimulants, such as hot brandy and water and strong coffee, should be given. The extremities must be kept warm, and a mustard plaster be applied to the spine. As the sensibility of the skin is impaired and the feelings of the patient are no guide, the heat must not be too great. Of late, the tincture of digitalis or foxglove has been given in extreme cases and with success, but the use of this antidote should be left for the medical attendant. Twenty drops of the tincture may be injected subcutaneously or half a drachm given by the mouth. Medicinally, aconite is used in acute diseases, such as erysipelas and inflammation of the lungs, but should never be employed except by a medical man. Externally in the form of a liniment it is used to relieve neuralgia, and may be combined for this purpose with an eighth part of chloroform.

ACTÆA RACEMOSA.—The tincture of the Actæa racemosa has been much recommended in the treatment of diseases connected

with the rheumatic constitution in all their forms and complications, of St. Vitus' dance, lumbago, &c.; but although it has met with favour from some, many, after having given it a fair trial, are still quite unable to accord it a recognised place as a remedy for rheumatism. The dose of the tincture is one drachm in water, either alone or in combination with other remedies. It has been much more generally used in America than in this country. The popular name for it is "black snake root." The scientific name is *Cimcifuga racemosa;* natural order, *Ranunculaceæ.* It is a native of North America, where it was introduced by Dr. Garden as a remedy for consumption, in 1823. Perhaps, however, actæa is now best recognised as one of our most useful remedies in some affections of the womb, and to relieve symptoms resulting from them, such as headaches. It will frequently, too, relieve the pain at the monthly period, and regulate its frequency and excess. When taken continuously for some time, ten minims twice or thrice daily in water is a sufficient dose.

ACUPRESSURE—(*Acus*, a needle)—is the name given by the late Sir J. Y. Simpson, of Edinburgh, to a method originated and proposed by him for the suppression of bleeding from arteries which have been cut. Instead of tying the mouths of the bleeding vessels with threads or ligatures, which is the usual custom, the Professor asserted that it was much better and much less likely to cause suppuration, to pass a needle through the texture and fasten the vessel, just as a gentleman passes a pin through the lappel of his coat to fasten a flower. There can be no doubt that wounds so treated are much more likely to heal by what surgeons call the "first intention;" but the method, being attended with many practical disadvantages, has not yet, at all events, met with that trial at the hands of surgeons to which its merits undoubtedly entitle it.—See *Artery—Hæmorrhage, &c.*

ACUPUNCTURE.—Acupuncture is a mode of treating some diseases by the insertion of needles into the body, at or near the seat of the malady. The needles, which are about two inches long, are fitted into a small handle. The method has long been known and employed among the Chinese. In this country it is chiefly used in sciatica, and the relief is sometimes instantaneous. The pain of the operation is very trifling, and such as none need shrink from.

ACUTE.—*Acute* is a term used in contradistinction to *chronic*, as applied to diseases, to denote such as are characterised by violent symptoms. Inflammation of the lungs, or erysipelas, are acute diseases; consumption, or ringworm, are chronic.

ADDER-BITES. — See Wounds, Poisoned.

ADDISON'S DISEASE, Bronzed Skin, or Disease of the Suprarenal Capsules, with bronzing of the skin and anæmia, formed the subject of a treatise written by Dr. Thomas Addison of Guy's Hospital. At the outset, the patient complains of feebleness, lassitude, great general debility and anæmia, with nausea, sickness and impaired appetite; the whites of the eyes have a peculiar pearly appearance; and there appears, sooner or later, a peculiar dusky bronzing of the skin which is most marked about the face and neck, the armpits, about the genital organs, and around the navel. The discoloration presents itself in all degrees, from the slightest darkening of the skin to the swarthy hue of the mulatto.

Cases of this disease have generally been found to terminate fatally, and there was often discovered after death, by Dr. Addison, disease of the little glands lying immediately above the kidneys, and called the suprarenal capsules. It has since been discovered that the group of symptoms described is always associated with a particular form of degeneration of the suprarenal bodies. In a few cases bronzing of the skin is absent during the whole course of the disease, even although the other symptoms are well marked. Nothing can be done in the way of treatment, except to improve the general health, and employ the remedies for debility and anæmia.

ADHESION.—Adhesion is the growing together of parts of the body which are, or have been, separated, either naturally or artificially. A common cut unites by adhesion, and when it does so at once, without the formation of matter, it is said to unite "by the first intention." It is evident how essentially valuable this property of animal bodies must be; it is effected in the first place, by the exudation of a glue-like liquid, which becomes solid. In some cases of inflammation, especially of serous membranes, such as the pleura and peritoneum, this liquid, known as adhesive lymph, is exuded, and adhesions result which may be inconvenient, and even dangerous. Adhesions are also prone to occur in cases of burns of adjacent surfaces, such as the fingers, and should be guarded against.

ADIPOSE.—Adipose, fatty.

ADULTERATION. — The adulteration and sophistication of foods and drinks must be classified among the numerous vices incidental to civilisation. As the wants of the community increase, trade develops, competition multiplies, and the desire to buy in the cheapest, and to sell in the dearest market, gives an impetus to this first principle of political economy, which not unfrequently displays itself in unpleasant tendencies. Fortunate it is that in the onward march there are moral agencies to counteract the evils in question, and that the State now regards the health of the people as among its most important trusts. Among the numerous enactments made by the Legislature within the last twenty years, to advance the comfort and wellbeing of the community, there are few to compare in importance with such as have had

for their object a bountiful supply of pure and unadulterated food. The first serious attempt of the British Goverment to deal with the subject of adulteration as a whole, dates from the year 1860, when a Parliamentary Committee collected a large amount of evidence, showing that extensive frauds were being carried on in connection with the sale of foods and drinks in all parts of the empire, and that severe measures of repression were necessary to check them. Long before this date, however, there had been numerous enactments made from time to time. These commencing almost from the earliest periods of our history, dealt with the sophistication of single articles of food, such as bread, beer, and wine, and had often as much reference to frauds on the revenue as to the health of the people. The regulations as to the sale or "assize" of bread, dates from the reign of King John; the statute was afterwards extended, and comprised some stringent regulations prohibiting the fraudulent mixing of meals of an inferior quality with the sound, and the use of false weights and measures. The punishments inflicted for these offences during the Middle Ages, prove how heinous they were considered by the State; for the first offence the enactment states that the offender "shall be grievously punished;" for the second, "he shall lose his meale;" for the third, "he shall suffer the judgement of the pillory;" and on being convicted a fourth time, "he shall foreswere the towne wherein he dwelleth." The Baker's Corporation in the city of London made diverse enactments as to the sale of bread, which bore on the digestion as well as on the morals of the citizens. The city bakers had evidently a jealousy of all breads imported within the sphere of their jurisdiction, that of Southwark being held as impure as that portion of the inhabitants who frequented the vile haunts near the south entrance to London Bridge. The servants of well-to-do people had a right to be present when the baker was preparing his dough, as a precaution against the latter making bread of a fine quality outside, and a coarse within, a practice not at all uncommon in those days. Two Acts passed in the early part of the present century refer to the abuse of alum in the manufacture of bread, rendering the offence penal, and providing regulations for the manufacture and sale of pure bread of specified size and weight. The same Acts render it criminal for the baker to add any mixture or ingredient other than those specified, and when bread was made from other cereals than wheat, the bread so made was to have a distinctive mark. Permission was also given to authorised persons to enter the premises of the baker to search for adulterated bread, or for substances used for the purposes of adulteration. The sophistication of liquors prepared from malt, also dates from a very early period. Prior to the introduction of hops, at the beginning of the 16th century, wormwood and other bitter substances were used in the manufacture of beer, and it is highly probable that the main frauds in connection with the manufacture were due to the attempts to get too much liquor out of the malt. In 1660, brewers were placed under the control of the excise, and no ingredients save malt and hops were permitted in the manufacture. It is clear, however, that other substances, many of them deleterious, were often mixed with the liquor, either by the wholesale or retail dealer. In an Act passed in 1816, reference is made to the fraudulent addition of molasses, honey, liquorice, vitriol, quassia, pepper, &c., and instructions are given to the excise officer to seize the same, the adulterator in each case being liable to a penalty of £200, and the druggist supplying the deleterious product to a still heavier fine. This law came to an end with the repeal of the duty on hops, and although the brewer is still prohibited from employing any articles in the manufacture of his beer which would prove injurious to health, he is permitted to substitute quassia or other mild vegetable bitters for hops, as well as colouring matter prepared from sugar.

The large consumption of tea following the introduction of the leaf to Great Britain, soon led to its extensive dulteration, and Acts passed in 1725 and 1730 were intended to prohibit the sale of tea mixed with leaves or with drugs of any kind. The latter Act specified the obnoxious ingredients with which tea was sometimes fabricated, to wit,—sloe leaves, liquorice leaves, tea leaves already used, terra japonica, sugar, molasses, clay, and logwood. It does not appear that these laws were very effectual, for in 1776 another Act was passed of a similar character, empowering the excise officers to enter premises and confiscate goods of known bad quality, which in a further warrant were ordered to be destroyed, the object being as much to protect the revenue as the consumer. Similar enactments were made with regard to coffee, which was often mixed with and simulated by roasted beans, peas, and other grains, not to mention its wholesale admixture with chicory, which has often been the cause of dispute. Statutes bearing on the sale of unwholesome meats and adulterated wines were also passed at varying intervals, notably in the reigns of Henry III., Charles II., and of William and Mary.

Without doubt the most important disclosures as to the extent to which adulteration was carried on in this country, were those brought to light by the analytical sanitary commission originated by the *Lancet* Medical Journal in 1851, and which was mainly instrumental in securing a Parliamentary Committee to inquire into the whole subject of adulteration. Dr. Hassall, who was employed by the *Lancet*, had made a vast number of analyses of articles exposed for sale in various parts of London, and to him is due the credit of bringing into prominence the valuable aid afforded

by the microscope in these investigations. The results of his inquiries were contributed periodically to the *Lancet*, and afterwards appeared in a volume entitled *Food and its Adulteration*, which has long been considered the best work of reference on the subject. The Parliamentary Committee referred to above was formed in 1855, and its report, containing the results of extensive, almost exhaustive inquiries, led to the Act of 1860, commonly termed "The First Adulteration Act." By this Act, any one selling any article of food or drink which was not pure, was liable to a heavy penalty, and some provision was made for the appointment of analysts by local boards in different parts of the country; but as the more important clauses of the Act were permissive, and not compulsory, it became practically a dead letter. Some of its defects were remedied by the introduction into the "Sale of Drugs Act, 1872," of several important restrictions with regard to the sale of food; but in consequence of the great misunderstandings which existed among experts and respectable tradesmen as to what constituted adulteration, it was found necessary to repeal both Acts and to substitute for them a new one, "The Sale of Food and Drugs Act" of 1875, which, with its Amendment of 1879, is now the law of the land. The provisions of this Act are so important in their bearings on the public health, that a brief summary of some of the clauses, especially those relating to purchase and analysis, will not be out of place in this article.

At the outset of all legislation on the adulteration of food or drugs, there has been a difficulty constantly felt in describing the precise meaning of the term and its relative application. Mr. Wynter Blyth in his work, entitled *Foods: their Composition and Analysis*, prefers the American to the English definition of adulteration, and quotes the following suggestive clauses which have been in great part incorporated with the American Act:—"In the case of food or drink, the article shall be held to be adulterated:—

"1. If any substance has been mixed with it so as to reduce, lower, or injuriously affect its quality, strength, purity, or true value.

"2. If any inferior or cheaper substance has been substituted wholly or in part for the article.

"3. If any valuable constituent of the article has been wholly or in part abstracted.

"4. If it be an imitation of, or be sold under the name of another article.

"5. If it consists wholly or in part of a diseased, or decomposed, or putrid, or rotten animal, or vegetable substance, whether manufactured or not; or in the case of milk, if it is the produce of a diseased animal.

"6. If it be coloured, coated, polished, or powdered, whereby damage is concealed, or it is made to appear better than it really is, or of greater value.

"7. If it contain any added poisonous ingredient, or any ingredient which may render such article injurious to the health of the person consuming it."

The main provisions of the English Act are comprised under the following sections:—

No person shall sell to the prejudice of the purchaser any article of food, or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser, under a penalty not exceeding £20, provided that an offence shall not be deemed to be committed under one or other of the following exception clauses:—

1. Where any matter or any ingredient not injurious to health has been added to the food or drug, because the same is required for the production or preparation thereof as an article of commerce in a state fit for carriage or consumption, and not fraudulently, to increase the bulk, weight or measure of the food or drug, or conceal the quality thereof.

2. Where the drug is a proprietary medicine, or is the subject of a patent in force, and is supplied in the state required by the specification of the patent.

3. Where the food or drug is compounded as mentioned in this Act.

4. Where the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation.

Sections 7 and 8 of the Act enact that "No persons shall sell any compound article of food or compounded drug which is not composed of ingredients in accordance with the demand of the purchaser, and that no person shall be guilty of any such offence as aforesaid in respect of the sale of an article of food or a drug, mixed with any matter or ingredient not injurious to health, and not intended fraudulently to increase its bulk, weight or measure, or conceal its inferior quality, if, at the time of delivering such article or drug, he shall supply to the person receiving the same a notice by a label distinctly and legibly written or printed, on or with the article or drug, to the effect that the same is mixed."

The following section 9 enacts "That no person shall, with the intent that the same may be sold in its altered state, without notice, abstract from an article of food any part of it, so as to affect injuriously its quality, substance and nature, and no person shall sell any article so altered, without making disclosure of the alteration, under a penalty in each case not exceeding £20."

Several sections of the Act refer to the appointment and duties of public analysts by various local authorities, and require that the analysts shall be persons of competent knowledge, skill, and experience, who may be permitted to act in their official capacity for one or more boroughs or sanitary districts. Provision is made for the purchase of samples by any purchaser for analysis by the public analyst on the payment to the latter of a sum not exceeding 10s. 6d., the analyst being bound to give a certificate of the analysis to the purchaser. Any medical officer of health, inspector of nuisances, inspector of weights and measures, or any police constable acting under the direction of the local authority, is at liberty to purchase samples for analysis, and to procure reports thereon from the analyst. To check fraud on the part of the purchaser, section 14 of the Act enacts that the person purchasing the article with the intention of having it analysed, shall at once notify his object to the seller, and divide the purchased article in the presence of the latter into three parts, each part to be sealed up separately on delivery—one to be returned to the seller, one to be retained by the purchaser for future comparison, and the third to be given to the analyst. An important section of the Act provides for a part of the sample being analysed by the Government

analysts at Somerset House, in case of any dispute as to the correctness of the analysis by the public analyst. Enactments are also made rendering it a penal offence on the part of persons forging warranties, or applying certificates of certain articles to others not so certified, and wilfully employing false labels for fraudulent purposes. The practical working of these clauses of the Act is largely under the control of the inspector or official purchaser, who soon finds it to his advantage to work by deputy, and to see that the numerous and stringent forms required by the Act are rigidly adhered to.

It is gratifying to learn that, notwithstanding numerous drawbacks in the frequent attempts at legislation with regard to adulteration, the improvement in the quality and character of food consumed by the population is most decided, especially in the articles of greatest consumption—bread, milk, tea and coffee. As regards bread, if we except alum (which is now employed but rarely to whiten the colour of flour), we seldom hear of any convictions for the use of extraneous articles in its manufacture; and although milk dealers are occasionally prosecuted for adding water to milk, the proportion of water is so much under the mark of what it was twenty or thirty years ago, that the present generation has reason to rejoice at a state of matters unknown in the lifetime of its progenitors.

ADVICE, MEDICAL.—When a medical man is consulted, it is a tacit acknowledgment of confidence; that confidence should be implicit, or placed elsewhere. In the first place, care should be taken that the necessary directions given are fully and accurately understood; being so, they should be as fully and accurately followed out, unless some evident change in the condition of the patient, or in circumstances which the prescriber could not foresee, renders a departure from them necessary; but of this he should have as early notice as possible. There is no greater folly than to call in a medical man, and then, either from wilfulness or weakness of purpose, to controvert or neglect his prescribed rules; it is only equalled by that which conceals or deceives in the particulars of a case, and looks for benefit. It is too commonly the case in illness, that officious persons are continually offering their counsel and opinions, disturbing the mind of the patient or of the friends, and perhaps undermining the trust reposed in the attendant practitioner; if it is reflected for one moment, how worthless such counsel and opinions must be, they would be less attended to than they are. Again, if proper confidence is felt in the judgment of the medical attendant, his requirements should be submitted to without remonstrance or grumbling. When doubt and uneasiness respecting the progress or prospects of a case intrude themselves upon the mind of those *most interested*, and a second opinion is desired, the matter should be openly, at once, stated to the ordinary attendant, and his views and wishes heard; but never should another be called in till this has been done; still less, even if a medical man can be found to demean himself so far, should a clandestine opinion be taken. Lastly, in sending for medical assistance, especially in country districts, as full an account of the symptoms of the illness, or accident, as possible, should be transmitted by written note. The precaution must save time; it may save life.

AERATED WATERS.—Water containing air is said to be well aerated, but the term is usually applied to effervescent waters, either from natural springs or artificially made, and which owe their effervescent property to the presence of carbonic acid gas. The most familiar of these waters are soda, potash, seltzer, and Apollinaris waters, but new beverages of this description are constantly being brought out.

AERATION.—Blood, during its circulation through the body, becomes impure in quality, dark in colour, and unfit for the support of the vital functions; being passed through the lungs by the powers of the heart, it undergoes purification, and the dark colour of the *venous*, is exchanged for the bright red hue of the *arterial* fluid; it has undergone "aeration"—it has robbed the air drawn into the lungs of a portion of its oxygen, and given off carbonic acid. This aeration of the blood is essential to the maintenance of life; if stopped entirely for a few minutes, death is the result. This fact is obvious, and known to all; not so, the injurious, ultimately fatal, effects of the imperfect aeration of the blood, to which thousands of our town population are daily and nightly exposed; living in a contaminated atmosphere, the vital fluid never fully purified, disease and shortened lives *must* be the result.—See *Blood—Respiration—Circulation.*

ÆTHERS are volatile liquids used in medicine as stimulants and antispasmodics.—See *Nitrous Æther—Sulphuric Æther—Chloric Æther.*

AFFUSION.—Cold water affusion in the treatment of fevers is a remedy, which after being abandoned for the greater part of a century, has again come much in favour, especially in hospital practice. Its object is purely a mechanical one, by the external application of cold to reduce the temperature of the body when it exceeds a certain standard, generally 102° or 103° Fahr. The success attending cold affusion in fevers both in this country and in Germany, warrants the belief that it may become more general, especially in the treatment of Typhoid, Typhus, and Scarlet fevers. The methods employed comprise the ordinary cold bath brought to the bedside, the douche bath, in which the patient, seated in a tub, has a bucket of water poured over him, wet sheet packing, and sponging the body with ice cold water. Of these, the bath and packing are

most in vogue; but the employment of the remedy requires great care and observation, and cannot be administered unless with the aid of a medical man and skilled attendant. These have to watch with the thermometer the effect of the cold on the body-temperature and on the pulse, lest at any moment the former should exceed the limited standard, and the bath or packing require repeating, which may happen several times during the day and night. As a rule, persons suffering from fever have a great repugnance to being immersed in a cold water bath, and it is now the general practice, at first to temper it with warm water to nearly blood heat and to diminish the temperature gradually to 80° or 76° Fahr. The time occupied with the immersion is to be governed by its effect, but it is not desirable to retain the person in the bath for a longer period than 10 or 15 minutes; a refreshing sleep with freedom from delirium is often the happy result, and apart from the somewhat irksome ordeal of the bath, the proceeding is not found to be attended with any untoward consequences. It is, however, not considered applicable to children or very old people, or to persons in whom there is reason to believe disease of the heart exists. By means of the douche cold affusion is much employed in India in cases of sunstroke.

AFTER-BIRTH.—In medical language the *placenta*. It is usually discharged at a period varying from five to forty minutes after the birth of the child. There is always some little anxiety, both on the part of the patient, and of the medical attendant, until this concluding part of child-birth has been accomplished. Within the above time in most cases, sometimes immediately after the child is born, the patient complains of an accession of labour pain, caused by the contraction of the womb which casts off the after-birth, at times expelling it entirely from the body, but generally propelling it so far towards the external orifice as to make its withdrawal perfectly easy. When all is as it should be, the business is concluded by the ordinary midwife without the least difficulty; at the same time, it must be remembered, that some of the most formidable accidents of the lying-in chamber are connected with the management of this part of its duties, and if a female only be in attendance, should the slightest embarrassment occur, not one moment is to be lost in summoning proper medical aid; above all things, let the attendants beware of any attempt to force matters by pulling strongly at the navel cord —they can only do mischief. The chief danger to be dreaded when the after-birth is retained, is loss of blood or flooding; if this comes on to any extent, the patient must be kept as quiet and cool as possible; gentle but firm pressure must be maintained over the bowels generally, and especially over their lower portion by the bandage and by the hand; cloths dipped in cold water are to be applied over the external parts and frequently changed; should extreme faintness occur, a little wine, or brandy, or sal volatile may be given in water, but stimulants must not be too readily resorted to. The retention of the after-birth is at times the result of irregular contraction, but often of adhesion to the womb; the possibility of such an occurrence should make those who are advanced in pregnancy careful to avoid anything which may press upon any portion of the distended womb, as for instance, the stays, and guard against habitually leaning, even gently, against any hard body. A careful attendant will always examine the after-birth: it ought to be nearly circular, about the size of a dinner plate, and should not exhibit any signs of tearing on the surface which is next the womb. The membranes which line the interior of the womb during pregnancy, are for the most part discharged along with the after-birth, and are more readily and neatly brought away, by giving the latter body a slightly twisting motion as it is withdrawn. If they are very tender, a portion may remain and pass off with the discharge; it is well to be aware of the fact, as persons are often needlessly much alarmed at this occurring a few hours or more after delivery. Occasionally, the after-birth is so placed over the mouth of the womb, that it must necessarily be detached in the first stages of labour; the case is always attended with danger, and cannot be too soon put under medical superintendence; it may generally be suspected, if simultaneous with the occurrence of labour pains, a free discharge of blood takes place, which is increased every time the pain recurs. In the event, as in the country, of any delay in procuring medical assistance, the measures recommended in the treatment of hæmorrhage, in "Abortion," may be resorted to.

Refer to—*Child-birth.*

AFTER-PAINS, are the regularly recurring pains which women often experience for a day or two after child-birth. They are rarely troublesome after a first confinement, but are apt to increase in severity at each succeeding one. After-pains are, in moderation, salutary, and are caused by the efforts of the womb to attain that properly contracted condition on which the woman's safety depends. If they are very severe, it is generally owing to the presence of clotted blood, which must be expelled before they moderate. A constant, unintermitting after-pain, coming on very soon after the termination of labour, is often symptomatic of internal flooding, and should be attended to accordingly. If after-pains are very severe, they are advantageously relieved by the administration of twenty drops of laudanum or chlorodyne, which may be repeated, but if the amount of pain be moderate this is unnecessary. If the discharge is not profuse, a hot flannel to the lower part of the abdomen affords comfort. After-pains are often kept up after the first

four-and-twenty or six-and-thirty hours by the bowels being loaded; a table-spoonful of castor oil is at once a safe and effectual remedy. Too tight bandaging may aggravate after-pains.

Refer to—*Child-birth.*

AGE.—Age is the important factor in calculating the effects of disease and death in a population. The object of medicine is to prolong life; that of hygiene to prevent disease. We are continually hearing of persons who have died after living a century and upwards, and many enthusiasts believe, that were the laws of health rigidly enforced throughout the community, there is no just cause why this term of years should not be reached by many. From the cradle to the grave, however, we are engaged in a perpetual warfare with disease, accident and death, and the prospect of the individual unit ever becoming a centenarian is infinitesimal. Our best authorities reckon only half a century as a fair prospect of life for a child born even under favourable circumstances, and if we take the mortality tables for all England, and divide the total deaths over given periods into four nearly equal classes, we find that one fourth of the deaths occur in the first year of life; another fourth from the first to the fifteenth year; another is spread over the long interval of forty years (between the fifteenth and the fifty-fifth year), and the remainder take place after the age of fifty-five. Such a calculation, however, gives a very inadequate idea of the causes constantly at work to control longevity.

If we follow Dr. Farr in his interesting sketch of the march of an English generation through life (contained in the Supplement to the Thirty-fifth Report of the Registrar-General), we will find these causes of mortality graphically illustrated. It may be difficult to assign the true causes of death in infants newly born, and during the first twelve months of their existence, but there can be little doubt that the high mortality is due to the rapid development and fragile condition of all the vital organs, indicating the necessity for care and warmth. Hence, diseases of the nervous system, culminating in convulsions, of the lungs and air tubes, and miasmatic affections, due to unhealthy surroundings, comprise the bulk of the deaths registered at this early period. Young age fares very differently under diverse associations, for although collectively 75 infants in 100 bridge over their first year, yet the proportion as distributed over the various classes of society is far from equal. In more favoured circumstances, such as we might expect among rich people, 87 in 100 survive the first year, and among the nobility 90 in 100. Again among the poor, crowded together in populous towns, these figures are often reversed, the death rate denoting 50, 60, 70, and 80 per cent.; while in a street in Liverpool, inspected by Dr. Parkes, it was found that 90 out of 100 children born, died before the end of their first year. In the second year, Dr. Farr remarks: "Pneumonia, bronchitis, and convulsions are still the prevalent and most fatal diseases; many also die of hooping-cough, scarlatina, and diarrhœa. Scarlet fever asserts its supremacy in the 2nd, 3rd, 4th, and 5th years. Hooping-cough is at its maximum in the first year, measles in the 2nd, scarlatina in the 3rd and 4th years. Thus these diseases take up their attacks on life in succession and follow it onwards." Of such as have escaped these maladies, or when attacked, have surmounted them, and have entered life afresh in their 6th year, a large portion succumb, before they have arrived at 15 years, from scarlet and other fevers, to which must be added diphtheria and consumption. Near to and after the age of puberty the prospects of life are more favourable, the diseases most fatal at this time being chiefly consumption and fevers. From the 20th to the 30th year is the period in which consumption gains an ascendancy, nearly one half of all the deaths from 20 to 25 years being due to this cause alone. Affections of the brain and heart are also not uncommon at this time, and as years advance these diseases become more chronic and intractable, and the probabilities of recovery from accidents and operations begin to lessen.

After 50 years of age the risks to life from fevers, and indeed from all maladies, are greatly increased, and the increase is noticed to continue till the end of life. As old age advances we come to a condition, of body rather than mind, sometimes termed the "second childhood," in which bodily infirmities become exaggerated by the most trivial causes; sudden changes of temperature, exposure to draughts or irregularities of diet, prostrate their victims. Old age itself becomes a disease, and the body, worn out by active work, succumbs at last, like an eight-day clock or similar piece of mechanism. Though the term "second childhood" is thus often applied to old age, it is, as a rule, more applicable to the body than to the mind, and this is especially the case among persons of both sexes who have spent their lives in active work, both physical and mental. Among our greatest men,—politicians, statesmen, judges, divines, and medical men,—we have minds as active and vigorous as they were in earlier life, though the bodies which they inhabit are weak and frail. A certain amount of exercise is necessary for the aged, but it must be moderate and not sustained. All the organs become less active, there is less force in the lungs and heart, and a consequent diminution in the assimilative functions. The animal heat must be supplemented by warm clothing and warm rooms, and there should be no exposure to extremes of temperature. The appetite also diminishes with the powers of digestion, and food must be administered more sparingly, and at the same time more frequently than in earlier life. It should also be soft, easily masticated, and well cooked. The longevity of families is sometimes

very remarkable, and the same remark frequently applies to certain villages and districts of the country, and is often quoted as an illustration of their comparative immunity from disease, while a higher death-rate is regarded as a sign of unhealthiness.—See *Children—Old Age.*

AGUE, or INTERMITTENT FEVER, is a disease which prevails chiefly in marshy districts; the production of that condition of the atmosphere which originates it being generally associated with the presence of decaying vegetable and animal matter. To this peculiar atmospheric state the terms "marsh miasma" and "malaria" have been applied. A certain degree of heat appears necessary for the origination of malaria: ague is unknown in cold regions, and becomes more virulent the nearer the tropics are approached. The malarious poison does not seem to extend to any great height above the surface of the marsh, and persons who are compelled by circumstances to sleep in a locality where ague prevails, are more likely to escape the effects by occupying rooms in the upper stories of the house. Moreover, as marsh poison may be carried a considerable distance by the wind, the leeward side of a malarious district is always the most dangerous. High and thickly grown trees have the power of attracting and retaining marsh miasmata; their vicinity, therefore, in malarious districts, at night, and especially as sleeping stations, is to be avoided; at the same time, the fact is taken advantage of by the residents in such districts, for if they can place their dwellings so that a belt of trees intervenes between them and the marsh, they are safe. Strangers are more likely to become the subjects of ague than those who are regularly resident in the district; the latter, however, if the district be a decidedly malarious one, even if they do not suffer from regular ague, are scarcely ever healthy. In former times, in England, ague was a much more general disease than it is now that drainage has been so extensively established; and in many districts from which it has entirely disappeared, the tradition of it still lingers in the language of the people; it is found almost entirely on the eastern coast of the island, in the vicinity of low, marshy, occasionally flooded grounds, in the counties of Lincoln, Norfolk, Kent, Essex, and Cambridge. Microscopic examination of the blood of sufferers from ague has demonstrated that the disease is always associated with the presence of a microscopic parasite known as the *plasmodium malariæ*, which develops in the red corpuscles of the blood, and, escaping from them, floats freely in the blood fluid. There is considerable probability that the malarial poison is not unfrequently conveyed from one place to another by mosquitoes which have bitten persons suffering from malaria, and have thus received the *plasmodium* into their bodies. One of the most remarkable features of intermittent fever, is its tendency to return upon those who have once suffered from it. An east wind, indiscretion in diet, anything which lowers the tone of the general health, may bring back the enemy.

When an attack of ague is about to come on, the person complains of general lassitude, oppression about the stomach, and general chilliness, which at last amounts to actual shivering, with chattering of the teeth, when the disease is fully established. By this time the features are pinched and blue-looking, and the whole body seems shrunk; the pulse is feeble, the tongue pale; sometimes there is vomiting; there may be stupor or convulsive action. Flying pains are felt throughout the head and limbs. After a certain time, this first —the cold—stage gives place to the second, or hot; transient heat-flushes become more frequent, till at last the coldness is entirely superseded by a state of fever, with quick, full pulse, hot skin, furred tongue, and thirst, with high-coloured urine, generally throbbing headache; at length the third stage brings relief, by copious perspiration; the symptoms of disease subside to the level of health, and the patient remains comparatively well during what is called the remission, that is, until the next attack, which may come on in twenty-four, forty-eight, or seventy-two hours, or at longer or less regular periods. The periodicity observed by the attacks of ague is one of the most marked features of the disease, and the terms quotidian, tertian, quartan, are applied to denote the interval of return. The more frequent the paroxysms, the more serious the character of the malady, as a general rule. The marked features of ague, its occurrence in particular localities, and its tendency to return, render it one of the diseases most easily and certainly distinguishable by the unprofessional, whilst, at the same time, the peculiar circumstances under which it often occurs, and the comparatively regular modes of treatment, permit of timely assistance being extended to the sufferer, in the absence of regular medical advice. When an individual is attacked with the cold stage of the fever, the application of external warmth is at once the most natural and beneficial remedy; this may be done either by means of bags of heated bran, salt, or any other convenient method; or if a vapour-bath be at hand it may be used, or an extempore one made, by seating the patient, wrapped in a blanket, on a chair over a bucket containing hot water, which is kept steaming by means of heated stones thrown into it from time to time. Warm, diluent drinks may be freely allowed, weak tea, barley-water, and such like; only in a very few debilitated cases may a little wine be added. Emetics have been given at this stage, but are not advisable; a brisk purgative is, however, required at the commencement; none is more convenient than a pill containing one grain of calomel, and three grains of the compound rhubarb pill. Of these,

two may be given to an adult. During the hot stage, opium must be given; it may be administered as laudanum, in one dose, averaging full five-and-thirty drops to an adult; the diluent drinks being freely allowed at the same time. The sweating stage is to be encouraged until the feverish symptoms are quite gone; if it then continues, wiping the skin dry, and changing the linen will put a sufficient check upon it. The individual paroxysm being over, the object is, next, to cure the disease, and prevent the recurrence; for this purpose, the one remedy, Peruvian bark, as formerly given, or its essence, quinine as now administered, is generally sufficient. If the bowels are not thoroughly cleared by the calomel and rhubarb, this point must be ensured by a full dose of castor-oil or some purgative, and two-grain doses of the sulphate of quinine in solution every five hours, immediately commenced with, and continued night and day, paroxysm or not. The dose of quinine should be increased till its effects are shown by ringing noises in the ears; continued at this level till the temperature ceases to rise at the usual period of the paroxysm; and then gradually diminished. Arsenic is the most to be relied on, but not in unprofessional hands. Sulphate of zinc, or white vitriol, may be given in six-grain doses twice or three times a day with safety, and often with success. The use of either of the remedies recommended must be continued for a week or ten days after the disease appears to have ceased, as relapse is apt to occur; but in the case of quinine, should headache, deafness or noise in the ears, be complained of, the administration must be stopped or greatly moderated.

Such are the principal general modes of the treatment of ague which may safely be had recourse to by the unprofessional, and with them, no one who is resident in a malarious district, no intending emigrant who may chance to find himself in such a district, should be unacquainted. At the same time, however useful a knowledge of these general principles may be, it will not be everything in all localities; in each, especially abroad, the disease assumes varied features which can only be properly known and treated by the residents. Ague may resist every remedy, or may frequently recur, as long as the patient resides within the malarious influence, or having been contracted, it may be kept up by the air of another district, particularly an east one in this country, although it could not be produced by it. In such a case, change to a dry and more genial climate is necessary, for though ague is not in Britain immediately fatal, its continuance undermines the constitution, and originates serious disease. Ague is most general in spring and autumn, the latter being the more dangerous period of the attack. Those who are temporarily or permanently compelled to reside in a malarious district, will do well to keep up the general tone of the system, by sufficiently generous living, or a moderate use of fermented liquors: they should protect the skin by woollen clothing, avoid night air, or if obliged to go into it, protect the nose and mouth by a handkerchief, and never go out early in the morning without taking food, or better, some warm fluid, previously. A few doses of quinine should be taken occasionally. Within the last few years, the blue gum tree of Australia (*Eucalyptus*), of which there are many species, has been planted in aguish districts as a counteragent to the malarious poison. Its beneficial action has been ascribed to its rapid absorption of water and consequent desiccation of the marshes, and also to the abundant aromatic essential oil exhaled from the leaves, and indeed from the whole plant. The beneficial effects, however, have yet to be fully proved. The sunflower is said to have a wholesome influence in correcting malarious evils.

Refer to—*Quinine—Zinc—Malaria.*

AIR.—The air or atmosphere which encases the globe, is the most necessary element for our existence. We are so accustomed to it that habit renders us almost unconscious of its presence, until we soil its purity, and then we treat it to unmerited abuse. It mainly consists of two gases mechanically intermingled, oxygen and nitrogen, in the proportion of 21 parts of the former to 79 of the latter. There is also present another important gas, carbonic acid, in the proportion of 4 parts in 10,000, and a small amount of watery vapour, fluctuating in quantity, with varying temperatures. To these must be added traces of ammonia and other organic and suspended matter in small amounts, noticeable under certain conditions and situations, and most marked when the wind is blowing in our faces. The impurities in the atmosphere are of more importance to us than their normal constituents, as such impurities are the causes of many diseases, and are usually the result of overcrowding and unhealthy surroundings. The chief of these are the emanations from the body itself, from the lungs and skin, the products of combustion from fires and lights, the presence in the atmosphere of living bodies in the shape of the lowest forms of animal and vegetable life, combined with an excess of carbonic acid, which though not of itself positively injurious, in the proportions it is usually met with, affords a facile indication of the amount of organic matter, so difficult to detect, in occupied apartments. The air of towns in proportion to their size, population, and the character of their manufactures, is more impure than country air, mainly from the products of combustion emitted from public works and coal fires, and from the emanations of decaying organic matter. Sulphuric, hydrochloric, and other acids, are being continually added to the atmosphere of large towns, which is also charged with particles of soot, when the air is partially stagnant to an extent greatly t›

interfere with the healthy process of respiration. In the sick-chamber, and more especially in the hospital ward, these conditions are exaggerated by the floating presence in the air of fibres of lint, cotton-wool, and organic matter from wounds and excretions, all of which have been noticed by microscopic investigation. There is also good reason for supposing that germs of disease may be propagated from one person to another through the same influence, since the measures which have been everywhere taken to improve these conditions by cleanliness, ventilation, and the abundant employment of antiseptics, have been attended with the greatest success. Men engaged in various occupations in which they are exposed to the action of dust and chemical compounds, either in their gaseous or granular state, suffer also from these respective impurities. Such is especially the case with miners, stone masons, brassfounders, water gilders, painters, and the workers in many other trades; and the conditions under which most of them are carried on, render it imperative that employers of labour should fully appreciate the dangers, and exert themselves in their several ways to diminish them by well-ventilated workshops, and the use of shields and other contrivances recommended for the purpose.

As regards *locality*, we assume that air is impure in marshy places, and people who value their health and that of their children, do not select such for their residence. The purest air is to be met with in the mountains or at the seaside, and to judge from the anxiety felt to resort to either locality, when one is out of health or recovering from disease, the desire appears both instinctive and intuitive. So strongly has the necessity of fresh air for the maintenance of health been urged by medical men and others, that the Government authorities, acting on the advice of repeated commissions of inquiry, have laid down certain principles in the construction of barracks and hospitals, whereby a certain amount of cubic space, accompanied with facilities for a regular change of air, should be allowed for each soldier. The same principle now obtains in schools, workhouses, and civil hospitals.

Generally speaking, the sense of smell is sufficient to detect an unwholesome atmosphere, but the sense of smell is liable to become vitiated by those whom it most concerns. We are barely conscious of any unusual "stuffiness" in the bed-room, which we have occupied during the night, until we return to it after having breathed for a few minutes the outside air, when we immediately become convinced of its unwholesomeness. Professor de Chaumont (who has made a large number of experiments in connection with atmospheric impurities) finds that the "stuffiness" in question is nearly in direct proportion to the organic matter in the air, and that as long as it does not become perceptible to the senses, that is to say, indistinguishable from the external air, it is not incompatible with good ventilation. When the stuffy odour is detected there is reason for changing the air, and this condition will be found to exist with an excess of carbonic acid, amounting to not less than 6 parts in 10,000 or 50 per cent. more than it ought to contain. Dr. de Chaumont considers that the minimum allowance of air for an individual, for health purposes, should be estimated at 3000 cubic feet per hour, and how to obtain this in inhabited houses, without causing bad results in the way of cold and draughts, is the key to successful ventilation. The agents employed for heating and lighting in most cases come next to the human breath in soiling the atmosphere of our rooms. With even a perfect combustion of coal and coal gas, the products of carbonic and sulphurous acids are certain to diffuse themselves to a certain extent; and with imperfect combustion, we have added to these the carbonic oxide and particles of carbon, which may be seen adherent to ceilings and walls. The well-known readiness with which carbonic acid unites with lime to form carbonate of lime or chalk, affords a very simple test for determining an excess of carbonic acid in the atmosphere of a building. If the carbonic acid should be in excess, it will form a white film on the surface of clear lime water placed in a saucer in any part of a room. A more correct and equally simple experiment, however, is that recommended by Dr. Angus Smith, and termed by him his "household" test. This consists in pouring half an ounce of clear lime water into a 10½ ounce wide-mouthed stoppered bottle, previously filled with the air to be tested. If the lime water when shaken up becomes turbid, it is fair to conclude that the air in the room contains an excess (or more than 6 parts in 10,000) of carbonic acid, and is therefore unsuitable for respiration. There are various methods for determining the quality of air, in use among chemists, but they are of too elaborate a character to be commented on here.—See *Respiration—Ventilation—Cubic Space, &c.*

ALBINO.—An individual in whom the usual colouring matter of the body is absent. The complexion is unnaturally white, the hair white, while the eyes appear pink. White rabbits with red eyes are albino rabbits. Albinos are rare among Europeans, but are found more frequently among the negroes.

ALBUMEN.—One of the principal constituents of the animal body. The white of the egg is nearly pure albumen. In the serum or watery portion of the blood it exists in large proportion, and may be coagulated from it by heat, like the white of egg. When it is reflected that from the albumen of the egg—for the yolk is largely albumen also—the perfect chick is constructed, its blood, muscles, bones, nerves—it will be seen how great must be the nourishing power of this substance. Besides existing in the blood, albumen forms a con-

siderable proportion of the animal solids; it also exists in the vegetable kingdom, more especially in the grains and pulses. Heat first coagulates, and then hardens albumen, thus impairing its digestibility—a reason for avoiding over-cooking meat, as well as eggs. In its pure state, albumen has the important property of being an antidote to various mineral poisons, such as corrosive sublimate, blue vitriol and chlorine. It also forms a precipitate with most acids. A mixture prepared with equal parts of white of egg and spirits of wine, makes an excellent application for a threatened bed-sore—See *Egg—Food.*

ALBUMINURIA.—A symptom denoting the presence of albumen in the urine. See *Bright's Disease.*

ALCOHOL.—Alcohol is the active principle on which the intoxicating and also the preservative character of most fermented liquors depends, and is mainly derived from malt and grape sugars, which have undergone *vinous fermentation.* It is a colourless, highly inflammable liquid, with a specific gravity of 825, and is largely used as a medicine in its diluted form in the various alcoholic beverages, as well as in the preparation of tinctures, liniments and lotions. It is also employed as a supplementary food, especially in cases of recovery from disease. The proportion of alcohol in spirits, wines, and malt liquors is variously estimated by different analysts, and must necessarily depend on the variety in strength of the different samples submitted for analysis, but the following table will give an approximation to the amount of alcohol in 100 parts of each liquor named:—

Whisky,	50 per cent.
Rum,	48 ,,
Brandy,	46 ,,
Gin,	45 ,,
Port Wine,	23 ,,
Sherry,	19 ,,
Claret,	15 ,,
Champagne,	12 ,,
Cider,	5 to 9 ,,
Stout,	7 ,,
Strong Ale,	6 ,,
Porter,	4 ,,
Small Beer,	2 ,,

It has long been a disputed question whether alcohol is to be viewed in the light of a food, a medicine, or a poison, and as a very large portion of the population daily indulge in it, it is of the greatest importance that its action on the body should be fully understood. At the same time, there are so many puzzling issues involved in what becomes of alcohol when taken into the stomach, in the new chemical affinities and changes it undergoes, and in the variety of its effects on different individuals, that we are far from having arrived at any satisfactory conclusion regarding this action. We know for certain that the malt extract and the sugar contained in malt liquors and wines have certain dietetic properties, and that the half ounce or ounce of alcohol in a pint of beer, or the 4 or 5 ounces of the same spirit in a bottle of wine, are consuming agents, and as such, undergo combustion, or are burned up in the system. When taken either with or without water, the first effect of alcohol is to produce a sensation of warmth, beginning at the stomach, and then an increase of the pulse; if the dose is augmented it produces dulness of perception, inclination to drowsiness, and slowness in the circulation. In these effects we see the properties of alcohol exhibited as a stimulant, a sedative, and a narcotic. We know also that when taken habitually and in considerable quantities, the constitution gets as it were seasoned to its effects, but this toleration arises less from the open expression of the above characteristics, than from a dulling and partial prostration of the nervous energies, since it is entirely through the medium of the nervous system that alcohol acts on the body. Drunkards are known by their shaky hands and liability to complaints indicative of a low condition of the nervous system, and are occasionally subject to intervals of excitement and depression (caused by the withdrawal of their accustomed stimulus) in which the nervous tremor develops into a disease termed delirium tremens. In producing this result, alcohol undoubtedly acts as a poison, but we have far more fatal evidence of its poisonous action when we come to investigate the history of hospital patients, and to follow it up by *post-mortem* inspection. It is impossible to specify any organ of the body which would be entirely exempt from the effects of alcohol when taken in excess for a course of years. The liver, the kidneys, the heart are especially susceptible of its influence, so also are the arteries, while the brain and entire nervous system become unhinged and utterly unfitted for healthy service. In commenting on the physical results of alcoholism, it is scarcely possible to avoid noticing the moral injury it produces, though the subject scarcely comes within the compass of this article. In view of the misery, crime, and poverty which follow in its wake, it is not surprising that many good people should combine together to eschew alcohol in every shape and form, and that even medical men of repute should erase it from their *materia medica*, as fraught with danger in the treatment of disease. The most recent application of this principle is in the foundation of a hospital for the sick in London, where patients are treated for critical diseases and undergo severe operations without alcoholic stimulants, and to judge from the annual reports of the establishment, they do remarkably well. Taking all things into consideration, it would appear that for persons in health, the stronger alcoholic liquors such as wine, brandy, whisky, and gin should be avoided. If taken even in mode-

rate quantities habitually, their employment is followed by a certain languor and depression which requires to be met by another application of the accustomed stimulus. There is no more common error than the supposition that a glass of brandy or whisky taken, say in a long journey, or in some task requiring much physical exertion, will assist a person in surmounting the difficulty. The late Dr. Parkes proved, by a series of experiments on soldiers in heavy marching order, that men who were plentifully supplied with water and their ordinary rations could accomplish more work than when they were furnished with beer and spirits. The alcoholic draughts were on each occasion followed by a kind of spurt in their work, which, in the course of an interval varying from three quarters of an hour to an hour, was succeeded by a corresponding depression which rendered their efforts less effective in the aggregate. Medical men differ materially as to the propriety of administering alcohol as a remedy in fevers and some exhausting diseases, but there are certain conditions of the system in which there is for the most part a consensus of opinion. If the patient has been in the habit of indulging in drink, his medical man would not rashly cut off the supply at once, but would probably prescribe it in diminished doses as a tonic. With a similar object he would prescribe it in convalescence from severe illness. There is always more or less torpidity of the alimentary canal consequent on serious maladies, and by stimulating the action of the stomach by alcohol in some form, digestion and the assimilation of food are promoted. The question whether we could part with alcohol as a food, may possibly be a bone of contention for all time, though it is scarcely conceivable that such an important operation as alcoholic fermentation, by which the fruits of the earth may be preserved, is not in some way intended for the benefit of mankind—See *Stimulants*.

ALCOHOLISM is a polite term often applied to signify intoxication due to the indulgence in spirituous liquors. It may be extended to indicate the origin of numerous diseases associated with the liver, heart, kidneys, lungs, air passages, and the brain and nerves.

ALE.—See BEER.

ALIMENT.—See FOOD, DIETARIES, &c.

ALIMENTARY CANAL,—the entire tube through which the food passes from the mouth to the anus; the total length in man averaging thirty-three feet. Its divisions are the mouth, the pharynx or throat, the œsophagus or gullet, the stomach, the small intestines, and the large intestines and rectum. The accompanying diagram exhibits the course of the canal from the mouth to the rectum, with the salivary glands, lacteal vessels, and thoracic duct leading into the venous circulation at the left side of the neck. The liver and gall-bladder are turned up to show the parts underneath. The œsophagus extends from the throat to the stomach, which it enters towards its larger extremity, passing down the posterior part of the chest. The shape of the stomach will be best understood from the figure; it has a larger

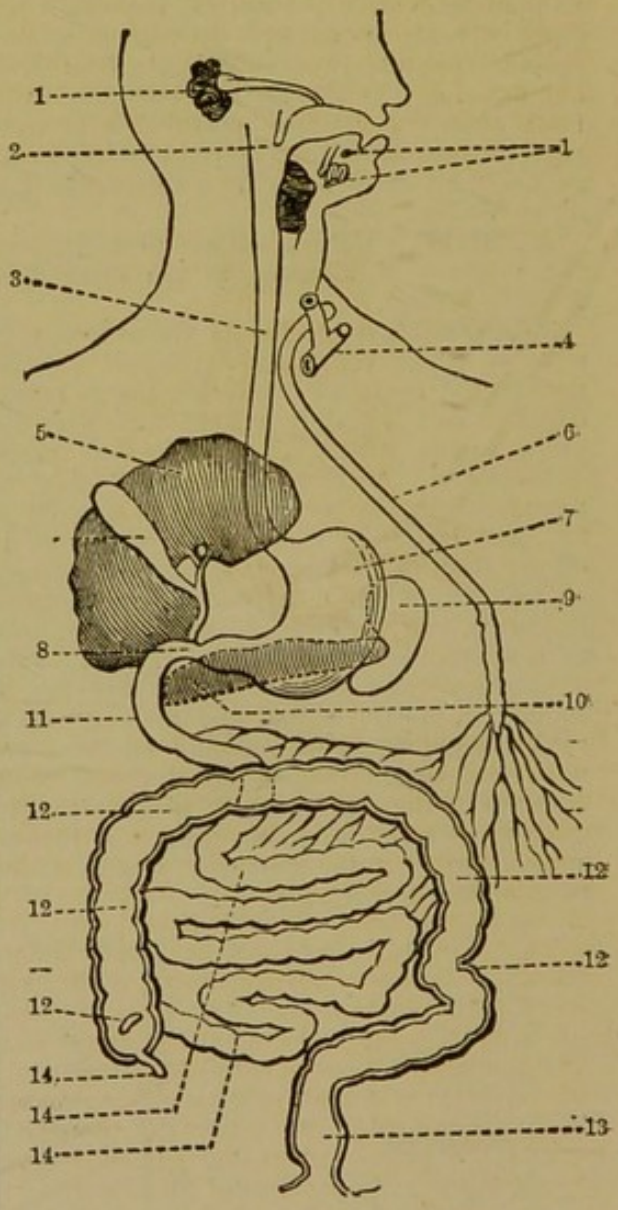


Fig. 5.

1. Salivary Glands.
2. Pharynx.
3. Œsophagus.
4. Left Subclavian Vein.
5. Liver and Gall Bladder.
6. Thoracic Duct.
7. Stomach.
8. Pyloric end of Stomach.
9. The Spleen.
10. The Pancreas.
11. The Duodenum.
12. The Large Intestine.
13. The Rectum.
14. The Small Intestine.

extremity, and a smaller. From the smaller proceeds the first portion of the small intestine, named the duodenum, divided, however, from the stomach by the pyloric valve. The small intestines, divided nominally into two more portions, jejunum and ilium, extend in a continuous coil to the length of about twenty-five feet, and then enter the large intestine in the

right iliac region. The opening of the small intestine into the large is slit-like (fig. 6 c), and is protected by a valve (d). The large intestine or colon, five feet long, ascends from where it is entered by the smaller gut, as high as the under surface of the liver, it then passes across the abdomen, and descending, after making a peculiar turn, ends in the rectum or vent gut. The calibre of the colon is much greater than that of the small intestine, and it is thrown into sacculi or folds by three longi-

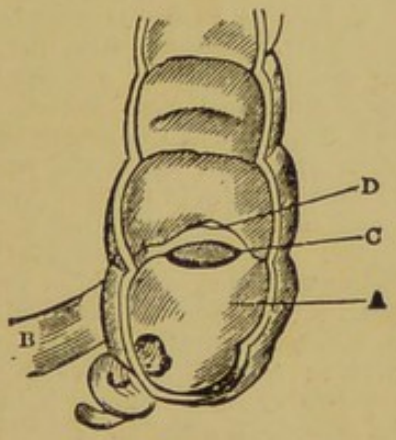


Fig. 6.

tudinal muscular bands. As soon as food reaches the back of the throat, it passes from the power of the voluntary to that of the involuntary muscles, and is conveyed into the stomach by a regular wave-like action of the muscular gullet or œsophagus. When persons eat too fast, and one morsel is passed into the throat too quickly after the other, this regular muscular action becomes spasmodic, producing a very painful sensation. The mass of food from a meal, being collected at the larger end of the stomach, is there mixed with gastric juice, and converted into a pulpy grey-looking mass, the chyme, which as it is formed, is propelled towards the pyloric or smaller extremity, by successive wave-like motions of the organ. At the pyloric valve all well-digested food is allowed to pass, but in the healthy stomach, any portions which are not thoroughly softened are stopped, and passed back into the organ. The food having passed through the pylorus into the upper part of the small intestine, quickly becomes mixed with the bile (which flows into the duodenum from the liver by its proper duct), and also with the pancreatic juice. The mass of chyme is now propelled forward by a worm-like motion of the small intestines, the nutrient portions being absorbed from it as it passes onward, by the lacteal vessels, and by the minute blood-vessels which permeate the lining membrane of the bowels throughout their whole course. Having traversed the small, the chyme is discharged into the large intestine, or colon, through the slit-like valve, and here the contents of the bowels, thought by some to undergo a kind of second digestion, assume the feculent character. After yielding up in the colon the remains of nutrient matter, the mass is discharged through the rectum and anus. The whole of these movements are effected by the muscular powers of the alimentary canal itself. The main object of the alimentary canal is, most undoubtedly, the digestion of food, but this is not its only office, it is one of the great and important drains and sewers of the body, and into it is cast a large proportion of the used-up material of our frames, which would be hurtful if retained, particularly so in illness, such as fever. The fact is a cogent one why, at all times, the bowels should be kept clear, and will explain to people wherefore, during illness, even when food is not taken, and when they often think and say, "there can be nothing in a patient," the medical attendant is so careful to keep this great drain, the alimentary canal, clear of its noxious contents.

Refer to — *Abdomen* — *Absorption* — *Digestion.*

ALIMENTARY TUBE.—A flexible tube designed to enable helpless patients to take fluid nourishment or cooling drinks without raising the head from the pillow. The glass or vessel containing the fluid stands on a table by the patient's bedside; the tube is inserted into the glass, to which it is fastened by a clip with a swivel joint to prevent its upsetting. This contrivance may be obtained from Messrs. Arnold & Son, West Smithfield.

ALKALI.—An alkali is a substance which neutralizes acids more or less perfectly, forming, by the combination, a salt which differs from either of its components; thus, nitrate of potash or saltpetre is a compound of potash and nitric acid. Alkalies have also the general property of turning vegetable blues to green, and reds to violet. Potash, soda, and ammonia are *the* three alkalies; the two first are fixed, the last is volatile.

Refer to—*Potash*—*Soda*—*Ammonia.*

ALMOND.—The sweet almond as an article of food is not very digestible, but as it contains little starchy matter and much oil, it has been made into a kind of biscuit bread, suitable for cases of diabetes. When triturated with gum and sugar, so as to form an emulsion, it constitutes a pleasant demulcent vehicle for medicine in affections of the chest or mucous membranes, and may be taken freely. The bitter almond is most decidedly unwholesome, unless in very small quantity as a flavour; and some persons cannot even take it in that way with impunity. The essential oil of bitter almond contains, after distillation, prussic acid in sufficient quantity to act energetically as a poison. A single drop of the pure oil would be dangerous. Cases of poisoning from eating bitter almonds have occurred; the symptoms and treatment are very similar to those in poisoning by prussic acid. The

strong peculiar odour of the oil will in most cases betray the accident.

Refer to—*Prussic Acid.*

ALOPECIA.—See BALDNESS.

ALVEOLUS.—The socket of a tooth.

ALOES.—The inspissated juice of the cut leaf of the aloe, imported into this country from the East and West Indies, and from the coasts of the Red Sea. It is one of the most useful and extensively used purgatives, is seldom given alone, and is scarcely employed domestically except in its combinations, particularly in pills; indeed, there are few active aperient pills into the composition of which aloes does not enter. The action is certain, and, except in peculiar cases, easy and safe. In pregnancy, and where any tendency to piles exists, the use of aloes is better avoided. The action of the medicine upon the stomach is, in small doses, tonic; but the principal effect of aloes is upon the lower bowels, the movements of which it appears to excite, without increasing the discharges; it seems to act similarly to the bile, and when that is deficient, as a substitute for it. The preparations into which aloes enters are generally better provided ready made. These are very numerous, and comprise the extract, pills composed either of the drug alone, or in combination with other drugs, the wine of aloes and the compound decoction. Of the pills, the simple aloetic, the compound rhubarb, and the compound colocynth are the best; the last is the most active. Of any of these, one or two pills, three grains each, may be taken at bedtime as an average dose. The compound docoction of aloes is a most excellent form, and may safely be given when quick action is required, in one to two ounce doses. For old people it often answers well, and is preferable to pills. It is made as follows:—take of aloes two drachms, saffron and myrrh bruised, of each one drachm and a half, carbonate of potash one drachm, extract of liquorice one ounce, compound tincture of cardamoms eight ounces. Add sufficient water to reduce to thirty ounces after ten minutes' boiling. Dose, one or two ounces. Aloetic purgatives may be taken habitually for a long time without an increase of the dose being required; the continued use, however, may induce piles.

Refer to—*Purgatives—Pills.*

ALTERATIVE is a rather indefinite term applied to certain medicines which are supposed to have the power of changing the varied disordered actions of the body, without producing any sensible effect when taken. These embrace a large number of remedies having much variety of action, and their administration depends on the morbid or constitutional taint from which the person suffers. Those most employed are the mineral acids, the compounds of mercury and iodine, and a combination of rhubarb and soda in repeated small doses, which is perhaps the safest and simplest of all. Sarsaparilla, dulcamara, and taraxacum are alteratives much in use, the action of which is not so well determined. There is, however, an alterative preferable to medicine—obedience to the laws of health. Temperance in eating and drinking, exercise, attention to the state of the skin, and to the ventilation of sleeping-rooms especially, are alteratives which every one may employ. A course of medicinal alteratives must be left to medical direction.

ALUM is a compound salt of sulphuric acid, potash, and alumina. It is a powerful astringent, and is used as such in medicine. In bleeding especially, as from the nose, lint dipped in a strong solution of alum, and applied to the part as a plug, will often stop the flow, or in the case of leechbites, the powder of burnt alum may be sprinkled upon the puncture. Internally, alum is given in cases of protracted diarrhœa, and in hæmorrhage from the lungs or stomach, &c. In case of an individual being attacked either with coughing up, or vomiting of dark blood, in the absence of medical assistance, alum, which is generally easily procurable, may be given in doses of from five to twenty grains every two or three hours. In cases of that painful spasmodic affection of the bowels, named painter's colic, to which those who work much among lead are liable, alum has recently been found of much advantage, and might safely be given provisionally, by an unprofessional hand, to ameliorate suffering—the dose from ten to twenty grains every three or four hours. Alum has also been found useful in the later stages of hooping-cough, in doses of three grains in honey or glycerine every three or four hours. As an astringent gargle in relaxed sore-throat, alum is most useful in the proportion of two drachms to half a pint of water. Alum may be given in pill, but better in solution, in distilled water flavoured with cinnamon, or some aromatic. Alum whey, made with five grains of the salt to every ounce of milk, and the curd strained off, is a pleasant and convenient form—a tea-cupful to be taken three times a day. A few grains of alum, agitated with the white of an egg, forms a coagulum, which, put between two folds of muslin, is used with benefit to the bed-sores of the sick.

Refer to—*Hæmorrhage.*

ALVINE.—Connected with the belly—as alvine discharges, concretions, &c.

AMAUROSIS, the *Gutta serena* of Milton, is total or partial blindness, depending upon disease of some portion of the nervous connexions of the eye. The retina, the brain, the connecting nerve, may any of them be the seat of the disease. The appearance of the eye is unaltered beyond the dilatation of the pupil, which gives it a peculiar dark, deep look, but the expression is unmeaning. Persons who exercise the eyes much on minute objects, or who are much exposed to the glare of intense

light, are liable to become amaurotic, but in such cases, the disease is mostly the result of some amount of inflammation going on within the eye itself, and if taken in time, is remediable. A person threatened with amaurosis, first observes, in the daytime, dark motes or specks floating, as it were, before the sight, at first distinct from one another, but gradually becoming connected, and forming, as it were, a thicker and thicker veil as the sight becomes obscured. In the dark, the motes or specks frequently appear luminous. Sudden flashes of light appearing is a sympton not unfrequent; there is usually pain in the eye and head. It must not be supposed, however, that every one who sees motes or specks is becoming amaurotic, some persons have this peculiarity of vision, either habitually, or whenever the stomach is disordered. In addition to the causes above stated, amaurotic blindness may be the result either of over-fulness of blood, or of the contrary condition, of disease of the brain, of indigestion, sexual excess, hysteria, gout, over-nursing, &c. In such a disease, requiring the nicest discrimination of the medical practitioner as to its cause, before he can adopt appropriate treatment, no unprofessional person is qualified to interfere. An individual threatened with amaurosis cannot too soon submit himself to skilled advice, and should let no consideration stand in the way of his doing so as quickly as possible. Should distance, or any unavoidable cause, occasion delay, all exercise of the eye should at once be stopped, the general health and condition of the bowels attended to, and unless there is evidence of *extreme* weakness, all stimulants avoided; if the patient is a nursing female, the child must be weaned at once. Amaurosis, or blindness without obvious cause, coming on suddenly in a person of *full habit* of body, is always a grave symptom, and, as in such a case, every minute may be valuable, if medical aid cannot at once be got, six or eight leeches may safely be applied to the temples; an active purgative of twenty grains of jalap, and four or five of calomel is to be given at once, and after the leeches, cold applied to the head; perfect quiet being observed. All further treatment in this disease must depend on the individual judgment of the medical attendant.

Refer to—*Eye—Brain.*

AMBULANCE. — This term, borrowed from France, where it refers to a department of the army employed in war time for succouring the wounded, has come of late much into use in this country, and has taken a wider signification, being applied to the means of securing immediate aid to the injured of all classes, and prompt action in cases of emergency and sudden illness. Short courses of lectures, as well as practical instruction on such subjects, are given by medical men and others to the police, volunteers, and other disciplined bodies, as well as to persons of both sexes who choose to avail themselves of them. In this article we will limit our remarks to the branch of the subject which relates to the conveyance of injured persons, from the spot where an accident happens, to their homes or to the hospital. In war time it is the province of the Hospital Staff-Corps in the British Army to carry the wounded to the rear or to the nearest field hospital, stretchers as well as other apparatus being provided for the purpose; but in civil life this duty is usually entailed on the people of the neighbourhood where the accident occurs, or on the police, when they are accessible. When a horsed-vehicle can be had, such as a cab, spring cart or waggon, the difficulty is readily solved, provided there is no unnecessary jolting, but much more frequently the onlookers are forced to have recourse to their own ingenuity for a means of conveyance. Many contrivances are resorted to, the readiest consisting in carrying the patient bodily to a place of safety. If only one man is present besides the injured person at the time of accident, and the patient is able to walk or limp, the former may give material help by allowing the patient to lean heavily on him, or he may carry him on his back, but if two assistants are at hand and the injuries are not severe enough to require the recumbent position, a tolerably comfortable support may be obtained by the assistants crossing their four hands under the buttocks, and allowing the patient to put an arm round the neck of each. When a number of assistants are at hand, as in street accidents, or in accidents in public works, the difficulties of removal are trifling, for although stretchers of an approved character are not to be obtained at every street corner, it is easy to devise one from a door, shutter, or a few planks of wood riveted together. Any one of these temporary substitutes, fitted with a pillow, and a blanket or two in cold weather, may be carried easily on the shoulders of four men, but, if a couple of poles are to be had, it is infinitely better to extemporise a stretcher, or rather a hammock. In his valuable little work entitled *The Surgeon's Pocket-Book*,* Surgeon-Major Porter has given numerous illustrations of methods of extemporaneous transport, suitable either for military or civil life. Carrying-poles, made of cedar, pine, or ash, to which cross bars are adjusted, can be fitted with a stout blanket or sheet, so as to form a comfortable conveyance, which can be borne by a couple of men; or a contrivance more nearly resembling a stretcher may be improvised by lashing round the poles, belts of leather, webbing, ropes of straw, or ordinary ropes as in fig. 7.

Whichever material is used, it is essentially necessary that the stretcher should first be tested, to see that the lashings are thoroughly

* Published by Charles Griffin & Co., London.

secured against any possibility of accident. The best stretchers are, of course, those made for the purpose; and there are none more handy or efficient than those employed by the Metropolitan police, for removing drunk, dying or injured persons to the Hospitals, and obstreperous subjects to the police stations. These are made of strong canvas, painted and riveted

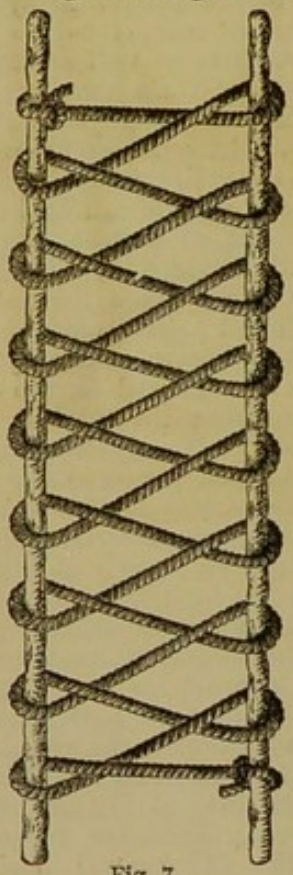


Fig. 7.

to the poles, which are kept apart by iron cross pieces at each end and furnished with side straps, to secure the person when required. A stretcher of this kind may be carried by two men or on the shoulders of four, and has four short iron feet attached, so that it is always raised above the ground level, when the person is laid on or removed from it. It is manufactured for the Metropolitan police, and for the London Hospitals, by Atkinson & Co., of Westminster Bridge Road, Lambeth. Of wheeled vehicles, that most employed, because of its universal use in street commerce, is the long narrow barrow known as the costermonger's. When filled with straw, the costermonger's barrow forms an excellent rest. The head of the patient should lie on a raised pillow at the far end of the vehicle, and care should be taken that the body should maintain either a perfectly horizontal position, or incline slightly from the head downwards. Somewhat on the same principle, but far surpassing it in elegance, ease, and comfort, is the wheeled litter of the "St. John" Ambulance Association, which consists of a stretcher and spring vehicle, now rapidly being brought into use in public works, and other places liable to accidents. The stretcher, furnished with a hood which may be opened or closed at pleasure, can be readily detached from the vehicle and carried with its burden by a couple of men up steps or staircase, into a private room or hospital ward, sparing the sufferer much pain and inconvenience. The accompanying illustrations (figs. 9 and 10, taken from the descriptive account by the Society of the litter in question) give an excellent idea of the mechanism of the vehicle and its capabilities.

When an injured person has to be put into the litter, the stretcher is detached from the vehicle, and its end carried as close as possible to the patient's head so as to be in a line with the body and to facilitate the transfer movements of the assistants. When at rest, the litter is supported by the wheels, a movable prop behind, and two legs in front; it has an inclination from the head downwards to facilitate ingress and egress, and the whole, is designed with the view of securing as easy and steady a position for the sufferer as can well be obtained. The philanthropic society which has patented the litter has its headquarters at St. John's Gate, Clerkenwell, and supplies it to the public, with no pecuniary advantage to itself, at a cost of £16. The entire apparatus is excellently and durably made, and is comparatively light, the weight of stretcher and vehicle combined being under 150 lbs. In the last war between France and Germany the ambulance departments excited much interest and attention, owing greatly to the efforts of the Red Cross Society, instituted specially to render prompt and substantial help to the wounded. All kinds of conveyances were in requisition for this purpose; among others, railway trains fitted up with hammocks, litters and extemporised kitchens, to convey the sick and wounded long distances. Mr. Porter, in the work referred to above, gives the accom-

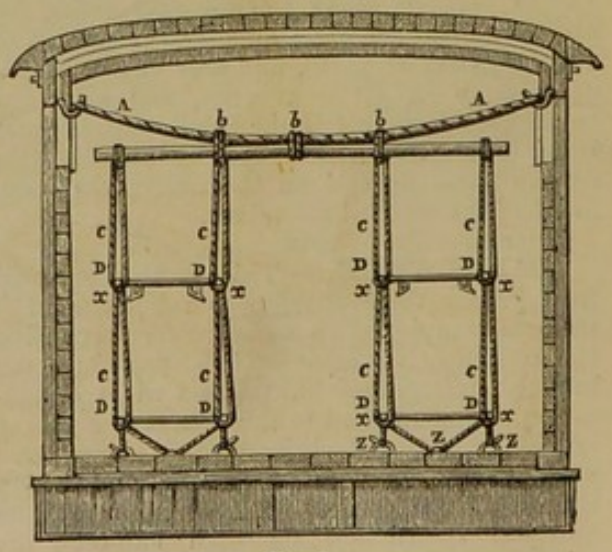


Fig. 8.

panying illustration of a stretcher and hammock combined, for conveying wounded and invalids generally by waggon or rail. This plan has

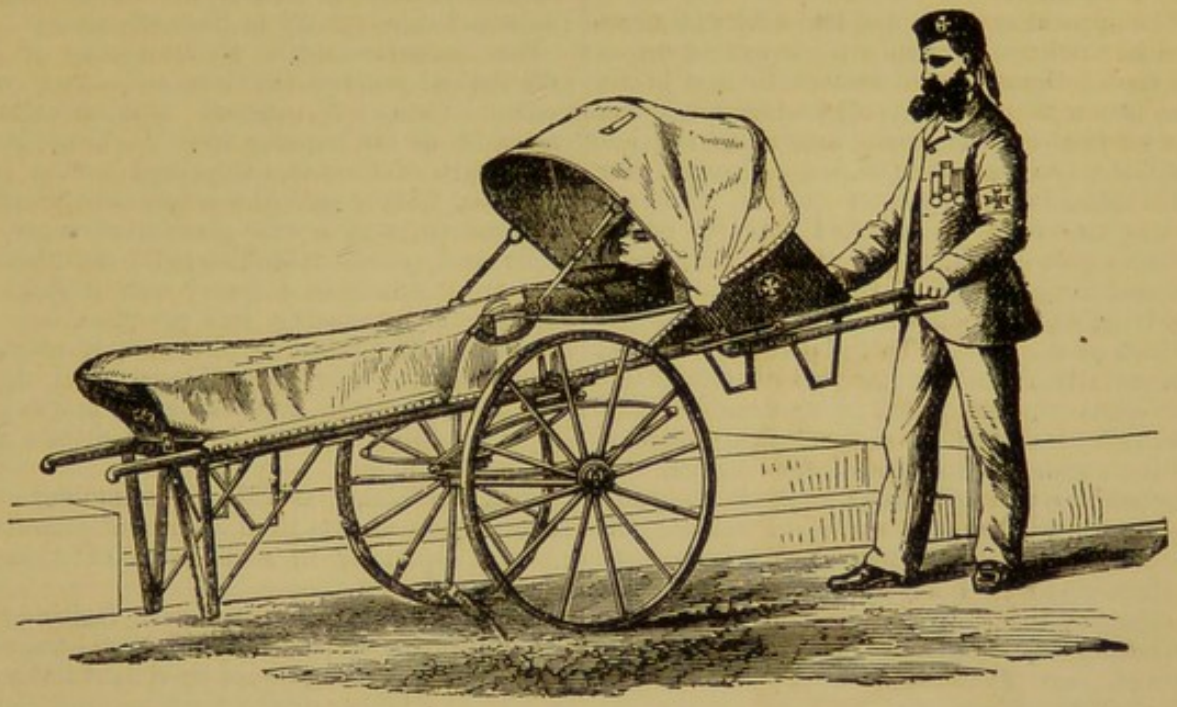


Fig. 9. The St. John's Vehicle in use.

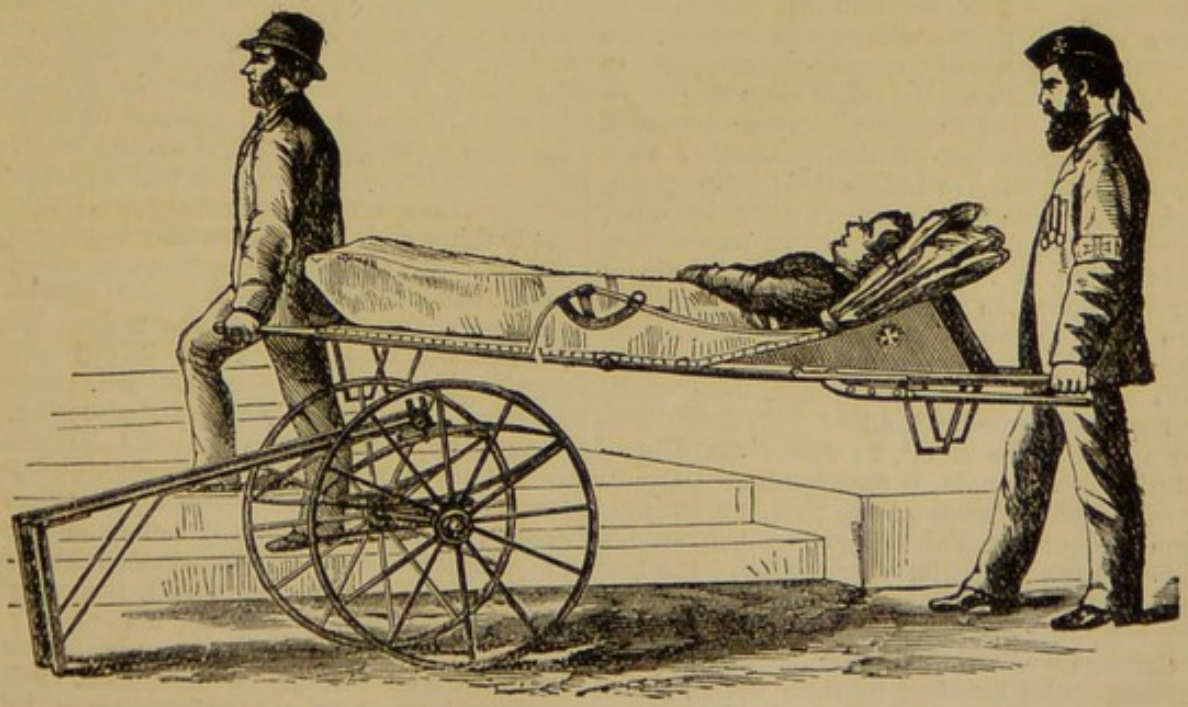


Fig. 10. The St. John's Stretcher as removed from the Vehicle.

The accompanying Illustrations are inserted by kind permission of the Society of St. John of Jerusalem.

been adopted in the Russian service, and is found to possess the power of preventing shocks from travelling.

The apparatus consists of two cables (A A) an inch in thickness, which are suspended across the top of the car, and secured to iron hooks that fasten to iron rings 2½ inches below the roof of the car. If hooks and rings are not available, the ropes may be passed through four holes bored into the side of the car. To each of the two ropes is attached at three points (*b b b*) a pole of oak, ash or other elastic wood, adapted to the width of the car, but at least 8 feet long, and 2½ inches thick in the middle and 1½ inch at the ends. To the poles thus placed horizontally there are attached on either side four cords (*c*), with knots (*x*) so arranged that they may support on a level the stretchers (D D) on which the wounded men recline. To prevent the patients being swayed backward and forward when the car is in motion, the lower stretchers are fastened by 1½ inch ropes to three small iron hooks (z z z) screwed into the floor of the conveyance. For information respecting medical and surgical aid to the injured, see *Emergencies — Wounds — Fractures—Hæmorrhage, &c.*

AMENORRHŒA.—See MENSTRUATION.

AMMONIA—VOLATILE ALKALI—SPIRIT OF HARTSHORN—a gas in its pure state, which is used in medicine in solution, either in water or alcohol, or as a salt, in combination with carbonic acid or acetic acid. In the former case it constitutes the common carbonate of ammonia; in the latter, the solution of acetate of ammonia, known popularly as "spirit of Mindererus." The solution of ammonia in water is used of two different strengths, one very strong, generally employed externally in combination with oil, the other more diluted,—diluted solution of ammonia,—given in cases of fainting, depression of the system, or as a stimulant ant-acid in indigestion; or in spasm, in doses of from five to twenty drops in water, or other simple fluid. In cases where very rapid effect is required, ammonia is advantageous, but when there is partial insensibility, care must be taken that choking is not produced in the administration. When combined with olive oil, ammonia forms a most useful and generally-used stimulant liniment. Two parts by measure of oil, to one of the diluted solution of ammonia, is a convenient strength; or equal parts of each may be used, if a stronger form is requisite. Poisoning by ammonia sometimes occurs, particularly by mistake: the best and most convenient antidote is vinegar, or any vegetable acid.

Carbonate of ammonia is an instance of two gaseous bodies forming, by their union, a firm solid. The actions and uses of this salt are the same as those of ammonia; it may, however, be given in pill; if in solution, five grains dissolved in three table-spoonfuls of water is an average dose.

Chloride of ammonia, formerly known as *sal ammoniac*, is now one of our most powerful remedies in neuralgia, and is also much used in India and this country in liver affections.

The aromatic spirit of ammonia, or sal volatile, is perhaps the best and most convenient form for internal administration; certainly so for popular use. It keeps good any length of time in a stoppered bottle; and the dose, from a half to a whole tea-spoonful, in three parts of a wine-glassful of water, is easily and readily administered. Solution of acetate of ammonia is a very certain and safe diaphoretic, producing free perspiration. In colds and slight febrile ailments, it may be given without fear, in table-spoonful doses diluted with water, repeated every few hours, its effect being assisted by warm drinks and *confinement to bed.*

AMMONIAC GUM—a stimulant expectorant, used also in the form of stimulant plaster, especially in some cases of diseased knee-joint.

AMPUTATION can never legitimately fall within the scope of unprofessional surgery, except when it is occasioned by violent accident; and when a longer or shorter time *must* elapse before surgical assistance be procured. The immediate danger in such cases is fatal hæmorrhage or bleeding; but, fortunately, from the usual nature of the accident, this does not occur to so great an extent as might be expected, the bruising or tearing which generally accompanies the severance of the limb acting as a preventive. The first thing to be done in such an accident, if there is much bleeding, is to tie a handkerchief, a garter, or band of some kind, round the limb, between the bleeding points and the body, and if a pad can be placed over the trunk of the main artery, so much the better. It is wise not to attempt to wrap up the wound itself too soon, it should be freely exposed to the air; there is no better stauncher of blood than a cool breeze: above all things, the bathing with water, especially warm water, which is so frequently done, is to be avoided. In addition, the wounded member should be elevated above the level of the body. When the *bleeding has ceased*, which it will almost certainly do, if these means are properly attended to, a soft linen cloth, or cotton, if there is no linen at hand, should be placed over the wound, the patient kept quiet in a recumbent posture, with the limb slightly but easily elevated, and nothing more done until the surgeon's arrival. No mention has been made of the method by which the surgeon secures a cut artery by tying; it is not a procedure to be attempted by the unprofessional, except in most extreme circumstances, such as the certainty of no medical assistance being procurable for many hours, it might be days. In such a case, it would be impossible to keep the tight band round the limb without mischief ensuing: by slightly relaxing it, after some

reaction has come on, the situation of any arteries likely to bleed would be made evident by their immediately doing so. A slender but firm hook, or pair of small forceps, should be used to pull forward every bleeding point in succession, so far as to allow of a ligature of silk, or fine twine, being tied around it by a second person. The cessation of the flow of blood will indicate whether this has been done effectually; at the same time, the band round the limb must not be removed, but only relaxed, and left so that it can be instantaneously tightened, should hæmorrhage return. In such an extreme case, it might be almost a matter of necessity to detach a limb, the bone of which had been crushed through and the main artery severed, by a few strokes of a sharp knife. Of course, after such an accident, watch, with light, must be kept up during the night. Should heat and inflammation come on, cloths dipped in cold water may be freely applied.

Refer to—*Artery—Hæmorrhage — Tourniquet.*

AMYL NITRITE—a volatile liquid of a strong odour prepared from amylic alcohol which has been treated with nitrous fumes. It is used chiefly by inhalation, a few minims (4 or 5) placed on a piece of lint or on a handkerchief, and held to the mouth and nose, give instantaneous relief to the pain of angina pectoris. It has also been found exceedingly serviceable in asthma, and in some cases of neuralgia. It is now prepared in glass capsules encased in cotton wool, which are crushed by the finger and thumb when the vapour is used. As the drug is very powerful, it requires to be used with extreme caution, especially with old people.—See *Angina Pectoris—Asthma—Epilepsy, Anæsthetics.*

ANÆMIA—Chlorosis—a condition of constitution, in which the quality of the blood is deficient in its red globules, or colouring portions, more especially. It is common in young females, especially of scrofulous habit. The pallor of all those portions of the body, such as the lips, which are usually well-coloured, sufficiently indicates the disease. Anæmia may arise from accidental causes, such as deficient nourishment, unhealthy situation, extreme loss of blood, or may be of constitutional origin. In the former case, it is generally quickly recovered from, if the constitution be a good one, under the use of iron and good living; in the latter case, it often requires long and patient perseverance in these and other means to effect a cure. General languor and listlessness, very heavy sleep, headache, mental debility, impaired, capricious, or depraved appetite, constipated bowels, swelling of the feet, are the general accompaniments of anæmia; the monthly secretion is either absent or very pale. The primary cause of anæmia is still obscure, but the direct cause of the symptoms is undoubtedly poverty of the blood, and to improve the vital fluid must be the great aim of treatment. The bowels should be kept open, not purged, by some mild aperient, such as the compound rhubarb, or colocynth pill, and ten drops of the perchloride tincture of iron, or five grains of tartarated iron, given in a wine-glassful of water twice or three times a day. If the appetite is deficient, and does not improve, a dose of tonic bitter, quinine, salicine, or gentian, must be given along with, or substituted for, one dose of iron. Cod-liver oil is also useful. The diet must be generous; meat twice a-day, eggs if preferred, puddings in small proportion, and bread partly substituted for vegetables. Malt liquor, especially porter, to the extent of one of the usual pint bottles, should be taken in divided portions, daily, or a couple of glasses of port wine, if the former disagrees. An anæmic patient ought to retire to rest by ten o'clock, and to rise, as a general rule, by half-past seven, but ought never to delay breakfast beyond the mere time required for dressing; going out before the meal is quite out of the question, and, indeed, in some cases, where there is a tendency to fainting, it is better to have a cup of coffee, or warm milk, before rising, and even to this, as a temporary remedy, it may be requisite to add a tea-spoonful of brandy. The skin must be attended to, and in many cases a cold sponge bath is of great service, while in others tepid sponging only can be borne. The bed should be a hair mattress. Exercise in the open air on foot or horseback, must be regular, but not carried beyond comfortable fatigue. Change of air to the sea-side, or to a chalybeate spring, is of great service. Mothers are often anxious about the non-appearance of the monthly discharge; its absence is but a symptom of the disease, and it is better that the constitution should not be drained even by it, until it is able to support it. Such are the general rules respecting anæmia, but a confirmed case should always be submitted to the medical man—causes may be aggravating, or effects such as consumption, springing from the disease, which he only can detect. Moreover, in extreme cases of this disease, sudden death has occurred.

Refer to—*Chalybeates—Iron, &c.*

ANÆSTHESIA.—Loss of sensation.

ANÆSTHETICS are agents which produce insensibility to pain, whether applied locally, or to the system generally, by inhalation. It is now generally accepted that while chloroform is the most convenient, ether is the safest anæsthetic, while a mixture of the two, with some pure alcohol added, is at once a safe and convenient form. The relative proportions are one of alcohol, two of chloroform and three of ether. The anæsthetics should never be given but by a duly qualified person, and *certainly should never be administered by any one to himself.* It may now be said that deaths from the administration of chloroform are very unusual, and we hope that they will become,

in time, almost unknown, especially since medical men are much more cautious in having chloroform given only by those who are experienced in its use, in which case it must happen very rarely indeed that there is any cause for alarm.

There are a great number of chloroform "inhalers" used at present, but the fact is that none of them can be specially recommended, and that the simplest method is the best. The patient ought to lie down, to keep his eyes shut, and breathe freely; any tight article of dress around the throat or chest should be loosened; about two drachms of chloroform should be sprinkled over a folded towel, which is to be lightly applied over the patient's face, and afterwards, when this is partially evaporated, one drachm should be added from time to time, till insensibility is produced. How much chloroform should be given, can only be determined by an experienced person, who tests the sensibility of his patient by opening the eye and touching it, by raising the arms and letting them fall again; thus judging if the muscles are relaxed; or by otherwise testing his patient's power. Many patients, before getting under the influence of chloroform, struggle violently, and require to be restrained by one or two assistants, but the administration should be continued till this is overcome, which it speedily will be, the patient then generally passing into complete insensibility. The uninitiated ought to know that patients often shout, and even appear to suffer great pain, when they are quite unconscious, and that there are great differences exhibited by different people in the way in which they are affected by the drug. When it is desired to relax the muscles entirely, as, for instance, to allow of the reduction of a dislocation, it will be necessary to produce even a more decided effect than is required for a painful operation, as the amputation of a limb, the removal of a tumour, &c. On such occasions, the administrator of the chloroform most attentively and momentarily watches the condition of his patient. It cannot be too emphatically repeated that care and experience are the two great requisites in the giving of chloroform. Another mode, which deserves notice on account of its simplicity, and which is in great favour, though, in the writer's opinion, inferior to the above-mentioned method, is to protect the nose of the patient by smearing a little glycerine or cold cream over it, then to spread a handkerchief over the face, and drop the chloroform, drop by drop, over the part just below the nostrils. Bottles are to be had with stoppers adapted for this dropping process. This has certainly the advantage of being a more economical method, but it is not so safe, nor so convenient, as the other. Should it unfortunately happen that a person has inhaled too much, or at all events does not appear to rally from the stupor, or should he, during the administration, cease to breathe, with a low or absent pulse, livid lips, and all the symptoms of suspended animation, then no time is to be lost, for on the energy and promptitude displayed within the next few seconds or minutes will depend, in all probability, the issue of the case. The head must be kept low, the face should be slapped smartly with a towel dipped in cold water, ammonia at once applied to the nostrils, and artificial respiration commenced, by pressing upon the chest, so as to expel the air, and then allow it to expand again of itself. This should be repeated at the rate of about twenty times in the minute, the surface of the body over the region of the heart being rubbed with a brush, or with the hand, warm blankets, or bottles, or hot bricks applied to the hands and feet, and the galvanic battery (which ought always to be in readiness where chloroform is frequently given) should be applied, to promote artificial respiration, in conjunction with the means mentioned above. The restoration of the pulse, the reappearance of the healthy colour of the lips and countenance, and, above all, the breathing of the patient, or his showing any sign of returning consciousness, will be hailed with joy, and if there still remains great prostration, a little brandy and water, or wine, may be given at intervals. Of late the nitrite of amyl has been used to restore consciousness. It is sold in capsules, which can be readily broken and held to the nostrils during a few inspirations until the face is seen to flush. If there is much pallor and depression after the anæsthetics, ten or fifteen drops of brandy injected subcutaneously will improve the heart's power. This may be repeated. It was formerly considered dangerous to administer chloroform to those suffering from heart disease, but, carefully handled, it may be given without hesitation. The only condition of the heart, which contra-indicates its use, namely, fatty heart, is rarely discoverable before death. It should also be given with extreme caution to young infants (in whom insensibility is quickly produced by using a very small quantity), to persons advanced in life, and to persons of feeble vital power.

It need scarcely be said, that many operations which formerly were very troublesome of performance, especially upon children, are now rendered comparatively easy by the use of chloroform; many operations also requiring great nicety of manipulation, and almost impossible, without the co-operation of the patient—a co-operation never to be obtained in the case of children, and even of some grown-up people—can be performed with the greatest ease, and without any trouble on the part of the surgeon.

Finally, it would be impossible to omit mention of the great value derived from the use of chloroform in childbed, and more especially in those cases of extreme difficulty and urgency occurring every now and then in the

experience of all practitioners. For its introduction and use in this, as well as in all other departments of medicine, the world is indebted to the late distinguished professor of midwifery in Edinburgh, Sir James Simpson, whose genius devised, and whose indefatigable energy brought into general use this, which must rank first among the many improvements he introduced into the practice of medicine and surgery.

ANALYSIS.—The art of separating and distinguishing the various constituents of a compound body, either as regards quality or quantity. In judicial inquiry, analysis is most important, and were its power and perfection more generally known, the dread of almost certain discovery, would tend to check the too common crime of poisoning. It is possible for the chemist to make the 1000th of a grain of arsenic demonstrable.

ANASARCA.—See DROPSY.

ANATOMY.—The science which treats of the structure of organized beings. It is divided under the heads of General Anatomy, which regards the general features and relative position of the various portions of a body; and Structural Anatomy, which regards the intimate and microscopic structure of the various textures.

ANCHYLOSIS is the stiffening of any joint caused by its impairment or destruction by inflammation. If complete, the joint cannot be moved; it can only be remedied by the surgeon. If partial, much improvement is often induced by passive movement, warm bathing, and gentle friction.

ANEURISM—a tumour communicating with the canal of an artery, and filled with blood. Its wall is formed by the dilatation of the coats of the vessel at some particular spot. The progress of the disease is for this sac to grow larger, whilst its coverings become thinner and thinner, until at last they give way, and the individual dies from loss of blood. In many cases, surgical interference can save life by arresting the disease, and the sooner this is done the better. Aneurism may be suspected, when a tumour is felt, which distinctly pulsates, conveys to the finger a thrilling sensation, and becomes smaller and less tense when the current of blood through the artery leading to it is interrupted. In such a case, the surgeon should at once be consulted. It is not, however, every tumour which pulsates that is aneurism, for proximity to a large artery may give the appearance of its doing so. The most common seat at which the disease can be recognised by the unprofessional is behind the knee. The symptoms frequently come on suddenly after severe exertion, they are often obscure and are mistaken for rheumatism. The chief are pain and swelling of the foot and leg with pulsation in the tumour.—See also *Artery*.

ANGINA PECTORIS, or SPASM OF THE HEART, is one of the most formidable and painful of the affections which terminate human life; it occurs more generally after middle age, and is more frequent in men than women. The attack is characterised by the sudden onset of agonizing pain, referred to the centre of the chest, or a little to the left side of it, passing through to the spine, up to the left shoulder, and down the arm of the same side even to the extremities of the fingers. Sometimes both arms are affected. Along with the pain, which is always said to be agony beyond description, there is a sensation as of instant impending death. The paroxysm ceases as suddenly as it comes on. Angina pectoris may be preceded by warning symptoms, palpitation, shortness of breathing, indigestion, or it may come on unheralded by any of these, generally during some slight exertion, as walking up hill, or during strong mental emotion, but not unfrequently in the night, after the first sleep. An attack of angina pectoris is an emergency affecting life, to which there are few equal; full, instant, stimulation is demanded, and the first agent of the kind at hand must be used, till other remedies and proper assistance can be procured. A glass of spirits and water as hot and strong as it can be swallowed, and with it, if procurable instantly, 40 drops of laudanum must at once be given. A strong mustard poultice is to be applied immediately to the front of the chest, and the same between the shoulders—hot applications to the feet. If the paroxysm be not subdued in a quarter of an hour, the stimulant is to be repeated with half the quantity of laudanum, and this again, after the same interval, if requisite. Spirits have been mentioned as being the most readily procurable, but when ether and sal volatile, either one or other, or both are at hand, they are preferable, and must be given in just so much water as will permit of their being swallowed; a tea-spoonful of each with thirty drops of laudanum. A person who has once suffered an attack of angina should never be without these three requisites, laudanum, or better, Battley's sedative solution, ether, and sal volatile. It is needless perhaps to say, that all these measures of an emergency in which not a moment is to be lost, are whilst waiting the arrival of the medical attendant, and that to him must be entrusted the direction of that regulated mode of life, which must ever be adopted after an attack of this disease. The treatment of the emergency it may be highly important for an unprofessional person to be acquainted with, that of the interval, which may extend to months or even years, with care, must be left in the hands of educated skill alone. Within the last few years, we have, in nitrite of amyl, the most effectual and rapidly-acting remedy in cases of heart-spasm. From two to four minims may be dropped on a piece of lint, and the vapour cautiously inhaled. Persons who suffer from attacks of heart-spasm frequently carry about with them a little stop-

pered bottle containing a small amount of amyl, finding a few sniffs sufficient to ward off an attack. Martindale's capsules, however, only lately introduced, are, perhaps, the most convenient form in which amyl can be carried about the person.

ANIMAL HEAT is the temperature which every animal body is enabled to sustain, independent of surrounding media. In healthy men, the average temperature of the body is 98° or 99°, in febrile diseases it rises considerably. Whether our animal temperature is sustained in part from other sources or not, it is generally now considered to be chiefly due to the continual union of the carbon and hydrogen derived from the food, and from the bodily tissues, with the oxygen conveyed to every portion of the living frame, from the lungs, by the blood. One great fulfilment therefore of the food we digest, is to keep us warm, by the continual combustion of elements going on within us; consequently, persons who can consume and digest large quantities of food, have much greater power of resisting cold than those who cannot, and chilliness is one very constant symptom of impaired digestion; the stomach is unable to keep the system supplied with fuel. The point is one of considerable importance in the selection of crews for Arctic expeditions, and ought to have some influence with intending emigrants in their choice of a future home. An individual who suffers from habitual weakness of digestion, ought to choose a warm or genial climate in preference to a cold one. Fats and oils especially, which contain much carbon and hydrogen, afford great protection against severe cold; accordingly all northern people, like the Esquimaux, consume them in large quantity, and Europeans travelling in northern latitudes have always copied the natives in this respect. Alcoholic fluids, like fat and oil, contain much carbon and hydrogen, but their stimulant properties, and more evanescent influence, render them unfit for *ordinary* consumption to sustain animal heat, although on *extraordinary* occasions they are invaluable. When the tissues are impoverished through exhausting illness, and but little food can be assimilated, alcoholic stimulants are found often very serviceable in keeping up the animal heat. They are quickly absorbed by the circulation, and more readily oxidised than food proper, and there are many physicians who employ alcohol in this way and continue to do so until convalescence is fairly established.

But internal heat cannot do all in our cold clime, and with our artificial modes of living, and it is of the utmost importance, especially in the young and delicate, to maintain the full temperature of the surface by proper clothing. The subject is one, respecting which much carelessness and ignorance prevail in all classes of society in this country, and children, half-clothed for the sake of appearance, with bare chests and limbs, and exercise not sufficiently active to counteract the effects of the chill, are exposed to all the evils resulting from internal congestions of the blood repelled from the surface. Warm clothing is, in some respects, a substitute for food, and both man and animals require less nourishment when protected from cold. It is well known to agriculturists, that sheep or cattle will fatten more quickly under cover in winter, than if exposed to the weather. The reason is obvious, they are able to store up in their bodies that which otherwise must have gone to keep them warm. When it is considered that abstraction of animal heat, by cold and wet, is one of the most fertile sources of fatal disease, the importance of maintaining to the full the temperature of the body is manifest. It is well known that exercise is the best antagonist to cold; it is so, by quickening the respiration, and thus increasing the supply of oxygen taken in by the blood, which is also circulated more rapidly. In fact, to use the simile which compares the body to a stove, exercise gives a free draught for the process of combustion. Continued exposure to an extreme degree of cold, which carries off the animal heat more quickly than it can be generated, gives, it is well known, rise to overpowering drowsiness, which, once yielded to, is death. It must be resisted, and when one of a party thus exposed is inclined to yield, the others must resort to every means calculated to rouse, even—as has been done—by thrashing him along; the temper which is excited is a most excellent resistant of cold.

Refer to—*Aeration—Blood—Lung—Circulation—Food.*

ANIMATION, SUSPENDED, is the term applied to that condition in which the life of the body is threatened, in consequence of respiration having been stopped or impeded, but in which there still exists a possibility of life being preserved. The chief causes of suspended animation are drowning, hanging, immersion in choke damp or irrespirable gas, and intense cold. These may be referred to under their proper heads.

ANISE—aromatic and carminative—is used chiefly in the form of the distilled water to correct flatulence in children, but is not so generally liked by them as dill water, which is equally efficacious. The dose is a tea-spoonful. The essential oil of aniseed is used to flavour mixtures, and is given in doses of five or six drops for an adult, upon lump sugar. The essence of anise, which is composed of one part of the oil and four parts of rectified spirit, is likewise employed as a carminative in doses of from 10 to 20 minims.

Refer to—*Carminative.*

ANKLE is the joint connecting the foot with the leg (fig. 11). It belongs to the class of hinge joints, and is formed by the extremities of the large and small bones of the leg (fig. 11, 2 and 1) on the one side, and the smooth,

"articulating" surface of a bone of the foot, named the "astragalus" on the other, the whole being kept in place by means of strong

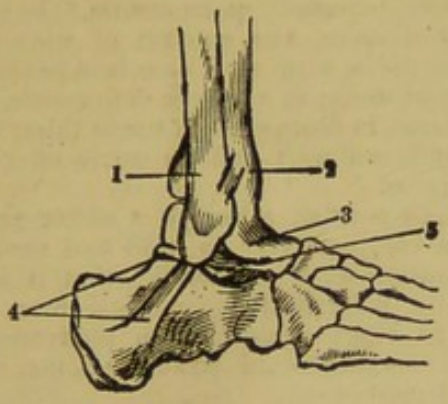


Fig. 11.

ligaments (4 and 5). The position of the ankle joint renders it peculiarly liable to injury—strain, dislocation, or fracture of the leg-bones close to their extremities. Whenever the least suspicion exists that violence to the ankle has caused more than a sprain, no time should be lost in submitting it to the examination of the surgeon; such injuries are often extremely obscure, and there is much difficulty in making out their exact nature after swelling has come on. A simple sprain of the ankle is to be treated in the mode directed to be followed in these injuries generally. In cases of dislocation, occurring at a *great distance* from medical aid, and when, from the extreme distortion of the foot, the accident is distinctly apparent, some attempt ought to be made by those near to replace the parts; for this purpose, the sufferer being laid down, one individual should grasp the leg firmly just below the calf, whilst another, grasping the heel with his left hand, and the lower part of the instep with his right, endeavours, by extension in the first place, and slight turning of the foot towards its proper position, to reduce the dislocation.

The ankles in children are very apt to become gradually distorted from weakness generally, and of the ligaments in particular, and the deformity is often not discovered until it has considerably advanced; the bones become altered in shape, and even the spine becomes affected, from the habitual malposition of the body. The best general remedies are, attention to the general health and strength of the child, as directed in the article "Children," the *prohibition of long standing*, and enforcement of regular but moderate exercise. The ankles ought to be bathed every morning with cold salt water, and well rubbed afterwards with a rough towel. Many contrivances, boots of various kinds, &c., are, and have been used in cases of weak ankles; unless in extreme cases, they are better avoided, and the case left to the gradual strengthening measures above recommended. If artificial supports supply the place of the natural ones the latter will not regain the proper tone and strength essential for permanent cure. One of the many forms of elastic socks or stocking may, however, be worn with advantage. In addition to the above means, considerable mechanical power may be exerted by making the inner or outer margin of the sole of the boot—for cloth boots should always be worn in such cases—thicker or thinner, according to the nature of the deformity; thus if the ankle be inclined to project inwards, the sole should be raised on the inner side, and *vice versâ*. Regular perseverance in the above mode of treatment will, in most cases, effect a cure without the more complicated contrivances often used. Attention, too, ought always to be paid to the habits of standing practised by the child at school or elsewhere. Children are sometimes born with ankles distorted.—See *Club Feet*.

Refer to—*Dislocation—Joint—Sprain, &c.*

ANODYNES must be regarded as constituting one of the most benevolent provisions of the Creator for the relief of his creatures. The removal of pain by an anodyne is like a breath of heaven. The more generally used anodynes are — opium, belladonna, aconite, conium, hyoscyamus, lettuce, hop, camphor, chloral hydrate.

ANOREXIA.—Loss of appetite.

ANT-ACID, in medical language, means whatever directly neutralises acid secretions, more especially of the stomach and bowels. The principal ant-acids are potash, soda, ammonia, lime, chalk, and magnesia. The use of ant-acids can only be palliative, and their continued regular use is productive of serious mischief; they inevitably destroy the tone of the stomach, and aggravate permanently the evil they may temporarily relieve. Whenever ant-acids are frequently called for, it is a sign that there is other disorder, though perhaps less prominent, which must be looked for and corrected.

Refer to—*Dyspepsia—Digestion.*

ANTHELMINTICS are medicines which remove the different species of worms found in the alimentary canal. The chief anthelmintics are—the liquid extract of male fern, santonin, quassia, turpentine, kousso; purgatives, especially jalap, calomel and scammony, are indirect anthelmintics.—See *Worms.*

ANTIMONY is the metallic base of our antimonial preparations; of these, the most useful are tartarated antimony or tartar emetic, antimonial wine, antimonial or James's powder, and the compound Plummer's pill. Of these, tartar emetic, the most powerful, is a remedy which stands without a rival as the controller of some forms of inflammation. A compound salt of antimony, potash and tartaric acid—it is formed in crystals, but usually sold as a white powder. It is sufficiently soluble in water to be conveniently administered in that fluid, which should always be used soft or distilled: a simple solution of the medicine is

preferable in most cases. In large doses, tartar emetic acts as a powerful irritant poison, causing intense nausea, vomiting, severe pain in the bowels, purging, bloody stools, and extreme general depression; and even in comparatively small doses, these effects are sometimes liable to be developed in degree, especially in children. Great caution, therefore, is required. In case of a poisonous, or over-dose of tartar emetic having been swallowed, the best remedy is some astringent infusion, Peruvian bark, nut galls or strong tea. There is considerable variation in the strength of the dose of tartar emetic given by medical men; when, under necessity, it is dispensed by others, the sixth to the eighth of a grain only should be given to an adult. A convenient form is to dissolve two grains of the salt in half a pint of soft water slightly warmed, and of this, to give a table-spoonful every three or four hours, so as to keep up continued nausea. Vomiting may follow the first dose or two, but after that, in most cases, the stomach becomes tolerant of the remedy. By giving tartarated antimony dissolved in a moderately small quantity of water, its irritant effects are less liable to be exerted upon the bowels, and should they come on, a few drops of laudanum, if otherwise admissible, must be given in some demulcent,—barley or rice water,—and the demulcent alone continued as common drink. To children, tartarated antimony must be administered with great caution, and is better avoided by the unprofessional, except in the extreme cases of croup, or severe inflammation of the lungs, plainly existing, and occurring at a distance from proper medical assistance. In the former alarming disease, tolerably full doses are required to make a quick impression upon the system, and to induce speedy vomiting. For a child of six or seven years, a single grain must be dissolved in an ounce of water, and a tea-spoonful of the solution, given either alone or in a little water as drink, every quarter of an hour, till free vomiting is produced. In inflammation of the lungs half the dose must be given; but this advice, let it be remembered, applies only to the severe diseases above mentioned, when occurring at a distance from medical aid. The practice of administering antimony to children generally, is not well, unless under medical sanction, and in those of weak constitution may be productive of serious or fatal results. It is better for the unprofessional to trust to ipecacuan wine or syrup, which keeps better.

For a simple emetic, antimony is seldom well adapted, and should not be used when others are obtainable. Tartarated antimony is used for counter-irritation in the form of an ointment, composed of two drachms of the powder to an ounce of simple ointment. It produces a crop of pustules over the part to which it is applied, and it is not advisable to use it in young children.

ANTIMONIAL WINE is a solution of tartar emetic in wine, two grains to the fluid ounce; in many cases it is a convenient preparation, but of course liable to the same dangers as the watery solution; it is much—too much—used popularly, especially as an emetic. In inflammatory diseases, the amount of wine which must be given with each dose is objectionable. It is most useful as a simple diaphoretic, given at bedtime, in doses of from ten to thirty drops, and combined with half an ounce of spirit of mindererus.

James's powder, although a secret preparation, is comparatively so mild and certain in its operation as a diaphoretic, that it is very generally prescribed by medical men; dose, three to eight grains. The pharmaceutical imitation—antimonial powder—is not *always* to be depended on.

Plummer's pill contains antimony in small proportion.—See *Plummer's Pill.*

ANTISEPTIC—a substance which counteracts the tendency to fermentation, or putrefaction, in organized bodies. These processes are due to the presence and action of minute organisms known as *bacteria;* antiseptics arrest their activity and destroy their vitality. Some antiseptics are themselves poisonous, such as perchloride of mercury and carbolic acid; others, for instance, boracic acid and permanganate of potash, are comparatively innocuous.

Refer to—*Fermentation—Disinfectants.*

ANTISPASMODIC.—That which allays pain arising from muscular spasm, or indeed any severe pain unconnected with inflammation. Anodynes, therefore, are antispasmodics, but there are others of the class which are stimulants, and which do not appear to possess any anodyne effect. The principal stimulant antispasmodics are ether,—which may also be regarded as anodyne,—ammonia, valerian, assafœtida, musk, and the various forms of spirit, brandy, &c. The anodyne antispasmodics are quite the safest for unprofessional administration; they cannot do mischief, which the stimulants certainly will, in the event of inflammation being present. Heat is, however, one of the best, and certainly the safest antispasmodic for general use; in spasm of the stomach, in colic, in gravel, in gall-stone, indeed, in pain generally, the continued application of heat—at as high a temperature as can be well borne—acts certainly, safely, gratefully. The antispasmodics above enumerated are more directly applicable to the treatment of painful spasm; those which are employed in the treatment of spasmodic diseases, such as St. Vitus' dance, hooping-cough, &c., are many of them more properly tonic remedies; spirits of chloroform, as a general antispasmodic, is eminently serviceable.

Refer to—*Anodynes—Spasm—Heat, &c.*

ANUS.—The fundament or terminating outlet of the alimentary canal. Itching in this situation is at times extremely troublesome; it will generally be allayed by slight relaxation

of the bowels, effected by a few doses of sulphur and magnesia, half a drachm of each taken every night, and by the use of a lotion composed of two or three grains of acetate of lead in the ounce of water. An ointment composed of oxide of zinc and solution of acetate of lead, of each one drachm, with an ounce of lard or vaseline to allay the irritation, is an excellent application. Fissure of the anus is a most painful affection, which requires the care of the surgeon. Prolapsus of the bowel, piles, and fistula, all occur in this situation. The anus is kept closed by a sphincter muscle which surrounds it. When this muscle loses its power, as it does in some diseases, involuntary discharges occur. Infants are sometimes born with an imperforate anus, and it is necessary for the surgeon to make an opening in connection with the end of the gut to remove the obstruction. In some cases of intestinal obstruction an artificial anus is made through the walls of the abdomen to allow fœcal matter to pass.

Refer to—*Fistula—Piles—Prolapsus.*

AORTA.—The main artery of the body, which arises directly from the heart, and from which all the secondary arteries have their origin except one, the pulmonary (see fig. 12).

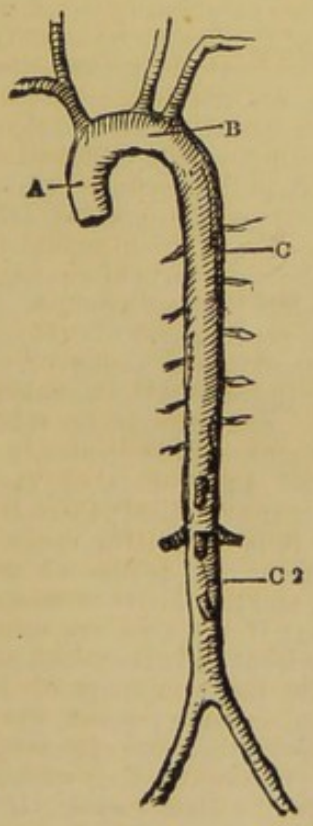


Fig. 12.

The aorta is divided into an ascending portion A, an arch B, and a descending portion C, the latter being subdivided into a thoracic portion C, and abdominal C 2. The origin of the aorta from the heart, is just opposite the junction of the fourth rib with the breast-bone. The passage from the heart into the aorta is closed by three "semilunar" valves, which, when perfect, effectually prevent any regurgitation of blood.

Refer to—*Artery—Heart.*

APERIENT,—whatever opens the bowels gently,—a laxative, in contradistinction to purgatives, and cathartics, which act strongly. The best examples are sulphur, castor-oil, carbonate and sulphate of magnesia. See *Purgatives.*

APHASIA.—Loss of the power of speech, a distinctive characteristic in some cases of paralysis.

APHONIA.—Loss of voice may be owing to inflammatory swelling, either acute or chronic, or to ulceration of the lining membrane of the larynx, to paralysis, or to hysterical affection. Coming on suddenly, accompanied with fever, pain in the larynx and upper part of the throat increased on swallowing, and difficulty of breathing, the above symptom must be regarded with some apprehension, as one of the concomitants of rapidly fatal disease, acute laryngitis. Loss of voice, however, frequently occurs, quite unconnected with the other symptoms mentioned, and is then not to be so seriously regarded. Many persons are liable to it after exposure to night or foggy air, or after much, or loud talking. Persons living in damp houses suffer from this form of aphonia, which is probably owing to the thickening or great susceptibility of the laryngeal membrane. When it continues, nothing affords greater relief than antimonial ointment, or croton oil, rubbed over the forepart of the neck so as to produce a free eruption. Mustard plasters may be used, but are not so efficacious. A hot bran poultice to the throat at night, and a tea-spoonful of paregoric, taken along with twenty drops of ipecacuan wine, will often remove a threatened attack. Inhaling steam from hot water or spray from Seigle's spray-producer is sometimes of great service. In the more chronic form, twenty drops of tincture of squills may be substituted for the ipecacuan. A syrup made with infusion of horse-radish, is popularly, and sometimes beneficially employed. Persons who are liable to loss of voice, ought never to expose themselves to damp, cold or night air, without protecting the mouth by means of a light shawl or respirator of some kind, and should keep the feet well protected, not so much on account of the symptom itself, though that is troublesome enough, but because of the indication it affords of general delicacy of the bronchial membrane. When along with loss of voice, there exists hoarse cough, pain, and expectoration of thick mucus, ulceration is to be suspected, and the case as soon as possible put under proper medical care. Aphonia from paralysis, or hysteria, must fall under the general treatment of these diseases.

Loss of voice in relaxed throat, is often quickly cured by brushing the back part of the throat over with a hair pencil, immersed in the following solution:—Take of nitrate of silver or lunar caustic 1 scruple; nitrous ether 1 ounce; dissolve. It must not be applied too often, otherwise the caustic effect will be too severely produced. Those suffering from enlarged and relaxed tonsils, with elongation of the uvula, such as clergymen, schoolmasters, and public speakers, or singers, will often derive benefit from this method of treatment, properly applied. Relief has also been obtained as above, in cases of that most distressing sore throat which often accompanies consumption. A little of the solution should be gently pencilled over the back of the throat, and allowed to trickle over the surrounding parts. The tannin lozenges of the British pharmacopœia and Brown's bronchial troches often alleviate the difficulty experienced in speaking and swallowing.

The voice is not unfrequently lost in young people, otherwise healthy, without the existence of any local disease in the throat. This is purely nervous, and is to be cured by change of air and scene, tonics and galvanism to the throat, administered by the continuous current battery for a short time each day.

Refer to—*Larynx—Laryngitis—Expectorants—Respirator—Inhalation—Electricity.*

APHTHA.—Thrush, is more especially a disease of early infancy, affecting the mouth and fauces, the lining membrane of which in this disease appears as if sprinkled over with bits of milk curd. Recent researches have discovered, that upon these patches, a filiform description of minute fungus is developed, which probably finds a congenial habitat in the disordered secretions which are the main feature of the disease; excess of acid, and irritation of the mucous lining of the bowels always existing. The disease is not generally serious, it is accompanied by slight fever and drowsiness, and passes off in eight or ten days; during the time, however, it interferes with the child taking the breast properly. Aphtha is very often the result of improper feeding, with bread and other things unfit for the infant stomach. The first thing to be done when an infant is affected with thrush, is to correct the acid state of the bowels by a few grains of calcined magnesia—in this case preferable to the fluid form—or if the bowels be relaxed, of chalk, following the antacid by a mild dose of castor oil. Carbolic acid in very minute doses, $\frac{1}{12}$ grain, may be given with advantage in the chalk mixture, with glycerine. This may be repeated every second day. The quality of the milk, and state of the nipple of the mother, are to be examined, and the food, if any be given, regulated; milk and water, two parts of the former to one of the latter—in which a little isinglass should be dissolved if there is diarrhœa—is to be the sole addition to the mother's supply, all saccharine matters being avoided. If the state of the bowels be corrected, the thrush will generally get well, but it is expedient to assist the cure by the use of a solution of borax in water,—one drachm to half a pint,—used to wash the mouth. The common system of mixing borax with honey is not advisable, as the saccharine matter may favour the fungoid growth. When the case is mild, the aphthæ separate in seven or eight days, leaving a healing surface below, and the mouth soon gets well; that is, if it be not injudiciously scrubbed ("cleaned") daily by the nurse. In children of weak constitution, or who are exposed to unhealthy influences, thrush may assume a malignant character; the aphthous specks become black, and ulcerations form on their site, diarrhœa increases, and the belly becomes tender, the child is drowsy, or it may be convulsed. In such cases, the chlorate of potash, internally, and saturated solution of sulphate of copper applied to the sores, as recommended by Dr. West, are most useful, the strength being at the same time supported by a tea-spoonful of strong broth, in which isinglass has been dissolved, given frequently. When, however, the disease assumes this dangerous character, medical assistance must be procured at once. Children past infancy, and even adults are sometimes affected with aphtha. Regulation of the bowels by a mild aperient,—castor oil,—chlorate of potash internally, and borax wash, are the best remedies. Bismuth is sometimes useful. The diet should be mild and unirritating, chiefly milk and farinaceous.

APNŒA.—The most common mode of dying, caused by the gradual failure of the respiration. Death from suffocation may be viewed as the acute form of apnœa.

APOPLEXY is an affection of the brain, during the continuance of which, sense and voluntary motion are wholly or partially extinguished; the patient lies unconscious, as if in deep sleep, and cannot be roused by any ordinary means. More generally the face is flushed, and the vessels of the head and temples appear over filled; there is snoring, or stertor, as it is called; the upper lip margin, partially or entirely, is blown forward at each expiration, and the skin is covered with profuse perspiration; if the eyes are examined, they appear bloodshot and glassy-looking. In some cases, while the symptoms of insensibility, perspiration, &c., are present, the face is pale, and the appearance is one of general depression; the weak pulse contrasting with its full hard condition in the former case. If a person be found in a state of insensibility, as he can give no account of himself, it is important for others to ascertain whether there is any assignable cause for the circumstance. The head should be examined for signs of violence; the breath for the odour of alcoholic drink; any circumstances likely to give occasion to poisoning searched out; but whatever the condition, no time should

be lost in procuring medical advice; in the meanwhile, much is to be done by well-directed attentions. Few attacks of apoplexy come on without previous warning; the patient, if of full habit, has suffered from headache or giddiness, especially on stooping, or has slept much and heavily; the mental faculties have been sluggish, the memory affected, or vision impaired; there may have been numbness or pricking in a limb, or in a finger only; to others, the face and eyes have looked full and red;—if of spare habit, there may also have been headache, giddiness, impaired vision, and confusion; but there has been, also, marked debility of the mental powers, memory affected, the power of following a consecutive train of thought impaired, articulation indistinct, while with these the face has been pale, the pulse weak, the whole manner inanimate, rather than oppressed. Individuals of sanguine temperament, with short necks and large heads, particularly if they live well, are the subjects of the first set of symptoms; those of spare habit, and weak, leuco-phlegmatic constitution, of the second. When in an individual, at any time of life, but more especially after the age of fifty, such symptoms show themselves, they should not be neglected for a day. It is evident, however, that depending on two very opposite conditions of body, the treatment for each must be very different. The extent and graduation of this treatment ought to be entrusted to the medical attendant; in the mean time, if any interval must elapse before that can be done, the man of full habit should at once reduce his diet, cut off entirely, or nearly so, his stimulants and spices, and animal food, eschew supper, take exercise *moderately*, and rise early. He should purge the bowels freely by a couple of calomel and colocynth pills, taken nightly for a few times, and by salines, such as bi-tartrate of potash or Epsom salts, a couple of tea-spoonfuls of the latter in half a pint of water, every morning. Mental excitement is to be avoided, the head kept well raised in bed, anything, either handkerchief or shirt, round the neck, worn perfectly easy. The man of spare habit must follow a more negative plan. Rest and quiet of body and mind are for him essential; anything likely to tax the nervous power, particularly of a sexual character, must be avoided; over fatigue is dangerous; while the bowels are kept regular, they must not be purged; the diet ought to be easy of digestion, and nourishing; and stimulants, if habitually taken, must not —unless found directly to cause uneasiness in the head—be discontinued, without medical sanction; spices, however, should be avoided. The temperature of the skin generally, and of the extremities, should be sufficiently preserved. When an individual is seized with symptoms denoting apoplexy, it being ascertained that they neither proceed from violence to the head, from intoxication, nor narcotic poison (see *Head—Intoxication—Poison*), during the longer or shorter interval which may elapse before the medical man can arrive, much is to be done. The patient should be laid on the back, the head and shoulders well raised, the neck bared, and a free current of air permitted to the head. Free purging should be resorted to. As the power of swallowing is lost or impaired, medical men usually effect this by means of a drop of croton oil placed on the tongue, and repeated if requisite; but in the circumstances now supposed, this can scarcely be obtainable, and instead of it, an enema containing salt or soap-water, Epsom salts, turpentine, castor oil, or whatever purgative is most readily available, must be given; the warmth of the feet must be preserved, but not excited, by hot water, mustard, &c. All attempts at giving nourishment must be suspended for many hours. In the event of the attack presenting the opposite symptoms, those of depression, all attempts at depletion are to be avoided, indeed, it may be requisite in an extreme case, to get a few spoonfuls of wine swallowed; purging must be let alone, but the extremities should be kept well warmed, and mustard poultices may be freely applied to the legs, thighs, or between the shoulders; liquid nourishment, such as meat broth, must be got down in tea-spoonfuls at a time. To the medical attendant must be left all beside. Ergotine, given hypodermically, is now employed in apoplexy, but could only be used by medical sanction and under medical supervision.

An attack of apoplexy may either disappear or be removed, and leave the patient apparently in perfect health, or it may leave him paralyzed in body, and weakened in mind, the man—but not the same man—changed; strength has been exchanged for weakness in every way, for weakness which increases as time goes on, loss of memory, irritability, childish desires, and childish weeping, till in all probability one or more attacks of the disease close the scene. Lastly, apoplexy may pass on to deeper and deeper insensibility, no sign of consciousness is ever given, the breathing becomes more laboured, the natural offices are performed involuntarily, the sweat becomes the cold one of death, which takes place with or without convulsions.

Apoplexy may come on suddenly; the person is struck as if by a blow, but this form is less to be dreaded than that which creeps on more insidiously. An individual becomes giddy and faint for a few minutes, perhaps vomits, but seems to recover; shortly after, however, he becomes dull, the eyes heavy, and insensibility gradually comes over him. The first form is most probably owing to sudden congestion in the brain, or to rapid effusion of blood; the latter to slower effusion; in this case, the first shock is felt at the instant the vessel gives way, but it requires the further gradual effusion to complete the attack. An individual who has once suffered an attack of

apoplexy, and recovered, cannot too carefully avoid every possible exciting cause. A momentary imprudence, the stooping to tie a shoe, looking at objects much above the level of sight, &c., a warm bath, may be sufficient to induce serious symptoms. Especially must the bowels be kept so easy that straining at stool is never required. The system of diet and regimen should be strictly laid down by the medical attendant, and as strictly adhered to by the patient; the mind carefully kept from excitement. In no disease, with exception, perhaps, of that of the heart, does the man who possesses habitual self-control, in body and mind, possess more advantage, than in apoplectic tendency, over the slave of passion or of temper.

Refer to—*Paralysis.*

APPETITE.—The instinctive desire for food which is periodically, and in health, regularly experienced, is a real blessing given to us by God, and its temperate enjoyment is a sign of a sound mind in a sound body. The sensation of hunger doubtless originates in the system at large, and its removal by the presence of food in the stomach, must be due to the sympathetic connections of that organ with the system. All that is required for the *immediate* appeasement of hunger is the presence of a substance, it may be of very small nourishing power, in the stomach; the unctuous earth consumed by the American Indians, and the berg meal of Norway act in this way. Taste has nothing to do in satisfying the appetite. Mr. Beaumont, who experimented in the famous case of St. Martin, found that appetite was quite as well appeased by food passed into the stomach by the external opening, as if it had been swallowed. A regular appetite is generally a symptom of a healthy state of system; as soon as disorder occurs, the appetite flags, nature herself stops the supplies, which, instead of nourishing the body, would only increase the embarrassment of the functions; but this is not understood, and the sick are too often tempted and pressed by anxious attendants, to take nourishment, to their own hurt and discomfort. Even then, nature asserts her right, and the stomach rejects what it did not desire. The longings of appetite sometimes appear to be almost instinctive, especially in illness, particularly where there has been much or obstinate vomiting. The patient will express a strong desire for some article of food or drink which our preconceived ideas or theories would certainly forbid, but which, being permitted, seems at once to agree. When the various morbid deviations from natural appetite are considered, such latitude requires of course great caution; but the fact should not be lost sight of. A variable appetite, at one time deficient, at another morbidly active, is scarcely consistent with health; in children, it is often indicative of worms. Depraved appetite consists in the longing for, or devouring substances not intended for food, such as chalk, slate pencils, cinders, earth, &c.; the symptom is not unfrequently a concomitant of the chlorotic diseases of young females. A morbid appetite is not an unfrequent symptom in pregnancy. The "dirt-eating" of tropical climates is another form of depraved appetite.

APPLES.—This fruit is wholesome and agreeable, and when roasted or boiled is much relished by the invalid.

Apple water is an agreeable beverage for the sick room, and a quart of it may be prepared in the following manner:—Take six apples peeled and sliced with the cores removed, and place them with the rind of half a lemon in a jug to which a quart of boiling water is afterwards to be added. The hot liquor sweetened to taste with sugar, is set aside to cool, and is afterwards strained through a cloth, when it is in a condition for using.

AQUA-FORTIS.—Nitric Acid.—Refer to—*Nitric Acid.*

AQUA-REGIA.—Nitro-Hydrochloric Acid.—Refer to—*Nitro-Hydrochloric Acid.*

ARCUS SENILIS.—The name given to the narrow ring which often forms round the outer edge of the cornea in old people.

ARECA NUT.—The seed of the betel nut tree.

AREOLA — a term applied medically to the inflamed circle which surrounds a vesicular or pustular elevation, such as that of the vaccine vesicle. Also applied to the coloured circle surrounding the female nipple. Generally, not invariably, previous to pregnancy, this areola is light in colour, but in the majority of cases, soon after conception, it begins to darken, and in some individuals, especially in those of dark complexion, it becomes of a deep brown. The change of colour in the areola is, therefore, classed amid the more certain signs of pregnancy, but as it has been known to exist in the virgin, and is not universally developed in the pregnant female, it can never alone be taken as a decisive proof, but only as a corroborative, along with other symptoms.

Refer to—*Pregnancy.*

ARM-PIT.—See Axilla.

ARNICA MONTANA.—Leopard's bane, is a plant bearing a composite flower, found in mountainous regions. It is scarcely, if ever, prescribed internally in this country; as an external application the tincture of arnica was formerly widely employed as a remedy for contusions and sprains. In some constitutions, however, its application is found to produce severe irritation of the skin with redness and swelling resembling erysipelas, accompanied by considerable fever. This is especially apt to occur when there is any abrasion of the skin where the arnica is applied. In consequence of this liability it has fallen much out of use in recent years; and in most

cases of sprain the application of diluted whisky or methylated spirit, or, when an astringent is wanted, of diluted hazeline or Pond's Extract, is probably equally effective, and certainly more free from risk.—See *Hazeline*.

AROMATICS.—Stimulants derived from the vegetable kingdom, possessing a more or less powerful and generally agreeable odour, a warm and agreeable taste. They are for the most part products of warm climates, and appear specially adapted to the relaxed constitutions of the natives. A free use of aromatics is said to counteract the effects of malaria in tropical countries. Some stimulant is certainly requisite in those climates, and the native productions bestowed by Providence are evidently much better adapted to fulfil the indication than alcoholic excitants. Mace, cloves, cinnamon, are all aromatics. Angelica is one of the few aromatics of temperate climates, and perhaps the best.

ARROW-ROOT, now so well known, is procured of the best quality from the West Indies, especially from Bermuda, whence it is imported in soldered tin cases. It is now also imported from East India, and an inferior kind is brought from Tahiti. Arrow-root is subject to much mixture and adulteration, but generally—as with potato-starch, &c.—of a harmless character as regards the consumer. The best arrow-root ought to be pure white, slightly glistening in the mass, and the powder of which it is composed collected together in small crumbs or lumps, which break down with a slight crackling sensation beneath the finger. Arrow-root is pure starch, and forms a peculiarly stiff jelly. As an article of sick cookery it is invaluable, where mild support is required without stimulation, and in convalescence, and chronic disease. There are few stomachs with which it disagrees, and infants both like and do well with it. At the same time, it is proper to caution against the too common error of trusting too much to the nutritive powers of arrow-root alone, especially for children. It may give support indirectly, that is to say, by supplying material for respiration and animal heat, it may save the tissues of the body, or it may even go to build up some of these tissues, but alone it can never make bone or muscle, for the simple reason that it does not contain the elements necessary for these constituents of the frame. A child fed exclusively on arrow-root, water, and sugar (and such has been the case), must become unhealthy, and, without fail, rickety. The case is abundantly altered, when, with arrow-root, milk is combined. In this fluid exists whatever is requsite for the animal frame, nitrogen for its muscle, phosphorus for its nerve, earthy salts for its bone. The combination of arrow-root with milk is one of the best which can be given to a child, or to an adult in the early stages of convalescence from illness. It must never be given to young infants. Arrow-root and milk is prepared in the following manner. Take a dessert-spoonful of arrow-root and stir it in a basin, with a dessert-spoonful of cold milk, until it forms a paste, and then add sugar, according to taste. Pour over this slowly half a pint of boiling milk, stirring the mixture at the same time, to render it smooth. Arrow-root pudding is best made by adding to the above mixture the yolks of two eggs, whipping it all well together. The whites of the eggs after being whipped into a stiff froth in a separate basin are to be added to the mixture, stirring lightly. The whole is then placed in a buttered dish and put in the oven to bake for ten minutes.

ARSENIC is a metal; the substance which usually goes under the name, and which is also called white arsenic, is an oxide of the metal; it is a too well-known poison, and was at one time more universally used than any other for destroying life. Its tastelessness, cheapness, and the culpable facility with which it was obtainable combined to make it familiar. The dangers arising to workpeople engaged in certain trades where arsenic is used, from the inhalation of arsenical vapour or dust are well known. Green flock papers which owe their delicate tint to an arsenical substance, Scheele's green, are injurious to the inmates of houses where they are used. Accidental poisoning has also occurred from the mixture of arsenious acid with soot used for cleansing sheep. Much controversy has at times taken place respecting the effect of arsenic upon the palate; it is certain the taste is very faint, but extreme irritation of the portions of the lining mucous membrane of the mouth and other parts quickly follows its contact. The length of time after arsenic has been swallowed that symptoms take to show themselves, varies much, depending in all probability upon the state of the stomach as to emptiness, or the reverse. Sometimes they appear in a few minutes, at other times not for hours. Poisoning by arsenic is distinguished by faintness, nausea, intense burning pain at the pit of the stomach, and vomiting of its ordinary contents, followed by that of a turbid brown fluid, and mucus, often streaked with blood; intense burning heat in the throat, and thirst; purging ensues, cold sweats, convulsions, death. The eyes may become inflamed, but this is more general when the case is prolonged, as it may be, in consequence of the small dose, or from other circumstances; in this case an eruption on the skin is not unfrequent. The symptoms of course vary, particularly that of pain, which occasionally has been almost entirely absent. It must, too, be remembered, that the symptoms of British cholera and those of arsenical poisoning, very closely resemble one another. When poisoning by arsenic is suspected, of course the first measure is to procure efficient medical aid. In the meantime, it is requisite to get as much of

the poison as possible evacuated from the stomach; it is seldom necessary to produce vomiting, that most generally comes on soon; but if it has not done so, five-and-twenty grains of white vitriol,—sulphate of zinc,—if procurable, should be given at once, in a little water; if this is not done, a table-spoonful of mustard in water, or tickling the throat with a feather, should be resorted to; milk, which by its coagulation may envelope the poison, or thick mucilaginous drinks, olive oil, alone or mixed with lime water, may, any or all, be given, and with them, magnesia. The great object must be, to clear the stomach of the poison as thoroughly and speedily as possible, for unlike many other poisons, there is no chemical antidote to arsenic which can be relied on. A preparation of iron has been vaunted, but it is of doubtful efficacy; if either this, or the stomach pump is used, it will be in medical hands. In following the directions already given, the friends or neighbours of the poisoned person will be doing good service. Should the patient survive, and pass on to the second stage of arsenical poisoning, inflammation of the stomach, nervous symptoms, &c., will perhaps end life, or recovery may follow, but these changes must necessarily be attended to under medical guidance. White arsenic is not the only preparation of the metal by which poisoning occurs; the colouring substances known by the name of King's yellow, and Scheele's green, are both compounds of arsenic, and being frequently, and culpably, used in confectionery, have proved fatal. Similar symptoms occur, and similar treatment is to be followed as after poisoning by white arsenic. Whether in poisoning by arsenic, or by any other agent, the vomited matters should always be carefully preserved in a vessel by themselves, for medical inspection; and if there is any suspicion of foul play, some responsible person should place them under lock and key. The antiseptic properties of arsenic tend to prevent the decay of the tissues after death. As a medical agent, it is employed in the form known as Fowler's solution, a compound of carbonate of potash with arsenious acid, and in doses of three to eight minims. It is the remedy in most favour in such skin diseases as eczema, psoriasis, pemphigus, and lichen. It is also used as an antiperiodic in ague and neuralgia, but it must be limited to professional hands.

The tests for the detection of arsenic are numerous and accurate. The best are Marsh's, by which the metal may be separated from a solution, and deposited on a piece of porcelain; the ammonio-nitrate of silver test, which will detect $\frac{1}{120000}$ of a grain of arsenic in a mixture; and sulphuretted hydrogen gas, which, passed through a solution of arsenious acid throws down a golden yellow sublimate that may be further reduced.

Did those who perpetrate the crime of poisoning by arsenic, know beforehand with what certainty the analyst can separate for exhibition in a court of justice, the instrument of their wickedness, perhaps from the body of the victim, years after it had been buried: selfish fear, if no other consideration, might stop the deed.

An Act to Regulate the Sale of Arsenic, 14 *Vict. cap.* 12.

Whereas the unrestricted sale of Arsenic facilitates the commission of crime: Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

I. Every person who shall sell any Arsenic shall forthwith and before the delivery of such Arsenic to the Purchaser, enter or cause to be entered in a fair and regular manner, in a Book or Books to be kept by such person for that purpose, in the form set forth in the Schedule to this Act, or to the like effect, a statement of such sale, with the quantity of Arsenic so sold, and the purpose for which such Arsenic is required or stated to be required, and the day of the month and year of the Sale, and the name, place of abode, and condition or occupation of the Purchaser, into all which circumstances the person selling such Arsenic is hereby required and authorized to inquire of the Purchaser before the delivery to such Purchaser of the Arsenic sold, and such entries shall in every case be signed by the person making the same, and shall also be signed by the Purchaser, unless such Purchaser profess to be unable to write [in which case the person making the entries hereby required shall add to the particulars to be entered in relation to such sale, the words "cannot write"]. And when a Witness is hereby required to the Sale, shall also be signed by such Witness, together with his place of abode.

II. No person shall sell Arsenic to any person who is unknown to the person selling such Arsenic, unless the Sale be made in the presence of a person who is known to the person selling the Arsenic, and to whom the Purchaser is known, and who signs his name, together with his place of abode, to such entries before the delivery of the Arsenic to the Purchaser, and no person shall sell Arsenic to any person other than a person of full age.

III. No person shall sell any Arsenic unless the same be before the Sale thereof mixed with Soot or Indigo, in the proportion of one ounce of Soot or half-an ounce of Indigo at the least to one pound of Arsenic, and so in proportion for any greater or less quantity: provided always that where such Arsenic is stated by the Purchaser to be required not for the use of Agriculture, but for some other purpose for which such admixture would, according to the representation of the Purchaser, render it unfit, such Arsenic may be sold without admixture in a quantity of not less than ten pounds at any one time.

IV. If any person shall sell any Arsenic, save as authorized by this Act, or on any sale of Arsenic shall deliver the same without having made and signed the entries hereby required on such sale, or without having obtained such signature or signatures to such entries as required by this Act, or if any person purchasing any Arsenic shall give false information to the person selling the same in relation to the particulars which such last-mentioned person is hereby authorized to inquire into of such Purchaser, or if any person shall sign his name as aforesaid as a Witness to a sale of Arsenic to a person unknown to the person so signing as Witness, every person so offending shall for every such offence, upon a summary conviction for the same before Two Justices of the Peace in *England* or *Ireland*, or before two Justices of the Peace or the Sheriff of *Scotland*, be liable to a penalty not exceeding Twenty Pounds.

V. Provided that this Act shall not extend to the Sale of Arsenic when the same forms part of the Ingredients of any Medicine required to be made up or compounded according to the prescription of a legally qualified Medical Practitioner, or a member of the Medical Profession, or to the sale of Arsenic by Whole-

sale to Retail Dealers upon orders in writing in the ordinary course of wholesale dealing.

VI. In the construction of this Act, the word Arsenic shall include Arsenious Acid and the Arsenites, Arsenic Acid and the Arseniates, and all the colourless poisonous preparations of Arsenic.

ARTERY.—An artery is a vessel which invariably conveys blood away from the heart, the blood, with one exception,—in the pulmonary, or artery of the lungs,—being bright red, "arterial," and flowing in waves or pulsations, corresponding with the beats of the heart. When red florid blood flows, or is spirted from a wound in jets, an artery is certainly wounded, and the case is most probably serious. Blood from a vein is dark and black-looking, and flows in a continuous stream.

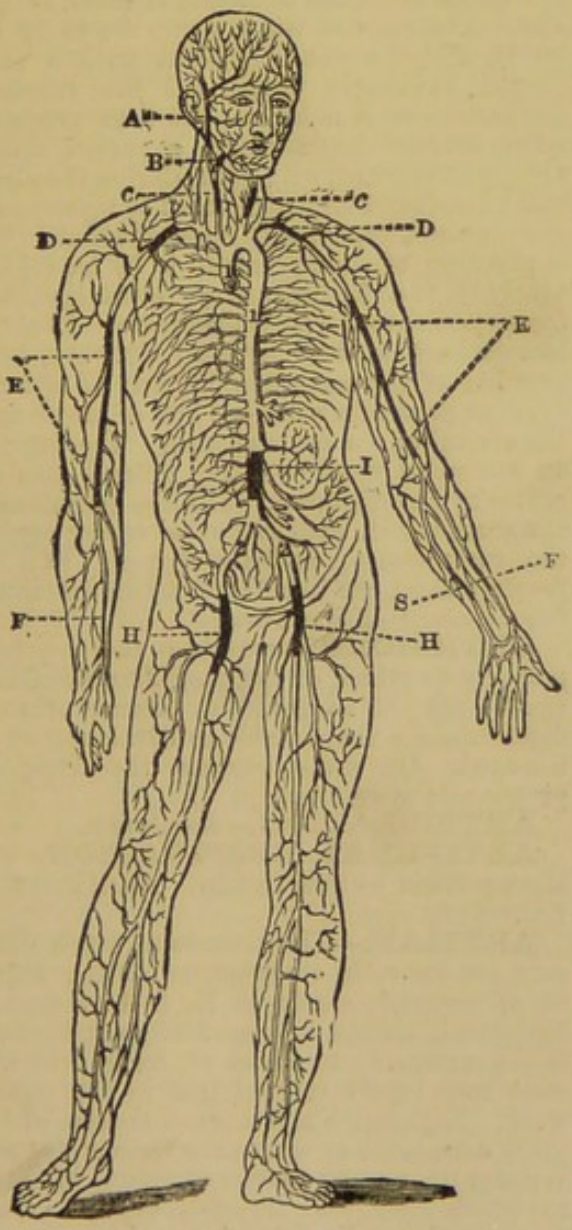


Fig. 13.

From the Aorta (see fig. 12), the main artery of the body directly connected with the heart, various secondary vessels are given off to supply the head and upper extremities, and the viscera of the chest and abdomen. Low down in the latter cavity, the aorta itself divides or bifurcates into the two large vessels which supply the lower limbs (fig. 13, 2). From the secondary arteries other branches are given off, until, at last, by division and subdivision, the vessels become "capillary," hair-like, in their minuteness, forming an intricate net-work, in which the arteries end and the veins begin. Arteries consist of three separate coats, an outer or protective, an inner or lining, and a middle, partly elastic and partly muscular. It is the thickness and firmness of this middle coat which chiefly distinguishes the artery from the vein.

As a general rule, the main arterial trunks run upon the anterior and inner surfaces of the body; some knowledge of their positions, and especially of those points in their course at which they can be most easily felt and compressed, may at times be useful to all. It is no uncommon thing for medical men to be called to accidents in which immense and injurious loss of blood has taken place from a wounded artery, which might have been saved to the sufferer by any one possessed of sufficient knowledge and presence of mind to put his thumb on the main trunk of the vessel. In the annexed figure, the portions of the main arteries most easily found and compressed are marked black, and any one, unless very corpulent, may verify the positions by examination of his own person. Wherever the finger is placed upon an artery, pulsation is felt.

In wounds of arteries of the head, such as upon the temples, there is the advantage of the bone, against which it is possible directly to compress the bleeding point, and when this can be done, it is the best method, otherwise, pressure may be exerted according to the position of the wound, at A in front of the ear; or just behind the ear; or at B, where the pulsation of an arterial branch may be found, as it winds over the edge of the lower jaw.

In wounds of the large carotid arteries of the neck, pressure is, unfortunately, of little avail; there is no point to press against, it is impossible to compress the artery without at the same time compressing the large vein, and from the size of the vessel and its proximity to the heart, the current of blood has much power. The vessels may be felt beating on the side of the windpipe.

In wounds of the large arteries about the shoulder or arm-pit, pressure must be made with the thumb, or handle of a moderate-sized key, wrapped in a few folds of handkerchief, upon the large vessel, at the point D, just behind the middle of the collar-bone, and where it passes over the first rib. In the event of a wounded artery lower down in the arm, the compression may be exerted over any portion of the course E, just inside the large muscle. At the bend of the arm the artery divides into two main branches, one of which

(F), the pulse artery, runs towards the thumb; the other (S) towards the finger, in which courses both may be felt; from the free intercommunication of the arteries of the hand, pressure is more certain to arrest hæmorrhage if exerted upon the single trunk of the arm (E). In case of arterial bleeding from wounds of the lower extremity, it is most certainly and easily arrested by pressure on the large artery of the thigh, at the point H, in or just below the groin. In all these cases pressure may be exerted by means of the thumb, or by some convenient body, such as the key above-named. To compress arteries in the limbs, surgeons use the tourniquet, specially adapted for the purpose; but as a temporary measure, a handkerchief will answer well, tolerably firmly tied round the member, between the body and the wound; if any one has knowledge enough to place a pad—a rolled-up stocking will do—over the course of the main vessel, so much the better.

ARTERIAL HÆMORRHAGE may also be arrested by compression directly upon the bleeding point, and this should be tried until the surgeon's arrival, but it must be in positions, such as the hand, foot, &c., where pads can be firmly bound over the wound. These pads must be graduated, that is, a small firm one is to be placed direct over the bleeding vessel, over the first pad a larger, and one still larger over that, and the whole to be firmly bound with a bandage or ribbon—or *strip* of cloth of some kind; at the same time, the site of the wound is to be raised above the level of the body. *Above all things loose wrapping up is to be avoided*, the wound had better be exposed to the air than enveloped in a hot poultice of clotted blood, which only causes it to bleed the more. Two cases which recently occurred in the writer's practice will illustrate the above directions:—(1) A girl when cutting some bacon off the flitch, slipped the knife and plunged it into her hand, dividing one of the arteries; it bled fast, and when she was seen by the author some time after, a large quantity of blood had been lost; compresses and a bandage being at once applied, not another drop of blood was lost, the wound was undisturbed for a good many days, and quickly healed. (2) A man when sheep-shearing, had the shears driven into his hand by a plunge of the animal, and the artery which runs between the thumb and fore-finger severed; he had to come three miles to the author's house, and must have lost above a quart of blood. In this case the vessel was tied, but in either of the cases, if, instead of the wound being loosely covered, and the hand kept down, some one had been sufficiently informed to tie a firm pad over the wound, until proper assistance was obtained, it could not fail to have saved either of these individuals a considerable amount of blood—and to a poor man blood is money, he must pay the butcher some hard days' work to make up a pound of the vital fluid. Various styptics to arrest bleeding are recommended, such as alum, matico, fungus, &c., but in arterial hæmorrhage, pressure is more to be trusted to. Surgeons arrest hæmorrhage from a cut artery by tying the ends with a ligature of silk or fine cord. This might be done in emigrant life *under necessity*. The bleeding point being distinctly seen, is by one person to be pulled forward, either by a pair of forceps, or by a hook-tenaculum (see *Instruments*) made for the purpose, sufficiently far to allow of another individual tying it securely. The sailor's reef knot is the proper one for the purpose. The end of the vessel next the heart is to be tied, but should the lower end bleed, as it may do, especially in a few hours after the accident, it must be tied also. The ends of the ligature are to be left uncut, and the wound covered with a cloth dipped in simple water, till the surgeon's assistance—as it must be—has been procured. After arterial hæmorrhage, a person should always be watched, with light, during the night, and a handkerchief which could be tightened at any moment, kept closely round the limb. The application of water, unless it be ice-cold or nearly so, to a bleeding artery, is better avoided, free exposure to the air is preferable. In severe hæmorrhage or flooding after delivery, compression of the aorta (fig. 12) may be of much avail in preventing further loss of blood until the arrival of the medical man. The hand of an attendant must be firmly pressed into the centre of the abdomen, until the pulsation of the aorta is felt, and felt to be acting against the compression, and not beyond it. The pressure must not be relaxed for an instant.—See *Ligature—Emergencies*.

ARTICHOKES—whether the vegetable properly so called, or the root, Jerusalem artichoke—are not adapted for persons of weak digestion, for those liable to flatulence, or for the aged. On some persons the artichoke proper acts as an aperient.

ARTICULATION.—See JOINT.

ARTIFICIAL RESPIRATION.—See RESPIRATION — SUSPENDED ANIMATION — DROWNING.

ARTISAN.—The diseases to which workmen are liable in consequence of the nature of, or materials employed in, their respective businesses, always a subject of great interest, is too extensive to admit of being otherwise than very briefly entered into in the present work. Legislation and invention have of late years done much to screen the various classes of artisans from many sources of injury to health to which they were formerly exposed, much more remains to be done, and would perhaps be done more quickly, were it not for the apathy, and sometimes even contradiction, of those who are chiefly to be benefited. It is useless to supply miners with Davy lamps, and fork grinders with magnetic respirators, when the means of safety are so constantly and carelessly

neglected. One immense source of evil—now happily ameliorated—has been exertion too prolonged, especially in the young; nutriment which should have gone to build up the growing frame, is consumed in mere physical exertion, the powers of the brain are used up in the same; and if not deformity of body, at least great weakness, and with it mental inaptitude, are the consequences. Many of those who are liable to disease in consequence of the materials they work in, owe much to their own want of cleanliness; this is the case with regard to the metals, especially lead, and a striking improvement has taken place in the health of workmen who have been compelled to observe certain rules of cleanliness, such as washing the hands before their meals. Workers in quicksilver are liable, in addition to affections of the teeth and gums, to a species of shaking palsy, or tremor of the limbs. Modellers in coloured wax, makers of wax flowers, &c., are in danger of suffering injury from absorption through the skin of the hand, of the poisonous colouring ingredients, and should be extremely careful. Workers in lead, such as plumbers, typefounders, or painters who use it in the form of white or carbonate of lead, are apt to suffer from paralysis, more particularly of the muscles of the forearm; their more usual disease, however, is the "painter's colic," or dry belly-ache (see *Colic*). Men employed in the manufacture of bichromate of potash are affected with a curious disease of the septum of the nose, which increases gradually till the partition disappears. Coppersmiths, smelters, lucifer-match makers, all have their peculiar affections, that of the latter being a disease of the jaw-bone. Those who are employed in filing or dry-grinding substances which give off a hard dust, are peculiarly liable to chest diseases, from the mechanical irritation caused by the particles continually inhaled. So much is this the case in some trades—such as the Sheffield fork-grinders—that most, if not all, of their members die before reaching the age of forty. Millers, and those employed among fine dust of a softer quality, are not so likely to become consumptive as the former class, but have more tendency to asthma; they also suffer from the consequences of the cutaneous pores and functions being clogged and hindered by the dust. Grocers and bakers who are in the habit of handling flour, sugar, &c., suffer frequently from a disagreeable skin disease affecting the fingers, well known by the name of "grocer's itch." Housemaids who kneel at work have their peculiar swelling, which forms, and sometimes suppurates, over the knee-cap; this may be prevented by kneeling on a soft substance. Thatchers who press their knees against the steps of the ladder, are exposed to the same thing. Clergymen, actors, and public speakers, have their peculiar throat affection, medical men below middle age experience a mortality much above the average, in consequence of their exposure to contagion, and irregular hours of business; in short, there is scarcely a trade or profession which does not expose its follower to some peculiar ailment, but there is scarcely one of these ailments which may not be prevented or much ameliorated by proper care—by cleanliness more especially, but also by attention to the various other prophylactic means which are now so generally known and provided.

Refer to—*Colic—Consumption—Lead—Skin, &c.*

ASCARIDES.—The small thread worms which infest the rectum.—See *Worms.*

ASCITES.—See DROPSY.

ASPARAGUS, when young, well boiled, and not overloaded with melted butter, is wholesome and digestible; it gives a peculiar odour to the urine. Its peculiar vegetable principle, asparagin, contains nitrogen.

ASPHYXIA.—Suspension of sensible vital phenomena in consequence of the blood not having undergone the proper change by respiration. In this condition the brain, the lungs, the organs of the body generally, all suffer from the obstruction to the natural current of the circulation; the heart is less and less excited, until, at last, it ceases to act, and death ensues, unless the cause of the asphyxiated condition, such as hanging, &c., be quickly removed, and suitable measures adopted for restoring the suspended animation.—See *Animation, Suspended —Apnœa—Death.*

ASPIRATOR.—The aspirator is an apparatus now much employed by medical men to draw off fluids from the various cavities of the body, without exposing them to the risk of septic infection from the air. It consists of a glass bottle, fitted with an india rubber cork and a couple of tubes with stopcocks; one of the tubes communicates with an air-pump syringe to remove the air from the vessel, and the other is attached to a trocar and canula employed in the operation. The matter or other fluid from the abscess cavity flows through the tube into the bottle.

ASS'S MILK contains seven per cent. of milk sugar, and in many respects approaches the composition of human milk. It is a most excellent dietetic article, and restorative in all cases of debility. If drunk too freely it acts upon the bowels.

ASSAFŒTIDA.—A gum resin and powerful antispasmodic, is useful in hysterical cases, and in flatulent distension of the bowels; in the latter case, especially, given as an injection, it is the most efficacious agent we possess. Two tea-spoonfuls of the tincture of assafœtida may be added to a simple gruel enema, or thirty grains of the drug to one of the purgative enemas, if requisite. When assafœtida is given by the mouth, it is best in the form of pill. The compound assafœtida pill may be given in three-grain doses three times a day. Where aperient action is required, especially in de-

ficient menstruation, the aloes and assafœtida pill is a most excellent combination, and may be given, three grains, twice or three times a day. The, to most people, disgusting smell of assafœtida, is a great obstacle to its employment, and yet in some countries it is used as a condiment as we use onion.

Refer to—*Enema.*

ASSIMILATION, the first process of nutrition in animals, by which the nutrient portion of the food is rendered fit for absorption by the veins and lacteal vessels, which convey it into the general current of the circulation.

Refer to—*Digestion.*

ASTHMA is an affection of the chest, characterised by distressing inability of the person suffering from it, to inspire sufficient air to fill the lungs. The term, although applied by medical men to a defined disease, is used popularly to denote any difficulty of breathing, from whatever cause occurring, whether from disease of the heart, or any of the varied affections of the lungs. Asthma, although a nervous or spasmodic affection, is very frequently connected with actual changes in the lungs themselves. Asthmatic fits, or paroxysms, come on at irregular intervals; for several days, or rather nights, successively the patient is attacked, and a considerable time may then elapse before he again suffers; not that a regular asthmatic is in the interval entirely free from uneasiness, for there is generally some slight oppression of the breathing, liable to be aggravated by slight causes: changes in the weather, peculiarity of situation, errors in diet, anxiety, fatigue, mental excitement, may any of them induce a paroxysm of asthma in the predisposed. The attack itself is premised by feelings of indigestion and flatulence, frontal headache, chilliness, languor, and drowsiness; after having experienced these sensations during the day, the asthmatic individual is probably awakened from his first sleep by a distressing sensation of constriction of the chest, he is forced to sit up in bed, labouring for breath, or it may be to seek an open window; the distressed state of the breathing, if not relieved by remedies, continues for some hours, and at last gradually subsides; the characteristic wheezing becomes less, the cough, almost impossible before, is now brought out, and sleep, never more welcome, comes on. The latter stage of the paroxysm of asthma is generally accompanied with expectoration of mucus, sometimes it is not, and upon this a distinction into dry and humid asthma is founded. Confirmed asthmatics have a distressed cast of countenance, and acquire a peculiar rounding or elevation of the shoulders, perfectly characteristic. Asthma may occur at any period of life, but is more general about the middle; and men are more commonly the subjects of it than women. The disease in itself, though most distressing, is not dangerous, further than as it tends to lay the foundation of other affections of the lungs or of the heart.

No one can witness a paroxysm of asthma without distressing anxiety to relieve the suffering individual, and not without alarm, if it is the first time of seeing the attack. The patient seems as if he must die for want of air in the lungs, but death rarely, if ever, occurs. In a disease of so long standing, and of so peculiar a character, as asthma, those who are the subjects of it generally have their own remedy, to which they habitually have recourse. The remedies are very various, and indeed happily so, for what gives immediate and full relief to one person totally fails in another. The practice of smoking the leaves and stems of stramonium or thorn-apple, is now extensively and popularly resorted to; with some it succeeds admirably, to others it seems to be hurtful,—it may be tried. A pipe of tobacco often affords relief. Antispasmodics and stimulants, as might be expected, are frequently beneficial. Ether and laudanum is a favourite combination; half a tea-spoonful of the former, along with twenty drops of the latter, in a wine-glassful of water. A tea-spoonful of sal volatile may be substituted for the ether, but is scarcely so efficacious. Assafœtida, henbane, hydrocyanic acid, all powerful antispasmodics, have occasionally been found serviceable. Bromide of potassium in a half drachm dose, with forty minims of sal volatile, taken in a wine-glassful of water at bedtime, will often avert or lessen a night paroxysm of asthma, and the same may be said of nitrite of amyl, a few drops of which may be administered by inhalation. Twenty grains of ipecacuanha powder given in half a wine-glassful of water, to act as an emetic, may be of service, particularly if the attack has come on after a full meal, or if there is any suspicion of the stomach being loaded. Some experience much benefit from strong coffee, drunk without milk or sugar. The inhalation of chloroform, a few drops sprinkled on a pocket handkerchief, has lately been found to afford relief; but this remedy, in the first instance, must not be tried without medical sanction. 'Sir T. Watson recommends the fumes of burning nitre (saltpetre) diffused through the air of the apartment, by means of pieces of blotting-paper, dipped in a saturated solution of the salt, and dried. One of these, about the size of the hand, ignited, and placed upon a plate or tile in the room, quickly diffuses its fumes throughout the apartment. When there is great dryness and deficient expectoration, steam, inhaled either simply, or with a few drops of sulphuric æther is worth a trial. If there is much acidity of stomach, ten or fifteen grains of carbonate of soda, with a tea-spoonful of sal volatile in a little water, should be given. Indeed, when an attack of asthma is threatened or has come on, care must be always taken, as far as possible, to remove

any existing disordered action. A basin of warm tea, and retirement to a warm bed, will remove the chill sensation. Constipated bowels ought to be relieved by a gentle dose of castor-oil, or of rhubarb and magnesia; flatulence or acidity corrected. Flatulence particularly must be obviated, and all sources of it avoided. Effervescing draughts, soda water, and such-like, are almost always hurtful. The effects of situation and of atmospheric peculiarity upon asthmatics are most varied; some can breathe freely in clear dry air, which drives others into a damp cellar for temporary relief; a close warm room which suits one, will be unbearable to another. Individuals who are never free from asthma in some situations, lose their attacks as soon as they remove. These are peculiarities of which all should be aware. Certain odours produce asthmatic breathing in the predisposed: the powder of ipecacuanha is notorious for this effect; and the smell of new-made hay, so pleasant to most, produces hay-asthma in a few unfortunates.

The habitual asthmatic soon becomes aware how much his freedom from paroxysms of the disease depends on the state of the general health, particularly of the digestive organs. He may not be altogether able to command situation, he cannot avoid atmospherical vicissitudes; but he can by temperate living, avoiding food before bedtime, exercise, attention to the bowels and to the functions of the skin in particular, pass long intervals without an attack. Sponging the chest and shoulders every morning with cold or salt water, friction being afterwards made with a towel or hair-glove, is a practice to be recommended, provided no other predisposition forbids. Asthma is one of those diseases long continued, marked in character, and not immediately affecting life, for which much may be done by well-timed and well-directed domestic management, whilst the frequent recurrence of the attacks renders the attendance of a medical man a serious consideration in the case of limited income. Nevertheless, an asthmatic patient ought from time to time to be examined professionally, especially should there occur any change in the nature of the paroxysm, which may be indicative of other and serious disease.

ASTIGMATISM.—The term applied to deficient sight arising from various causes and due to the imperfect refraction of light. It may be remedied by suitable spectacles.

ASTRINGENTS produce diminution of the secretions and contraction of the tissues when applied to living parts. In cases of relaxation or debility, in hæmorrhage, either external or internal, in increased and injurious secretions from glands or mucous surfaces, astringents are the chief remedy. The amount of astringent action, however, depends greatly upon the mode and circumstances of its application. The astringent principle in the vegetable kingdom, in the form either of tannic or of gallic acid, is very widely diffused. The principal vegetable astringents used in medicine are—oak-bark, matico, galls, kino, catechu, tormentilla, uva-ursi or bear-berry, logwood, &c. The mineral astringents are the acids, alum, salts of iron, particularly the perchloride, sulphates of copper and zinc, a nitrate and oxide of silver, and salts of lead. Cold in any form is astringent. Refer under the individual heads.

ATMOSPHERE.—See Air.

ATONY.—Deficient tone of the system characterised by debility and laxity of the muscular fibres generally.

ATROPHY, Wasting, may be either general or local. General atrophy is in one sense natural to advanced life, when the powers of nutrition being diminished, the muscles, the brain, and the organs generally, shrink. There may be fat, but at the same time much atrophy of the other bodily components. Atrophy occurring earlier in life, without *obvious* cause, ought to be regarded suspiciously. When an individual, without departing from ordinary habits, begins to lose flesh, the cause ought to be looked for, and if the change continues, the person should be submitted to a thorough medical examination, and the existence or not of incipient disease, if possible, ascertained. In young children atrophy occurs as a consequence of faulty digestion, most frequently from improper feeding; it is also the result of a diseased condition of the glands of the belly, through which the nutrient portion of the food passes on its way to the general circulation. For this condition, cod-liver oil is *the* remedy, given in tea-spoonful doses twice a day, to an infant of six or eight months old, and the same quantity well rubbed into the skin of the abdomen night and morning. Some medicines, such as iodine, have the power of causing local or even general atrophy.

Local atrophy is liable to occur from various causes. Whatever diminishes the supply of blood to a part will cause it to waste. Pressure on the main artery of a limb, obliteration of the smaller vessels of a part by previous inflammation, disuse of a member from paralysis or any other cause, are all followed by diminution in size of the part affected.

Refer to—*Infancy.*

AURICLE.—The external ear, as well as the name given to the two smaller cavities, right and left of the heart.—See *Heart.*

AUSCULTATION.—The application of the sense of hearing to the detection of disease. The art is most extensively useful to the medical man in the case of the chest; but in diseases of the abdomen it is also a great assistant, and indeed applicable to most circumstances, such as affections of the blood-vessels, fractures, &c., in which, movement makes sound audible. When the medical man elicits various sounds by tapping on the body with his fingers or by any other means, it is called percussion, and the present meaning of auscultation is the

practical investigation of those sounds which are produced by the movements within the living body. Probably no addition to the science and practice of medicine has more extended the power of detecting the existence and nature of diseased action than the practice of auscultation. The stethoscope, now so well known from its universal use by medical men, is but a conductor of sound, used for obvious reasons of delicacy and convenience, and in some cases to prevent unpleasant contact with the uncleanly, but the sounds are equally well heard by the unassisted ear. The stethoscopic examination of females may always be conducted with perfect delicacy and sufficient nicety through a covering of linen, and never (as sometimes is done, though rarely) should this means of investigation be denied to the attendant practitioner.

AXILLA.—The arm-pit, is an important region of the body, on account of the large blood-vessels and nerves which occupy its space. A wound of the large artery in this situation, unless efficient means are speedily adopted to control the bleeding, must be quickly fatal. When from the copious flow of florid blood from a wound in or near the arm-pit, such an accident is supposed to have occurred, a bystander should with all speed exert pressure by means of his thumb upon the artery as it passes over the first rib, just behind the middle of the collar bone, until the effusion of blood ceases. This pressure of course must be kept up, but as to do so with the thumb simply, would be too fatiguing, some solid body—the handle of a moderate-sized key is generally recommended—wrapped in a few folds of handkerchief, may be used for the purpose. While this is done, if medical assistance be many hours distant, as an additional safeguard, firm graduated pads should be tightly fixed into the hollow of the axilla, and firmly retained by a handkerchief or bandage crossed over the opposite shoulder; but this must be a supplementary aid, until the artery is properly secured by the surgeon. The pressure behind the collar-bone cannot be relaxed for one moment without risk to life.

Refer to—*Artery.*

AXUNGE, Hog's-lard, is used as the principal component of various ointments, but is often injurious, in consequence of being slightly rancid, in which case, instead of soothing, it has an extremely irritating effect upon abraded or blistered surfaces especially. Even when applied fresh, if allowed to remain too long unchanged, it will become a source of irritation.—See *Lard.*

AZOTE, Nitrogen.—One of the gaseous components of the atmosphere, of which it forms 77 per cent. by weight. It is one of the most abundant and widely distributed of the elementary bodies. With oxygen, it forms various compounds, of which nitric acid is the best known. Combined with hydrogen it forms ammonia. Nitrogen is regarded as the characteristic element of animal substances; it is also present in vegetables, but in smaller proportion.

BACK.—Pains in the back may be owing to affection of the spine itself, or of the kidneys; to rheumatism of the muscles (lumbago) or to sympathy with disorder in some distant organ—as in females, in the uterus.

Refer to *Spine—Kidneys—Lumbago, &c.*

BACON.—The flesh, or rather fat and flesh of the hog, salted and dried, and sometimes smoked, forms the staple article of diet of the English labourer; the dietetic breakfast of the invalid. In the former case, it is undoubtedly a relishing, convenient, and economical addition to the general fare; at the same time, it is a question whether it does not in many districts form too large a proportion of the ordinary nutriment consumed, and whether an advantageous exchange might not be made, in part at least, for a more nitrogenous diet. Owing to the great proportion of fat in bacon, there is comparatively little of those elements of food which go to build up the constituent tissues of the animal body, and which are contained so abundantly in meat and in the grains and pulses. Where the choice lies between bacon and bread, or bread and milk, or oatmeal and milk, as consumed in Scotland and in the northern English counties, there is no question that much more real nourishment will be obtained from the vegetable grain and milk, which contain whatever is requisite for every portion of the frame, than from that of which simple fat forms so large a share, and which does little more than afford respiratory food. To full-grown men this may be of comparatively little importance, but to growing children and youths, it must of necessity be a consideration, whether, in consuming the amount of nutriment circumstances permit, they consume that which really will afford them strength and substance, or not. Of course these remarks apply principally to the pure bacon fat consumed in such large quantities by the labourers and servants in the midland and southern counties of England. Bacon used as a dietetic, as it is usually done, with breakfast, is often of much service in cases of biliary disorder. It is the fat alone, toasted in slices before the fire, which must be eaten, the lean is hurtful, and must be discarded by the bilious dyspeptic. When used in this way, a slight aperient action is certainly exerted, and it is to this, gently but regularly carrying off its daily proportion of bile, that the undoubtedly beneficial effect is most probably to be attributed.—See *Pork.*

BAKING is the exposure of any substance to a high temperature in a confined space. Though both convenient and economical, baked meat is not usually considered so palatable, or so easily digested, as meat roasted before an open fire. The process of roasting by gas in a

closed oven is much better, and is superseding the old plan of baking in most public establishments and in many private houses.

The disinfecting oven, used for destroying contagion and vermin in bed and body clothes, acts on the same principle as the baking oven. The temperature must be 230° Fahr. to be effectual. If raised much above that, the heat will destroy most fabrics.

BALDNESS, or loss or deficiency of hair on parts usually covered by it, is sometimes seen in infants; it frequently occurs in adults of the male sex, even in the prime of life, and almost universally in a greater or less degree, in old age. The direct occasion of baldness is defect in the hair follicles, from which the hairs are developed, and this defect may arise from diseases affecting the skin itself, from acute general disease, as fever, or chronic constitutional disease, such as consumption; it may also arise from constitutional peculiarity, or the diminished circulation of blood, such as occurs in advanced life. Some families appear to be peculiarly liable to become the subjects of baldness even early in life; those who perspire much about the head are often bald. Generally, however, whatever occasions diminished supply of blood to the scalp or skin, gives the hair a tendency to shed, and the treatment must be directed to stimulating the skin as much as possible. After acute disease, if the hair falls off, shaving the part two or three times in succession will probably strengthen the growth. In other cases, much covering upon the head, which causes perspiration, and consequently weakens the skin, must be avoided; the head should be well washed with cold water every morning, and afterwards rubbed and brushed to promote reaction. Various applications are recommended to prevent or cure baldness; they are all stimulant. Those of which cantharides, or Spanish blistering flies, form an ingredient, are generally most serviceable. A drachm of the tincture of cantharides, rubbed up with an ounce of lard, will form a sufficiently stimulating ointment. Falling off of the hair, which is occasioned by eruptive disease, or which is accompanied with inflammation of the skin, of course requires a different and more soothing treatment; probably medicine is required, and the case is better submitted to the treatment of a medical practitioner.

In the baldness of early life, the hair drops off without the previous change of colour which occurs in age; in the latter case, of course, no treatment is either likely to be resorted to, or to be of service.

The following has been found an excellent hair-wash:—

Take of

Tincture of Cantharides . . .	1 drachm.
Spirit of Rosemary	1 ounce.
Elder Flower Water, ...	1 pint.

Mix.

This wash may be freely applied night and morning, to the roots of the hair, by means of a piece of lint or sponge.

Or, take of

Eau de Cologne	2 ounces.
Tincture of Cantharides, . .	2 drachms.
Oil of Lavender and Rosemary, of each	10 drops.

This may be applied once or twice a day, but if the scalp becomes sore, it must be discontinued for a time.

Baldness often arises from fungus in the hair, in which case it is likely to show itself in isolated bald patches, until it involves the greater part of the scalp. In such cases, it is advisable to remove the hair from the immediate vicinity of the patches, and to destroy the fungus by a stimulating application, consisting of equal parts of collodion and tincture of cantharides. Sir Erasmus Wilson recommends this to be alternated with a wash, consisting of two drachms of oil of almonds, the same proportion of ammonia and two ounces each of honey water and spirits of rosemary.—See *Hair—Skin*.

It may be stated as a rule, that all the vaunted specifics of advertising quacks fail in producing the results said to be obtained, and generally consist merely of some irritating or stimulating application, while many of them are positively injurious.

BALSAM.—The term is derived from two Hebrew words, signifying the "prince of oils." It was formerly applied to many more substances than it is at present. The balsams of Peru and Tolu, and of Copaiba, are most generally known medicinally. The two former are used popularly as external applications. Tolu balsam is used to impart a pleasant flavour to lozenges, cough mixtures, and a syrup and tincture are prepared from it. It undoubtedly exerts a beneficial expectorant action. Quarter of an ounce of gum acacia powder, an ounce of Tolu syrup, one drachm and a half to two drachms of ipecacuanha wine, and water sufficient to make up six fluid ounces, form a pleasant and good cough mixture for children, to be given in from teaspoonful to table-spoonful doses, according to age. When fever is absent, and the cough getting loose, a drachm of tincture of squill may be added with advantage to the above.

BALSAM OF COPAIBA is an oleo-resin which acts decidedly upon the mucous surfaces of the body, and is employed in bronchitis, and in irritation of the urinary passages. It is extremely nauseous, and liable to disagree with the stomach. These properties are endeavoured to be overcome by enclosing the medicine in gelatine capsules, and by preparing it in various ways, as by covering the taste with aromatics, such as cinnamon or peppermint water. When active inflammatory or febrile action is present, copaiba must not be used. The dose of the Balsam is from ten to sixty minims.

BANDAGES are strips of calico, linen, flannel, or of any other convenient material, employed to envelop in rolls any portion of the body requiring artificial support, or upon which it is requisite to produce pressure, or to retain dressing. The art of applying a bandage well, that is, both neatly and efficiently, requires some practice and attention, and it is always a most useful accomplishment; for a bandage, if required at all, must be properly applied, otherwise it is worse than useless; if, therefore, none but the surgeon can undertake the task, it necessitates a much more frequent attendance on his part than might otherwise be requisite. In general, the first few applications of a bandage, will be made by the medical attendant himself, and ought to be in the presence of the individual to whom the duty may be afterwards deputed. By careful attention on the one hand, and kind explanation on the other, much may be learned and taught, but not all, as the inexperienced bandager will discover on the first attempt; by all means, therefore, let the first beginnings be made on some one in health, before the call is made to the invalid. Attention to the following directions will facilitate the application of the previous practical lesson, or in some measure supply its place, if from circumstances it has been wanting. Whatever the material, the width of the bandage or roller must be proportioned in some degree to the size of the part to which it is to be applied; if too narrow, it is apt to be stringy, and to cut; if too broad, it does not adapt itself readily to the inequalities, and the pressure is unequal. For an ordinary-sized adult male leg, a bandage of 2½ inches broad is a good proportion; for the arm of the same person, 1 or 2 inches ought to be sufficiently well adapted. The material for bandages must neither be too strong nor too weak; ordinary "shirting calico" is a very convenient texture, or unbleached calico will do very well. When there is much tenderness, cotton wool should be placed under the bandage. The length, of course, must vary according to what is required, but rollers are usually put up in six or eight yard lengths; they are better *torn* in one continuous strip, free from joinings, and without selvage edge. The strip, when prepared for use, must be rolled up as firmly as possible, either into a single or double head, fig. 14, the former is much the most generally

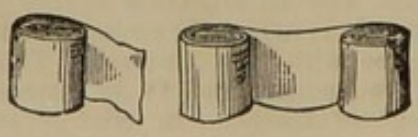


Fig. 14.

employed. If the bandage is a new one, of calico or linen, the loose threads of the roll at each end must be roved off, otherwise they are troublesome when the roller is applied. Bandages may be applied in simple circles (fig. 15 B), in spiral, &c., or in reverses (fig. 15 C). They are also applied in various other forms to suit the different portions of the body. In applying a bandage, the rolled-up strip being held in the right hand, the end which is commenced with is secured by the first turn. If it be the simple circular bandage, round the trunk of the body, or round a limb of nearly equal girth throughout, either naturally, or from swelling, the roller is carried round and

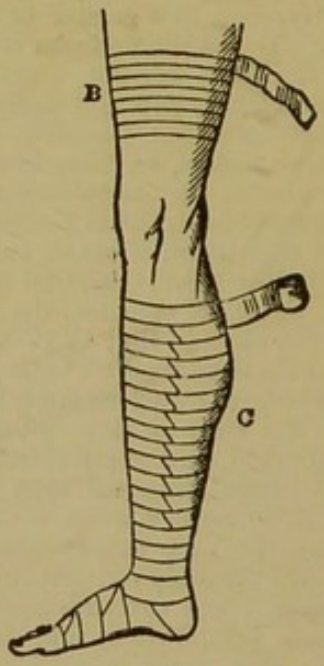


Fig. 15.

round, each succeeding turn slightly overlapping the one before it; if the spiral bandage be required, the rolls are carried up very obliquely, but if, as most likely, it is the reversed bandage, then, wherever the inequality of the parts prevents its being laid on flatly and evenly, the band must be turned upon itself (fig. 15), so as to become reversed, the

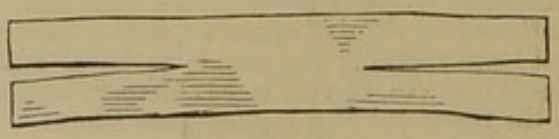


Fig. 16.

surface of the cloth which was next the skin, being turned outwards, and *vice versâ*. It is difficult to describe the manœuvre, and it is a little difficult at first to execute it neatly and well, but when practised it becomes perfectly simple. This is by far the most useful form of bandage, and a person who can put it on well, will have but little difficulty in accomplishing the other varieties.

For the purpose of retaining dressings upon

the head, nothing answers better than a close-fitting calico cap; a handkerchief will often serve every purpose, or the split cloth (fig. 16) may be used; applied—fig. 17—the upper tails being brought beneath the under ones, and fastened under the chin, the under tails



Fig. 17.

being carried to the back of the head. *When it is desirable to retain the head in one position*, it may be done by bands attached to a cap, and fastened as required to a band going round the chest. When for this purpose, or to fix a broken rib, such a band is required, it ought to be from eight to ten inches wide, made of tolerably strong double calico, and sewed firmly round the body.

To retain a pad or poultice in the arm-pit, a good-sized handkerchief answers better than any bandage, the middle being placed at the arm-pit, the ends are crossed at the side of the neck opposite, carried under the corresponding arm-pit, crossed and brought up and tied on the shoulder. *Slinging the arm*, a very simple business, is often very badly done—in almost every case the forearm should be supported throughout its entire length, and it is generally well to include the hand, especially in children. The simple sling handkerchief may be put on as at fig. 18, but a much more



Fig. 18.

confining sling is made by enveloping the elbow in the long side of a triangular handkerchief, fastened up into a little pouch at the centre, the point, including the hand, being fastened up to one of the ends going round the neck (fig. 19).

Upon the trunk of the body, dressings, blisters, &c., may be retained by means of a broad band of any convenient material, fastened round and prevented from slipping down by braces over the shoulders (fig. 20).



Fig. 19.

For bandaging the abdomen, a broad band, of whatever material is suitable, is generally made, the ends split for convenience of fastening either before or behind, and a triangular

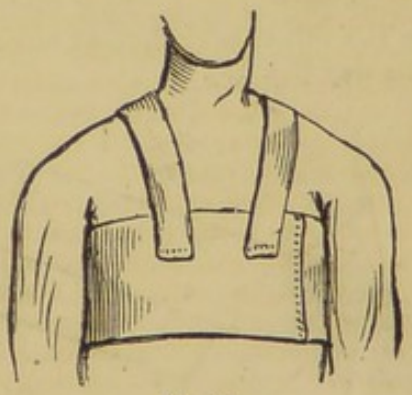


Fig. 20.

piece cut out of either edge at the centre, and the edges joined, in order to fit the shape of the region. In order to retain poultices, &c., at or near the groin, a piece of cloth is to be

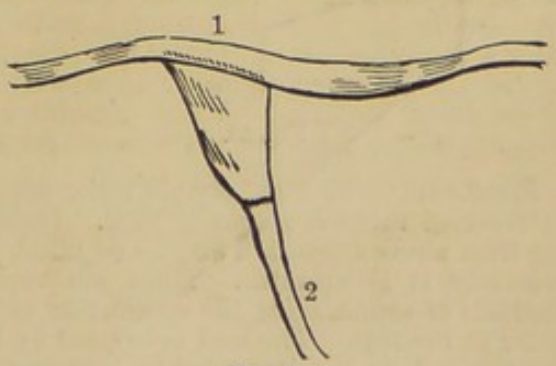


Fig. 21.

shaped to fit the region (fig. 21), a band long enough to go round the body, and to cross and fasten in front, is to be sewed to one end (1), and to the opposite point another small band (2)

is attached, which, passing between the legs, is brought up to the band behind. To retain dressings, &c., between the legs or nates, the double T bandage (fig. 22) is used. For the groin and parts adjacent, the spica or figure of 8 bandage is also used. Two turns should be made round the thigh of the affected side from within outwards, then the bandage is to be

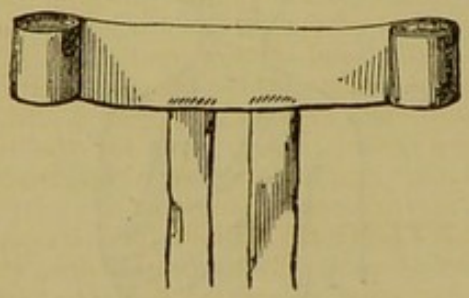


Fig. 22.

carried along the lower part of the groin, and over any pad which it may be desired to hold there; then to pass round the pelvis and back over the pubes, crossing the former fold at the groin, and thus completing the figure of eight. A series of similar turns, each slightly overlapping the other, may then be carried round the same way (fig. 23).

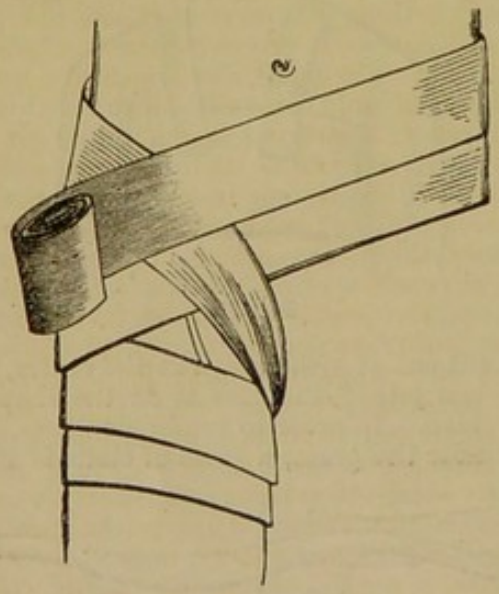


Fig. 23.

For the extremities, the simple roller applied in reversed turns is generally used. Bandaging from above downward may be required, but generally it is upwards. There are various methods of commencing the application of the roller at the foot. The heel is covered by laying the end on the inner ankle, bringing the roller under the heel, then round the ankle so as to secure the end, from thence going down to the toes, and carrying the bandage up from that point round the foot and leg, reversing where required. The arm is to be bandaged —with the requisite modifications—by the reverse, like the leg. As a general rule, leg bandages, habitually worn, ought to be put on before the individual gets out of bed in the morning. A bandage which gives pain after its application, without obvious cause, ought to be taken off, and reapplied. If there is reason to suspect inflammatory swelling beneath, it will be well to try the use of cold water before disturbing matters. There is some little management required in taking off a roller as well as in putting it on: as each successive turn is unrolled, it should be gathered in a bunch in the hand, and not, as is often done, three or four yards of bandage at full length pulled round the limb every time. A many-tailed bandage (fig. 24) is used to bandage the

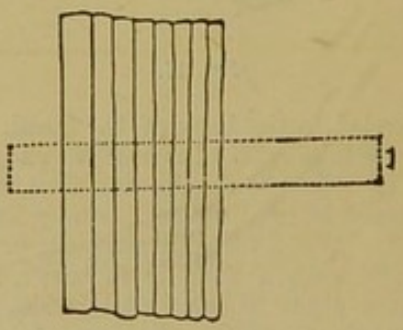


Fig. 24.

leg where it is an object to avoid the slightest movement. It is formed of a number of short strips of bandage, long enough each to go once and a half round the limb. They are placed obliquely, and overlapping one another; they may, or may not, be joined by a central strip (1). Upon these arranged strips the limb is laid, and each strip in succession is brought round the limb, every succeeding strip securing the previous one. The advantage of the many-tailed bandage is, that it can be changed, either partly or entirely, if soiled, without the slightest disturbance. It is only necessary to attach a fresh strip to that which is to be removed, and pull the one away, and the other into its place. When, from movement, a bandage is liable to become displaced, the inconvenience is in great measure prevented, by brushing a weak solution of starch or gum over the turns as soon as applied. This is different from the starch bandage which is so useful in many cases—fractures, &c. For this bandage the roller is thoroughly saturated, as it is put on, with strong starch or flour paste, and if requisite, brown paper pasted on the top of the first bandage, and another dry one put over all. In thinly settled countries, where it might be requisite to move a person soon after a fracture, the foregoing application would prove simple, safe and efficacious. It must not, however, be put on till inflammation has subsided. A useful bandage, and one which may be handled and carried about like a handkerchief is that known as Esmarch's. It is cut in a triangular

form, and can be made of the ordinary material, or may be bought stamped with illustrations of the methods of applying it. It measures 4 feet along the base by 2 feet 10 in. (fig. 25). For illustrations of its application see *Fractures*.

For the uses of Martin's india rubber bandage in ulcers, see *Ulcers*.

In bandaging the hand (see fig. 26), the bandage may be from 1½ to 2 inches broad according

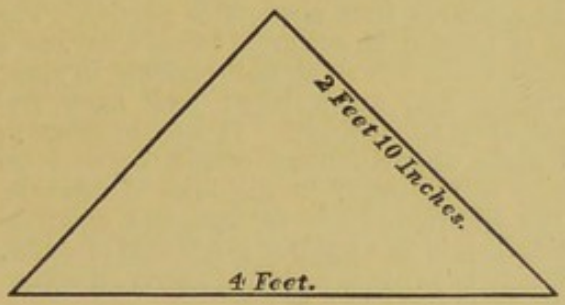


Fig. 25.

to circumstances; for the finger of an ordinary-sized person, it may be ¾ of an inch. In bandaging a finger, the band may first be carried round the wrist, and crossed over the back of the hand to the root of the finger, round which it is carried both up and down again in spiral

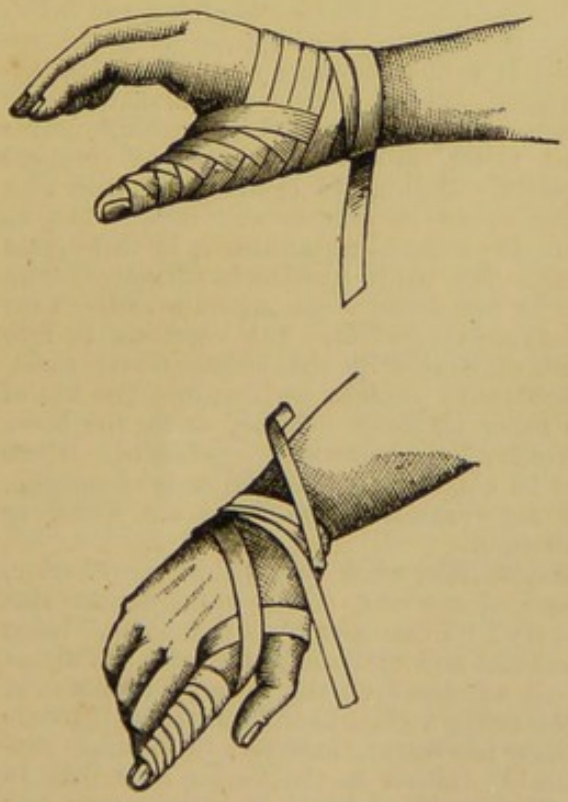


Fig. 26.

coils; it is then brought back to the wrist and fastened by splitting the end so as to make two strings. A bandage may either be fastened by pins or split up in the way described.

In many cases, in which bandages used formerly to be applied they have been superseded by elastic materials, of which stockings and belts of all kinds are fabricated: elastic rollers are also manufactured. The flannel bandage unites at the same time support and protection to the surface; it is useful in rheumatic cases, and also when applied over the abdomen in diseases of that cavity.

There are now many forms of manufactured bandage, some of which have their own special uses. The woven or double stocking bandage is more easy of application than that made of simple calico, and is more comfortable in wear; while the solid rubber bandages are most effectual when support is required, either for enlarged veins in the legs, for the cure of eczematous eruptions, or of ulcers, frequently resulting from such enlargement.

BANTING SYSTEM (or "BANTING"), so called after Mr. Banting of London, who has made his name celebrated from the fact that from being an immensely stout man (so much so, that he was a burden to himself, and was obliged to walk down stairs backwards, and with great care), by adopting a certain regimen he soon became of normal size and weight, and was so grateful that he made known the details of his system in a public pamphlet, the perusal of which soon gained him many imitators amongst all classes of the community. Let no one imagine, however, that there was contained in this pamphlet anything that was startlingly new, or anything whatever that was not perfectly well known to physiologists, and indeed, taught by them in detail, at all medical schools. Mr. Banting only brought forward a well-known fact in a striking manner; and, unfortunately, it is probable that the too general adoption of his system in cases not exactly suitable for it, has been attended with harm. In a word, the system consists in the avoidance, as far as possible, of all articles of food likely to favour the production of fat in the body, such as sugar, starch, and fats of all kinds, as well as substances containing fat or assisting in its formation, such as bread, milk, butter, beer, sugar, and potatoes. Malt liquors, port wine, champagne, and the sweet wines, generally, are also to be avoided; and sherry, claret, or Madeira substituted. An occasional tumbler of grog (made of gin, whisky, or brandy, without sugar) is not forbidden, and on the whole, a very liberal diet is allowed, as will be seen from the following table, taken from the amusing pamphlet of Mr. Banting himself:—

"For breakfast, take four or five ounces of beef, mutton, kidneys, broiled fish, or cold meat of any kind except pork, a large cup of tea (without milk or sugar), a little biscuit, or one ounce of dry toast. For dinner, five or six ounces of any fish except salmon, and meat except pork, any vegetable except potato, one ounce of dry toast, fruit out of a pudding; any kind of poultry or game, and two or three glasses of good claret, sherry, or Madeira; champagne, port, and beer are forbidden. For

tea, two or three ounces of fruit, a rusk or two, and a cup of tea without milk or sugar. For supper, three or four ounces of meat or fish, similar to dinner, with a glass or two of claret. For night-cap, if required, a tumbler of grog (made of gin, whisky, or brandy, without sugar), or a glass or two of claret or sherry."

A similar diet, though less luxurious, is used by men and lads in the course of training for sports of various kinds, but in these cases it is associated with a good deal of exercise, and the waste of tissue is made up by the consumption of a larger amount of meat, which is generally preferred half cooked.—See *Training.*

The Banting system, with modifications suited to particular cases, is an excellent one, only it should be borne in mind that (as recommended by Mr. Banting himself) it is not one which every corpulent person should rush headlong into, without, first of all, consulting his medical adviser.

BARBADOES LEG. — See ELEPHANTIASIS.

BARK.—The term used alone is always applied to the bark of the cinchona, also called Peruvian or Jesuit's bark, which was introduced into Europe from South America about 1640, and at first was enormously expensive. Many marvellous tales are told of the way in which the virtues of cinchona bark were first discovered by the natives of the country, but they have been proved erroneous. The remarkable power of bark in curing, not only intermittent fever or ague, but periodic diseases generally, and its efficacy as a general tonic, have rendered it one of the most valuable drugs possessed by man. The varieties of cinchona have been classed as pale, yellow, and red barks, but there are many more than these, and some of them are almost worthless as medicine. The kind of bark has now, however, since the discovery of quinine, become almost a matter of indifference to the general purchaser; when the drug itself, either whole or in powder, is required, the only security is to procure it from a respectable chemist. The powder, which was formerly given so largely, is scarcely ever now prescribed, but the infusion, decoction, and tincture of bark still retain their places. The infusion may be made by pouring a pint of boiling water upon an ounce of coarsely powdered bark, and allowing it to stand near the fire, in a covered vessel, for two hours; the dose, a wine-glassful twice or three times a day. The decoction is made by adding double the quantity of water to the same quantity of bark, and boiling down to one half. The dose is about the same as of the infusion. A favourite domestic method of administering bark, is to steep an ounce of the powder for a week in a bottle of port wine, and of this to give a small wine-glassful once or twice a day. Where the stimulant is admissible, the form is a good one. If the tincture is required, it is better bought. The characteristic properties of bark are concentrated in the alkaloid substances, quina and cinchonia. The former of these is much the most widely known and used, but the latter is considered by many equally efficacious. Quina or quinine is used in medicine in the form of sulphate, or rather disulphate. Pure white in colour, it is in the form of silky crystals, and has a most intensely bitter taste. Its high price renders it liable to much adulteration; it ought, therefore, always to be procured from respectable parties. The dose of quinine is one grain twice a day, as a general tonic, but as an anti-periodic in ague, neuralgia, &c., much larger and more frequent doses are required. It may be given in pill made up with bread crumb, but is more usually administered in the form of mixture, by the addition of five or ten drops of dilute sulphuric acid in a small wine-glassful of water, or it may be taken in a glass of sherry, if stimulants are admissible.

As a curative agent in ague, and in diseases generally of an intermittent or periodic character, bark, either in its original state, or in the form of quinine, is quite unrivalled; as a tonic, in diseases of debility, in the advanced stages of fever or at its very commencement, in weakened digestion, it is equally efficacious. In some persons, quinine, even in small doses, is apt to occasion headache and other uncomfortable symptoms, and to disorder the bowels. When given as a stomach tonic, it cannot be long continued with advantage. Where there exists inflammatory action, or tendency to head affection, quinine must never be given, except by medical sanction. Quinine in combination with iron —the citrate of quinine and iron, forms an admirable tonic in certain cases, in three-grain doses. The use of quinine in various diseases will be found under the separate heads, such as *Ague—Neuralgia.* The cinchona is now much cultivated by the Indian Government, which seems anxious to introduce the use of the other alkaloids obtained from the bark, especially quinoidine and cinchonine. These may be obtained at half the cost of quinine, and are considered nearly, if not quite, as efficacious.

BARLEY, when prepared as pearl-barley, is one of the most useful additions to sick cookery; its decoction, "barley-water," being a pleasant and extremely beneficial demulcent in all affections of the mucous membranes, and forming a grateful and nutritious beverage in fever; it ought, however, to be made considerably thicker in the former case than in the latter. To make plain barley-water, two and a half ounces of pearl-barley are to be well washed in cold water, half a pint of boiling water is then to be poured upon the grain, the whole boiled for a few minutes, and the water strained off, a couple of quarts of boiling water must then be poured on, the quantity boiled down one-half and strained.

This process does not quite exhaust the barley, and another portion of water may be boiled upon it, by those to whom the saving is an object. A little lemon or orange peel is a pleasant addition to the beverage. A compound and very pleasant drink is made by adding, to a quart of simple barley-water, figs sliced, and raisins stoned, of each two and a half ounces, liquorice root sliced, five drachms, and a pint of water, the whole to be boiled down to a quart and strained. This compound decoction is not so well adapted for a fever drink as the simpler form.

In irritation of the urinary passages, from gravel, or after the application of a blister, or from any other cause, barley-water is most valuable; its soothing properties are still further increased by the addition of an ounce of gum arabic to each pint of liquor. In catarrh, and irritable cough, or simply as an article of mild unstimulating nourishment, it is serviceable. The late Dr. A. T. Thomson recommended equal parts of barley-water and milk, sweetened with a little refined sugar, as a good food for infants brought up by hand. It may act upon the bowels.

BAROMETER, the instrument by which the amount of atmospheric pressure is determined.

BARRENNESS.—Sterility of the female, may be the result of defect of structure in some portion of the generative organs, or of functional disorder resulting from local or constitutional causes. Such cases always require the care and consideration of a medical attendant.

BASILIC VEIN.—Frequently opened in the operation of bleeding from the arm.—See *Blood-Letting.*

BASILICON OINTMENT, or RESIN OINTMENT, is made with resin in coarse powder eight ounces, yellow wax four ounces, simple ointment sixteen ounces, which after melting is strained, while hot, through flannel, and stir constantly while cooling. It is a stimulant ointment, not as much used at the present day as formerly.

BATH.—Applications to the surface of the body, either general or partial, in the form of liquid, vapour, or hot air, are now comprehended under the term "bath."

Water baths may be *simple* or *medicated.*

As regards temperature, they may be *cold, tepid,* and *hot.*

As regards application, they may be *general* or *partial, shower, cold affusion, douche, sponge, wet sheet.*

Vapour and *hot air* are both used as baths.

The extreme vascularity, the nervous sensibility, and sympathies of the skin, and its important functions as an excreting organ, all render it a most important medium through which to impress and act upon the system generally.

The *Cold bath,* if not too long continued, acts as a tonic and exhilarant, and increases the temperature of the skin. If it has not this effect, it is injurious to a person otherwise healthy. The temperature of a cold bath cannot be well specified, as it depends on the condition of the weather; but 60° Fahr. is usually about the average in our climate, the effect upon the system varying with the length of time it is endured, and the amount of muscular movement exerted during that time. A single plunge into ice-cold water, may depress less than a longer-continued bath of a higher temperature. As a rule, individuals of weak and nervous circulatory powers, do not bear well the effects of cold bathing, it robs them of an amount of animal heat, which they cannot readily again make up; it produces nervous exhaustion, and perhaps, internal congestion, unrelieved by reaction to the surface. In fevers, the application of cold abstracts heat from the skin, and if continued long enough, from the internal organs as well, but the reaction after the bath soon restores the temperature. In cases of very high fever, the reduction in the temperature is more permanent.—See *Cold—Affusion.*

When an individual in comparative health, after the cold bath, in any form, remains chilled, the fingers and lips blue, the countenance pale; and when languor and drowsiness succeed: he may be certain that more harm than benefit is being derived from the custom, and that it be must be modified or given up.

In such a case, if the bath has been usually taken before breakfast, the hour should be altered to a couple of hours after that meal; this with some will be quite sufficient to make the difference between agreeing or not; indeed, it requires a person of very good vital power to derive real benefit and comfort from bathing before breakfast. If the change in hour does not alter the effect of the cold bath, something may be due to its low temperature; or the bather, especially if he be not a swimmer, may expose himself too long to the depressing influence; he may be in the habit of going into the water after his powers have been exhausted by much exercise, or when he is in too chilled a condition. All these points require consideration, before either the undoubted good effects, or the comfort of bathing, whether in fresh or salt water, are given up as unattainable. The last point mentioned is one on which particular caution is required; many persons, in dread of going in to bathe too hot, run to the other extreme, and allow themselves to become so chilled that reaction will not come on. After coming out of a cold bath the skin ought to be well rubbed with a rough towel, till a glow is felt; or the hair glove, now so well known, may be used. The above remarks apply to the application of cold water generally to the skin, in whatever form. Few old people can take cold baths with advantage, and the perseverance in their use may lay the foundation of rheumatic, urinary, or other disease. Those who

are liable to head affection, should not take the general cold bath; for them the shower bath is preferable. Females should not bathe in cold water during the menstrual period.

Sea-bathing and the *Salt-water bath.*—Some persons who cannot bathe in fresh water, can do so in the sea; the saline ingredients producing a more stimulant effect upon the skin; sometimes, however, the stimulation goes so far as to produce a painful rash, which forces the person to give up the custom. The restorative and tonic effects of cold bathing are undoubted in many cases, if the mode of taking it be properly regulated. As a *general rule*, five or six minutes immersion is sufficiently long. Sea water, from its containing numerous salts, is more buoyant and invigorating than fresh, and undoubtedly exerts a more tonic influence upon the bather. Moreover, its temperature is more equable, and seldom so low as that of the latter. Hence, many persons, unable to take a cold bath in their own dwellings, can do so with impunity in the sea. From the beginning of June to the end of September, according to weather, may be considered the sea-bathing season, during which the temperature of the water on our shores averages from 55° to 70° Fahr.

Sea-water baths, however, especially on a small scale, are now readily procurable in one's own house or room, by means of the sea salts, such as Tidman's, Palmer's, &c., abundantly advertised, and sold at so moderate a rate as to put them in the power of most. As directions accompany the packets of salt, it is needless to give them here. Better still for those whose place of residence enables them to avail themselves of it, sea water is supplied by the various railway companies which have branches or termini at the chief watering places, and arrangements are made by which many inland towns may be supplied with it regularly at very reasonable prices.

A bath is either ordered as a remedy, or desired as a comfort, and if when cold it does not agree—

The *Tepid bath*, of a temperature varying from 85° to 94°, may be used—about 88° is an agreeable and convenient standard. Of course, the tepid bath involves the use of a receptacle for the water. It does not produce the shock to the system like the cold, and the person may remain in it from a quarter of an hour to twenty minutes. The tepid bath relaxes and purifies the skin, and promotes the insensible perspiration. For the purposes of cleanliness and comfort, it is most generally applicable. After fatigue from travelling, hunting, shooting, &c.; in irritable states of the system, with dry or chafed skin, the tepid bath is at once grateful to the feeling, and salutary. Neither the tepid bath, nor any other, should be taken soon after a full meal.

The *Warm*, or *Hot bath* is, or ought to be, a remedial agent only, not one for general use. Its temperature ranges from 95° to 105° Fahr. —100° is the most general standard. The warm bath is used to promote reaction, to allay pain, spasmodic or inflammatory, to soothe convulsive action, and to cause relaxation of the tissues prior to some surgical operations. It is invaluable in soothing children who suffer from simple and inflammatory fevers, while in the treatment of numerous skin affections, and in Bright's disease, it is frequently employed with benefit. The time for remaining in the warm bath is generally from twenty to five-and-twenty minutes, but this must be regulated somewhat by the effect required. The hot bath of a temperature of 105° is a powerful stimulant agent, to be used cautiously, and rarely without medical advice; in disease characterised by extreme depression, coldness, &c., it is useful. In the employment of these baths generally, persons who are the subjects of any organic disease, or have a tendency to acute attacks of functional disorder, such as determination of blood to the head, &c., must be very cautious, and ought if possible to have medical advice. The regulation of the temperature of baths ought never to be left to the sensations, the thermometer is the only trustworthy guide, and, indeed, is an article which no house ought to be without; the price of the instrument is now extremely low, and whether for the bath, the temperature of the room, or the instruction of a child, it is equally useful. —See *Thermometer.*

Mode of Application of the Bath.—Baths are made either to contain the whole person, as the "slipper bath," or on a smaller scale, as the "hip bath" and the "sponge bath." In choosing a bath, it is well to have one which will answer the desired purpose with as large a quantity of water as possible. Every house where it can be afforded should have the means of providing a bath, be it ever so small, and every town and village should have its public baths for the use of its poorer inhabitants.

Hip baths and *Foot baths* are used where a full bath is unnecessary. The former, either cold, tepid, or warm, is extremely useful in affections of the loins, hips, &c. The foot bath, generally used as a derivative, should be at as high a temperature as can be borne, and ought to redden the skin after the immersion. If a stronger effect is requisite, an ounce of mustard, and a couple of handfuls of salt may be put in the water. To reap the full benefit of the foot bath, the extremities should either be clothed in woollen stockings, or wrapped in flannel immediately on coming out of the water. In using the foot bath in cases of insensibility, the fact must always be kept in mind, that it may be so hot as to scald, and that the patient cannot complain. The best mode is to use the thermometer, and not to raise the heat above 110°.

The accompanying illustration (fig. 27) shows a new and convenient form of bath (manu-

factured by Messrs. Allen & Son, of Marylebone Lane, London) for invalids and general purposes. The bath when mounted on the stand, as figured, prevents the trouble of raising and lowering the body in helpless cases, while, by lifting it out of the stand, it can be used as an ordinary hip bath. For nursery purposes it is useful, preventing splashing, and affording a support to the child to hold by when being bathed.

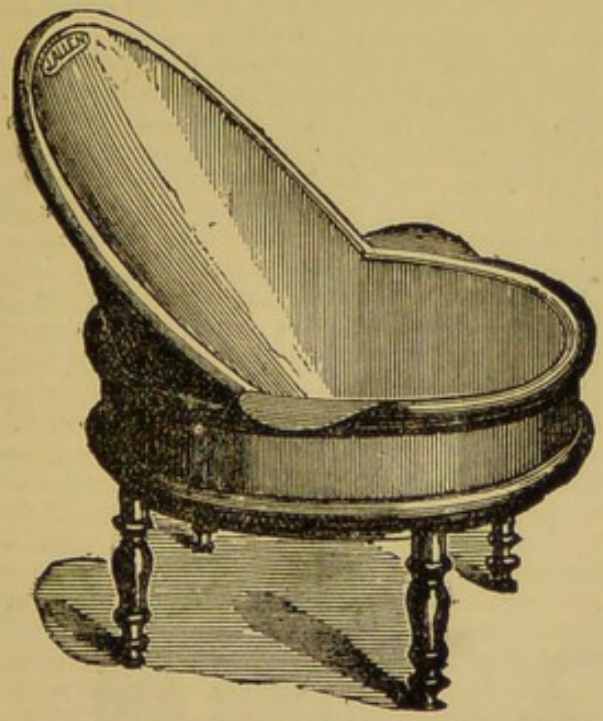


Fig. 27. Nursery and Hip Bath combined.

The *Sponge bath* is now universally used for purposes of cleanliness and comfort. It may, however, produce depression if employed before breakfast. Partial sponging, sponging with tepid water, changing the hour, or having a cup of tea or coffee on rising, before taking the bath, may obviate this effect. Rough friction is to be employed after. Persons who suffer

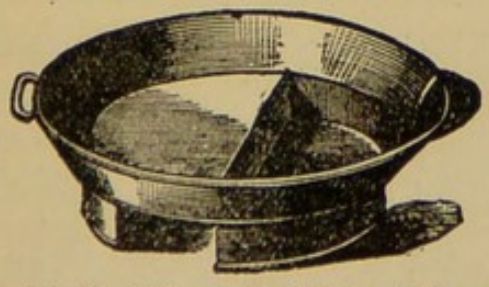


Fig. 28. Well and Dry Platform Bath.

from a determination of blood to the head, are often compelled to give up the practice of the daily sponge, finding this tendency intensified by the standing in cold water. To meet this difficulty, the same firm to whom we owe the last bath mentioned, has invented a small portable bath with a dry platform on which the bather stands during the operation. In cold weather, a quart of hot water poured over the platform will suffice to keep the feet warm during the period of bathing.

Portable baths made of Mackintosh material are extensively used by travellers, military men, emigrants, and others. They fold up into small space, and can be readily inflated when desired for use.

Cold Affusion (see *Affusion—Cold*).

The *Douche bath* consists of a compact stream of water, either warm or cold, allowed to impinge forcibly upon any portion of the body. In some bathing establishments, on the Continent especially, the douche stream is of great force and bulk. Domestically, the most familiar douche instrument is the pump, and a most efficient one it is to strengthen a limb which remains weak after an accident, such as fracture or sprain,—it must be used till aching is produced. The most convenient domestic douche is a watering can without a rose, but a jug will do; in short, whatever will send a stream of water upon the part required. Additional force is obtained by the person administering the douche standing upon a chair.

The *Shower bath* whether of fresh or salt water, whether quite cold or tepid, is a valuable agent in the treatment of many nervous affections, and is more powerful than the cold bath. It is frequently recommended in cases of St. Vitus' dance and hysteria, when the patients can safely bear it. It is well for persons of weak habit, or who suffer from the head, to have a thin layer of warm water put in the bottom of the shower bath before getting in. Useful hand-shower baths are sometimes employed which greatly moderate the shock when compared with the ordinary shower.

Another useful appliance may be mentioned here. This consists of a bell-shaped tin vessel, the bottom of which is pierced with holes, and from the top of which rises a hollow tube. To use it, the bell must be immersed in a basin of water, and then the thumb or finger must be placed over the aperture of the tube, which serves as a handle. If the thumb be kept firmly pressed over the aperture, the atmospheric pressure will keep the bell quite full of water while it is raised over the head or any part of the person to whom the shower is to be applied. By raising the thumb the water is suddenly discharged in a shower. This bath is invaluable as a means of applying all the benefits of a shower bath to children, without any of its terrifying accompaniments. It is peculiarly valuable, and has been much used by the writer in cases of nervous disease among children, such as chronic St. Vitus' dance, &c. The intensity of the shock may be varied according to the height at which the instrument is held; and, of course, the temperature of the water may be varied to suit the individual cases of disease.

As a rule, the use of the shower bath should

not be persisted in with children to whom it continues to be very irritating and disagreeable, after the first few applications. When administered as above, many children become exceedingly fond of using it.

The *Swimming bath* which is now—thanks to the liberality and enterprise of our town corporations, or of public companies—to be met with in almost every large town, must be looked upon as an important means of improving public health, as well as of affording an opportunity of learning the art of swimming to many who, from being resident in towns, would otherwise remain ignorant of it. It is generally resorted to as a pleasure and luxury, or for the purposes of ablution, or healthful and most useful exercise. The bath should be spacious, and its temperature should be maintained at a pitch which will render its use agreeable as well as safe, even for the comparative invalid who cannot remain any length of time in perfectly cold water. Salt water should also be added in sufficient quantity, if possible, as by this means its action is rendered more salutary.

The *Wet Sheet bath* is sometimes, by misnomer, called the cold wet sheet. It is, in fact, a warm bath, or rather a large warm poultice, kept warm by the animal heat. It is formed by enveloping the person in a sheet (or several large towels), wrung out of cold or tepid water, and covering or packing him up with layers of blankets; very free perspiration is the result. It is a most useful remedy, and might with advantage be more generally used. Sponging with cold water after the use of this bath is occasionally practised.

The *Vapour bath* produces free perspiration and may be used whenever that is required, as in incipient cold. It is very relaxing. Many different forms of vapour baths have been invented. A small kettle to place on the fire, with tubing to convey the steam underneath the blanket or oilcase, in which the person is enveloped, forms a good vapour bath. A simple extempore vapour bath may be made by placing a vessel of boiling water underneath the coverings of the patient, and keeping up the steam by means of hot stones or metal. The Turkish bath is partly a vapour bath, but as the Turkish

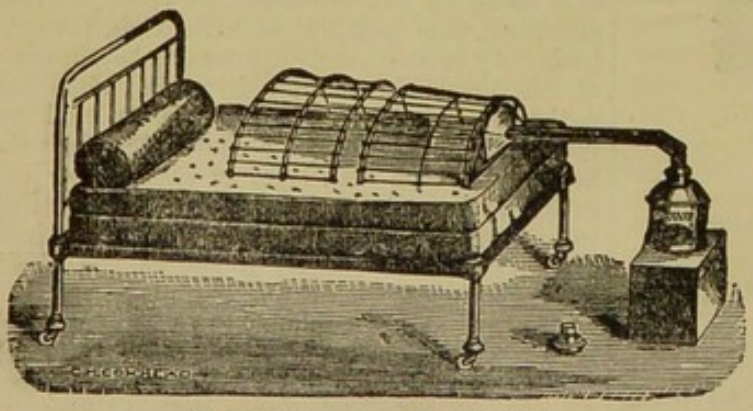


Fig. 29. Vapour or Hot-Air Bath.

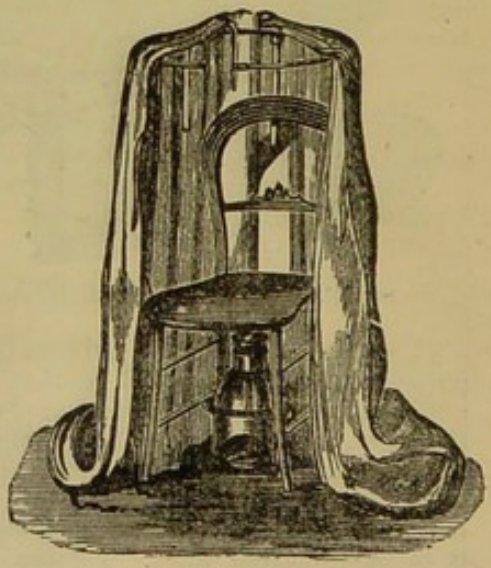


Fig. 30.

bath cannot be employed in the case of a person confined to bed, other expedients are had recourse to. The best of these is an enclosed copper vessel or boiler, heated by one or more spirit lamps placed on a stool, or on the floor near the bed as in the illustration (fig. 29); communicating with the boiler is a piece of copper tubing about 1½ inches in diameter, which is carried under the bed-clothes. The steam is in this way projected over the body of the patient, a wire or wicker work cradle, placed in the centre of the bed, preventing the bed-clothes from touching his body, and thus admitting the free dispersion of the vapour round him, while an ingenious contrivance protects his feet from being scorched. In consequence of the saturation of the bed-clothes with the vapour, the ordinary vapour bath has been now practically discontinued for general use, and has given place to

The *Hot Air bath*, which is both more convenient and more stimulating. Apparatus of various kinds for the generation of hot air are employed, such as hot bricks, the hot air from a gas burner conducted under the bed-clothes, &c. The most convenient and effective apparatus, however, is either Messrs. Allen's, as figured above, which (by removing the boiler, as shown in the illustration) can be made to supply hot air only—or a lamp-cage suspended within the cradle figured. With due precaution, there is little danger of either form of apparatus scorching the person or the bed-clothes, and in order to obtain a good action of the skin and to lessen the dropsy (as in cases of Bright's disease) the tempera-

ture may be made to range from 120° to 150° Fahr.

Medicated baths are those in which chemical compounds are added that they may effect a certain action by absorption through the skin. Thus the addition of carbonate of soda, to the extent of four ounces to thirty gallons of hot water, is used sometimes in skin diseases and chronic rheumatism, and is known by the name of the *alkaline bath*. The well-known property of sulphur in destroying the itch mite has caused it to be used in the form of a bath. The preparation employed for the purpose is the sulphurate of potash, four ounces of which are to be added to thirty gallons of hot water to make a bath. The best known form of bath medication is the *mercurial vapour bath*, which is arranged by placing the patient on a cane-bottom chair and enveloping his body in a blanket or two. Underneath the chair is placed a small boiler surmounted with a platinum saucer or crucible into which are put about twenty grains of calomel. Heat is applied to the apparatus by means of a spirit lamp, and the vapour with the calomel is soon dispersed about the body of the patient. In the illustration (fig. 30) is shown the same apparatus described as applied to a bed (fig. 29), but which can be used with equal facility under a chair for the purpose of giving either a medicated or mercurial bath. The operation takes about twenty minutes, and is used as a remedy in persons suffering from constitutional syphilis, and when it is not desirable to give mercury by the mouth.

Mineral baths.—The natural mineral waters, besides being drunk, are also much used as baths in their warm state, and may be classified under the several headings of chalybeate, sulphurous, saline, alkaline, and gaseous. The best known in England are those of Bath, Buxton, Cheltenham, and Harrogate, and on the Continent, Spa in Belgium, Aix-la-Chapelle, Kreuznach, numerous resorts in the Pyrenees, Wiesbaden, Homburg, Baden Baden, Carlsbad, Marienbad, Vichy, and many others.

The Turkish bath.—There are few subjects, perhaps, upon which less accurate information is possessed by the public than upon Turkish baths. The Turkish or Oriental bath has been known from antiquity, and used more or less by all Eastern nations, though at present it is chiefly patronised by the disciples of Mahomet. How much of the effeminacy and sensuality of that race may be attributed to its use or *abuse*, it is not easy to say. The ancient Greeks and Romans were also acquainted with the use of baths of a similar kind; and we can trace mention of them up to the time of Hippocrates, the Father of Medicine, himself. They were undoubtedly introduced into this country and into France with the Roman conquest, and were extensively made use of for centuries.

The great principle of the Turkish bath is to produce the freest perspiration, and afterwards to brace and stimulate the nervous system through the medium of the skin. To effect this, it is necessary to alternate the greatest amount of heat with a due proportion of cold, and the arrangement consists of a chamber supplied with heated air, not dry, but with a little fluid—just enough to moisten or soften the skin, and allow of the free escape of its secretions, which takes place to a remarkable extent, thus relieving congestion or obstruction of internal organs, and favouring the circulation of blood through the fine capillary vessels of the skin itself. Exhalation from the lungs also is favoured, so that the body gets rid of impurities by both channels. Of course the building in which the bath is so administered must be one adapted and intended for the purpose, with all the appropriate chambers, the tepidarium, calidarium, &c., and skilful attendants must also be provided, who, remarkable to say, are not found to suffer in health from their residence there. We would advise people not to be too anxious to have an enormous quantity of cuticle or scurf rubbed off their skin by the attendant whose duty this is. Some persons are apt, from having read the exaggerations that have been circulated on this subject, to measure the benefit they are likely to derive from the bath by the amount of the matter which is removed by the hair-glove. Finally, let it be clearly understood that the Turkish bath is a very useless remedy in some, if not in most, of the cases for which its help is sought by the ignorant, and that in many cases it is likely to prove hurtful and dangerous, so that there can be no greater folly than its use by an invalid without the advice of a properly qualified medical practitioner, who will always be ready to point out the cases (and there are many such) likely to receive benefit from its proper and discriminate application. Some people are so stupid they cannot see that it does not follow that because A. derived advantage from the use of a Turkish bath, B. must necessarily do so, because his case seems to them to resemble A.'s. They forget that there may be many other circumstances connected with B.'s case which might make the use of a bath hurtful to him. We, therefore, hope to hear less for the future of the reckless gratuitous advice tendered by the public to their friends on this subject; and still less of the public being so silly as to follow the advice of those who are interested in the use of baths from pecuniary considerations.

Amongst the number of cases likely to be benefited (due attention being paid to the precautions aforesaid) may be mentioned chronic rheumatism and gout, especially those cases followed by deposits in the joints, and scaly eruptions upon the skin. Certain cases of sciatica and tic douloureux, as also certain chronic diseases of the lungs, stomach, and liver. It has been known to act as a charm in removing local dropsies, as of the feet and legs,

when not depending upon any serious organic disease. We hope to see a wider application of the Turkish bath as a means of treating disease upon scientific principles, as a preventive of disease, as a promoter of cleanliness and of health, and this is only to be effected by its moderate and judicious employment, since nothing will be more calculated to drive it into the regions of obscurity and neglect than the intemperate and ill-advised encomiums of those who are neither capable of understanding its action nor of judging of its effects, but who are disturbed by an uneasy desire to try anything and everything that is new.

BATH—The city of, is celebrated for hot springs, the only ones in England. The waters are used for bathing, and are drunk. They are found useful in gout, rheumatism, paralysis, liver and stomach affections. Persons who suffer from impaired health, in consequence of long residence in a hot climate, frequently derive considerable benefit from the use of the Bath waters. One time the Bath waters were considered an infallible remedy for rheumatism and dyspepsia, and are still held in considerable repute. They contain salts of lime, soda, and magnesia, as well as iron, in solution.

BATTLEY'S SOLUTION OF OPIUM is a secret preparation, but one largely prescribed by medical men on account of its efficacy. It is more purely sedative than the other preparations of opium, and is said to be twice the strength of laudanum, but this it is not. Twenty drops of the sedative solution are almost equal to thirty-four of laudanum. It more certainly produces sleep than the latter, and excites less

BEAN.—The various species of bean are most nutritious to those whose stomachs can digest them; they are used either young and fresh gathered, or old. The nutriment they afford, as shown in the case of the miners in South America, who live almost exclusively upon them, is calculated to sustain a high condition of muscular development and vigour. Garden-beans as brought to table in this country, must be avoided by those of weak digestion. They are less likely to disagree if deprived of their skins.

BEBEERINE.—An alkaloid prepared from Bebeeru bark, and sometimes employed as a substitute for quinine. Useful in excessive uterine discharges, such as "Whites."—See "*Whites.*"

BED-ROOM (The), in health. The fact that civilised people spend on an average about one-third of their lives in their bed-rooms, is quite conclusive as to the importance of their salubrity being a first consideration with every one. Whatever the public rooms, bed-rooms should be as spacious, lofty, and well aired, as circumstances will permit. Unfortunately the reverse of this is the general rule, and we have close, small, sleeping apartments, crowded and ill-ventilated nurseries, and bad health. Good ventilation will do much, but it will do far more if aided by plenty of space. During the daytime there is much less danger of persons generally suffering from want of fresh air than during the night, when, in sleep, they are many hours confined to one place. Every respiration of the sleeper contaminates a certain amount of air, and as a matter of course, the smaller the space around, the sooner will the contamination of the whole body of air contained in that space be completed; it will become loaded with an amount of carbonic acid and organic matter injurious to health. The room must be sufficiently large,—and this is rarely the case in modern houses,—to supply pure air for respiration during six or eight hours, or some means must be provided for carrying off the impure atmosphere. This, certainly, is not to be effected by closed doors and windows, and blocked-up chimneys, assisted in their injurious operation by closely-drawn curtains, which might be contrived for the special purpose of enveloping sleepers in their own exhalations, rendering sleep unrefreshing, and waking a painful, rather than a pleasurable operation; it cannot be otherwise, after the poison of carbonic acid has been regularly inhaled for the last few hours of slumber.

If the door of a sleeping apartment *must* be locked, the upper panels ought to be perforated for the admission of air, but the purpose is much better answered by the door being left ajar, while it may be rendered equally secure by means of a chain-bolt. There is an advantage in admitting the fresh air by this channel, for it must be warmed in some degree in its passage through the house.

Air may be admitted directly from without, through the window, left slightly open at the top, or better, by means of barred glass or perforated panes (fig. 31, A, B, C). Some of these panes are made so that the perforations may be opened or closed at pleasure.

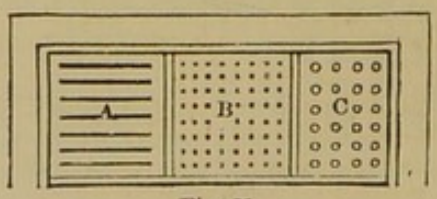


Fig. 31

It is not sufficient to let in pure air, the impure must have some means of escape, and for this the chimney—and no sleeping-room either for rich or poor should be without one—is the most ready channel, and perhaps the best, if under proper arrangements. In former times, when fire-places were ample and lofty, the chimneys were of themselves sufficient to carry off bad air; but since, by change of fashion, the openings have been lowered and contracted, they cannot do this. The air, warmed by respiration, ascends to the top of the room, where it must remain till it becomes

cooler, but not more wholesome, it descends to be rebreathed, and reaches the level of the breather's nostrils before it can pass up an ordinary chimney. All this may be obviated by making a proper opening for the escape of the impure warm air into the chimney. Dr. Neil Arnott's chimney ventilator (fig. 32) was contrived for this purpose. A brick is taken

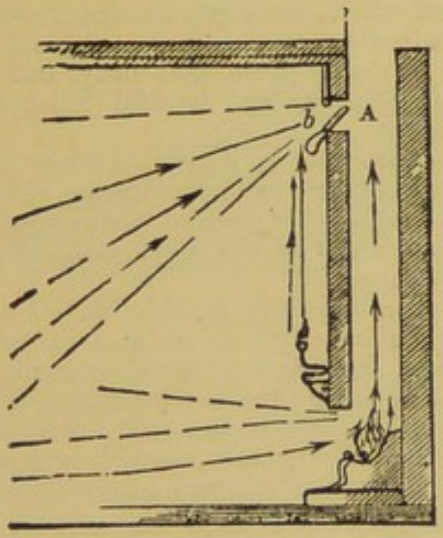


Fig. 32.

out of the wall at the top of the room, so as to make an opening into the shaft of the chimney, the opening being kept closed, and smoke prevented during the use of fires, by means of a balance valve (*b*). Thus, a bed-room, to be healthy, *must* have a sufficient entrance for good air; *must* have a proper exit for that which has been rendered impure; should have space, if possible. The greater the number of sleepers, the more requisite the fulfilment of these conditions. Arnott's ventilator, though still in use, has been superseded by other contrivances, not so liable to get out of order. The best of these is a simple grating furnished inside with a movable diaphragm made of talc, oil-silk, or other light material, which cannot interfere with the current of air as it is drawn by the chimney suction from the upper part of the room, and closing on the open orifices of the grating, should the smoke from the chimney attempt to make a counter current through the valve. This ventilator, introduced by Mr. Ayres, gasfitter, of Tooley Street, is now largely used in private houses, and in numerous public institutions.

Fires in bed-rooms are frequent sources of impure air, uncomfortable sleep, and morning headaches, and should not be adopted by people in health. During the first hours of the night, when burning briskly, the fire promotes ventilation; but when, as often occurs, towards morning, it smoulders down, and becomes choked with ashes, it has not sufficient power to create a draught; the current of air is reversed, instead of passing up the chimney, it passes down, carrying with it into the room a very deteriorated atmosphere, perhaps loaded with sulphurous gases. None who regard health will have curtained beds; it is difficult to conceive what other purpose the huge masses of drapery around a "four-post bed" can serve, than to collect dust, and when drawn, to confine impure air around the sleepers.

However perfect the provision for the ventilation of a bed-room during the night may be, it must require additional purification in the morning. As a rule, the window should be opened as soon as the occupant is about to leave the room, or even before, in summer, and the bed-clothes turned down over the end of the bedstead, or thrown entirely off, for at least an hour before the bed is made up for the day; in this way, perspiration, and the emanations which take place from every animal body, are evaporated and got rid of. Turn-up beds, box-beds, and all enclosures of the kind, are perfect abominations. Slops of all kinds should be removed from sleeping-rooms as early as possible. Children even more than adults require fresh pure air during sleep, yet how often are nurseries crowded and shut close up during the night; the beds made as soon as left vacant; and the little creatures confined to the room in which they have slept, for a great part of the day. This ought not to be, nor would it be, but for the generally prevailing ignorance upon all points connected with health, and the rules for its preservation. There are few parents but would make sacrifices to give their children a change of room were they sufficiently aware of the importance of so doing; even self-interest would dictate the course, could they know how often the first cause of illness, and all its expenses, has originated in the badly-aired nursery.

It is much to be regretted that in the houses of the poor, crowding at night is so frequently compelled by circumstances; if it must be so, its evils ought to be counteracted by the means of ventilation already pointed out, and by strict cleanliness; at the same time, floors should not be washed in damp weather, and when they are washed, it should be done early enough in the day to permit of their being thoroughly dry before the room window is closed for the night. It would be much better if all bed-room floors were stained and polished with bees'-wax and turpentine. It will be long before this process of floor-scrubbing will be adopted by the poor, but it is gaining ground among the well-to-do. Rooms which are at all crowded at night, ought to be white-washed at least twice a year.

The Bed-room in Sickness.—The chamber of sickness requires all the provisions for health to be attended to with increased care, more especially if the illness be of an infectious character. In this case, as free ventilation with cool pure air as the case will admit—the window, if possible, being open through the

day—must be continually preserved; and all superfluous furniture or clothing, of cotton or wool especially, and bed hangings, removed; dirty linen must be taken away at once, and excretions—kept, as they should be, for the inspection of the medical attendant—removed to an unoccupied room, or out of doors. The zeal for cleanliness, however, must never, either in infectious disorders or not, go so far as to dictate washing the floor of an apartment occupied by the sick; a gentle sweeping with tea-leaves to prevent dust, is all that is allowable. Cooking of any kind is out of the question. If it is possible to have a second bed into which the sick person can be moved occasionally, it is a valuable resource. A thermometer to regulate the temperature of a sick room is at all times a safer guide than the sensations of individuals, and the best average temperature to be maintained is from 60° to 65° Fahr. (See *Thermometer*). All sources of unpleasant or teazing noise, creaking hinges or shoes, the ticking of a clock, &c., are to be obviated; if there is a mirror into which the invalid can gaze, it should be removed. Vessels, whether for food or medicine, should be carefully cleansed each time of using. The medicines ought to be kept in some regular order in a place by themselves, never, as is frequently done by the poor, placed in the window, where they are liable to be decomposed by the action of light, or by the heat of the sun's rays. All external applications should be unmistakably marked POISON.

Even in disease of an infectious character, if proper ventilation and cleanliness be observed, the attendants upon the sick have comparatively little to fear, though at the same time, every additional precautionary measure is to be adopted. The evacuations from the patient and all napkins and dirty linen should be treated as directed under *Enteric Fever* and *Disinfection*. The practice of hanging a sheet previously soaked in carbolic acid solution outside the entrance to the sick chamber is useless, and only tends to produce a false security. A bottle of Condy's fluid ought to be always in readiness, so that a small portion may be added to the water used for washing the hands. (See *Carbolic Acid—Disinfection.*) Aromatic vinegar sprinkled about has no power of protecting against, or of destroying the power of morbid emanations; but it is sometimes grateful to the patient, and pleasant to the attendants. Darkening a sick room is too often resorted to, and should not be done except by order of the medical attendant, for some special reason. Bed and body linen of course require to be frequently changed, in fever, &c., once in twenty-four hours, if possible, that is, if it can be done without exhausting the patient.

Those in attendance upon the sick, especially of an infectious disorder, should live sufficiently well, but they cannot indulge with impunity in alcoholic beverages. A sitter-up should have tea or coffee and something substantial, during the night, and those who have to go about a fever patient in the morning, ought previously to take a cup of one or other of these beverages. The breath and exhalations generally of any one labouring under an infectious disorder are to be avoided; and, as much as can be done, any continued position, towards which a draught of air may be directed *from* the patient. With these precautions, those whose duty calls them to attend upon the sick, ought never to shrink from that duty, but face it with cheerfulness and trustful reliance upon Providence.

There are now so many inventions for promoting the comfort and convenience of the sick, that it would be impossible to enumerate them here, but a few of the most useful requisites may be suggested.

Bed-room Requisites for the Sick.—Commodes of various descriptions are manufactured for sick-room purposes, and are exceedingly useful when the patient may be permitted with impunity to get out of bed. The best form of commode is that made to resemble an arm chair, which, when out of use, may be of service for the latter purpose.

It ought to consist of a porcelain pail, with handle and porcelain cover, fitted into the sunken rim of the pail, which, when filled with water, forms an excellent trap to prevent noxious exhalations from the receptacle. The pan rests in the wooden framework of the chair, and a wooden seat with hinges closes over the lid of the pail when it is out of use, and completes the apparatus. Fyfe's night chairs, employed in many Government and other hospitals, are made somewhat on this principle, but are furnished with metal lids, and have metal pails outside the porcelain ones, an objectionable arrangement, as all metal work has a tendency to corrode and smell. A commode made on the principle of the earth-closet has been found exceedingly convenient for bed-room purposes, as the necessity of continually emptying its contents is obviated, and at the same time the excreta are disinfected.

When persons are too ill to use the night-chair (as is the condition in fevers, in paralysis,

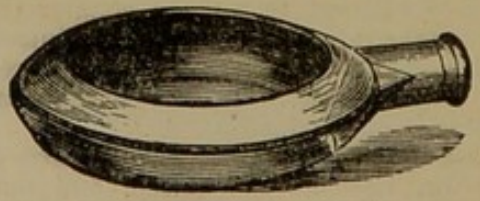


Fig. 33.

and in fractures of the lower limbs, pelvis, and spine), it is essential that the bed-room should be furnished with a bed-pan of the shape and size best fitted for the requirements of the individual. This useful utensil may be had in

various materials, such as metal enamelled inside, porcelain, and vulcanite. Mr. Hooper manufactures excellent bed-pans of pure india rubber, but those made of porcelain are the best and cleanest, the two shapes represented being found most convenient, the round form (fig. 33) as a rule proving more applicable for men, and the slipper form (fig. 34) for women.

Before using, it is better to warm the pan by rinsing it in warm water, and, in most cases, it

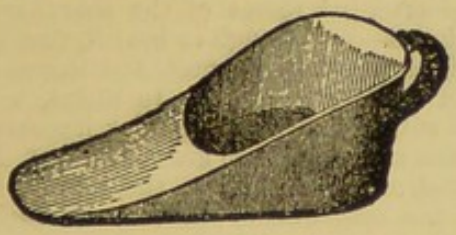


Fig. 34.

is necessary to protect the tender skin from injurious pressure, by placing a thin cushion of flannel over those parts of the utensil which are brought into contact with the skin.

Medicine spoons, though not essential, are often found useful adjuncts to the sick room. They are made of metal, porcelain, or glass; those of porcelain are the best, and are marked inside to denote a tea-spoonful, a dessert-spoonful, and a table-spoonful; while another form of spoon, occasionally employed in giving medicine to children, is so made as to conceal the noxious potion from the eyes of the little ones.

A metal spoon furnished with a hinged lid, suggested by Dr. A. T. Thomson, has been much used in administering medicine to delirious patients and refractory children. This spoon, which is illustrated by the drawing,



Fig. 35.

answers the purpose of a wedge or gag when introduced between the teeth, but it is scarcely necessary to say that the instrument should not be employed until all other means of persuasion have failed.

Many excellent contrivances are now sold for the purpose of heating and keeping warm nourishment, preparing tea, &c., during the night. Of these, the one figured below, and manufactured by Messrs. Allen, of Marylebone Lane, is useful. Another, which may be recommended

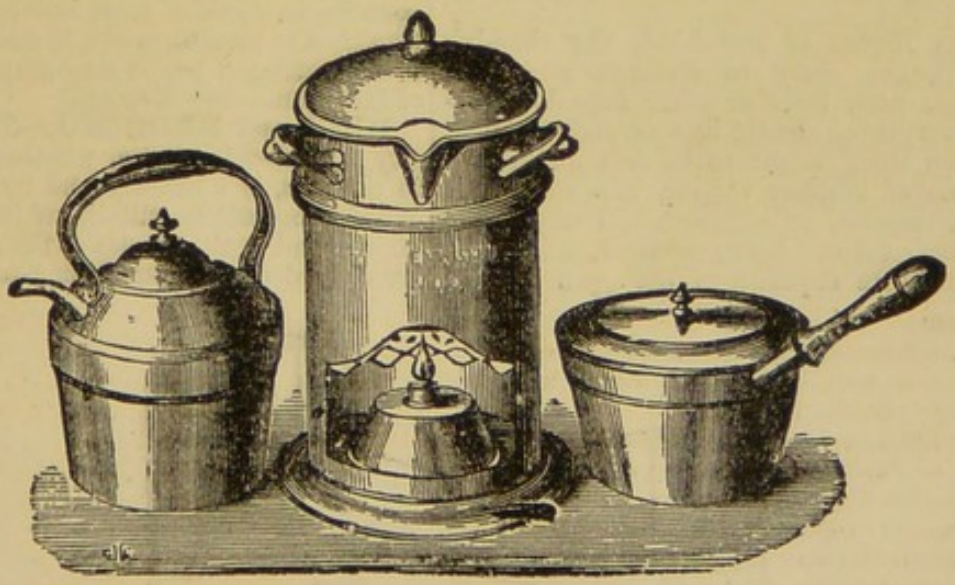


Fig. 36.

on account of the little space which it occupies, is patented by Mr. Lloyd of Birmingham. It consists of a movable stand containing a lamp for burning methylated spirit, a kettle with elongated spout for imparting moisture to the air, telescoped over a shorter spout which may be used when hot or boiling water is required for any purpose. A water bath with earthenware basin, in which milk, gruel, broth, or other food may be heated as required completes the apparatus, which is furnished in a neat japanned tin box, where it is kept when out of use.

Other useful articles in the sick-room are a drop or minim measure; a piece of water-proof sheeting, of some one of the numerous materials now manufactured; a fan; a night-light, either simple or made to keep water hot; an air or water cushion, of waterproof material, similar to the illustration (fig. 37)—an admirable form, which can be used either as a cushion or as a

bed-rest, adapted to any elevation. Further, a sick-feeder or half-covered cup (fig. 38), with a spout and handle, is most useful for giving

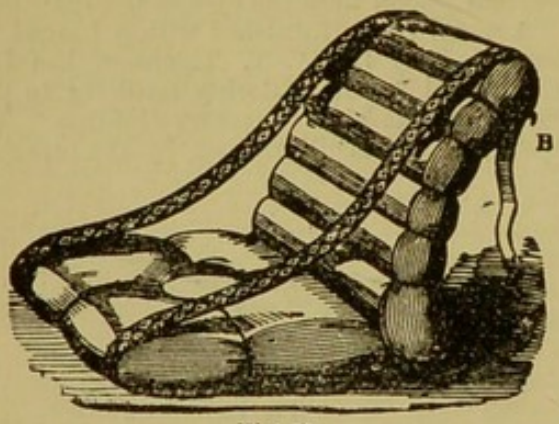


Fig. 37.

either liquid aliment or medicine in severe illness, when it is desirable that a patient's head should not be elevated —See also *Alimentary Tube.*

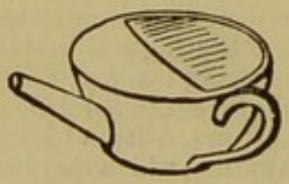


Fig. 38.

During illness of any kind, the chamber in use ought daily to undergo a general cleansing; after fever or other infectious disorder, everything should be *separately* cleaned. The room itself ought to be first disinfected by means of sulphur vapour, and afterwards papered, painted, or white-washed afresh, the bed-frame taken down, scoured, and with other furniture exposed to the open air for some days; feather beds and hair mattresses taken to pieces, their coverings washed, their contents re-baked or fumigated; whatever can be washed, should be. Expose articles which have been about the sick freely to the action of air or boiling water, and they will speedily get rid of the noxious particles,— "fomites," as they are called. Shut them up, or bundle them together, and they will retain the power of propagating disease for months, it may be for years.

The crowded rooms of the poor have been mentioned—bad enough in health, they become ten times worse in sickness, and this is chiefly felt in country districts. In towns, a person seized with an infectious disorder, if accommodation and means at home are insufficient, has the hospital as a resource; in the country he has not; the consequence is, that to their own detriment and that of others, the sick are compelled to be lodged in the crowded family dwelling, with every chance of the disease spreading through the house or village—the case is continually occurring. It might easily be prevented by providing some isolated cottage in a healthy situation, properly *laid out* and furnished for the reception of the sick, with proper nursing attendance. Cottage hospitals are now extensively dispersed throughout the country, and the Local Government has made considerate provision for infectious disease; but there still appears to be a want, in many country districts, of more isolated accommodation than at present exists, to assist, if possible, in mitigating, if not in stamping out, the seeds of infection.—See *Hospital.*

BEDS and **BEDDING.**—The first necessity of a sleeping-room, whether in health or in sickness, is a healthy and comfortable bed. Wooden bedsteads still linger in old-fashioned houses, and in the abodes of the poor, but they are discarded in all public institutions, and are

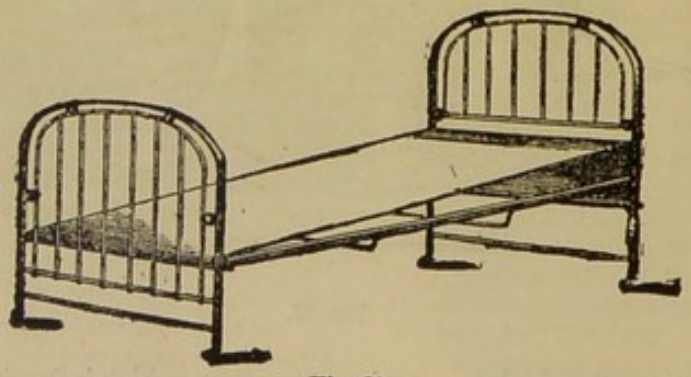


Fig. 39.

being gradually replaced everywhere by iron bedsteads. These are cleaner, cheaper, and take up much less room than wood, and are constructed in a variety of forms to suit the convenience of all parties. In most modern iron bedsteads, the bottom part is composed of iron laths interlacing, and fixed by pivots to the sides, by which a certain elasticity is imparted to the bed, but in many cases the old custom of employing strong canvas (laced to the sides with stout cords) to form a support to the bed, is still adhered to, and is even considered preferable, as it admits of easy removal and cleansing should it be necessary. An

excellent bedstead, with an improvement on this principle, has been introduced by Mr. Stidolph of Dartford, and, from its durability, cleanliness, and comfort, bids fair to command general approval (fig. 39). Instead of the canvas bottom being attached to the bedstead by laced cords, it is double and endless, and is made to revolve round bearers placed at the head and foot of the bed, much on the principle of a round towel. Tension may be kept up by tightening the canvas from time to time, the elasticity imparted being almost equal to that of the spring mattress. Not the least important of the advantages of this bedstead, is the facility with which the sacking can be moved from one part to another, or detached altogether from the iron frame-work when soiled. In all cases, the head of the bedstead should be at right angles with the wall, and sufficient space should be left on either side of it. As regards the mattress or bed itself, nearly all experience is in favour of horse hair. It is clean, durable, and elastic, and is not likely to form into knots. When furnished with a palliasse as well, the hair mattress makes the best form of bed we possess; but it is expensive in the first instance, and the necessity for its periodic renewal, especially when used for sick-room purposes, almost debars its adoption among the poor. Any other material which takes the form of the tufted mattress is subject to the same disadvantages as regards renewal, but for the sake of economy, cheaper substitutes are generally had recourse to. The more common are wool of various qualities, from that taken direct from the fleece to the refuse of old carpets and old clothes; cotton waste, cocoa fibre, sea weed, and Indian grasses, are also in use, but none of these possess the elasticity of horse hair, and all are liable in time to form into knots. For the poor, the most available and easily-cleaned bed is the loose one, which can be filled with any of these materials, and which, when in use, should be shaken up every day like a feather bed. The feather bed itself is still much in use, and, although considered a trifle too luxurious for the present generation, it would be hard to deprive the aged of the comfort they associate with it. Probably the most economical and at the same time cleanly bed, is the loose bag filled with flock of a fairly good quality. Flock is a mixture of cotton and wool, and sells at about threepence per pound, and as it takes on an average about twenty-five pounds weight to make a bed, the total cost, inclusive of the linen ticking, will not much exceed ten shillings. Good wheaten straw, now very much discarded, makes an excellent bed, and is usually easily obtainable under circumstances when the others cannot be had.

Beds for the Sick.—For the bed of an invalid, nothing answers better than the spiral spring mattress. It makes movements easy and pressure slight, but it is liable to rust and get out of gear, and on this account numerous adaptations of the same principle, but in a less bulky form, have been recently introduced into hospitals and private households. That most in favour is termed the wire-woven mattress, an American invention, which may be rolled up when out of use, and can be fixed to any bedstead of ordinary dimensions. This, covered only with a blanket, makes an excellent sanitary bed in hot weather, and at ordinary times it requires only a thin mattress to complete it.

Great comfort is experienced by the invalid from the air or water bed. These are specially useful for the prevention of bed-sores, and need not be so large or so costly as they are usually made. It is, as a rule, only necessary to relieve pressure from the hips and back, the shoulders and legs being comparatively exempt from it, so that a water mattress half the length of the bed will be sufficient in the vast majority of cases. Air and water pillows are designed for the same purpose, but their utility in the above cases are perhaps over-estimated, as it is barely possible to keep them on a level with the patient's body and with the bed or mattress. A modification of the ordinary water mattress has been introduced by Mr. Pocock of Southwark Street, by which it may be rendered more serviceable for various purposes. It consists in the division of the mattress into eight or ten compartments, like a series of long flat bottles placed crossways, any one of which may be removed at pleasure, and filled more or less either with air or water to suit the patient's requirements. The water bed is usually preferred to that containing air alone. It is filled to about two thirds of its area with warm water at about a temperature of 98° Fahr., and it is astonishing how the warmth imparted from the body keeps up the temperature. Should the patient complain of chilliness, it can easily be remedied by withdrawing a portion of the water, and replacing it by warmer water.

BED LIFTS.—Numerous contrivances have been invented for elevating patients in bed, to afford facilities for making the bed under them, and for dressing wounds on the back. Some are independent of the bedstead and are brought to the bedside when required, while others form an essential part of the bedstead. One form, manufactured by Hooper, of Pall Mall, is found valuable in many bedridden and other cases where it is impossible to change the patient without much risk and pain. The patient is supported by a movable stretcher composed of bands of webbing forming a false bottom to the bedstead, which the nurse has no difficulty in raising on account of its attachment by iron supports with hinge joints to the horizontal bars connecting the feet of the bedstead. But in order to change a helpless invalid, and to have his bed re-made, it is more usual to have him removed entirely from the bedstead. If there is another bed in the room,

he is usually transferred to it for the time; in hospitals for the sick, folding stretchers reaching from the floor to the level of the bed, are employed for this purpose, and where numerous assistants are at hand this mode of changing is the simplest and most convenient.

It may be desirable, however, to employ an invalid-lift, which by its action would relieve the attendant, and to some extent the patient, and such an apparatus has been suggested by the late Dr. Thomas Thomson of Leamington, as figured in the next woodcut. It is made of

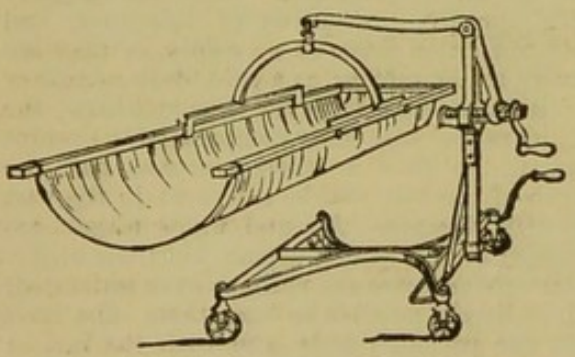


Fig 40.

wrought iron, and the lifting force is obtained by a crane, raised and depressed by a lever. The crane is fixed on a framework on castors, and at the end of it is suspended a cradle stretcher, which, when detached, can be drawn under the body of the patient.

Another lift of a cheaper and simpler construction, manufactured by the invalid furniture makers, consists of a couple of wooden poles, to which are attached several bands of webbing, to form a stretcher. A wooden triangle placed at the foot and another at the head of the bed, and connected together by a longer pole above, support the stretcher, and the raising and lowering is accomplished by means of a handle and screw attached to the triangle at the foot of the bed, which a child might turn with its hands. The cost of this apparatus is about fifty shillings.

BED RESTS.—In persons suffering from great difficulty in breathing, arising either from disease of the lungs or the heart, or among convalescents, a bed rest is often found a great boon. As a makeshift, an ordinary bed-room chair propped up with pillows is made to answer the purpose, but it is an uncouth arrangement. The old fashioned rest, stuffed with hair and furnished with elbow pieces, is not a bad one, but it is beyond the reach of the poor, and, like most bed rests, it has a tendency to push the patient forward in the bed, as the bottom part, to give freedom to the rackwork motion, occupies usually eighteen inches, or more space, near the head. To remedy this, and in other respects to make the rest more available and cleanly, it is now usual to have it made of cane work in a wooden frame, with a bottom part, not over six inches in width, connected by hinges with the incline, which is moved to any angle by a single curved iron support fitted with a pinion. A very simple and excellent rest is made by Hooper, of Pall Mall, and another by Mr. Nixon, of University College hospital, while a third, introduced by Mr. Thomas Allen, of Bristol, made of iron with canvas backing, of easy adjustment to any angle, may be recommended as both cheap and cleanly. Specimens of these and other bed rests may be seen in the Parkes' Museum of Hygiene, Margaret Street, Cavendish Square, London.

In many cases of heart disease, patients experience most comfort by bending their bodies forwards, and resting their arms on some support in front of them. A convenient rest for this purpose will be found in a horizontal board placed across the bed, and supported on either side by two iron uprights made to fit into the sides of the bedstead.

BED-SORES on the back and buttocks of bedridden persons are caused by long-continued pressure from lying in one position, and, owing to a want of vital power in such cases, they are often extremely difficult to heal. They are most frequently met with as a consequence of paralysis of the lower part of the body, and occasionally in fractures of the pelvis and lower limbs, in long-continued fevers, and in other debilitated conditions of the system, where due attention has not been paid to the state of the parts subjected to pressure. Bed-sores commence with a red patch on the skin, which soon loses its vitality and becomes a sloughing wound, always retarding recovery, and often accelerating death. To guard against its occurrence is alike the duty of the doctor and the nurse, and every precaution—notably the sponging of those parts of the back most liable to be affected daily with water or spirits and water, and then carefully drying them—must be rigidly attended to. Where there is much constitutional depression, languid circulation, or great emaciation, the patient ought to be put upon a spring mattress, or the parts most liable to suffer should be relieved from pressure by the air or water pillow, or, better still, by the water bed, should the circumstances of the patient allow it. When a bed-sore has formed, which it will occasionally do notwithstanding every precaution to the contrary; it is best treated by poultices and the resin ointment, felt plaster being placed round the wound to protect the adjoining parts from further injury. The sore should now be treated with carbolic acid dressing or other stimulating application; one of the best of these is a liniment composed of white of egg and spirits.

BEE.—See STINGS.

BEEF.—BEEF TEA.—Beef, the most strongly nutritious animal flesh in use, is not quite so digestible and light as mutton for those of weak digestion; but this depends in some degree upon the part selected. A slice from a coarse-grained

shoulder of mutton may be much more difficult of digestion than one from the under side of a sirloin of beef. As a general rule, however, mutton is preferable for the dyspeptic and the convalescent.

Beef tea is a most important article in sick cookery, but is very often badly made, and much too weak for the purposes for which it is ordered. In diseases of exhaustion, or in the last stage of fever, strong beef tea is perhaps the form of nourishment most easily assimilated, and best adapted to afford powerful support to the system. Beef tea may be made from beef cut into thin slices; but the method recommended by Professor Liebig has been much employed. This celebrated chemist directs a pound of lean beef, freed from fat and bone, to be chopped small, as for mince meat, and to be "uniformly mixed with its own weight of cold water, slowly heated to boiling, and the liquid, after boiling briskly for a minute or two," to be "strained through a towel." A little salt, or any allowable seasoning, may be added. The more general plan is to take a pound of lean meat, and after tearing it into shreds and mincing it, to place it in an earthen jar or jam-pot, adding to it a pint of cold water, allowing the mixture to stand for an hour and stirring it occasionally. The pot containing it is then put into a saucepan half-filled with water, which is placed on a slow fire or gas stove for an hour. The jar when removed should have its contents put through a strainer, after which, with the addition of a little salt, it will be ready for use.

BEER, which includes ale and porter, constitutes the principal beverage of the working classes in England. It is prepared from malt by simple fermentation, and contains more or less saccharine matter, alcohol, and the bitter principle of the hop; it also contains, especially when old and hard, a proportion of lactic acid. As an ordinary beverage for most people, good table beer is particularly well adapted; it contains just enough spirit to afford gentle, almost inappreciable stimulation, and its bitter undoubtedly assists to maintain the tone of the stomach, so apt to fail in the hard-working, anxious-minded citizen. Ale is too strong for ordinary every-day use for the robust, but in the delicate, and in convalescence from illness, when it agrees, it is often admirably adapted to support the powers of the constitution. Pale ale or bitter beer agrees well with some persons, and the great amount of bitter it contains, acts as a powerful tonic to weak stomachs; but for this very reason, its use ought not to be persevered in long at a time. The amount of spirit it contains is not large, but the narcotic properties of the hop are apt to affect the head. It is lighter, however, than the more saccharine ales. Malt liquors never agree with those who are liable to gout or gravel, and if their use be continued, they are almost certain to induce a paroxysm of either of these diseases; the slightest degree of acidity or hardness aggravates their bad effect tenfold. A single glass of hard ale is sufficient to induce an attack of gravel in the predisposed. Those who suffer from plethora, and consequent head symptoms, from chronic cough, or oppression of breathing, from gout, gravel, or habitual acidity of the stomach, should never touch malt liquors. Hard or acid malt liquor is always injurious; some persons on this account habitually add a small portion of carbonate of soda to their malt liquor—the practice is most hurtful, and rapidly debilitates the stomach and deteriorates the blood.

BEET-ROOT contains so large a quantity of sugar, as to make its extraction an object of commerce. The sweetening powers are less than those of cane-sugar. The root itself, when boiled, is easy of digestion. Its beautiful colouring-matter might often be substituted more frequently than at present for more deleterious substances.

BELLADONNA, the deadly nightshade, grows wild in many parts of Britain. The juice of the plant is powerfully narcotic and anodyne. It is a valuable medicine in proper hands. Domestically, belladonna should be known as a poison, which has proved fatal to children, who have been tempted to eat its violet-black shining berries, which are about as large as a wild cherry, and furrowed on each side. The flowers (fig. 41) grow solitary from the axils of



Fig. 41.

the leaves, are bell-shaped, and purple at the border. Wherever the plant is found, children should be warned against it. The symptoms of poisoning by nightshade, are dryness of the mouth and throat, difficulty in swallowing, a kind of laughing delirium, followed by insensibility, and extreme dilatation of the pupil. With such symptoms, a powerful stimulant emetic cannot be too soon administered, and will probably make the case clear, by bringing up the black skins of the berries. Cold douche to the head, mustard plasters to the back and legs, and sal volatile internally, are appropriate remedies, and may be used until the arrival of

the medical attendant. The drug is much used by medical men to allay pain in neuralgia and muscular spasm. It is also occasionally employed in hooping-cough and asthma, in the form of tincture, prepared from the leaves, and is given in doses ranging from five to twenty minims. The liniment prepared from the root is a useful remedy to dull local pain. There is also an extract prepared from the leaves, used mainly for plasters, and an ointment, consisting of eighty grains of the extract to an ounce of lard, very serviceable in breast-abscesses and kindred complaints.

BELLY.—See ABDOMEN.

BENZOIC ACID, obtained from gum benzoin, is in the form of white silky scales, and has a penetrating not unpleasant odour. It has been found useful in cases of obstinate wetting the bed in children. Dose: five grains made into pills with bread crumbs, twice a day, to a child of ten years old. It is an ingredient in paregoric.

BERIBERI and **BARBIERS.**—Diseases peculiar to India.—See *Tropical Diseases.*

BILE.—The peculiar fluid secreted by the liver from the blood, is in man of a brownish yellow colour, and has a bitter taste. Its composition is complex, and it undoubtedly fulfils more than one important office in the functions of the body. Bile is separated by the liver from dark blood, which passing through that gland, on its way to the heart, from the abdominal organs, is thus purified of noxious matters, containing a large amount of carbon, before re-entering the general circulation. The separated bile is discharged into the duodenum (see *Alimentary Canal*), and mixing with the digested food, appears to assist in fitting certain of the constituents for absorption into, and assimilation or transformation in, the body. A large proportion of the constituents of bile are along with the food reabsorbed into the system, and are probably intended and adapted to support the processes of respiratory combustion. It is chiefly the colouring matter of the bile which is discharged from the bowels in health. Bile itself when duly formed, even when absorbed along with its colouring matter into the blood, as we see in jaundice, scarcely produces injurious effects upon the system, but the elements of bile allowed to remain unformed in the blood, act almost like a narcotic poison.—See *Liver, Digestion, &c.*

BILIARY CALCULI.—See GALL STONES.

BILIARY DISORDER.—Biliary derangement is so frequent an ailment in civilised life, its history is so intimately connected with the general principles of health, and the prevention, or at least alleviation, of the disorder is so much under individual control, that it has special claims upon our attention.

It has been shown in the last article, that in ordinary health there must be a certain balance maintained between the secretion and ultimate destination of the bile, the assimilation of food, and the functions of respiration; that in the excreted bile the blood is freed from certain principles—containing a large amount of carbon—which could not be retained in it without injury to health; that further, the bile, after being separated from the blood by the liver, and thrown out into the general tract of the alimentary canal, performs an important part in the function of assimilation; and that lastly, a considerable proportion of the bile—without the colouring matter—is reabsorbed into the system, with the nutriment, in such a state as to fit it—or rather its carbon—for union with the oxygen which enters by the lungs, so that while heat is generated, the carbon, by taking the form of carbonic acid, is fitted for excretion by the lungs or skin. Upon these facts hinge the causes of one at least of the most prevalent biliary disorders, that which depends upon the introduction into the system of a proportion of carbon aliment too great to be removed by the oxygen obtainable through the lungs, and which has its ordinary termination in the attacks which are termed, "bilious attacks," "sick headaches," "bowel complaints," "bilious or British cholera," according to the manner in which the patient is affected.

The second form of biliary disorder depends upon torpidity or inactivity of the liver itself. The third form is the reverse of the first: the gland itself may be sufficiently active, but the blood does not afford sufficient material for it to work upon, and bile is deficient. This is most frequent in children.

In addition to those affections, there is jaundice, which will be treated of in its proper place.

The first form of biliary disorder, that dependent upon the accumulation of carbon, or of the elements of bile in the blood, must evidently be owing to one of the following causes, or a combination of them; either too much food, especially of a highly carbonized character, such as fats, oils, sugars, &c., is habitually consumed; or the habits are too physically inactive to keep the functions of respiration, animal heat, and motor change and circulation, in healthy action; or the external atmosphere is so temporarily or permanently rarefied by heat, that the individual cannot obtain the full supply of oxygen in respiration; lastly, the excretory functions of the skin may be impeded. Now, although it is unquestionable that some individuals have a much greater tendency to biliary disorder than others, it is also unquestionable that all have it in their power, in a great degree, if not entirely, to control or obviate that tendency, by attention to, and practical application of, the above principles. In those who suffer habitually from sick headaches—which depend generally upon the presence of bile in the stomach—and from other forms of biliary disorder common to this country, there is generally traceable great error in diet; fats, melted butter, pastry, meat,

malt liquors or wine, and other highly carbonised articles of diet, are taken too freely, or at least, are too regularly indulged in, whilst at the same time very little active exercise is taken; the blood becomes overloaded with carbon; langour, sleepiness, headaches, giddiness, loss of appetite, furred tongue, depression of spirits, are the consequences, and continue, until at last the system is relieved, wholly or partially, by an excessive excretion of vitiated bile, which passes off either by vomiting or purging. That deficient exercise has much to do with the formation of such a state of system, is evident from the much greater prevalence of such attacks among females, who take little exercise, than among men; and, indeed, they would be still more prevalent among the former, were it not for the monthly relief. Habitual neglect of the skin, also, by impeding the excretion of carbonic acid from its extensive surface, undoubtedly assists the evil. Again, we have bilious attacks, more especially those known by the name of British cholera, prevalent among the community generally, but at particular periods of the year—that is, in summer or autumn, during or immediately succeeding a prevailing high temperature; and to this high temperature must we look for the cause; for whilst, as a general rule, habits have not been changed, people have been, in consequence of the rarefied atmosphere, inhaling a less proportion of oxygen than usual. Liebig calculates the difference at one-eighth between winter and summer in Germany. Here we have another traceable and universally-acting cause, permitting the accumulation of carbon in the blood, and one which is likewise found to operate upon Europeans especially, who in tropical climates, adhere too nearly to the habits of comparatively full living, admissible in colder climates.

From what has now been said, it is evident how much the avoidance of biliary disorder is under individual control; the question is in reality not one of medicine, but of diet and regimen; medicine certainly may be required, but not by any means to the extent it is often used. Those who are habitually liable to biliary disorder ought most strictly to regulate the diet; fats of all kinds—except, in some cases, toasted bacon—must be avoided; butter either entirely avoided, or used in very small proportion, and never when melted; animal food may be taken in moderation, but should never be consumed at night; much sugar, strong tea or coffee, malt liquor, and the heavier wines, such as port or sweet wines, are all bad. In addition to plain meat, bread, well-boiled vegetables, farinaceous preparations, and fruits ripe or cooked, are the best articles of diet, and if stimulants are required, a little sherry, brandy, or gin with water. Exercise regularly in the open air *must* be taken, and the skin kept clear and in an active state. If the bowels are confined, a pint of warm water, used as an enema, will be a most suitable aperient, or one or two of the compound rhubarb and blue pills may be taken; it is much better, however, not to trust to medicine. When from any cause, the languor, sleepiness, furred tongue, &c., give notice of an impending bilious attack, five or six grains of blue pill should be taken, and followed by a black draught or dose of infusion of senna, or of castor oil, in the morning. Having thus cleared the system, it is better to trust to diet and regimen, than to a repetition of the dose as a corrective of indulgence.

After the attack has somewhat subsided, keeping in mind that the tendency of it is to clear the system, the bowels must not be allowed to get confined, but kept slightly relaxed; if requisite, a desert-spoonful of castor oil, with half a dozen drops of laudanum or chlorodyne, or a small dose of rhubarb and magnesia, with or without laudanum, may be given. The diet should be chiefly of a diluent character for a short time, but nourishing. Should any of the symptoms which preceded the attacks, such as languor, fulness about the region of the liver, pain between the shoulders, furred tongue, &c., continue, a few doses of the compound rhubarb and blue pill will be advisable; if the stomach remains weak, from five to ten grains of carbonate of potash in a wine-glassful of infusion of calumba or gentian will be found useful; if the tongue is perfectly clean and there is debility, one grain of quinine in half a glass of sherry twice a day.

There are, however, states of biliary disorder, generally connected with stomach derangement also, which are not the consequence of excess of aliment, but may even arise from the reverse, and which require the aid of medicine for their removal; the liver is torpid, the blood is insufficiently freed from its superfluous carbon, and in addition to impaired digestion, the individual suffers from the train of symptoms above enumerated as attendant upon such a condition of the circulating fluid, mental and physical depression being the most prominent. The bowels are confined, and the motions inclined to be light or chalky, at other times almost black; there is pain between the shoulders, and sensation of fulness in the region of the stomach. When such a train of symptoms occurs, it is better to take proper medical advice; if this cannot be done, in order to relieve, two grains of blue pill or euonymin, given every night, or every other night, are each to be followed by a moderate dose of castor oil or infusion of senna in the morning. At first, the infusion of taraxacum, with five to ten grains of carbonate of potash, and, if the stomach is weak, a tea-spoonful of tincture of calumba, taken twice a day, will be of much service. The diet should be nourishing and easy of digestion, such as plain meat, potato, and light puddings, but pastry, cheese, and oily preparations of all kinds, except toasted bacon, must

be avoided. In cases of debility, wine, malt liquor, or a little weak brandy and water (whichever generally agrees best), are not to be allowed merely, but must be taken medicinally in moderation. Daily exercise to the extent of slight fatigue, relaxation from business, cheerful company, early hours, and attention to the state of the skin by means of the tepid bath or sponging, are all assistant means, and will, even of themselves, be sufficient to remove slight attacks. Where the bowels are obstinate, an enema of tepid water is especially useful, and preferable to the continual use of purgatives, which weaken the digestive power of the stomach. When the tongue is tolerably clear, and debility of the stomach or of the system generally remains, twenty drops of dilute nitric acid may be taken with advantage twice a day, either in water or in infusion of taraxacum, with or without the addition of a tonic bitter.

It is important to have a clear distinction in the mind between the two conditions of biliary disorder treated of. In the former, that which precedes the attack of British cholera, the liver fails because there is more given it to perform than it can do, even in its most healthy state; in the latter, the liver itself is incapable of doing the work it ought, to maintain a healthy condition of body. In the former case, reduction of diet is evidently the most common-sense prevention and cure; in the latter, the organ must be brought up to its work; and made, if possible, to do its part in the assimilation of sufficient nutriment for health. The diet is to be regulated, not diminished, the general functions kept active, and, especially, the nervous system, by moderate exhilarating exercise both of mind and body, is to be maintained in such a state of regular tonicity, as will enable it to impart that due stimulation—which is so much wanted in these cases—to every function connected with assimilation. When cases of chronic biliary disorder present feverish symptoms, the mercurial at night, and the aperient in the morning, are still to be used, and also the potash and taraxacum, but without the bitter; animal food and stimulants strictly forbidden, and milk and farinaceous diet substituted; the tepid bath used, and enemas.

Although such general directions as will be found useful in the treatment of chronic biliary disorder have been given, it is not recommended that home medicine should be resorted to when medical assistance is within reach. Much certainly may be done by judicious management, but it is probable that efficient medical advice will save both time and suffering.

In children, particularly those of fair complexion, deficiency of biliary secretion is frequently evidenced by the irregular action of the bowels, and light-coloured chalky motions. It is of course desirable to correct this, but it must not be attempted by the "grey powders," so usually resorted to. They, will, undoubtedly, for a time improve the appearance of the motions by causing an increased flow of bile, but this is obtained at the expense of the system, which does not appear able to furnish sufficient material for the secretion—in a few days the motions are as deficient in bile as ever. Such a condition can only be permanently corrected by a good allowance of animal food, and general tonic treatment, iron being especially requisite. A few grains of grey powder, however, may be given once or twice a week, or, better still, from quarter of a grain to a grain of "iridin," according to age, iridin being one of the new remedies found to have special and beneficial action on the liver.—See *Iridin—Euonymin—Diarrhœa.*

BINDER — the bandage which is put round the abdomen of the mother in childbirth, and which forms a most important requisite, both as regards the comfort and safety of the patient. Many forms of binder are used, but none are so generally applicable, or so efficient, as a light, small tablecloth, or shawl, or square of calico, folded broad like a cravat, so that it will embrace the whole of the lower portion of the abdomen, and can be tied in a double knot at the back *outside* the bed-dress, where it is under the control of the attendant. The binder ought always to be put on at the commencement of labour, and tied so as just to give comfortable and moderate support to the abdomen; as the process of parturition progresses, it must be gradually tightened, and as soon as the child is born, as much so as will afford comfortable support; lastly, after the separation of the after-birth, it must be tightened again. In all these changes, the best guide is the feeling of the patient; comfortable efficient support being all that is requisite; if tied too tightly, the binder will do mischief. The greatest benefit which results from the early application of the binder, is the prevention of faintness. The sudden emptying of the abdominal cavity which takes place when the child is expelled, is quite as frequently a cause of the above symptom, as loss of blood, the effect being in great measure purely mechanical, and similar to what occurs when fluid is drawn from the belly in dropsy. This mechanical support given by the binder, moreover, exerts regular and regulated pressure, which must give some assistance to the efforts of the womb, and lastly, after the concluding processes of labour are over, it is no slight advantage to have a firm efficient binder in its place, instead of having to disturb the patient by its adjustment. In cases of hæmorrhage or flooding, such an arrangement may be of the very highest importance. In the course of an hour or two after labour is concluded, the form of binder which has been recommended above, can be exchanged for the ordinary broad band, fastened round the abdomen by pins, or buckles, or for one of the numerous forms of binder, shaped to fit the abdomen. A very useful form of binder may be made of double calico, about ten inches wide in the centre, and made

to go twice round the abdomen; one of the ends being rather broader than the other, so as to admit of the latter running through the slit, and both being sufficiently long to be brought round and fastened in front. A very good form of obstetric binder is manufactured by Mr. Salmon of Wimpole Street, it is made of strong linen, and dispenses with the usual pinning.

Refer to—*Child-birth.*

BIRTH.—See CHILD-BIRTH.

BISMUTH is administered in the form either of the subnitrate or the carbonate, a white, rather heavy powder. It is found useful, and frequently prescribed, in nervous pain of the stomach (gastralgia), and in waterbrash. In the distressing diarrhœa of the last stages of consumption it will sometimes afford relief when other remedies have failed. The usual dose is ten or twelve grains, twice or three times a day, in any thick vehicle, such as linseed tea, or thick barley-water. Bismuth is also given in the form of lozenges and mixture; the former contain two grains each of the subnitrate, and are useful in cases of heartburn and gastralgia. An ounce of the mixture, which is the form usually adopted, contains ten grains of the subnitrate, with an equal quantity of gum tragacanth and an ounce of water. There is a very useful sedative mixture of bismuth in the Guy's Hospital pharmacopœia, composed of subnitrate of bismuth, bicarbonate of soda, compound powder of tragacanth, of each ten grains, with ten drops of the solution of hydrochlorate of morphia and an ounce of water, to form a dose.

BISTOURY — a kind of small surgical knife.

BITES.—See WOUNDS.

BLACK-DROP is a preparation of opium, formerly secret. It is, essentially, a preparation of acetate of morphia, and is devoid of some of the stimulating properties of crude opium. Black-drop is estimated at three times the strength of ordinary laudanum. It is mainly used to deaden the pain in toothache.

BLACK-DRAUGHT, so well known as a domestic remedy, is a mixture of infusion of senna with Epsom salts, and frequently some aromatic, such as ginger or caraway. It is a certain and active purgative, but not well suited for weak habits. Quarter of an ounce of senna leaves may be infused in a pint of water, to this is added one ounce of Epsom salts, and along with it, if there is no fever, a couple of drachms of tincture of senna; of this mixture a small tea-cupful should be taken every two hours, till the desired effect is produced.

BLADDER.—The urinary bladder (fig. 42) is the receptacle for the urine, after it has been secreted by the kidneys, and previous to its discharge from the body; it is an oblong membranous bag composed of three layers or coats, the middle one being muscular, and is situated in the pelvis, just behind the pubic bones, rising, however, when much distended, into the abdomen. At the neck of the bladder, in the male, is situated the prostate gland (fig. 42, *i*).

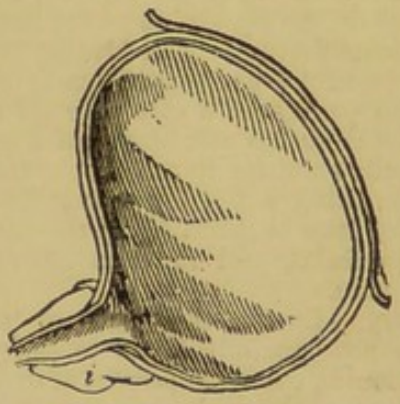


Fig. 42.

Many of the diseases and disorders of the bladder are brought on by carelessness, neglect, or too great subservience to the conventional restraints of society; those persons especially, who habitually or necessarily are frequently compelled to restrain the desire, and forego for a time the relief, of emptying a distended bladder, are liable to affections of the organ. Not infrequently in childhood, and sometimes even later, the bladder habitually empties itself during sleep; night after night this occurs, and proves a serious annoyance, and expense too, from the consequent destruction of bedding. The habit or disorder is sometimes extremely difficult, if not quite impossible, to eradicate. The regular use of the cold hip bath every *morning* is one of the most efficient remedies; and the tincture of the perchloride of iron, given twice a day, in ten-drop doses, in water, is often useful. Benzoic acid, and nitrate of potash are both said to have proved successful. In such cases fluid is to be taken in small quantity only, in the evening. Malt liquor always increases the evil. Where the habit is inveterate, it is better to use one of the india-rubber urinals attached to the person, than to allow the patient to be a nuisance to himself and others.

Rupture of the bladder is almost invariably fatal. It is generally caused by blows or falls when the viscus is full of urine; but sometimes without violence, simply from over-distension. In the former case, intoxication is in most instances the first cause of the accident; the individual sits drinking till the bladder is quite full, staggers out to relieve himself, and either falls or stumbles against some object; the urine is effused into the cavity of the abdomen or surrounding tissue; agonizing pain, and extreme vital depression are the immediate consequences, and the patient speedily dies. In the latter cases, when the bladder is ruptured

from over-distension without violence, it is generally caused by long retention of urine, from obstruction to its discharge. In this case, the first sensation of rupture is rather one of relief than otherwise, the rent being at the lower part of the organ; the fluid is diffused into the loose tissues of the scrotum and surrounding parts, giving rise to severe inflammation and mortification. The bladder is sometimes ruptured by extreme violence, such as that of the passage of a cart over its region. In all these cases the attendance of a surgeon is absolutely requisite if possible. Death is all but inevitable, but if life cannot be saved, much relief may be afforded by the moderate use of stimulants, and the free use of large doses of opium.

Strangury.—During the prime of life, the bladder is not generally liable to suffer from chronic disorder, except in persons of dissipated or intemperate habits, but one acute and very painful affection, strangury,—generally caused by the application of a blister,—is not uncommon. The affection is characterised by burning pain, extending through the urinary passages up to the neck of the bladder, accompanied with constant and distressing desire, and straining effort to pass urine, which will only come away in very small quantities, often mixed with blood. While it lasts, the condition is a painful and most distressing one. The means of relief are warm hip baths, demulcent drinks copiously taken, such as barley-water with gum arabic, linseed tea, &c. Warm injections, consisting of half a pint of gruel containing twenty or thirty drops of laudanum, give much relief; twenty drops of laudanum, or ten or fifteen drops of the sedative solution, may be given by the mouth, and repeated if requisite. When the patient is not in the bath, hot linseed meal poultices are to be used over the lower part of the abdomen. Enlargement of the prostate gland is a frequent cause of retention of urine amongst old people.

Stoppage of Urine.—With declining years, the bladder becomes more subject to disorder and disease; perhaps the most frequent affection is sudden inability of the organ to expel the urine. This may arise from its having been allowed to become over distended; from cold; from drinking hard malt liquor,—a very frequent cause in England,—or sometimes from external violence. The case is one of much distress and alarm, and being not devoid of danger, cannot be too soon placed under proper medical treatment. In the meanwhile, the person should be got into a hip bath, temperature 100°, and kept in it for at least half an hour, a warm bed being ready to receive him on coming out; hot bran poultices must be ready to be applied as soon as he is placed in it; just before entering the bath, a tablespoonful of castor oil with ten or fifteen drops of laudanum should be administered. It is not improbable that relief may be obtained by these means; but all efforts at straining must be avoided as useless and hurtful. Of course, fluid must be eschewed as long as the stoppage continues. Whilst the above measures are being carried out, medical assistance ought to be procured; for should other means fail, the introduction of the catheter must be resorted to, to save life. Nevertheless, the prosecution of the mode of treatment recommended, if it does not prevent such a necessity, will certainly facilitate a sometimes difficult operation.

Weakness of Bladder.—Weakness of the bladder, and inability perfectly to retain the urine, is a frequent disorder of advanced age. It often commences with, and is accompanied by, imperfect emptying of the organ, either through carelessness or weakness. Sponging the lower parts of the abdomen, &c., with vinegar and water, or salt water, may be of service. Dr. Day recommends the use of tincture of ergot of rye in these cases; but as a general rule they should be placed under regular medical superintendence. The same may be said of that very troublesome complaint of old age, catarrh of the bladder, in which large quantities of thick mucus are discharged.

Stone in the bladder may be suspected when the urine is liable to become bloody after exercise, when there is pain in the bladder and surrounding parts, in the back and down the thighs, and when the stream of urine is apt to stop suddenly during the act of passing. Under such circumstances, proper advice cannot be too soon obtained.

Refer to—*Kidney—Urine—Blister.*

BLINDNESS.—Loss of sight may be the one effect of a great variety of causes. Disorder of the brain itself, or sympathy of that organ with the stomach, may be the occasion of the symptom; the optic nerve or its expansion within the eye, named the retina, may be the affected part; or, lastly, some of the transparent structures of the organ of vision may, by becoming opaque, obstruct, wholly or partially, both light and vision.

Loss of sight may come on suddenly, or very gradually; in the former case, it is generally consequent upon some disorder, actual or sympathetic, of the brain or nervous tissues, and is always to be regarded seriously. It may last only for a few seconds, or it may be permanent. In diseases such as apoplexy, or water in the head, loss of sight is a very constant symptom; at least, the eye is insensible to the usual impressions; in these cases it is dependent upon pressure on the brain. In diseases attended with exhaustion, or after copious loss of blood, the same symptom occurs.

A transient loss of sight, unrepeated, and occurring unaccompanied by symptoms indicative of head affection, will sometimes be occasioned by simple disorder of the stomach, which abstinence and one or two doses of the blue and compound colocynth, or rhubarb pills, will rectify; but in the event of the symptom

recurring, and with it other symptoms, such as headache, giddiness, or sickness, medical advice should be instantly procured; in the meanwhile, if the person be of *full* habit, a few leeches may be applied to the temples, a smart dose of calomel and compound colocynth taken, and abstinence and perfect quiet enjoined; if the habit be spare, milder action upon the bowels, moderate diet and quiet will be the safest course till the case is seen by a medical man. For other information on this point see *Amaurosis*.

Blindness which ensues in consequence of changes of structure in the eye itself, is either the result of active inflammation, or if not, is very gradual in its approaches.

It was discovered by the late Dr. George Wilson, that colour-blindness, or inability to distinguish certain colours, was a much more common affection than is generally supposed. He proved conclusively from his experiments that a large number of persons were unable to distinguish the different colours, and also that these same persons were quite unaware of the fact themselves. It follows that railway companies should be exceedingly careful with regard to this particular in the selection of their servants, as it is easy to suppose how accidents might arise from the wrong interpretation of signals.

A remarkable form of temporary colour-blindness is produced by the administration of santonin, the new remedy for long round worms. Patients taking this drug complain that they see everything coloured green or red, and they are often afraid that the condition may continue, whereas it always ceases when the medicine is left off for a few days. It colours the urine of a deep citron-yellow tinge, and this is at once changed to a brilliant scarlet on adding a few drops of solution of caustic potash to it, hence we may easily understand how the tissue of the eye may be acted upon to cause the above-mentioned effects. Santonin has even been tried as a remedy in some cases of blindness, but without much success as yet.

In some cases colour-blindness is complete, and in others it only exists to a slight degree. The following table of Dr. Wilson's will show how frequent this defect is:—

1 in 55	confound	red	with green.
1 in 60	,,	brown	,,
1 in 46	,,	blue	,,

Hence, one in every 17·9 persons is colour blind. Most persons will be surprised to learn from the above table what a large proportion of people are unable to distinguish colours; but it is not after all so astonishing when we reflect how many people have peculiarities as to their other senses of taste, smell, touch, and hearing. Dalton, the celebrated chemist, was colour blind, and hence the affection is often called "Daltonism." It is calculated that one person in every 1800 of the population suffers from blindness, either inherited, or caused by disease, or accident, and there are numerous institutions in various parts of the country founded for the purpose of teaching the blind to read by means of raised type, or instructing them in some manual occupation. There are other establishments in which music and the higher branches of education are also taught.

BLISTER.—The term is applied either to that which causes effusion of serum—the watery portion of the blood—underneath the scarf or outer skin, or it is used to denote the effect itself, that is, the bag or vesicle containing fluid, which is formed. There are various methods of producing blisters on the skin, in fact, any powerful irritant may have the effect; and we may regard the effusion of fluid underneath the insensible or outer skin, as an effort of nature to protect the true and acutely sensible skin from the action of the irritant substance. Steam, boiling water, strong ammonia, mustard, and many other irritants, have the power of raising blisters, and are used for the purpose by medical men; but by far the most convenient, certain, and generally-adopted agent, is the *Cantharis vesicatoria*, or Spanish fly. The most usual form in which this is used is the common blistering plaster, which being spread upon leather, or some other material, is applied to the skin. A solution of the active principle of cantharides in strong acetic acid, and a collodion blistering fluid are also used; but the most convenient, elegant, and sufficiently efficacious applications, if properly applied, are the blistering tissues or papers.

To the old form of blistering plaster there are many objections; its weight and smell in the first place, its tendency to leave small particles of irritating matter adhering after its removal, and more especially its liability to occasion strangury (see *Bladder*), rendered an improvement desirable, and the end has been quite accomplished by the blistering liquid of the British pharmacopœia, and by the very efficient blistering tissues now manufactured; they are light, almost free from smell, are removed with the greatest ease, are not liable to affect the kidneys or bladder, and are remarkably well suited for children. In applying a blister to any portion of the body, the first care must be *to ensure accurate contact with every portion of the surface it is intended to affect*, the fitting to irregularities being ensured by snipping the edges; and all hairs, whether about the head and face, or elsewhere, being shaved off clean, just before the blister is put on. In the case of the paper blisters, it is better to add the weight of a folded napkin placed about them. If the old form of blistering plaster be used, the cantharides ointment should be spread on leather or adhesive plaster according to the prescribed size, leaving half an inch of margin bare. A few drops of oil rubbed over the surface will increase its

activity, and facilitate its removal; this, however, is still better ensured, and the injurious effects apt to follow the use of this preparation prevented, by the interposition of a piece of thin muslin between the plaster and the skin. The evening is generally the best period of the four and twenty hours for the application of a blister, which, on an average, takes twelve hours to rise well, but sometimes much longer, especially in those who have very dry skins, or are far advanced in life, or when there is much nervous depression. In children, and in those of very delicate skin, the time is much under twelve hours. In the former the action of a blister ought to be closely observed, and the more so the younger the child, and the application removed as soon as it begins to rise; a soft bread poultice being substituted, and kept on for a few hours, full rising will take place. When a blister has well risen, the plaster being removed, and a cloth placed so as to catch the fluid, the vesicle or bag is to be punctured at the most dependent part by the point of a penknife, or with a pair of scissors, and the thin skin which has been raised allowed to subside unbroken, and the dressing applied. If there are more vesicles than one, each must be punctured, unless very small. It is very common for medical men to be told that a blister has only risen in one place, or at the lower part, but this is generally erroneous, the blister having risen all over, but the fluid gravitated to the lower side. It sometimes happens that instead of watery fluid, blisters contain a jelly-like matter, which will not run out; no attempts at squeezing should be made in such a case; if the dressing be applied, gradual oozing will drain the vesicles.

Very various methods of dressing blisters have been proposed and practised, that more generally followed, being by means of lint and linen spread with lard, or simple cerate or spermaceti ointment. Prepared cotton wool is probably the pleasantest dressing that can be used, and is the one, now, always preferred by the writer. If properly applied and left undisturbed, no further dressing beyond the first need be required. Brown's Tissue Dressing, which consists of a cerate evenly and thinly spread upon fine tissue paper, also answers well, being unirritating, easily washed off, should there be profuse discharge, and so light as to require no extra applications to retain it in place; in this point differing from the heavy, ointment-covered, serum-hardened, lint or linen, which in many situations it is impossible to keep on, and which, falling off, usually pulls the cuticle with it. When a blister, from mismanagement, or any other cause, becomes inflamed, or as it is popularly called, gets "the fire in it," a soft bread and milk poultice applied for a few hours will give great relief. Blisters should always be healed; the custom of dressing them with irritant ointments to keep them "open," is at once barbarous and injurious; the teazing pain, by its irritating effect upon the nervous system, does much harm. If continued counter-irritation is required, it is much better to apply a succession of small blisters, not on, but close to the same spot. "Flying blisters" are blisters which are taken off as soon as the skin is reddened and irritated—a diluted mustard poultice answers much the same purpose.

Blisters are often applied domestically, without medical advice, but often injuriously during the continuance of acute inflammation and fever. In such cases, especially when put on just over, or very near, the affected part, they do harm, they increase general fever, and may aggravate instead of relieving the local disease. This error is frequently perpetrated in cases of acute inflammation affecting the throat, or in pleurisy, when a bran poultice would be much more serviceable. In persons who are suffering under, or who are liable to, affections of the kidneys, blisters must not be used, except under medical sanction, and that will be given in but few cases. Persons are sometimes needlessly much alarmed at the fact of a blister not rising. Unquestionably, such a result may be owing to extreme and fatal depression, but is quite as frequently due to trivial causes.—See *Bladder*.

THE BLOOD.—The vital fluid. "The Life."—As the living blood, circulating in the living body, it is made up of "*liquor sanguinis*," or the liquid of the blood, and of blood corpuscles or globules. The *liquor sanguinis* holds dissolved the animal principles fibrine and albumen, and various mineral salts, and in it float the globules. Blood consists of 79 parts of water, 4 of albumen, 14 of globulin together with fibrin, and salts 3 parts. It also contains the 3 important gases, oxygen, nitrogen, and carbonic acid, with a small portion of ammonia. When blood is drawn from the body, it separates, as most are aware, into a solid and a watery portion. The former consists of the fibrine, which thus solidifies out of the blood liquid, when withdrawn from the direct influence of vitality, and entangles the globules in the process; the latter, or serum,—the same kind of fluid which is thrown out in a blister,—still retains in solution the albumen and the salts, the former being easily coagulated,

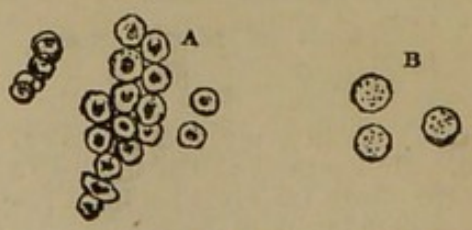


Fig. 43.

like the white of egg, by heat. The blood-corpuscles, or globules, are of two kinds, red (fig. 43 A), which are much the most numerous, and white or colourless (fig. 43 B). These

bodies are of course very minute, the average diameter of the human red globule, being the 3200th of an inch—of the colourless, a little more. The red globules of the blood are composed of protoplasm permeated with red colouring matter; under the microscope they have the appearance of flattened disks with a depression in the centre (fig. 43 A). When fresh drawn from the body they have a tendency to arrange themselves in connected rows. When the red corpuscles are deficient in amount, as in persons suffering from anæmia, often termed poverty of blood, tonics, especially the preparations of iron, are required. It is iron which gives the red colour to the blood. Blood circulates in the living body in the two very different forms of arterial and venous blood. In the former case it flows in the arteries, is bright red, and conveys life-giving influence and nourishment to every portion of the frame; in the latter, it is black-looking, flows in the veins, and possesses properties destructive to life, until by the action of the liver, and more especially by exposure to the action of the atmosphere in the lungs, it becomes purified. The properties and composition of the blood in health, and the changes which these undergo in disease, have of late years received much attention, and many important discoveries bearing upon the nature and treatment of disease have been the result; but the greatest improvement as regards the blood, in the practice of medicine, is the much greater caution exercised in the abstraction of the vital fluid. Bleeding from the arm, which formerly was so generally resorted to, even as a periodical habit, is comparatively rarely practised. This is strikingly evident from the newspaper reports. Very few years ago, the addition to the accounts of accidents, of whatever kind, might have been stereotyped, that "a surgeon came and bled" the sufferer, and with it the too frequent addition of "the vital spark had fled;" and certainly, if anything could extinguish the spark of life flickering after the shock of a severe accident, it must have been the senseless, unmeaning custom of bleeding, when perhaps brandy and water or ammonia were required. The disappearance of such notices as above from the public prints, evince the improved practice; but even now, in the country, it is difficult to persuade people that they do not require bleeding after an accident, and all bad consequences are attributed to the omission of the mysterious agency of blood-letting. Blood, we are told, on the highest authority, is the "Life," or at least the medium of life to the body, and it is we know the great feeder of every portion of the frame, and to feed, it must be fed, and every drop extracted unnecessarily is money from the poor man's pocket; but worse still, if largely abstracted by design, or lost by accident, it frequently cannot be recovered, and the constitution receives a shock, and facility of yielding to disease, which it never gets the better of.

Blood-Letting.—But yet, in blood-letting, we have a powerful auxiliary in the treatment of some diseases, although one to be used with due caution; and the ability to perform the operation may be serviceable in remote or thinly-settled districts. Any man who has the idea of using the lancet, if required, should see the operation performed: one practical lesson, accompanied with a little kind explanation, is worth all description, although this may be useful as a reminder afterwards.

Bleeding with the lancet *may* be performed wherever a superficial vein can be detected. The large vein of the neck (the jugular) is not unfrequently opened by the surgeon, also the veins of the hand or foot; but the bend of the elbow is the most usual site of the operation.

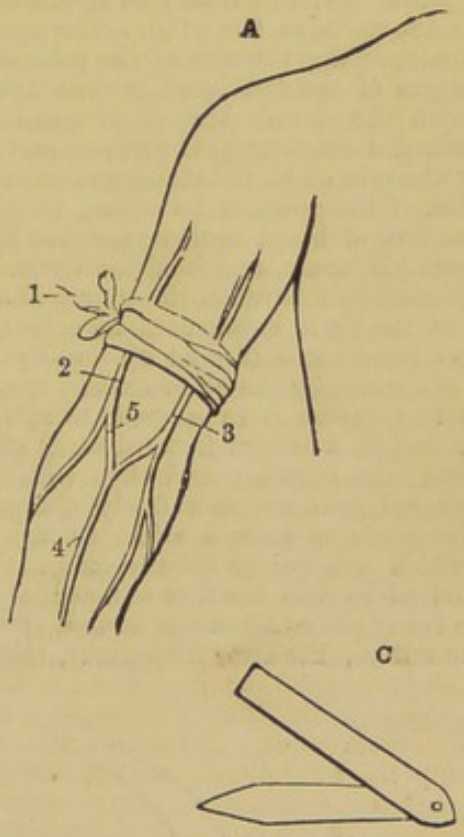


Fig. 44.

In this position, if regularly distributed, there should be a tolerably large vein (fig. 44, 2-3) running up each side of the arm, and a central vein (4), which, dividing into two branches, sends one to each of the vessels above-mentioned. It is the branch (5) going to the outer vein which is usually opened in bleeding; the veins on the inner side of the arm are, as a rule, avoided by the surgeon, if blood in sufficient quantity can be procured from the more external branches. The reason of the selection is the presence of the main artery of the arm close beneath the inner veins, and the possibility of its being wounded in the operation. A skilful bleeder may undoubtedly avoid so serious a mishap; but certainly no unprofessional person should run the risk, and,

indeed, in whatever situation, and by whomsoever a vein is opened in the arm, it must always be ascertained beforehand, by pressing the finger down upon the part, that no artery is pulsating underneath.

The first thing when the operation of bleeding from the arm is to be performed, is to have all things in readiness. These are, a bandage of some kind, or soft half handkerchief, a piece of linen folded six or eight times into a pad an inch and a half square, a basin, or two or three cups, a stick to support the patient's arm if requisite, a towel, and a little cold water. The band is to be tied round the arm, with a bow knot, about two and a half inches above the elbow (fig. 44—1), with sufficient tightness to stop the flow of blood in the veins, but not in the artery, which may be ascertained by feeling the pulse at the wrist. The operator, whilst supporting the arm of the patient with the fingers of the left hand, presses upon the vein with the thumb a short distance below the intended opening, this pressure serving to steady the vein under the incision of the lancet, and also, if the operator be alone, to prevent the free flow of blood until he has had time to lay down his lancet, and hold the basin. The lancet being held between the thumb and forefinger of the right hand, with its sides in the position represented (fig. 44 c), and the hand being supported by the other fingers, the point of the instrument is to be made to pierce the vessel, and it is carried forward so as slightly to enlarge the opening, and then withdrawn. If the blood does not flow freely, the patient may be made to grasp a stick, or any solid body which will partly fill the hand. When it is desired to stop the flow of blood, the left thumb being placed upon the wound, the band is to be untied, the arm, if requisite, cleansed,

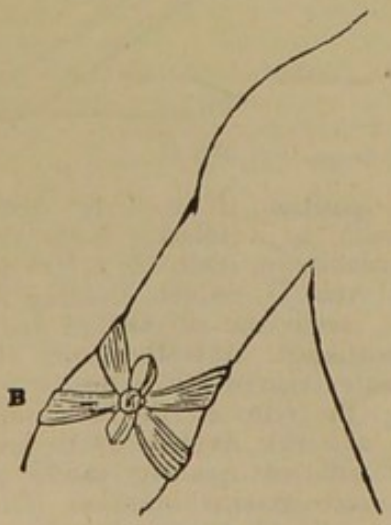


Fig. 45.

the linen pad substituted for the thumb upon the wound, and secured by the band or handkerchief passed round the arm in the form of a figure of 8 (fig. 45 B). The arm ought to be kept at rest for some hours after the operation, and not used in *exertion* for some days.

Such is the operation of bleeding, not to be undertaken rashly, never by one who has not seen it performed; but yet one which it is desirable that some person in a remote district should have the ability to perform. Again it is repeated, the lessons must in the first instance be practical, and then the few simple directions above given may afford timely aid to the memory. It must be kept in mind that a person in the upright posture faints sooner from loss of blood than one who is lying down, and that when faintness does come on, a little cold water, and a perfectly flat position are the best restoratives.

The emergencies in which bleeding may be ventured upon by the unprofessional will be noticed under their proper heads.

Local Blood-letting, Cupping, Leeching, Scarifying.—See their respective articles.

Bleeding.—See *Hæmorrhage.*

BLOWS may be serious either from the violence used in their infliction, or from the site of the injury. A blow on the head may cause merely bruising of the scalp—if more severe, concussion or injury to the brain, or fracture of the skull. The latter accident is most likely to happen at the side of the temple, where the bone is thin; but severe injury to the brain frequently occurs from blows at the under and back parts of the head. A severe blow on the spine may cause paralysis of the lower limbs, with or without fracturing the vertebræ. When a blow, even comparatively slight, is inflicted upon a spot immediately over a collection of nerves, most distressing effects, and sometimes immediate death, may result; such is the case from blows on the neck, on the pit of the stomach, or over the region of the heart. The deadly faintness which ensues should instantly be combated by the first stimulant—ammonia, ether, or spirit of any kind—which can be procured. Cold water should be suddenly dashed over the surface, or down the spine; if this is unsuccessful, the patient is to be put into a warm bed, and artificial respiration employed along with external heat, mustard plasters to the spine and pit of the stomach, and stimulant injections.

Refer to—*Brain—Bruises, &c.*

BLUE DISEASE—Cyanosis—a condition dating from birth, in which, from malformation of the heart, the blood is only partially arterialised in the lungs. Few subjects of the disease survive infancy, but there are instances of their attaining mature age. The disease is characterised by the purple appearance of parts which are usually red, as the lips and cheeks, by languor of all the functions, and by great susceptibility to cold.

BLUE PILLS.—See Mercurials.

BOIL—a boil consists in local inflammation affecting the true skin, and subjacent cellular membrane. A whitish-looking point,

in the conical centre, is surrounded by an inflamed hard base. A core or slough occupies the interior of the boil, and this must be discharged before there is relief to the often intense pain, and before a cure can be effected. The pain may, however, be soothed, and the natural process facilitated by the use of warm fomentations, simple, or made with poppy capsules, and poultices, the latter being continued until the core is fully thrown out, after which simple water-dressing may be applied. Persons who are compelled to go about their occupations during the progress of a severe boil, will find a small piece of lint dipped in olive oil, and retained in its place by a disk of adhesive plaster, a very soothing and convenient application. Boils are apt to recur in succession, for the reason, probably, that they depend upon some derangement of the system which requires attention. If the person—and boils generally occur in the young—be of full habit, the diet should be reduced, all fat and rich things eschewed, meat partially or entirely given up for a time, and stimulants avoided. A blue pill and black draught, or one or two doses of calomel and compound rhubarb pill are to be taken, and regularly for some time every morning, a tea-spoonful of Epsom salts in half a pint of water. If the habit is delicate, tonics and nourishing diet should be employed, and the bowels should be regulated by aperient medicines.

Boils are popularly said to be "healthy," and in one sense they may be so; that is, if the deranged state of the system relieves itself by their eruption; but they are also to be regarded as warnings that some change in habits, or that medicine, is required. A series of neglected boils may wind up with a carbuncle. Carbuncle is of the same nature as a boil, but more severe and dangerous.—See *Carbuncle.*

BOILING—is the process in cookery by which food is submitted to the action of water at the boiling point of 212° Fahr. Theoretically, this is the case, but in the cooking of meat especially, boiling, that is ebullition, should not be permitted—a temperature 20 or 30 degrees lower being sufficient, if proper time be given, to cook meat thoroughly, whilst it is rendered much more tender and easy of digestion than when the process is carried on more quickly, and by a greater degree of heat. In fact, meat to be properly cooked in this way ought rather to be stewed than boiled. Somewhat, however, must depend upon the end in view in cooking the meat. If it is desired to be simply a piece of well-cooked meat, not only as regards taste, but as to nutritive powers, the water in which the meat is to be cooked should be made to boil briskly at the time the latter is put into it, and for a few minutes after, and then sufficient cold water is to be thrown into the pot to reduce the temperature of the whole to 180°, at about which point it should be maintained until the meat is thoroughly cooked, that is, till all appearance of redness has disappeared. The principle of the process is, that by the sudden immersion of the meat in *boiling* water, the most external of the constituents of the flesh, but more particularly the albumen, become quickly hardened and coagulated, so as to form a kind of case around the interior portions. Of course, if the high temperature is preserved, this process of hardening will go on throughout the whole mass, which is thus—and too often it is the case—made hard and indigestible. But in consequence of the reduction of temperature produced by the addition of cold water this is prevented, the meat is cooked by a heat which cannot harden it, and its nutritive soluble principles are kept from exuding by the case-hardening of the first few minutes' boil. The reverse of the above must, in some degree, be the case, when meat is boiled for the sake of the soup: it must then be put into the water whilst it is cold, and the temperature gradually raised to near the boiling point. In this way there is no outer hardening to interfere with the water dissolving out the soluble nutrient principles of the whole mass; the latter, of course, losing proportionally. As meat cannot be cooked in water without a certain portion of its nutrient matters being dissolved out, the water *should never be thrown away;* if the saving is unimportant to those who cook the meat, there are plenty of poor to receive the unused liquor; but if it is a consideration that nothing be lost, then may the soup be turned to account by being consumed along with the meat. Of course the cooking may be so managed as to make both palatable.

Vegetables require thorough boiling, and often disagree for want of it.

Refer to—*Food.*

BOLUS—a large, rather soft pill, which can be swallowed. This form of administering medicine is now out of use.

BONE is the component of the hard frame-work of the animal body, which supports and protects, and to which are attached the soft parts. Bone, in mass and in its dry state, is made up of about two-thirds mineral or earthy, and of one-third animal matter, and both are so intimately united and diffused through one another, that either (the one by the action of heat, or the other by the aid of an acid) may be entirely removed, and yet the form of the bone be maintained by the remaining constituent. The animal matter of bone consists of gelatine, fat, and a trace of albumen, which may be, and are, used as articles of food in various ways. The extraction by manufacturing process is complete; but for domestic purposes, much of the bone gelatine may be extracted by the use of Papin's digester. There is not, perhaps, as much real nutriment in gelatine as is popularly imagined; but there is quite enough to make its extraction worth while, even domestically, as an addition to soups. The mineral matter

of bone consists mainly of phosphate of lime combined with a smaller proportion of the carbonate and some mineral salts.

The bones of the body are divided into flat bones like those of the head, long bones as of the arm and thigh, and irregular bones, of which the vertebræ are examples. The outer case of a bone is always harder than the interior, and is covered by a firm investing membrane, the periosteum. Bones are liable to various diseases; one of these, caries, is to this tissue what ulceration is to the soft parts of the body; another, necrosis, is the actual death of the bone substance. In both these cases, there is generally deep-seated continued pain in the bone, followed by swelling and redness of the soft parts covering the affected spot; matter forms and is discharged, but healing does not take place, as after a common abscess; the discharge continues, it is thin, perhaps acrid, frequently fœtid, and communicates a dark stain to the dressings. The opening in the skin, or rather openings, for there are usually more than one, may be small, or there may be diffused ulcerations of the integument. These diseases —unless from situation, as in the head—are not rapidly fatal, but if unremedied, wear out the patient, by long-continued irritation. The suspicion of their existence should be the signal for placing the sufferer under proper medical advice without delay. Too often they are trifled with, and one quack ointment after another—each professing more than its neighbour—is had recourse to, whilst the constitution of the patient suffers irretrievably. Bones may become softened in consequence of a deficiency of earthy matter. In adults, this is the result of defective constitution, insufficient nourishment, and unhealthy dwellings, and is a fatal disease. In children, the disease named rickets, in which the bones likewise become soft and capable of bending, is the result of similar causes; but in the latter, good diet, change of situation, and a course of tonic remedies will effect a cure.

Refer to—*Rickets—Fractures—Papin's Digester.*

BORAX is a compound of boracic acid and carbonate of soda, and was formerly thought a useful and convenient antiseptic as well as a serviceable drug. Until recently its use as a preservative was extending, but preparations of borax for preserving meat are now forbidden in the German navy. Boracic acid is now largely used as an antiseptic, and as an application in irritable skin affections. Fifteen grains of boracic acid, rubbed up with an ounce of vaseline, will greatly allay the itching of nettle rash, and a wash composed of sixty grains in a quarter of a pint of water will be found useful in various skin diseases, such as eczema, &c. Boracic lint, now much used as an application to foul and sloughing wounds, is prepared by the action of a saturated solution of boracic acid on lint. Boracic acid interferes with the digestion, and should never be used for keeping sweet milk given to babies. Mixed with an equal quantity of oxide of zinc it is frequently used as an antiseptic drying powder for dusting inflamed surfaces; in this form it is especially useful for application to inflamed vesicles resulting from vaccination.

BOUGIE—a surgical instrument used for the dilatation of the male urethra.

BOURNEMOUTH, on the east coast of Hampshire, is said by Sir James Clark to "deserve a place among our best climates, and for a certain class of invalids, capable of taking exercise in the open air, to afford a very favourable winter residence." The soil is porous and dries quickly after rain, and the place is sheltered from the north and east by hills and pine woods.

BOWELS.—The tract of the alimentary canal contained within the abdomen.—See *Alimentary Canal.*

BRAIN.—The brain is the large mass of nervous matter contained within the cranium or skull case. By anatomists, and in medical science, the organ is variously divided and subdivided, but more especially into the cerebrum, or large brain (fig. 46—1), and the

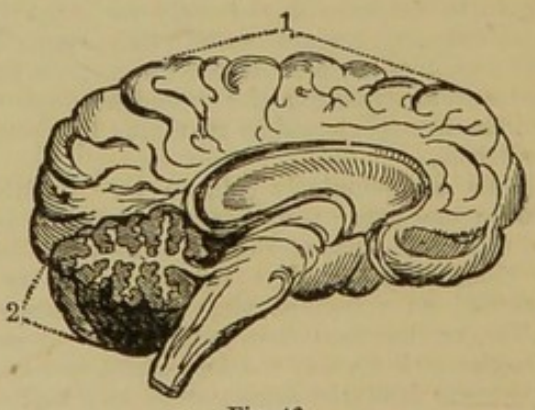


Fig. 46.

cerebellum, or little brain (fig. 46—2), the latter being situated at the inferior and posterior part of the cavity within the head. The nervous matter is partly white and opaque; partly greyish, and semi-transparent. The whole organ is supported and enveloped by three membranes, and is defended from all ordinary injury by the arched bones of the head. The next figure (47) represents a side view of the brain (1) and cerebellum (2), and their connection with the spinal cord (3), as well as of the skull case (4) and upper part of the canal formed by the cervical vertebræ through which the cord passes (5).

Concussion of the Brain.—One of the most frequent injuries to which the brain is exposed, is concussion. Either in consequence of a fall or a blow, a person becomes stunned; the effect may be but momentary, there is transient unconsciousness, and the individual "comes to himself," without further symptom; but if the concussion be severe, the state of unconsciousness continues, the power of motion

is almost or entirely lost, the breathing is slow and quiet, the pupils frequently contracted, but sometimes dilated, and very generally there is vomiting; the pulse is small and weak. This

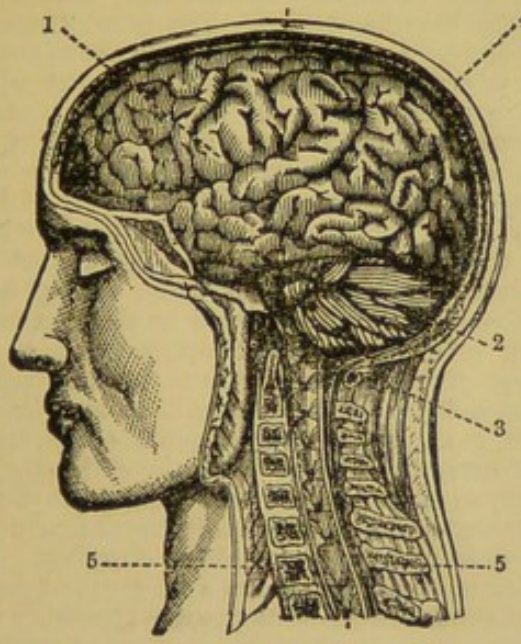


Fig. 47.

condition may continue for a longer or shorter period, according to the violence of the shock, and may terminate in death; but if it be simple concussion, there is generally a restoration of the usual condition of health, permanent or otherwise. In some cases of simple concussion of the brain, but little active interference is required; the patient should, if possible, be put in bed, and the warmth of the surface, particularly of the feet, attended to; if there is extreme depression, a little sal volatile or brandy and water *may* be given, *but sparingly*, on account of the subsequent reaction. The chief danger to be apprehended after concussion of the brain, is inflammation affecting either the organ itself or its covering membranes, and on this account the sufferer from the accident ought to be extra careful for at least ten days or a fortnight after the receipt of the injury. All alcoholic stimulant is to be avoided, and rest both of body and mind submitted to; the diet should consist entirely of milk, the bowels being kept relaxed by the use of gentle aperients. If the immediate reaction is great, that is, if a few hours after the accident, there is much pain in the head, shivering, followed by heat, quickened pulse, sickness, the case demands the most serious attention, and should be seen by a medical man as soon as possible. The hair must be cut or shaved off, and the head kept cool with cold or iced applications; the most perfect quiet, in a dark situation, observed, and active purging with calomel and colocynth, jalap and calomel, or the most active aperient at hand. The diet is to be reduced to the very lowest ebb. Such cases are generally so urgent, and their cause and nature so palpable, that they not only require the most active treatment, but also render that treatment justifiable in the hands of the unprofessional, in the absence of, or during a lengthened interval of the non-arrival of medical assistance. Symptoms, similar to those detailed above, though not directly referable to reaction, may, coming on some days after a concussion of the brain, indicate the commencement of inflammatory action. In such a case the above measures should be cautiously carried out. It ought to be known, that direct violence to the head is not always requisite to produce concussion; a heavy fall on the feet may equally cause it, by the shock conveyed through the spine to the brain. But violence may go beyond the production of mere concussion—there may be rupture of the substance of the brain, or of a single vessel, causing effusion of blood. In such a case, the individual may never rally from the first condition of unconsciousness, or he may rally only partially, to sink again as reaction comes on into a state of apoplectic stupor, or become the subject of those symptoms of inflammation of the brain already described; in which case, of course, the same treatment is to be pursued. If the case runs on to a fatal termination, there is generally apoplectic stupor, paralysis, convulsions, one or all of them.

Fracture of the Skull.—Violence applied either directly to the head, or communicated to the skull through the spine, may be sufficient to fracture the bone with or without breaking the skin. The accident is sometimes sufficiently obvious even to the inexperienced, at other times, as in the case of a simple crack, it is not detectable even by the most skilful; but whether plainly apparent, or only suspected, the existence of fracture amounts to the same thing, as far as the unprofessional are concerned, as concussion; the case ought to be seen as soon as possible by a surgeon. The symptoms will in many respects resemble those of and following concussion, and may be similarly treated; if there is external wound as well as fracture, simple water dressing should be used. When a portion of bone is driven down upon the brain by external violence, it occasions apoplectic insensibility by the pressure it produces; in such cases, the aid of the surgeon is imperatively called for, to relieve, by elevating the depressed bone.

The brain, or its investing membranes, are liable to become inflamed. Shivering, followed by hot skin, thirst, furred tongue, intense pain in the head, intolerance of light, the eyes being blood-shot and wild-looking, sickness, and delirium, are the most general symptoms; at other times, a severe attack of convulsions ushers in the disease, or continued and obstinate vomiting may be the first symptom of the brain being affected, the more direct symptoms referable to the head coming on later. However

it may be, such cases can only have proper energetic treatment in the hands of the practitioner; but until his assistance can be procured, the plan of treatment recommended to be followed in cases of inflammation after violence is to be adopted—particularly cold to the head, *thoroughly* applied by means of ice bags (see *Cold*).

Inflammation of the brain may arise from a variety of causes; violence is one of the most common; it may arise in the course of acute disease, or after the suppression of an accustomed discharge; it is not uncommonly set up in cases where there has been long-continued discharge from the ear.

In children, particularly those of scrofulous constitution, inflammation of the brain at its conclusion frequently takes the form of what is popularly termed—

Water in the head, or water on the brain, technically termed *meningitis*. The fatality of this disease when it has once established itself in the constitution, renders a knowledge of its earlier symptoms a matter of serious and important interest to every parent. As mentioned above, children of scrofulous constitution are most liable to this disease, and should be closely watched, especially from the second to the sixth or seventh year of life, the most general period of attack, and particularly after the child has suffered from any of the diseases incidental to childhood. At first, the patient is languid, looks heavy, is subject to irregular heats and chills; the appetite is capricious, the bowels irregular, and the discharges from them unnatural in colour; the sleep is disturbed, there is frequent starting, moaning, perhaps screaming; the teeth are grated, the thumbs folded across the palm of the hand; when awake, the brow is contracted; the nose is continually picked; the child, if able to speak, complains of the head, which is hot. As the disease advances beyond the first stage, all these symptoms become more marked, and probably obstinate vomiting, and when the stomach is empty, retching, occur. Towards the termination of the disease, insensibility, dilated pupils, convulsions, &c., come on; but long before the latter stages the case should be under proper medical treatment. The object here is to put parents on their guard as to the advances of an insidious and very fatal malady, not to induce them to incur the responsibility, and unless under very extreme circumstances indeed, the culpable responsibility, of its treatment. Many of the symptoms above detailed undoubtedly occur in less alarming combination in many of the diseases of children; but come as they may, and when they may, they should not be neglected. Some amount of treatment ought, however, to be employed to save time, and the most important and safest indication, is to purge the child well with calomel and scammony, a grain of calomel with two grains of scammony is a very efficient dose for a child of two years of age, and it may be repeated according to the effect produced, which should be two or three motions in the course of twenty-four hours; the head is to be kept cold, and quiet strictly to be observed. One or two leeches may be applied. The term "water in the head," as regards the disease above treated of, is erroneous; the effusion of water which takes place is but one of the stages of the affection, which is truly inflammation of the brain and its coverings. The causes are numerous, but sometimes the disease arises without any being distinctly traceable; the irritation of teething, long-continued disorder of the digestive organs, falls or blows on the head, exposure of the child's head to the heat of the sun, infantile febrile disorders, may any of them give the first impetus to the diseased tendencies. Most important, as undoubtedly it is, to detect the first symptoms of threatened inflammation of the brain in children, still more so is it to detect and improve that state of constitution which facilitates the incursion of that and so many other disorders. If a child is scrofulous, or has a tendency to scrofulous constitution, let not parents foolishly shut their eyes to the fact, but rather endeavour as far as possible to correct the misfortune; more especially, let them beware, lest they in any way foster into activity the seeds of so deadly a malady as acute meningitis. Those children who are most obnoxious to its attack, are often the most endowed intellectually; there is a morbid tendency to excitement in the brain, which gives it power beyond what is natural to its age; if permitted or encouraged, the child will give up the sports and exercise of its time of life for the sake of mental employment, and sometimes a parent's pride permits the erroneous system, which in all probability leads either to early death from active disease of the brain, or to the possession in after-life of a sickly body and morbid mind. In no children is it so necessary to insist upon strict observance of all the laws of *physical* health, as in those who exhibit precocious development of mind.

Water in the head, properly so called, is a chronic disease, dating from birth or very early infancy. The effusion of water advances by slow degrees, distending more and more the brain and the bones of the head, until the latter attains an enormous size. It has been measured as much as forty-four inches in circumference. The disease may last for years with no hope of recovery.

Brain in Old Age.—In the aged, the brain becomes more liable to disease than heretofore. Congestion of blood from various causes, more especially in consequence of earthy deposits and ossification of the arteries is frequent, but quite as often, headache, giddiness, slowness of intellect, or paralysis, arise from deficiency of blood in the brain. The distinction is important, as in the latter case lowering measures are certain to be followed by an aggravation of

the disorder. Softening of the brain, so frequent a disease of advanced life, has many symptoms similar to those consequent upon deficiency of blood, but in an aggravated degree; the mental functions are more regularly and permanently impaired, paralysis is more certain. Although cerebral softening is incurable, if its threatenings are early detected, it may be retarded by the use of tonics and abundant nutriment. The arteries of the aged brain lose their elasticity, become brittle and liable to rupture if unduly distended, a fact which renders all excitements, whether of the passions or otherwise, so dangerous to those advanced in life. The other affections of the brain, such as apoplexy, paralysis, delirium tremens, will be found under their respective heads.

BRAN is the broken-up husk of the grain of wheat, which is separated from the flour after grinding. It contains a considerable amount of nitrogenous and fatty as well as mineral matter, and when mixed with the flour it is made into brown or whole meal bread. When heated it is one of the most useful adjuncts we possess in the alleviation of disease and pain, and particularly in a domestic point of view. It is generally to be procured, is soon made hot, and retains the heat well; it is at the same time soft and adaptable.

Heated bran is best applied in a flannel bag, which should be made ample in size, compared with the part affected; it may be either a dry or a moist application, but the latter is in most cases preferable. The best method of heating, is in the frying pan, sprinkling with hot water during the process, so as to give just perceptible moisture, and turning over and over until the substance is thoroughly hot throughout; it is to be quickly transferred to the bag, and the latter fastened by pins or thread. When moist, if covered after it is applied to the skin, by a piece of oiled silk, oiled calico, or any other waterproof material, the heat will not only be better retained, but the vapour also, and no dampness will be communicated to the clothes. Sometimes, the bran is put into the bag dry, and the bag and all dipped into boiling water, but in this way too much moisture is absorbed.

Dry, hot bran may produce perspiration, but frequently it causes only feverish dry heat, and if it does not do harm, does little good, compared with the soothing heat and vapour of the moist preparation, which is in fact a continued local vapour-bath, causing free perspiration from the skin over the affected part, and often relieving to an extent sufficient to render the use of leeches or cupping—which would otherwise have been required—uncalled for.

In severe pain, whether spasmodic or inflammatory, the bag of *hot* moist bran efficiently used is one of the best, softest, and most certain alleviators we possess; and, greater advantage than all, may be used in most cases of pain with the most perfect safety. In many acute inflammatory affections, such as those of the chest or abdomen, its use is very often preferable, both as regards the comfort and real good of the patient, to either blister or mustard plaster. In the inflammatory affections of childhood, and in threatened croup, it is invaluable from its easy application, soothing, and, at the same time, most beneficial effect. When weight is an objection, of course the bag must be more lightly filled. The bran may be heated in a dry state, and the effects of moisture procured by laying underneath it a double fold of flannel wrung out of hot water. Again it is repeated; the hot bran bag, to be efficient, must be sufficiently ample and well filled to retain the heat so long that frequent changing is not required. It must be thoroughly hot, slightly moist, but *not wet*, and is better covered after it is put to the part by some material which will prevent evaporation.

For the dietetic uses of bran see *Bread*.

BRANDY is procured by distillation from grape wines, and owes its peculiar flavour to the presence of an ethereal spirit formed by the action of the acetic or tartaric acid on the alcohol.

Brandy, like every other ardent spirit, ought not to be freely or regularly used, either diluted or otherwise. As an addition to our stimulant medicines, and as a dietetic, it is most valuable. As a medicine, it does not, perhaps, possess any particular advantage over pure spirit of any kind; but in England, at least, it is preferred by most to either whisky or gin, and it is generally the first procurable stimulant in most cases. As a dietetic, dyspeptics, and the aged, who require stimulant, and yet cannot take it in other forms, can often use regularly and with the greatest benefit a measured quantity of brandy in a little cold water, with their meals, once or twice a day, and certainly without any of that subsequent depression, or craving for an increase of the dose, which is by some said to be the consequence of the habit.—See *Alcohol*.

BRANKS.—The Scotch name for the mumps.

BREAD.—The term, as usually applied in this country, means the leavened, raised, or fermented loaf of wheaten flour, but may also be appropriate to any of the other forms in which flour or meal is made up, either from wheat or the other cereals. The flour of wheat consists of several ingredients; the gluten, which approaches animal matter in composition, starch, and dextrine, with small amounts of oily and mineral matters. Wheat flour, simply made into a cake with water, and baked, like the "damper" of Australia, will undoubtedly yield nourishment equally as well as leavened bread, to those whose digestion is equal to the task; but for the general purposes of civilised life, fermented bread is much to be preferred for the greater ease with which it is assimilated. The careful mixture with the saliva during the mastication of bread, is a

condition essential to the rapid conversion of the starch into sugar. Hence the increase of digestibility obtained in bread by the porous form given to it. This porosity and lightness is produced in the dough by a process of fermentation. Beer-yeast is added to the dough, which brings into fermentation the sugar formed by the action of the gluten on the starch; and the open porous texture of the mass is the result of the carbonic acid thus formed in every part of it.

Various kinds of "digestive bread," raised without fermentation, are, however, occasionally used. Carbonate of ammonia has been employed for this purpose; but carbonate of soda, with the addition of some acid—butter milk will do—to disengage the carbonic acid, is the most general agent. The following method is a good one:—Two drachms of carbonate of soda in fine powder are to be *well* mixed with a pound and a half of flour; to rather less than a pint of water there is to be added two and a half drachms of dilute hydrochloric acid, and the water and acid together are to be added to and mixed up with the flour. A rather liquid dough, which must be *baked immediately*, is formed, and if properly managed, is well and lightly raised by the disengagement of the carbonic acid from the soda, the latter being at the same time converted into common salt by union with the hydrochloric acid. These various kinds of unfermented bread have been extolled as particularly digestible; it is a question whether they are more so than the ordinary bread which has undergone fermentation.

Bread made by the process introduced by Dr. Dauglish, and called *aerated*, from the dough being subjected to the action of highly carbonated water, agrees better with some people than bread made in the ordinary way. It is lighter and more easily digested, and is less likely to turn sour. It has also the great advantage over other bread, that it is manufactured free from contact with the hands of the baker.

To be thoroughly wholesome, bread must be well raised, well baked, and at least twenty-four hours old before it is used. The finer descriptions of bread made with fine flour are liable, it is said, to constipate, and the coarser, which contain much coarse bran, are too irritating for many stomachs. As bread is at present made in this country, that made with "seconds" flour is quite the most generally wholesome. It is a matter of much importance, as regards the nutritive properties of bread,—"the staff of life,"—in what manner the flour from which it is made is prepared. Generally, in consequence of the very large separation of bran effected in grinding, in this country at least, a great proportion of the real nutriment is abstracted, and the fine flour which remains has too large a preponderance of starch, which does not afford so much nutriment.

It is not necessary for bran to be coarse. By more thoroughly grinding it into the flour, not only would bread made from the flour be much more nutritious and wholesome, but the actual amount of bread-food supplied to the people would be considerably increased. Moreover, the mechanical aperient action of the bran upon the bowels could not fail to be useful in a country where constipation is so general a disorder, as it is in this. No one who is liable to habitual constipation should regularly eat fine bread, but should systematically vary his diet in this respect by the aid of the wholemeal bread, now extensively prepared, which is not so irritating to the stomach as the common bran bread.

A certain proportion of bread should form an addition to every meal, with those whose digestion is at all weak. It must not be new; fatal accidents have occurred from the distention of the stomach by an excessive meal of newly-baked bread. Sour bread is, of course, most unwholesome. A great mistake is often made in feeding young infants upon bread in various forms; it always occasions disorder, griping, and flatulence. If circumstances render it necessary that bread must be given, it should, at all events, be slowly toasted, or re-baked as hard as a biscuit or rusk throughout, and then well soaked. Water is largely contained in bread. When newly taken from the oven it consists of nearly one-third water, which it gradually parts with as it becomes stale. The same, or rather a greater, loss of water is produced by toasting bread, and its digestibility is thereby improved without any detriment to its nutritive properties. Rusks, tops and bottoms, and other kinds of bread used chiefly in the nursery, owe their estimation to the fact of the water having been dried out of them by keeping them longer in the oven. They form grateful additions to the limited diet of a sick person, and contain variable proportions of butter, milk, and sugar, which render them more valuable as foods. Biscuits are made in a similar way, and are chiefly valuable on account of the length of time they may be preserved, but as a rule they are less digestible than bread. Biscuit powder is a useful preparation, and is sometimes employed in the nursery mixed with milk and a small portion of sugar.

Refer to—*Grain*, *Flour*, *&c.*

BREAKFAST—The first morning meal is to the strong and healthy a most enjoyable one, and it may always be taken as one of the best signs of health when a man can eat and *digest* a good breakfast, especially after exercise. The circumstance that the strong and healthy can enjoy with impunity a full breakfast, has given an erroneous idea as to the advisability of invalids making it a hearty meal, and still worse, of prefacing it by exercise. With very many, perhaps the majority of people in this country, especially in towns, the interval between rising and breakfast is not one of great vigour; the powers both of body and mind are

undoubtedly recruited if there has been due rest, but they are not in full action, and if, injudiciously, too long an interval is permitted to elapse before food is taken, they become exhausted, and still more so if physical exertion is engaged in. Instead, as is too frequently supposed, of the exertion improving the digestive power, it weakens it; appetite there may be, but digestion will, in a weak individual, be sadly deficient; the nervous power which should aid the process has been used up. The very same deficiency of nervous power renders a full breakfast, under any circumstances, inadmissible for those of weak digestion; instead of giving strength it causes discomfort and inaptitude for business for the first hours of the forenoon. Thus it is why it speaks well for the health and constitution of the individual who can make the first meal of the morning a hearty one.

It would, perhaps, be difficult to find a social custom more suited to the present state of civilised life than the warm tea, coffee, or cocoa breakfast, taken along with bread, and, if it agrees, with the addition of meat, fish, or egg; it just affords the gentle stimulation which the system requires. The amount and nature of the nourishment taken at breakfast must vary, of course, with the habits and powers of the individual; if digestion is weak, it is better to be content with little, and wait for an early luncheon. Some dyspeptics can scarcely take any kind of food at the morning meal without its disagreeing; such will sometimes find it of advantage, when it can be done, to have a *small* cup of hot coffee, or some warm fluid, brought to them just before rising; with others, a very slight supper, just before going to bed, a biscuit or piece of toast, with a little wine and water, will relieve the weakness in the morning. Above all, it should be kept in mind by those with whom breakfast is apt to disagree, that exhaustion of any kind before the meal, such as walking, gardening, bathing, or even cold sponging, is almost certainly injurious. As a breakfast for children, bread and milk is better than the stimulants, tea and coffee; for strong children, nothing is better than oatmeal porridge, as used in Scotland and northern England.

Refer to—*Digestion—Bathing.*

BREAST.—The term, as here used, is applied to the female breast, the organ peculiarly devoted to the nourishment of offspring. The essential component of the breast is the "mammary" gland, which secretes the milk. This gland, along with the breast generally, becomes fully developed, and fitted for its functions, as womanhood advances; and at the same time, the nipple enlarges, if it is permitted to do so by the stays, which too often offer such impediment to its development as to entail much suffering when women come to be mothers. Too frequently, when the nipple ought to be fit for the suckling of the child, it is found so flattened into the breast that it is nearly impossible, sometimes quite so, to get it drawn out sufficiently; much suffering, and not unfrequently abscess in the breast, is the consequence.

Females are often morbidly sensitive respecting any ailment affecting the breast, and render themselves unnecessarily miserable if they detect, or fancy they can, anything unusual. Sympathetic pains are put down as the certain precursors of some dreaded disease; or the slightest hardness is observed and fingered, till it really becomes tender and inflamed, and in consequence enlarged. In such cases, if the patient is reasonable, and can be persuaded to give up the habitual interference with the ailment, the uneasy symptoms and suspected "lump" will often disappear together. Still, they may not do so, at least quickly, but that is no reason why the affection is necessarily a serious one; quite the best plan in these cases, is to take professional advice without delay; if the cause of alarm is unimportant, the mind is set at rest; should it be otherwise, its nature cannot be too soon detected. Above all things, tampering with such matters must be avoided; the rubbings, &c., too often employed, may irritate a slight swelling into rapid and painful increase, or something worse.

If the above advice is followed, as it ought to be, it is unnecessary in a work like this, to treat of that dreaded disease, cancer of the breast; a suspected case ought neither to be left to unprofessional opinion nor domestic treatment, and to detail the incipient symptoms which are many of them common to more harmless affections, might only tend to excite groundless fears. When cancer has reached the confirmed open stage, opiates and narcotics are the chief sources of physical comfort; hemlock poultices will sometimes relieve pain, and a chlorine lotion will in some measure neutralise the fœtor. The disease generally occurs after the age of forty.

Inflammation and Abscess.—The disease from which the female breast most frequently suffers is inflammation, followed by abscess. This may occur at any time, but most commonly it is within the first few weeks after child-birth. Generally within twenty-four hours after the birth of a child, the breasts become turgid, and slightly hot, from the increased flow of blood which is directed towards them to supply the secretion of milk; in this excited condition, and indeed during suckling generally, they are peculiarly liable to become inflamed; cold, any slight bruise, such as that from a bone in the stays, over distention with milk, or even mental excitement, may, any of them, give rise to inflammation which ends in abscess. All these causes, and any others likely to injure, must therefore be most carefully avoided, and particularly the accumulation of milk; the breasts should be well emptied. If from flatness of the nipple, weakness of the

child, or any other cause, the milk is not well drawn out, measures which will relieve must be adopted. Various forms of breast-pumps are used, the suction being made either mechanically, or by the mouth—by their means; a leech-glass is tolerably convenient; or a wide-mouthed bottle, capable of holding a couple of quarts, may be employed, being first dipped into hot water to exhaust the air, and then applied to the breast, the suction exerted as it cools will cause the milk to flow freely. Some nurses have the art of drawing the breasts with the mouth, more thoroughly than any instrument, and when such aid can be procured, it is right to make use of it. The first symptoms of threatened abscess, are pain and knotty hardness in the part; if the process goes on unchecked, there is much throbbing and a sensation of weight, the skin over the part affected becomes red, gradually thins, and at last gives way, allowing the escape of the matter, occasionally mixed with milk. Some amount of irritative fever accompanies the progress of the affection. After the discharge of the matter, the abscess may quickly heal, or it may remain open and running for a considerable time.

The first few hours of threatened mammary abscess are the most valuable; if it is to be prevented, it must be then. The breasts being well emptied, gentle friction, continued for ten minutes at a time, and repeated every four or five hours, must be most assiduously employed. A soft palm is indispensable for the process, and fresh olive or almond oil is the best for rendering the friction easy; the various applications, such as goose fat, &c., often recommended and used, are disagreeable, and not better than the simple oil, the mechanical friction being the active agent for good. During the intervals between the friction, the best application is lint soaked in tepid water, and covered with oiled silk. The bowels should be kept clear: ten grains of Plummer's pill may be given, and followed in four hours by castor oil, and from six to ten grains of carbonate of potash, with the same quantity of nitrate of potash, and five minims of tincture of aconite rising to ten minims, are to be given every five or six hours in a wine-glassful of water. The diet light and cooling. Leeching the breast in cases of threatened abscess is useless, and tepid moisture is better than much heat. It is of much importance to support the breast, and it is sometime found beneficial to exert pressure by strapping with plaster, or, as lately practised, by means of collodion applied all over, which, as it dries, contracts and produces an equable compression. When from the throbbing character of the pain, or from the tension and inflammation of the skin, there is reason to suspect that matter has formed, the treatment must be changed; hot fomentation and poultices are to be regularly applied, the distressing weight of the whole breast being relieved by slinging with a handkerchief round the neck. The bowels are to be kept open, not purged, the pain and restlessness relieved by an opiate at night, cooling drinks allowed, and the diet light but nourishing. In certain stages, and under certain conditions, it is the practice of medical men to open breast or milk abscess with the lancet; for the unprofessional the safest course is to permit it to discharge itself. The hot poultices ought to be continued for a few days after the evacuation of the matter, and then exchanged for simple water-dressing.

After the discharge of the abscess, a more nourishing diet is to be allowed, and wine or malt liquor may probably be required. If there is much debility, a wine-glassful of infusion of bark, with thirty minims of sal volatile, or a grain of quinine in a glass of sherry may be taken twice a day. If the system is relaxed, and tendency to perspiration exists, twenty minims of diluted nitric acid should be substituted for the sal volatile in the bark infusion. As long as mammary abscess is merely threatened, the child ought to be allowed to suck, but from the time of matter having formed, till its discharge, it must be kept from the affected breast.

Even when milk or breast abscess has considerably advanced, it may often be checked by the use of extract of belladonna tolerably thickly smeared over the swollen and inflamed part, the extract being, in the first place, softened by the addition of an eighth part of water. If the application is used near the nipple, care must be taken that it does not come near the infant's mouth—a piece of linen is of course placed over the breast.—See *Belladonna*.

If hardness remains after the breast is healed, friction may be used with soap liniment, either simply, or with the addition of a drachm of compound tincture of iodine to each ounce.

Refer to—*Nipple—Child-birth, &c.*

The breasts of infants a few days after birth are liable to become distended with a thick milky-looking fluid, which some nurses barbarously squeeze out. This should never be practised; bathing with warm water, and the use of cold cream, or some simple ointment, is all that is requisite

Youths, about puberty, occasionally suffer from a hard, slightly painful swelling around the nipple, which sometimes creates alarm. It is of no moment, and requires no treatment beyond warm fomentation, if painful.

BREATH and **BREATHING** are terms which are sometimes applied synonymously to denote the double act of respiration; but a distinction is as often made, and the first restricted to signify the single act of expiration, when the air, having traversed the lungs, issues from the mouth loaded with watery vapour, after having exchanged a portion of its oxygen for carbonic acid.

The odour of the breath is a good index of the state of the body. When tainted, it is so,

not uncommonly, from decayed teeth, or from a morbid secretion of the tonsils; but more frequently, in children especially, it is indicative of disordered stomach, and of loaded bowels. The cause of the symptom should always be inquired into, and as far as possible remedied. A brisk purgative may be all that is required. Disease of the lungs is sometimes, and gangrene of the lungs always, accompanied with intolerably fœtid breath.

Some persons suffer habitually from tainted breath; and many remedies have been proposed. The first thing to do is to ascertain the cause of this very disagreeable affection. If it is dependent upon carious teeth, the dentist should at once be consulted. The holes or cavities in decayed teeth, besides at times giving off an offensive odour from their carious or ulcerating surface, become filled with particles of food, which rapidly undergo decomposition from the constant passage of the heated breath over them.

When foul breath proceeds from ulceration of the gums, whether connected or not with bad teeth, a medical man should be consulted, as also when there is ulceration about the palate or posterior part of the nostrils.

The following is probably the best and most effectual wash for destroying the odour from all sloughy sores or conditions of the mouth, gums, or throat, giving rise to foul breath:—Take of solution of permanganate of potash, one ounce. Fifteen drops of this, mixed with two or three table-spoonfuls of water, may be used frequently for rinsing the mouth. If the foul breath proceed from disordered conditions of the stomach or bowels, and be accompanied with an offensive odour of the evacuations, ten drops of the solution, mixed with two table-spoonfuls of water, may be swallowed twice a day, with the best effect. A good plan also, in cases of the latter kind, is to take five grains of powdered charcoal three times a day, either alone or with an equal quantity of white bismuth. Charcoal biscuits are prepared for this purpose, and may be had at most of the principal chemists. Animal charcoal is the most effectual. In a very offensive and intractable case, a respirator of charcoal might be worn, such as is recommended to be used by persons exposed to foul or to infectious odours. The breath has such an exceedingly bad odour in cases of mortification of the lungs, that it will be necessary to employ some of the means recommended under the head *Disinfectants*, in order to make the atmosphere of the room, or even of the house, in which the patient is situated, at all tolerable. The peculiar odour of the breath in patients who are undergoing what is called a course of mercury, is so characteristic as to have received the name among medical men of mercurial fœtor. In cases of bad breath caused by offensive discharge from the nose, the diluted solution recommended above, or a weak solution of carbolic acid, should be injected into the nostrils with a syringe, and warm water should be, at the same time, freely injected. In such cases, tonics, cod-liver oil, and residence at a bracing part of the sea-coast are very beneficial. It is again repeated, however, that such cases, especially if ulceration be suspected, should at once be put under the care of a medical man.

People who suffer from foul breath, from whatever cause, should never employ musk, or any other aromatic substance, with a view to covering or masking the unpleasant odour by a stronger one. Such practices are always disgusting, and, of course, have no effect in remedying the evil.—See *Lungs—Respiration.*

BRIGHTON.—The favourite watering-place on the south coast of England. It is well sheltered from the north by the downs, and the air as a rule is dry and bracing, and many Londoners flock to it annually as a health resort. Cold winds prevail in the spring and late winter, and it should be avoided by invalids at these times.

For convalescents, and all persons who require bracing, and in whose cases sea-air is suitable, Brighton presents one of the most favourable climates which can be selected. For children and young persons generally, it forms an excellent residence.

BRIGHT'S DISEASE.—An affection of the kidneys in which albumen remains persistent in the urine. This symptom is characteristic of acute and chronic inflammation of the kidneys (*nephritis*), which are often termed simply *albuminuria*. Acute Bright's disease is by no means an uncommon complaint, being due sometimes to exposure to cold, causing a suppression of the cutaneous secretion; but it is far more frequently met with as a consequence of scarlet fever, and occasionally of measles and erysipelas. The symptoms vary with the nature of the attack, and are sometimes so slight as to escape observation; there is usually, however, a feeling of chilliness, with pains in the back and loins, and other febrile symptoms. Then appears swelling of the face, feet, and legs, which frequently extends over the whole body. From the first the urine is loaded with albumen, and when heated in a test tube by means of a spirit lamp, it becomes first flocculent and then a solid mass. The urine also contains a little blood and casts of the tubules from the kidneys. In the most favourable cases, the amount of urine secreted is not much diminished, and the blood and albumen are limited in amount; but in the unpromising class, the reverse is the case. In professional hands, the treatment consists in aiding the action of the skin by warm and hot-air baths, and in keeping the bowels freely open. Diuretics require to be administered of the mildest character, such as linseed tea, barley-water, and tincture of digitalis.

The chronic forms of Bright's disease are far more numerous than the acute, the kidneys being subject to different kinds of degeneration,

often difficult to distinguish during life. Apart from the albumen in the urine, there may be swelling of the ankles and eyelids, and the person may for months and even years have no other symptoms. Dropsy, however, sets in sooner or later, the swelling of the ankles goes higher and higher, and the urine decreases in consequence, the dropsy at last carrying off the sufferer. Death very often results from the urea of the urine accumulating in the blood, giving rise to coma, and sometimes to delirium; but the causes of death are very various, being sometimes assignable to the heart, occasionally to the liver and to the lungs, and, most frequently of all, to a collective influence of disease in various organs. If no serious complication occurs, recovery in the first stage of the complaint may be hoped for; but as the disease becomes developed, the prospect is very unfavourable. Bright's disease occurs at all ages and in both sexes, but it is more common after forty or fifty than before that time, and may be traced to intemperance, exposure to cold and unwholesome atmosphere, and to the scrofulous diathesis. Medical men can do little more in the way of treatment than relieve urgent symptoms of distress, since the disease is universally recognised as an incurable one. The dropsy is treated by medicines which have an action on the bowels, the skin, and the kidneys themselves, namely purgatives, diaphoretics, and diuretics. The diuretics used are more powerful than those employed in the acute stage of the complaint, and comprise nitric ether, broom decoction, and digitalis; the purgatives, Epsom salts, jalap, cream of tartar, and elaterium, a powerful cathartic which is given in doses of one-eighth of a grain. In the early stages (and in fact throughout the course of the disease) it is of essential importance that the patient be kept warm; and diaphoretics, such as Dover's powder and the diaphoretic saline mixture, as well as the hot-air bath, are usually recommended. Very little benefit accrues from tapping in Bright's disease, though it may be occasionally beneficial to give freedom to the fluid in the limbs by acupuncture, —the insertion of an instrument like a darning needle into parts which are most tense.

BRITISH CHOLERA.—See DIARRHŒA.

BROCCOLI—belongs to the cabbage tribe, the portion eaten being the undeveloped flower buds. When well boiled, it is one of our lightest and most wholesome vegetables.

BROILING is, perhaps, the most primitive method of cooking; the savage puts his piece of flesh or his fish upon the burning coals and broils it. In civilised life, the gridiron is made the medium for the process. The principle involved in broiling is, that by sudden exposure to the fire, the outer portions of the meat are so hardened that they retain the juices of the inner, during the process of cooking. This is still more fully effected by brushing over the surface of the meat with white of egg before putting on the fire. Broiling is not so well adapted for weak stomachs as either roasting or boiling; but meat cooked in this way is very nutritious.

BROKEN BONES.—See FRACTURES.

BRONCHITIS—is inflammation of the membrane lining the air-tubes or bronchi. In its subacute and chronic forms, it is one of the most common diseases of the climate of Britain; prevailing at all seasons, but especially in spring. It may be either acute, subacute, or chronic, and varies according to age. Acute bronchitis may commence directly in the chest after exposure to cold; but very often, particularly in children, the lining membranes of the eyelids, nostrils, and throat are first affected, and the disease spreads downwards into the air-passages of the chest. In the latter case, watering of the eyes, &c., precedes the actual bronchitic attack for a day or two. Acute bronchitis, as it occurs in the adult, is a severe disease, requiring the most prompt medical attendance; it is generally the result of exposure to cold in some way, but may be caused by irritant vapours. In it the fever is high, the breathing extremely oppressed, the cough frequent, and expectoration at first difficult. The disease terminates, either with the subsidence of these symptoms, the breathing and expectoration in particular, becoming easy; or respiration becomes more and more oppressed and difficult, the mucus which ought to be expectorated accumulates in the bronchial tubes, and the blood being unchanged, the lips and surface generally become blue and cold; delirium preceding death. The rapid progress which this disease sometimes makes, from its commencement to a fatal termination, renders the sending for medical assistance as quickly as possible an imperative duty; but the same reason renders it important that those around should be aware of the best method of treatment. Confinement to bed is a matter of course; but foot-baths, hot bran poultices to the chest, and warm diluent drinks, are all serviceable. The chief dependence is to be placed upon expectorant medicines, and ipecacuanha is the best and safest. Two tea-spoonfuls of the ipecacuanha wine should be given, or, better still, grain doses of the powder, either in milk or in some fluid, should be given in a little water every twenty minutes, till free vomiting is produced; and this repeated every two or three hours. About an hour after the first vomiting, four grains of calomel are to be given, and if the disease continues severe, repeated in six or eight hours. In the event of symptoms of collapse, or sinking coming on before the arrival of medical assistance, it will be necessary to stop the nauseating treatment, and to give stimulants, such as five grains of carbonate of ammonia, in three table-spoonfuls of water, every half hour or hour; or a tea-spoonful of sal volatile may be given instead, in the same quantity of water, and at the same intervals. If these stimuli are

not to be procured, the most readily obtainable alcoholic stimulant must be substituted; but ammonia is always preferable; the strength must at the same time be sustained by table-spoonfuls of strong meat broth frequently given. When the urgency of the attack has yielded under the use of the expectorant and emetic systems, the severity of the treatment may be relaxed, and the following substituted; Three grains of ipecacuanha powder, a drachm of carbonate of potash, and an ounce and a half of spirit of mindererus are to be made into an eight ounce mixture with water; and of this two table-spoonfuls should be given every three or four hours. If the cough is very troublesome, three or four drops of laudanum may be added to some of the doses—but this cautiously. The diet must be light and nourishing.

The acute bronchitis of children is not usually so rapid and strongly marked a disease as that just described; it often begins with the irritation of the membrane of the nose and eyes, and extends itself into the chest. Languor, succeeded by fever, oppressed and quickened respiration, and cough, are the usual symptoms. With these there is a dry hot skin, full and rapid pulse, and great increase in temperature. If these set in severely, from one to four leeches, according to the age of the child, may in an early stage of the disease be applied to the chest; but here, as in the adult, the chief dependence must be on ipecacuanha, half a grain to a grain, or more, frequently repeated so as to cause occasional vomiting. Poultices ought to be used to the chest. If the child is unweaned, it must not be allowed to suck, either from the breast or bottle, during a severe attack of bronchitis, but ought to be fed with the breast milk, or its usual food, by means of a spoon. The bowels, of course, will require attention. It is of the greatest importance to attend to the atmosphere surrounding either child or adult suffering from bronchitis: the chamber should be well ventilated, and the temperature not suffered to fall below 60° Fahr. The bronchitis kettle (see *Bronchitis Kettles*) should be employed to add moisture to the air of the room, and the warm bath may be occasionally employed, taking care that the child should be thoroughly dried before being put back in its cot. In the later stages of the complaint, the warm bath is not advisable. Bronchitis in children is so hazardous and frequently fatal a disease, that its domestic treatment ought never to be undertaken, except under necessity. Its exciting cause is almost invariably cold and moisture, particularly during the prevalence of east wind in the spring months; whilst careless and insufficient clothing amongst the poor, and absurd modes of dressing amid the higher classes, render children more susceptible of these injurious influences.

Chronic bronchitis, known also as winter-cough, catarrh, and often erroneously called influenza, is quite the commonest form of this chest affection, and assumes every condition, from the almost acute attack, to the cough which comes on with the first advent of cold weather, and lasts through the winter and spring. The malady may commence with irritation of any portion of the continuous membrane of the eyes, nostrils, throat, or trachea; the part affected feels sore and raw, and instead of its usual bland mucus, secretes a thin, somewhat acrid fluid; along with the local symptoms, there is more or less feverish disturbance of the system, and often severe frontal headache; cough is present, or not, at first, according to the part affected. If a threatened attack of bronchitis is to be checked, it must be done in the earliest stage, and for this purpose nothing is more efficacious than the hot-air bath, and in its absence, the employment of means to produce free perspiration, such as hot foot-baths, a hot bed, and the free use of warm diluent drinks. The most efficient medicine for the purpose of checking is opium, in small doses, and no better form can be found than that of English paregoric or compound tincture of camphor, one or two tea-spoonfuls, along with a table-spoonful of solution of acetate of ammonia, and twenty drops either of ipecacuanha or antimonial wine, should be given at bedtime, along with sufficient water to fill a wine-glass. A tea-spoonful of spirit of sweet nitre may be substituted for the spirit of mindererus. An aperient should be taken in the morning. The above dose may be repeated for two or three nights in succession, if the disease is unchecked. In this case, of course, confinement to the house, or to bed, is required; and demulcent drinks—barley-water is the best—are to be freely used. There is seldom occasion for much medicine; for the alleviation of the cough, the following mixture will be found useful:—Tolu syrup, one ounce and a half; thick mucilage of gum-arabic, one ounce and a half; ipecacuanha wine, one drachm; water, sufficient to make up six ounces. Of this, a table-spoonful may be taken every four hours. If the cough is very troublesome, forty drops of laudanum may be added, and towards the end of the attack, a drachm of tincture of squills.

Linseed meal or bran poultices to the throat and chest are of service at the commencemen of subacute bronchitis; mustard plasters are not advisable when there is much fever or heat of skin, but a *small* blister to the upper part of the chest will frequently stop the further progress of the malady. In the attacks, the diet of course ought to be reduced, and meat and stimuli eschewed whilst they last. An attack of subacute bronchitis ought never, if it possibly can be avoided, be allowed to establish itself for any length of time; consumption, asthma, and other chest affections are too nearly allied to it, and too often the seeds of fatal disease, which otherwise might have lain dormant for years, are quickened into activity by the neglected cold.

The bronchitic attacks of the aged are always to be regarded with serious attention; what in youth might be but a slight cold, may now be a fatal disease; this arises partly from the viscid nature of the secreted mucus, but more especially from the inability of persons advanced in life to expectorate it; accumulation of phlegm takes place in the bronchial tubes, the oxygenation of the blood is interfered with, torpidity of the vital functions ensues, and adds to the already existing inability to free the lungs, and death quickly takes place, often unexpectedly sudden. For the above reasons, colds in old people must always be watched; all lowering measures must be avoided, the diet kept nourishing, and the medicines be stimulant expectorants. Opium should not be ventured on without medical sanction; the compound squill pill is useful. Camphor, in the form of julep, carbonate of ammonia, and sal volatile, are frequently required. The inhalation of steam by means of the bronchitis kettle or ordinary inhaler, will assist the expectoration of viscid mucus. Confirmed chronic bronchitis, or winter cough, requires rather management than medicine—protection of the skin generally, particularly that of the chest, by flannel worn next it, being most important. Some persons derive much comfort from wearing on the chest a dressed hair-skin, with the fur inwards, or cotton wadding, or chamois leather. The feet, of course, are to be well protected from cold and damp by thick or cork-soled shoes; and the air passing into the lungs warmed by means of one of the various respirators now in use. As an ordinary method for allaying irritation, a tea-spoonful of paregoric, taken at bedtime in a little water, is most serviceable; or where the opium is objectionable, three or four grains of extract of henbane, or of hemlock, in the form of a pill. In all forms of bronchitis the condition of the stomach and digestive organs requires due attention. When cough is frequent and violent, the mechanical effect upon the stomach is liable to disorder digestion, and this again reacts upon the lungs, increasing irritation; for this reason the food must be kept light, and a dose of compound rhubarb and blue pill taken occasionally. The infusion of hop, at once a good tonic bitter and a sedative, is useful. In some forms of bronchitis, in which the cough assumes a spasmodic character, and particularly in children, coming on when the stomach is empty, a little food taken will more certainly allay its incessant irritation than any other means.

BRONCHITIS KETTLES.—The importance of imparting moisture to the air inhaled by a person suffering from disease of the lungs or air passages, is now universally recog-

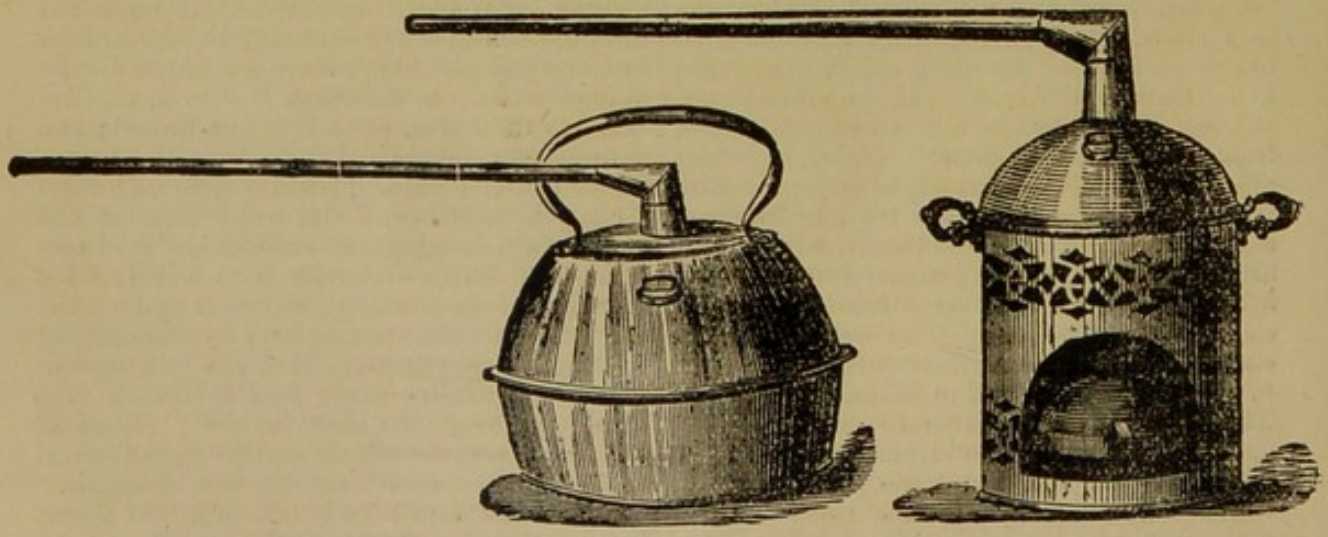


Fig. 48.

nised by medical men, and various apparatus are employed in the sick-room for this purpose, the best known being the croup or bronchitis kettles, which are made either fitted for an ordinary fireplace or furnished with a spirit lamp, so that the apparatus may be brought near to the bed of the patient. The kettle is fitted with one or more steam pipes, usually of a long horizontal shape, telescoped into each other. The two specimens represented secure the conditions above stated; they are each made to hold five pints of water, and are manufactured by Allen & Son, of Marylebone Lane.

Refer to—*Expectorants, &c.*

BRONCHOCELE — Goitre — Derbyshire Neck—Full Throat—are all names for the same disease, an enlargement of the "thyroid gland" situated in front of the windpipe. The disease is endemic, that is to say, it is confined to particular districts of country. In England, Derbyshire, and the adjoining counties of Stafford, Leicester, and Nottingham, form its chief locality. In Switzerland and the Tyrol it is common; and it occurs in Hindostan, Canada, &c.

Full throat varies in size, from the enlargement so slight as to be scarcely perceptible—or even, in some eyes, to add grace to the neck—

to a tumour many pounds in weight. In Britain, however, it seldom attains the immense size it does elsewhere. The thyroid gland consists of two lobes, which lie on either side of the windpipe, and of a connecting neck. The whole of these parts may suffer enlargement at once, or only one of them. Bronchocele is much more common in females than in males; indeed, in this country it is rarely seen among the latter; and in both sexes, as a general rule, does not appear till after puberty; children, however, do suffer from it even from earliest infancy. The rise and progress of bronchocele are for the most part slow, unaccompanied with pain; but occasionally rapid enlargement occurs, and then pain is severe. Coughs, childbearing, strong muscular exertions, are all liable to induce and accelerate the progress of bronchocele; the monthly period also exerts considerable influence upon it. Females of lymphatic temperament are more liable to be attacked.

Bronchocele is a disease for the most part devoid of danger; the chief inconvenience attending it when of large size being impediment to the breathing, and fulness of the head arising from obstruction to the circulation in the vessels of the head and neck. The appearance of a large bronchocele is of course unsightly, although in those localities in which it prevails it is scarcely observed.

Various causes have been assigned for the production of bronchocele; but none with so much probability as that which attributes it to the regular use of water containing lime and magnesia, which are always found in excess in goitrous districts. The use of snow water, as formerly supposed, is now proved to have nothing to do with its development. Carrying heavy weights upon the head has been said to cause the disease; it is not probable that of itself the practice could produce true bronchocele; but undoubtedly, in common with all other physical efforts or forces, such as cough, which tend to impede temporarily and violently the general circulation about the neck, it will hasten its progress. It certainly is more common among the class of females who are forced to make strong physical exertions. Many different remedies have been proposed, but none possess the same efficiency as iodine; of course, so long as the disease is due to the water or air of the district, it is useless to attempt to remedy it by medicine, but in order to change the constitution, iodine has a powerful influence. Even before its discovery, the element was used, though ignorantly, in the form of the lozenge of burnt sponge. The best form of administering it is in the form of mixture, combined with iodide of potassium,—what is popularly termed Lugol's solution. The dose of this should commence with a teaspoonful three times a day, and be gradually increased. In addition to this the remedy is generally employed in the form of ointment or liniment, the former being preferred. It is made of equal parts (thirty-two grains) of iodine and of iodide of potassium, a drachm of proof spirit, and two ounces of lard, and should be rubbed into the swelling night and morning, intermitting the application, if the skin—as it often does—becomes sore; or the tumour may be painted over every night with compound tincture of iodine.

Acute attacks of bronchocele require the application of leeches and the use of purgatives, to allay excited action, before iodine can be used with advantage. Bronchocele ought always to be submitted to treatment as soon as discovered. If this is done there is seldom much difficulty in its removal; but if it is allowed to gain a large size, or if it is of old standing, it will resist the most persevering treatment, and perhaps prove a serious cause of inconvenience, especially if it becomes hardened, which it not unfrequently does as life advances. When the ordinary remedies have failed to give relief, and the disease becomes so aggravated as to interfere with important functions, it may be necessary that the surgeon should puncture the cyst, or even remove a portion of the tumour. The latter operation is, however, very dangerous, and is not often attempted.

Refer to—*Iodine.*

BRONCHOTOMY is the operation of making an artificial opening in the bronchial tube, in cases in which suffocation is threatened from any cause which impedes or stops the passage of air into the lungs.

BROOM.—The common broom is one of our most certain and valuable diuretics, too much neglected; it is, also, perfectly safe. The decoction is made from the dried tops of the broom, which grows so extensively in these islands; an ounce of broom is to be boiled for ten minutes in a pint of water, then strained and as much water poured over the contents of the strainer as will make up a pint. The dose is from two to four ounces twice or thrice a day. It may be combined with juniper berries and acetate of potash to increase its diuretic properties. In cases of liver affection, the substitution of half dandelion root for one half broom is a valuable combination. The seeds may be used when the tops cannot be procured.

BROTH is the decoction obtained from animal substances, and, when made for the sick, must, of course, be varied in strength, according to the state of the patient. It is best made by putting the article from which it is to be formed into the quantity of cold water requisite, and keeping the whole at a heat somewhat short of boiling, for many hours: it should then be allowed to become cold and the fat skimmed off. In cases of diarrhœa, broth, in quantity, is apt to increase the tendency, but it is at the same time extremely beneficial, if properly managed; in such cases, it is best made from veal or fowl, and thickened with

rice—which may be strained off—and gelatine; and it must be given in small quantities only at a time. In Scotland, by broth is meant the decoction from meat, boiled with pearl barley, and a good proportion of vegetables; it is a much used and wholesome article of diet, and might, with advantage, form an addition to the fare of the English,—the labourer in particular. To be wholesome it must be thoroughly boiled.

Refer to—*Beef — Beef-tea — Mutton — Veal, &c.*

BROW AGUE—a name for neuralgia of the head, derived from the marked periodicity of the attacks of pain.

Refer to—*Neuralgia.*

BRUISES and **CONTUSIONS** are the effects of external violence applied to the body, and may be simple, or complicated with wound of the skin. The effects of bruises depend, of course, greatly upon their situation, and the possibility of the violence which produced them having injured important parts, this being more likely to happen when the contusion affects the head, neck, or trunk. The first effect of a bruise is to cause effusion of blood, more or less, within the textures injured; on the head this is very evident from the large tumour which will often rise immediately after a blow;—a black eye renders the effused blood visible. Blood effused, as the result of a bruise, does not remain in one spot, but diffuses itself through the loose surrounding textures, and causes discolorations to appear at a distance from the bruise, days after the receipt of the injury. The changes in colour, from black or blue to greenish-yellow, &c., which take place during the recovery after a bruise, and which are caused by the mode of absorption of the effused blood, are too well known to require description. After bruises of the abdomen, particular attention should be directed to detect the occurrence of blood, either in the stools or urine; if a medical man is called in, it is highly important for him to have information on these points. In bruises of the surface generally, the best and most agreeable application is ice-cold water, kept up by means of india rubber bags, or a cold lotion made with half an ounce of methylated spirits to the pint of water. Should inflammation increase and symptoms of suppuration appear, hot applications—poultices—will be most required. If heat be used too soon, it may tend to increase the effusion of blood, which the cold checks. The same treatment may be followed, whether the bruise is simple, or complicated with a wound. It is a frequent error, popularly, to apply leeches *immediately* after a bruise, when they cannot possibly be of service; they cannot remove the blood which is effused, and are only useful in the event of inflammation succeeding the injury. After pain and inflammation in a bruise have subsided, simple water-dressing may be substituted for the poultices for a few days, and after that, should discoloured swelling remain, friction with soap-liniment will hasten its removal. The blebs which frequently follow a bruise may be pricked, and the fluid allowed to escape, after which cotton wadding should be applied to protect the part from the external air. The new American remedy, *hazeline*, prepared from the wych hazel, may well supersede arnica as an outward application. A severe bruise may run on to the formation of an abscess, or end in mortification of the part. In either case, the effect is known by the supervention of the usual symptoms attendant on these processes, and must be treated accordingly. Severe bruise of a bone is liable to be followed by death and separation of the injured part.

Refer to—*Abscess—Concussion—Mortification—Wounds, bruised.*

BUBO is the inflammatory swelling of a lymphatic gland, tending to suppuration. The term is most generally applied to the glands of the groin, when affected, either by venereal causes, or from an injury to the foot or limb affecting the lymphatics. The treatment of bubo is similar to that required in abscess generally.

BUCK-BEAN is one of the most beautiful of our marsh plants. It bears a trefoil leaf, and flowers in June. The blossoms are white and feathery-looking, with a tinge of pink. The leaves of the buck-bean are powerfully bitter, and might, perhaps, be more generally used as a tonic than they are at present. It has also been recommended as a remedy for worms. The infusion may be made with an ounce of dried leaves to a pint of water.

BUCK-THORN is a shrub, native to Britain. A syrup made from its berries is used as a purgative, but it is apt to gripe, and need not be used when there are so many better medicines of the same class.

BUNION is the result of chronic inflammation of a small bursa which is situated over the joint—at the ball—of the great toe, and is generally occasioned by the pressure of tight shoes. It is a most inconvenient and unsightly affection, and the more it enlarges, the more does it become exposed to those sources of irritation which originated it. A bunion ought to be attended to at first, and one or two leeches, warm fomentation and poultice used to allay irritation, the offending shoe being at once discarded. Malposition of the bones at the joint, is a frequent attendant, and perhaps, an antecedent cause of bunion. When the disease is fully formed, the best plan is to avoid, by the make of the shoe, &c., every source of irritant pressure.

BURGUNDY PITCH is a resin obtained from the pine tribe, but the real article is seldom procurable; that sold for it being a preparation made from common resin. It is used for plasters and is slightly stimulant.

BURIAL. — As a general rule, it is de-

sirable that the bodies of the dead should be consigned to the earth as soon as consistent with decency and necessary arrangement, more especially where, as in the dwellings of the poor, space is confined and crowded. As a rule, some means for the purification of the air in the chamber occupied by a corpse should be provided, and this is best done by thorough ventilation of the room and the use of a disinfectant, such as carbolic acid or chloride of lime. This is especially called for in cases of infectious disease. The coffin in these cases should be well pitched inside.

Refer to—*Death.*

BURNETT'S SOLUTION, or, as it is sometimes called, Sir Wm. Burnett's Disinfecting Fluid, is one of the cheapest and best liquid disinfectants (see *Disinfectants*). It is composed of a solution of chloride of zinc, and, from its cheapness, has been much used in the departments of the public service. When diluted with water, it may be used to cleanse night chairs, water closets, chamber utensils, &c., and is especially useful for this purpose in cases of gastric, enteric, or, as it is often called, typhoid fever, in which the stools are not only offensive, but are the means of conveying to others the contagious poison peculiar to the disease. The solution is so cheap that it may be freely used for the above and for similar purposes. It may be used as a stimulant, disinfecting and deodorising dressing to foul-smelling ulcers and sores, but for such purposes it must be freely diluted, according to the directions which are furnished for its use in the different ways recommended. The chief objection to the free employment of Burnett's disinfector is its poisonous character. If used at all in private houses, it ought always to be carefully labelled Poison, and placed in the custody of some responsible person. Sulphate of iron and carbolic acid are now being more generally used than chloride of zinc.

BURNS and **SCALDS** are injuries inflicted upon the body by heat, the latter term being confined to those cases in which the medium has either been liquid or vapour. A burn may vary in intensity, from the slightest scorch, to complete roasting of the tissues; a scald is not so severe in its effects. There are, perhaps, no accidents for which more remedies have been proposed and used than those resulting from heat; but it will be sufficient if the best, and most generally and easily applicable, are kept in mind. The following may be laid down as at once the simplest and the best, as well as the most readily applicable, and the least painful and troublesome method of treatment. Suppose a person, whose clothes have been set on fire, to be badly burned. The clothes should at once be cut off and removed. The patient must, however, be kept warm, as he invariably suffers much from cold and depression soon after a burn. The burned surface should next be smeared over with a feather with some oily substance, it does not much matter what, provided it be fresh. Carron oil is good, if it can be had (*i.e.*, equal parts of olive or linseed oil and lime water). Next, linen or muslin is to be steeped in this oily substance, and laid over the burned parts. Those parts which are much burned ought to be well protected with this, and finally a layer of cotton wool should be put on and secured by some light turns of a bandage. Cold water is perhaps the most directly grateful application to a burnt or scalded surface, and if continued sufficiently long, will undoubtedly restore the usual condition of the part, but it must be persevered with for many hours, and when a burn or scald is extensive, this is a serious objection, in consequence of the extreme constitutional depression which so often follows the accident, especially in the young; and here the opportunity is taken of warning parents of the necessity of watching closely the effects of even slight injuries of this kind upon children, particularly when the chest or abdomen is the seat of the accident; extreme depression requiring the free use of stimulants may unexpectedly come on, and death, from an apparently very slight cause, be the result. Whatever application is used in the treatment of a burn, should be calculated to exclude the action of the external air; it ought to be one also, which does not require frequent changing; indeed, the more extensive the surface involved in the accident, the greater care should be taken not to expose it to atmospheric influence, which, in the first place, increases pain, and in the second, adds to constitutional depression. This depression must always be carefully watched, and combated by the use of ammonia, wine, or spirit, sufficient to support without stimulating. When pain is excessive, and is irritating the nervous system, a gentle opiate is required; but in some of the severest burns, the sensation, not only in the injured part, but generally, is either wholly or partially abolished, in consequence of the shock to the nervous system at large. The symptom is of most serious, and indeed fatal, import. In the less severe forms of injury from heat, if the treatment has been properly pursued, little after-treatment is necessary; but when a burn has been neglected or badly treated, or caked with flour or other powder, when the blisters are broken, and the true skin beneath is inflamed, and secreting matter, a simple tepid bread and water poultice should, in the first place, be applied for six or eight hours, and after it an ointment composed of one drachm of glycerine of subacetate of lead, rubbed up with an ounce of perfectly fresh lard, or carbolic oil dressing may be applied. The ointment, spread on linen, quickly relieves the very painful condition of the injured surface, and is often preferable to the lead lotion sometimes used.

In the case of slight burns, and of scalds generally, quite the best application is the

cotton wadding in sheets; it should be at once used to envelop the injured parts, double if possible, and bound or bandaged on with moderate firmness. If this mode of treatment be resorted to within the first twenty minutes after the injury, nothing more need be done; the cotton may be allowed to remain on from twenty-four hours to three or four days, according to the severity of the accident. Under its use blistering rarely occurs, and if it has commenced before the application, it subsides quickly and painlessly. For the first ten minutes after the cotton dressing is put on, the pain of the injured parts seems increased, but ere long it diminishes, and the inflamed skin appears to relieve itself by gentle perspiration. In the cases above named, when cotton is to be procured—and no house in the country ought to be without one or two sheets of it—it is perfectly unnecessary to use any other measures.

During the cure of burns involving contiguous parts, such as the fingers, care must always be taken to keep the surfaces asunder by the interposed dressings, otherwise they may become united. After extensive burns or scalds, the constitution requires attention; the stimulating treatment of the first few hours or days must be dropped when feverish symptoms come on, and mild and cooling diet, gentle aperients, and cooling and saline medicines administered; opium being given if requisite to allay pain or nervous irritation. This system will again require to be changed for one of stronger nourishment; meat soups, meat and wine, or other stimuli, if there is continued discharge. The use of stimulating diet, however, requires caution, on account of the tendency to inflammation of the lining membrane of the stomach and bowels, which exists during convalescence from injury to the skin by heat.

The frequent occurrence of accidents from burns or scalds, renders it desirable that all should be aware of the best methods of managing these painful injuries, which, when slight, may be well attended to without the aid of the surgeon; but which, when severe and extensive, and when, in children, the chest or abdomen is involved, ought, without delay, to be put under professional care; accidents and symptoms may arise which educated skill alone can foresee or counteract. Scalds of the throat are not unusual accidents to children in consequence of their attempting to drink from the spout of a kettle of boiling water. The injury is imminently dangerous, and when it has occurred, *whether alarming symptoms come on at once or not*, a surgeon should be summoned; it may probably become necessary very speedily to open the windpipe to save from death by suffocation; and the operation may be resorted to with good hope of success. In the interval, before the arrival of medical aid, leeches, from two or six, according to the age of the child, should be applied to the throat externally, and four grains of calomel administered at once. If ice is to be procured, it should be constantly put into the mouth in small fragments.

In managing burns or scalds immediately after their occurrence, the following should be remembered:—

To protect from the action of the atmosphere—and the greater the extent injured the more necessary the precaution—to give stimulants or opium cautiously. The external remedies—cotton-wool, oil and lime-water, and carbolic oil.

Refer to—*Skin, Water-dressing, Emergencies.*

BURSÆ are small bags of membrane, containing an oil-like fluid. They exist naturally in various parts of the body between the bones and the skin, acting as lubricating pads; in other parts they are occasionally developed by internal pressure or friction. The most conspicuous are those on the knee-cap and the elbow; when irritated or inflamed the bursa on the knee-cap gives rise to "housemaid's knee." Occasionally, if much inflamed, they degenerate into abscesses.

BUTE—an island in the Frith of Clyde, possesses "a mild, equable, but rather humid" climate, resembling in this respect the south-west of England. Invalids, for whom the air is not too relaxing, find Rothesay, in Bute, a good winter residence.

BUTTER consists of the fatty part of milk, and is one of the most wholesome articles of diet. It is obtained by the direct churning of milk, and besides the fatty constituents, it contains a certain amount of casein and milk-sugar. Possessing the same characters as fat, it is essentially a heat-giving or respiratory food, and, in combination with bread, supplies a want which is almost instinctively felt by every one. It has the advantage over fat in being less likely to disagree with a delicate stomach. It is to be avoided by invalids when at all rancid, as it then produces stomach-irritation owing to the presence of butyric acid, the product of decomposition. Butter has always more or less salt added to it, and cheap butters have often more than their due proportion, which ought never to exceed eight per cent. To preserve it better, a small amount of sugar is sometimes added to it. The chief adulteration of butter is with water, of which it may take up as much as thirty per cent., though it should never exceed twelve per cent. The other adulterations of butter with fats from various sources are not so easily recognisable, they are usually sold as Brittany and Normandy butters, and are imported into England from various sources. These butters may be wholesome enough in their way, but ought to be sold as substitutes, and not as the genuine article.

BUTTERINE — "Dutch" Butter — Oleomargarine or Edible Fat—all denote varieties of an article made expressly to imitate butter. This artificial butter appears to have come into commerce about the year 1872, and to have been proposed first by Mége Mouries, a

chemist. Its chief constituent is beef-fat (which consists for the most part of stearin, margarine, and olein), and it is largely manufactured in the Netherlands, and also in the United States of America, where animal life is abundant and cheap. As conducted in Chicago, however, the operation of transmogrifying beef-fat into a presentable imitation of butter, is managed in a cleanly fashion, and is thus described by a recent writer (Wynter Blyth on *Foods*).

"The beef-fat, freed first as much as possible from fibre, passes in a very finely divided state from a sort of mincing machine, technically called a 'hasher,' to large tanks, where it is melted. . . . . The result of this process is, that the fat appears as a clean yellow oil, the water and *débris* sinking to the bottom, and a thin scum of impurities rising to the surface. The latter is skimmed off, and the oil run into wooden cans in which the stearin, after a little time, begins to deposit in a more or less crystalline or granular condition. . . . . The refined fat is then filtered through cotton cloths, and pressed, when the stearin is left behind as a white cake, and is ultimately disposed of to the candlemaker. The oleo-margarine, at this stage, is quite tasteless, and has no flavour of butter. This flavour is given to it by churning with milk; lastly, the product is coloured with annatto, and rolled with ice; after which it is either made up into pounds, or packed into kegs for export. Arrived, in this country, it is either sold honestly as butterine at the price of about a shilling per pound; fraudulently, at a higher price, as butter; or it is used as an adulterant of butter."

Mr. Blyth adds that, in all such preparations, there is a great deficiency of the soluble fatty acids as compared with true butter-fat.

BUTTERMILK, the thin acid fluid left after the separation of the butter, is a most wholesome and refreshing article of diet, either in health or sickness, and one too much neglected. In diseases attended with fever it may be given largely with benefit. It can be made artificially, by shaking a quantity of milk in a bottle, capable of containing four times the quantity, until the butter—which must be strained off—is separated; the cork of the bottle being removed occasionally during the process, to permit of the renewal of the air.

BUXTON, celebrated for its mineral springs, is situated in an elevated part of Derbyshire. It is much frequented for the purpose of bathing, during the summer months, by those who suffer from chronic gout and rheumatism; and many persons derive much benefit in these diseases from the use of the waters. The season extends from the beginning of June till October. The waters contain carbonates of lime and magnesia, with chlorides of lime, sodium, and potassium, together with a large amount of free carbonic acid, and issue from the limestone rocks at a temperature of 80° Fahr.

CABBAGE, as an article of diet, is not only wholesome but nutritious; it is, however, best suited for persons of good digestive powers. From the extreme liability of cabbage to pass into a state of putrefaction, it should always be used as fresh as possible.

CACHEXIA is a term used to express an unhealthy state of the system, induced by causes—such as deficient or unwholesome nourishment—which tend to depress, without causing fever. The word is also employed to characterise a condition of the body brought about by disease such as cancer, and is usually indicated by the sallow and dusky hue of the complexion.—See *Scurvy—Rickets, &c.*

CADDIS.—Lint.

CÆCUM.—The commencement of the large intestine.—See *Alimentary Canal.*

CÆSARIAN OPERATION is the process of extracting the infant by cutting through the walls of the abdomen and womb. It is occasionally resorted to by medical men, as a fearful necessity, to save life, when delivery can in no other way be effected. It derives its name from the tradition that Julius Cæsar was brought into the world in this manner.

CAFFEINE is the characteristic principle of coffee, identical with that of tea, "theine." It is a compound, nearly approaching the kreatine of animal muscle in its constitution. In some forms of nervous headache caffeine is specially useful. Bishop's granular effervescing caffeine is an excellent and convenient preparation.—See *Coffee.*

CALABAR BEAN, The Ordeal Bean of Old Calabar.—This is the seed or bean of a plant called the *Physostigma venosum.* It is of a brown coffee colour, kidney shaped, and about one inch long by half an inch thick. The kernel is the active part. When given internally, it acts as a powerful poison, causing paralysis of the heart and asphyxia. The extract of the bean and the powdered bean are sometimes used in medicine, as remedies in cases of strychnine poisoning and tetanus. Their power of rendering flaccid muscular rigidity is undoubted, but their virtue in other respects is questionable.

The Calabar bean first attracted attention from the discovery by Dr Argyll Robertson of Edinburgh, that when a solution of it was applied to the eye, it caused contraction of the pupil. Now previous to this, medical men were not acquainted with any substance which could be practically used for this purpose. It is well known that the opposite effect, viz., dilatation of the pupil of the eye, can be readily produced by belladonna, or by its active principle atropia, which are extensively used for this purpose in the treatment of eye diseases. The Calabar bean is used to counteract this effect of belladonna when it is excessive, or when it continues too long. It is also used in the treatment of disease of the eye where it is necessary to produce an effect the

opposite to that of belladonna, and it is capable of application to many cases of alteration of the power of vision owing to the faulty adaptation of the structures of the eye to distances. A drop or two of the solution of an alcoholic extract in glycerine is applied to the eye, or still better, what are called Calabar bean discs are used for this purpose.

CALCULUS.—See GRAVEL.

CALOMEL.—See MERCURIALS.

CALORIC.—The term used to distinguish the cause of the sensation of heat, from the sensation itself.—See *Heat.*

CALUMBA, or **COLUMBO** or **COLOMBA,** are different modes of spelling the name of the same root. Calumba-root is sold in transverse sections of various diameter and

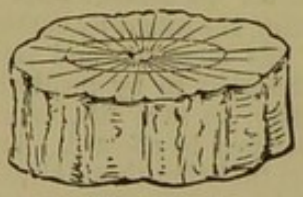


Fig. 49.

thickness (fig. 49), which are covered by a brown wrinkled bark, are of a greyish-yellow colour, and rayed on the cut surface. Calumba is one of the best pure bitter tonics we possess; it is free from astringency, and exerts a sedative action. In irritable dyspepsia, with vomiting, and particularly in the vomiting of pregnancy, its effects are most beneficial, especially when it is combined with from five to fifteen grains of either bicarbonate of soda or of potass. Calumba may be given in powder, in infusion, or tincture, but never in decoction. The dose of the powder is from ten grains to twenty; of the infusion, from a table-spoonful to a wine-glassful; of the tincture, one to two tea-spoonfuls in water. The powder of calumba may be taken in water, simple or aromatic: eight parts of calumba powder, eight parts of carbonate of soda, and two parts of ginger, form a most excellent stomachic in dyspepsia, of which half a tea-spoonful may be taken in a wine-glassful of water once or twice a day. Infusion of calumba is made by pouring a pint of cold water upon an ounce of calumba root cut small, and macerating for a couple of hours in a covered vessel. It ought to be made fresh every day, as it quickly spoils. Tincture of calumba is better purchased.—See *Tinctures.*

CAMBOGE.—See GAMBOGE.

CAMPHOR is a white, semi-transparent, volatile substance, but resembles in some degree the volatile oils. It is a product of the camphor tree, and is prepared by sublimation, and again sublimed in bell-shaped masses for the purposes of commerce. It is stimulant, diaphoretic, anti-spasmodic, and anodyne. It possesses also some preservative and antiseptic properties, and is much used for destroying moths and other insects, which it probably does from its narcotic action. Camphor is but sparingly dissolved by water, but sufficiently so to communicate both taste and smell, and to form a slightly stimulant solution, or julep, which may either be used internally, or as a refrigerant lotion. It is most simply made by keeping a few fragments of camphor in a bottle of water. In the low stages of fever, camphor is one of the most valuable remedies we possess, exerting at once a stimulant and a soothing effect; it is sometimes given for the purpose in almond emulsion, but quite the best vehicle is milk. From twenty to thirty grains of powdered camphor are to be rubbed up in a mortar with an ounce of milk and five ounces of water gradually added; of this mixture the dose will be two table-spoonfuls. It must be remembered that camphor cannot be reduced to powder unless the lump is first wetted with a few drops of alcohol, or spirit of some kind. Spirit, oil, and acetic acid, all dissolve camphor readily; its solution or tincture, in the first, is well known as a dentifrice, and is frequently given domestically, dropped into water, as a stimulant, in colic, hysteria, &c. It is made by dissolving one ounce of camphor in eight ounces of spirit. The dose from ten to forty drops, in water. The solution of one ounce of camphor, in eight ounces of olive-oil, forms the common domestic stimulant embrocation, camphorated oil. The compound camphor liniment is also an excellent application in cases where it is advisable to use a more stimulating embrocation; it is made with two and a half ounces of camphor, a drachm of oil of lavender, five ounces of strong solution of ammonia and fifteen ounces of rectified spirit. An over-dose of camphor produces giddiness, confusion of sight, and delirium; an emetic is the best remedy.

Refer to—*Dentifrice—Embrocation.*

CANCER is one of the most fearful, and justly one of the most dreaded diseases to which the human frame is liable; and whilst its formidable nature classes it with those which ought *at once* to be placed under proper medical care, the same reason renders it most important that its first symptoms should be known and attended to, whilst there is yet time to save life. Cancer usually commences as a hard tumour, unaccompanied with inflammation, and either painless, or the seat of intermittent shooting pain. It more frequently occurs in females than in males, and attacks the breast oftener than any other organ. In men, the genitals are liable to be affected, and chimney-sweeps particularly, become the subjects of cancer of the scrotum, produced in all probability, from continual contact with the soot. The skin generally may become the seat of cancer. Of the internal organs, the womb in the female, and the stomach, are the most frequent seats of the disease; of these the symptoms will be noticed under the head of

the individual organs. Cancer is very rare under thirty years of age. When, from the nature of a tumour, its hardness, situation, age of the patient, and particularly if there be any hereditary bias towards the disease, incipient cancer is suspected, there should be no trifling, no leechings, or rubbing, or fomentings; the advice of a skilled surgeon should be sought at once; and neither time, distance, nor expense, should stand in the way of procuring that assistance which may not only preserve life, but save from a lingering and painful death. Should the suspicions be unfounded, the mind is restored to peace; should they be correct, the one remedy, excision, cannot be too soon submitted to, before the glands adjacent to the disease, or other textures of the body, become tainted. In any stage of the disease, however, the advice of the regular practitioner ought to be taken; above all, let the sufferer and the friends beware of being tempted by the specious advertisements of quack remedies, and of wasting time of which every day is precious.

When, unfortunately, cancer has reached the stage at which hope of cure must be given up; when it has become an open grey-looking ulcer, discharging thin fœtid matter, the seat of shooting and stinging pain, and when the constitution is affected, it only remains to make the situation of the sufferer as comfortable as possible. Opium in its various forms is the great soother, and the other anodynes, hemlock especially, both internally and as a poultice, are all of service. Cod-liver oil in some cases allays the pain and retards the progress of the disease; but the regulation and administration of these remedies must be committed to the care of the medical attendant; the domestic remedies must be, the most perfect cleanliness and kindest consideration for the comfort and irritabilities of any one who is the victim of cancerous disease. Much may be done to mitigate the fœtor from cancerous sores by the application of antiseptics, of which charcoal in coarse powder is by far the best. The charcoal should be put in bags of fine muslin, in layers of not more than a fourth of an inch in thickness, and placed over the ordinary dressings. Cotton wadding prepared with charcoal has been found useful for a similar purpose, and wool soaked in a solution of boracic acid or chloralum is also employed with benefit. Cancer cannot be said to be propagated by contact; but this should be avoided as much as possible; in the intimate relations of husband and wife, especially, whatever the organ or structure affected.

The lower lip is not unfrequently the site of cancer in old people; especially in those who smoke much; a painful sore in this situation which will not heal, ought not to be neglected, but submitted to medical examination.

Refer to—*Breast—Stomach—Womb, &c.*

CANCRUM ORIS is a species of mortification, or gangrenous inflammation affecting the cheek and gums. It occurs in children of weak scrofulous constitution, who are ill fed, and exposed to the influences of unhealthy habitations; and most generally immediately after acute disease, particularly measles. Mercury is often blamed as the originator of this disease, and if given too freely, it may perhaps contribute towards its development; but the main fault is in the constitution. The usual first symptom of the disease is a red, hard, angry-looking spot on the cheek, which quickly opens into a gangrenous fœtid ulcer inside the mouth, the gums become affected, the teeth drop out, the breath, as might be expected, is unbearably fœtid, and the extending ulceration goes on destroying the cheek and contiguous parts, till it is either stopped, or death ensues.

As the first cause of this fearful affection is traceable to poverty of constitution, the first remedial measure is to nourish. The strongest meat soup—beef-tea is the best—must be given in small quantities frequently repeated; milk and eggs if the little patient will take them. Wine may be allowed if the debility is extreme, but scarcely, if at all, should fever run high and there be much heat of skin. The preparations of chlorine are most to be relied on as medicines. A drachm of chlorate of potash is to be dissolved in six ounces of water, and to this added twenty drops of diluted hydrochloric acid — a table-spoonful of the mixture to be given to a child of six years of age every four hours; it may be slightly sweetened. Half-grain doses of quinine, or an ounce of infusion of bark, may be given twice or three times in the twenty-four hours. A lotion made with an ounce of Condy's fluid to ten ounces of water, or weak carbolic acid solution, is extremely serviceable applied to the affected parts, and diminishes the fœtor, or solution of the chlorinated lime or soda may be used for the same purpose. The case ought to be seen by a medical man as soon as practicable, and the diseased structure, if possible, destroyed.

CANELLA BARK is an aromatic tonic, and is used as a spice. It may be given in powder, in doses of fifteen or twenty grains, but it is now superseded by other aromatics

CANINE TEETH.—See TEETH.

CANTHARIDES.—The word is the Latin plural of *Cantharis vesicatoria*, the Spanish blistering fly, an insect with long wings of a bright green colour. It is now chiefly brought from Hungary, where it is brushed in masses from the trees, and afterwards dried and reduced to powder. In addition to its uses as a blistering agent, the Spanish fly is used internally; but is too hazardous a remedy for general use. It is sometimes given as a poison for malicious or criminal purposes. When swallowed in a poisonous dose, cantharides quickly produce severe pain in the stomach and bowels, and intense inflammation; distressing irritation of the urinary organs follows, with

constant desire to pass urine, which comes away in small quantities, with or without blood, or is entirely suppressed; stupor and delirium precede death. The remedies in a case of poisoning by Spanish fly must be of the most soothing character; milk given cold may, as it coagulates in the stomach, envelop the irritant particles, or it may be used boiled with flour; white of egg, linseed tea, or indeed the emollient most quickly and easily procurable should be swallowed largely; and vomiting, if not present, promoted by a feather in the throat, or by ipecacuanha. Oil is sometimes forbidden in such cases, from its being a solvent of cantharides; but after vomiting, or even before, if the dose is not large, one or two doses of castor oil may safely and advantageously be given, each in combination with twenty or thirty drops of laudanum. Injections of starch, linseed tea, or the like, with or without laudanum, will allay the irritation in the lower bowels. Hot applications to the abdomen generally should be used, and if there is much tenderness, leeches, freely. Should the patient recover, the state of the alimentary canal and urinary organs for some time require care, and the mildest and most unirritating mode of living must be pursued.

Refer to—*Blister.*

CAOUTCHOUC, or Elastic Gum, or India Rubber, is obtained from different species of trees, both in South America and in the East Indies. It is interesting in medicine, from being the basis of the various elastic mechanical contrivances, now so extensively used in the relief and cure of disease. One of the chief inconveniences in the use of caoutchouc, was its becoming hard when cold; the discovery of its combination with sulphur—vulcanized india rubber—has obviated the difficulty, and we now have a material which remains perfectly elastic and soft at all temperatures. This valuable property has been quickly taken advantage of, and various appliances for the sick-room and hospital, composed mainly of india rubber are now constantly employed. Air and water cushions and mattresses, bags and other contrivances for the application of cold or heat, catheters, bougies, pessaries and douches are so many valuable adaptations of vulcanite for medical purposes.

—See *India Rubber.*

Refer to—*Elastic.*

CAPILLARY—hair-like. The term is applied to the minute vessels connecting the arteries with the veins in the animal body; also to tubes of minute calibre.

CAPSICUM.—Cayenne pepper is better known as a condiment than as a medicine, though it is extremely useful in the latter capacity also. A product of warm climates, it is admirably suited as a stimulant counteragent to the relaxing effects of heat. It is extensively used in this country, and when not immoderately, is undoubtedly serviceable to persons of languid digestion. In too large quantity it will, of course, prove an irritant poison. Capsicum is extensively used to check the craving for drink among dipsomaniacs, a dose composed of ten drops of the tincture, ten grains of bromide of potassium, and a drachm of spirits of ammonia, administered in a little water three or four times a day, will in most cases be found very beneficial. Two parts of cayenne, three of compound rhubarb pill, and one of quinine, form an excellent dinner pill, from three to six grains of which may be taken twenty minutes before the meal, for a week or ten days at a time, by persons of feeble habit of body, with tendency to constipation. Dr. Christison recommends a strong infusion of cayenne—a tea-spoonful in six fluid ounces of boiling water—to be used as a gargle in incipient sore throat—fever being absent. The tincture of capsicum is perhaps a more convenient preparation for this purpose, and may be used in the proportion of two drachms to five ounces of water. The accidental introduction of a particle of cayenne into the larynx is dangerous; it has occasioned death. The pepper is known to have been adulterated with red lead and other colouring matter.

CARAWAY SEEDS are the fruit of an umbelliferous plant, and are too familiarly known to require description. They are a good carminative, may be given whole, in tea-spoonful doses, or in the form of distilled water, a wine-glassful at a time, or may be added to other medicines, such as senna.

CARBOLIC ACID is obtained from the distillation of coal, of which process it is one of the products. It is an oily-looking liquid, having an odour and taste somewhat resembling creasote. Like creasote also, it possesses the property of destroying noxious smells and vapours, and is a powerful antiseptic or preserver from decay and putrefaction. It is given internally in the dose of one drop made into a pill, in cases of obstinate vomiting, and it might be tried in cases of sea-sickness, but its chief use is as an external application to foul and grangrenous sores or ulcers, and in cases of disease of the bones in which the discharge is very offensive. The strength of the lotion should be twelve grains of the acid to an ounce of water, being one in forty parts. Some have advocated carbolic acid as a disinfectant; but for a statement of its real value in this respect, we refer the reader to the article on *Di-infection.* The popular custom of suspending about a sick-room, sheets, &c., dipped in the solution, is useless, so far as disinfection is concerned, and encourages a false security.

Carbolic acid, when pure, forms long needle-shaped crystals, (which are very readily dissolved). It is now largely employed, in combination with lime or in simple solution, to destroy and prevent offensive smells from dung heaps, privies, and drains. Calvert's powder, which is also in much request, is a

combination of carbolic acid with alumina and silica.

Carbolic acid is now employed on a very extensive scale, in what is termed antiseptic surgery, whereby atmospheric impurities of all kinds are prevented and destroyed, and wounds and open sores rendered innocuous to the influence of the atmosphere. It is also largely employed as a deodorising agent and as a disinfector, though we have no satisfactory evidence of its power in this latter respect. As an antiseptic dressing for wounds, it remains without a rival. This system of dressing (which was introduced by Professor Lister, many years since) has gradually gained ground in hospitals and private practice, and has been productive of much benefit in reducing the mortality from surgical operations, as well as rendering practicable numerous operations which would be otherwise hazardous. One of its main benefits is its power of greatly lessening the tendency to erysipelas, blood-poisoning, and other complaints which were formerly considered to be more or less due to the crowding together of persons suffering from open sores. In order to obtain the full benefit of carbolic acid dressing, Lord Lister insists on attention being paid to the most minute details of the process, and there is no doubt that where the system fails of success these details are not rigidly carried out. One of the features of the process used to consist in rendering the air round a wound free from noxious germs, accomplished by a stream of spray from carbolic acid solution, which was made to play upon the wound and its surroundings, prior to its being thoroughly protected from the air by numerous prepared dressings. This is not now considered necessary, if the skin of the patient at the site of operation, and the hands of the operator are made thoroughly aseptic. Carbolic acid is largely employed for numerous surgical purposes without reducing it to the condition of spray; a weak solution may be injected into the cavities of abscesses, or into the internal passages in cases of cancerous and other offensively-smelling diseases. Mixed with olive oil in the proportion of twenty-four grains to the ounce (one in twenty), it is an excellent dressing for burns in a certain stage, and of wounds which have a tendency to suppurate or slough. Soaps made with variable quantities of carbolic acid are now largely used for scouring the floors and woodwork of rooms in which infectious disease has been located, and a toilet soap is much employed by doctors and nurses to remove noxious matters from their hands. Many cases of poisoning by carbolic acid have occurred from mistakes in its administration for other medicine. If the strong acid is taken, death follows quickly, and little can be done to alleviate the symptoms, but if the lotion is wrongly used, an emetic consisting of twenty grains of sulphate of zinc should be at once administered, and after the vomiting has ceased an ounce of castor oil and demulcent drinks should be given. Bottles containing carbolic acid and kept in a house, should always be labelled POISON.

CARBON—CARBONIC ACID—CARBURETTED HYDROGEN. Carbon, charcoal, occurs in its purest natural state in the form of the diamond, and of plumbago, both of which are pure carbon. It is one of the bodies considered elementary, and forms a large proportion of the matter of our globe and of its productions. The most familiar form of carbon is that of wood charcoal, which is interesting in a medical and hygienic point of view, from its powerful antiseptic properties, and the rapidity with which it removes the signs of, and tendency to putrescency. Water which has become putrid, as it frequently does at sea, is quickly restored to wholesomeness by agitation with charcoal powder. The powder is frequently applied to fœtid and sloughing sores, either sprinkled upon them or mixed with one of the common poultices: it is also a good dentifrice. Charcoal powder is often used with advantage in indigestion, particularly when it is accompanied with fœtid eructations and foul breath. A tea-spoonful of the powder may be given in a glass of water two or three times a day. Charcoal biscuits are prepared and taken for a similar purpose.

Either in a fixed or in a transitory condition, carbon is an important and abundant constituent of organized bodies. Of the vegetable kingdom it is the characteristic element; every leaf and every blade of grass which is exposed to the influence of day-light, is busy abstracting from the atmosphere the carbonic acid which is continually diffused through it in small proportions, decomposing it, and rendering back to the air the vital oxygen, but fixing the carbon as a component of the vegetable solids, and putting it in that form, in which, along with other elements, it is fitted to become the nutriment of the animal. Carbon, although not so characteristic a component of the animal, as of the vegetable kingdom, yet enters largely into the constitution of the former; it assists to give permanent form to the various tissues, and furnishes one of the most active material agents, which, under the influence of life, make up the sum, and contribute to the varied changes and effects which are ever going on in the animated body. We have every reason to believe, that carbon is the medium by which, as it combines with the oxygen inhaled by the lungs, and carried through the system by the blood, the animal temperature is maintained. Such being the case, it is evident, that next to oxygen, carbon is the element which must be most regularly and sufficiently supplied to the living body; the other constitutent elements must undoubtedly be provided in food, but their omission for a time is not so apparently and quickly felt as that of carbon; if this be not furnished from outward sources, it is used up from the bodily tissues as long as they will yield it,

even though its use involves their destruction, and the dispersion of the other elementary bodies of which they are composed. This actually happens in cases of starvation and in some diseases, during which little or no nourishment is taken: the carbon (and hydrogen) of the fat in the first place, and afterwards of the other portions of the body, is used up in sustaining the animal heat—as fuel—until a point is reached when it can be yielded no longer, and when the patient will actually die of cold, unless there is freely administered the gelatinous soups, the wine and spirit, with their abundant carbon and hydrogen, which yield their own combustible elements, to maintain the heat, and to protect the tissues of the already exhausted patient.

The discoveries of modern chemistry show us how beautifully the Almighty, in His goodness, has arranged the products of the various latitudes of the globe, has disposed the varied articles of food He gives to His creatures, to man, in accordance with the various climates and modes of life in those climates, so that carbon may be consumed in due proportion along with the other elements; less in the watery fruits of the tropics and of our own summers, more in the fats and oils of the cold north.

Refer to—*Aeration—Blood—Bile—Digestion—Food—Respiration, &c.*

CARBONIC ACID GAS or "choke damp," is a compound of one part of carbon with two parts of oxygen; it is colourless, and much heavier than atmospheric air, a property which gives it a dangerous tendency to collect at the lower parts of any enclosed spaces in which it may be disengaged. Old wells, brewers' vats, the holds of ships, &c., are all liable to become the receptacles for carbonic acid gas, which, formed from some decomposing vegetable matter, lies like a stratum of water at the bottom of the receptacle. Should any one incautiously descend, so as to become enveloped in the carbonic acid atmosphere, respiration is either instantly stopped by spasmodic closure of the chink at the upper portion of the windpipe, and complete suffocation is the consequence; or if the gas is sufficiently diluted with air to be drawn into the lungs, it speedily manifests its narcotic effects upon the system, and the person quickly falls into a complete state of stupor. The respiration becomes laboured, and after a time ceases; the countenance is livid or pale, and there may be convulsion, and frothing at the mouth. In such a case, the body of the individual must be removed, if possible, and as soon as possible, from the poisonous atmosphere, or the latter must be destroyed or dispersed. The many fatal accidents which have occurred from persons venturing rashly into old wells, and such places, might be a warning for the future, and prompt the invariable employment of the simple test of lowering a lighted candle into the suspected place. If the flame be extinguished, the atmosphere is certainly destructive to life; if it burn even with a feeble and diminished intensity, there is danger. Of the various modes of destroying a carbonic acid atmosphere, none is more speedily effective than the introduction into it of newly-slaked lime, either spread upon a board, or mixed with water and dashed into the place; fresh lime, having a powerful affinity for carbonic acid, quickly absorbs it. In the absence of lime, a quantity of fresh water dashed freely down, so as at the same time to absorb the gas and promote circulation of air, will be serviceable; or large bundles of combustible material, which will cause currents of air, may, when blazing freely, be thrown in. Caution in the first instance, is the best preservative; but in the event of an individual dropping in an atmosphere of choke damp, it is perfectly useless for others to rush in to bring him out; they can no more exist in it than he could, and in stooping to lift a fallen body, they become all the more thoroughly immersed in the poisonous gas. Instead of rashly sacrificing life in the ill-directed endeavour to rescue another, let those who are present dash bucket after bucket of water or weak lime and water into the place, and on the fallen person, until the unextinguished flame betokens that the fatal atmosphere is weakened at least; and when they do venture in, tie over the mouth a cloth soaked in lime-water, in a *weak* solution of caustic potash, or of simple water if these cannot be obtained.

In cases of suffocation from immersion in choke damp or from any other irrespirable gas, cold water should be dashed freely over the individual as soon as he is removed into the open air, and this measure is to be followed up by heat applied to the surface, stimulant embrocations to the chest, spine, &c., stimulant injections, and ammonia held *at intervals* to the nostrils, whilst artificial respiration is at the same time brought into action, and steadily persevered in for some hours.

Carbonic acid is produced during fermentation, or by the slow decomposition of vegetable matter, such as damp straw, sawdust, wood chips, &c. It is the gas disengaged in effervescing liquors generally; it is also produced along with other vapours of which carbon forms a constituent, in the burning of charcoal.

Poisoning by charcoal fumes, either by design or accident, is not an unfrequent occurrence. In the latter case, it usually occurs from persons ignorantly retiring to sleep in a closed-up room, in which burning charcoal is used as a means of warmth. The carbonic acid, and other fumes disengaged, act slowly and insidiously, and exert so powerful a narcotising effect, that those exposed to the influence are quickly rendered insensible. Too often it happens, that the discovery of the accident does not take place until morning, long after it is too late to remedy the fatal effects;

the sufferers are usually found dead. If living, they will probably be perfectly insensible; the countenance pale and livid. Immediate removal to the open air, and free exposure to its influence by removal of the greater part of the clothing, is the first proceeding, and the treatment recommended in cases of poisoning from choke damp is to be followed. Carbonic acid is largely evolved in the process of lime-burning, and persons who have incautiously slept in the immediate neighbourhood of a kiln have been destroyed by it. The poisonous contamination of the air in crowded assemblies has already been treated of in the articles, *Aeration*, *Air*, *Blood*, *&c.*

In medical practice, carbonic acid is given in the form of effervescing drinks. Some mineral waters contain it naturally; soda water, and other similar fluids, are mechanically impregnated with the gas; it is, too, very frequently given as disengaged from one of the carbonates of the alkalies by means of an acid. In most cases, the action of carbonic acid, given in this way, on the stomach, is very beneficial; it appears to be at once stimulant and sedative, and no remedy is more generally useful in cases of vomiting; it is an agreeable form of medicine to most persons. Iced soda water will often remain on the stomach when other drinks are rejected, and effervescing wines, especially champagne, are retained where still wines like port or sherry disagree. When effervescing drinks are given to persons confined to bed, they should always sit up for a few minutes after the draught is swallowed, to allow of the eructation of the air, which not being got rid of in a horizontal posture, may produce uncomfortable distension.

Refer to—*Effervescing.*

CARBUNCLE resembles a boil in many respects, but is larger. It is a hard, inflamed, intensely painful swelling, of any size, up to that of a saucer, or even larger; it is flat on the top, and contains a slough, or mortified portion of cellular tissue, which must be discharged before the disease can subside. After the inflamed swelling has existed for some days, small points of ulceration through the skin on its surface begin to show themselves, they enlarge, coalesce, and at last form one or more large openings, through which the slough or core is discharged, either entire or broken down and mixed with bloody matter. When all has been got rid of, the cavity begins to fill up from the bottom; and generally in the course of a few weeks becomes entirely healed. Such is the progress of a carbuncle, which does not require interference. The treatment consists in the first place, of assiduous fomentation, and poultices of bread, oatmeal or linseed meal with laudanum sprinkled on the surface to allay pain, and in the open stage, yeast; when the cavity is fairly emptied of sloughs, the poultice must be exchanged for carbolic oil or water dressing, which will in all probability require no alteration during the cure. A small carbuncle may thus, as far as the sore is concerned, be simply and safely attended to, but much more may be required. Carbuncle occurs in two very opposite states of system—in those of full habit, and in those of broken constitution. In the former, eight or ten leeches may with advantage be applied round the base of a large incipient carbuncle, and cooling saline medicines, and moderate diet be resorted to; should a surgeon be in attendance, he will probably make a free crucial incision to facilitate the exit of the core. In those of broken constitution, the opposite treatment will be requisite—all unnecessary loss of blood must be avoided, and whilst gentle alterative mercurial aperients are given, the system must be soothed by opiates, and supported by quinine or bark, along with strong meat broths, wine or porter. When the tongue has become tolerably clean, twenty minims of the dilute nitro-hydrochloric acid may be given with advantage three times a day, in a wine-glassful of water or infusion of bark, or with a grain of quinine. The addition of five or ten drops of chloric ether to each dose is pleasant and useful. In such constitutions, a carbuncle of any size is a serious, and not unfrequently a fatal affection. Carbuncle is certainly indicative of a deranged state of the system generally, and of the assimilative powers in particular; it more frequently happens too, that a large carbuncle has been preceded by two or three smaller ones, or boils, in succession, indications of blood poisoning. The occurrence of these ought always to be taken as a warning; the man of full habit should reduce his diet, meat and stimuli in particular, take exercise freely, and five or six grains of blue pill and compound colocynth pill occasionally with a gentle saline aperient in the morning. A carbuncle, if seen in its earlier stage, may often be checked by passing through it one or more strands of thread saturated with carbolic acid and glycerine. A tendency to carbuncle in the delicate or aged, must always be regarded seriously, not only as indicative of serious functional disorder of the assimilations, but from the direct danger arising from the disease itself. On this account, it is always desirable that the case should be put under efficient medical care early, so that, if possible, constitutional treatment may arrest the threatened evil. In the case of a carbuncle of any size being developed on persons advanced in life, of weak constitutional power, the case is too dangerous to be left to domestic management, if medical assistance can be procured; if not, the treatment must be carried out as above directed. Carbuncle may occur on any part of the body, but its chief seat is the nape of the neck.

CARBURETTED HYDROGEN. — Coal gas, or fire-damp, is a compound of carbon with hydrogen. The fearfully destructive

explosions in coal mines are in a great measure the result of the ignition of this gas when it has collected in quantity. Its constant use in dwelling-houses, as a means of light, sometimes gives rise to similar accidents, and occasionally life has been endangered and death resulted by the inhalation of it when it has escaped into an apartment. This has sometimes occurred from persons unused to gas-light, blowing out the flame on going to bed, instead of turning the stop-cock. In such cases, treatment very similar to that pursued in poisoning by carbonic acid may be followed out.

CARDAMOMS are the seed capsules and seed of a shrub, a native of the islands of the Indian Sea. They resemble orange pips in shape, are about half an inch long; the covering which envelopes the seeds is brown and tough, and must be removed. Cardamoms are one of the best stimulant aromatics we possess, particularly the compound tincture, in one or two tea-spoonful doses in water. The powder of the seeds may also be given; from ten to fifteen grains at once.

CARDIAC.—Belonging to the heart.

CARDITIS.—Inflammation of the substance of the heart. The more common inflammatory affections of the heart are, *pericarditis*, when the inflammation involves the outer covering or pericardium, and *endocarditis*, when it affects the lining membrane.

Acute inflammatory affections of the heart may arise from cold, violence, &c., but in the majority of cases, they are concomitant with rheumatic fever, in the progress of which they are so apt to arise that the medical attendant must be constantly on his guard to counteract the slightest symptom indicative of a tendency towards the heart becoming involved. This tendency he may sometimes detect by means of the stethoscope, even before the patient complains or is conscious of any uneasiness about the organ; this is of course a great advantage, and strong argument, why every case of rheumatic fever, however slight in appearance, should be placed under the care of the regular medical man. But the symptoms of inflammation, particularly in the above disease, may come on suddenly—whilst medical aid is hours distant. The patient is seized with palpitation, increased rapidity of pulse, oppression of breathing, and sense of extreme anxiety in the region of the affected organ—pain may or may not be present. Every minute is of consequence. Continued nausea should be maintained by the fourth or sixth of a grain of tartar emetic, given every three or four hours, and a pill containing three grains of calomel and half a grain of opium, given every four hours. Perfect quiet must be observed, and the lowest diet. If the rheumatic inflammation has suddenly deserted a previously inflamed joint, it will be well to apply a mustard plaster to the place, with the view of possibly re-exciting the action which appears to have been transferred to the heart; at the same time, it must be remembered, that the heart may be affected without any such apparent transference.

The above measures judiciously carried out, will do much to retard the progress of so serious a disease as inflammation, and there is the advantage, that from its so frequently accompanying rheumatic fever, an unprofessional person will have less difficulty than in many other affections, of making up his mind on the nature of the seizure. Inflammation of the heart, whether arising in the progress of rheumatic fever or not, will of course be characterised by the same symptoms. The treatment recommended above, is to be resorted to irrespective of cause.

CARIES, the most common affection of the bones, consists in the disintegration of a part of a bone by a process equivalent to ulceration. The treatment is both constitutional and local. —See *Bones.*

CARMINATIVES relieve flatulence and spasm in the bowels. The principal carminatives are, dill, anise, caraway, lavender, peppermint, pennyroyal, and their various preparations; but any stimulants and aromatics, such as nutmeg, ginger, spirituous liquors, &c., are carminatives.

CAROTIDS are the large arteries which pass up the neck on each side of the windpipe, to supply the head with blood.—See *Artery.*

CARRAGEEN or **IRISH MOSS.**—The article sold under the name is a sea-weed When boiled in water it yields a vegetable jelly or mucilage, which requires flavouring to make it palatable. It contains very little nutritive matter. One ounce of carrageen, previously soaked for a quarter of an hour in cold water, is to be boiled in a pint and a half of water till it is dissolved.

CARRARA WATER is an artificially prepared effervescing water, holding carbonate of lime in solution by means of an excess of carbonic acid. It is useful in some forms of dyspepsia.

CARRON OIL is a mixture of equal parts of lime-water and olive oil; it has been much celebrated as an application in burns, having first come into use at the Carron iron works, in Scotland. It is certainly soothing and extremely serviceable in bad burns and scalds. When used, it is smeared over the burnt part by means of a feather, or by lint or rags previously steeped in the oil and placed over the skin, and afterwards covered with cotton wool.

Refer to—*Burns.*

CARROT, the well-known vegetable, is nourishing, and contains a considerable proportion of saccharine matter, but it is not easily digested by weak stomachs, and requires thorough boiling to make it wholesome for any. Grated carrot is frequently used as a poultice to foul sores, but it does not possess any special

advantages over the ordinary materials for poultices, bran or linseed meal.

CARTILAGE—GRISTLE—is a white-looking semi-transparent substance, closely resembling gelatine in composition. It covers the extremities of the bones at the joints, and also serves as a bond of union between different bones. Bone itself is in the first place deposited in cartilage, which is abundant in the young; but as age advances, much of the latter substance—such as that which connects the ribs with the breast bone—becomes ossified.

CASCARILLA BARK is obtained from a tree native to Jamaica and the Bahamas. It bears considerable resemblance to cinchona bark, but is more aromatic. It is stomachic, tonic, and expectorant; and in the latter capacity it is often combined with other remedies. In dyspepsia and debility generally, it is useful. The infusion is made by pouring on an ounce and a half of bruised cascarilla bark, a pint of boiling water, and macerating for two hours. The dose, from half to a whole wine-glassful. The tincture is of course, a warmer stimulant. One to two tea-spoonfuls of the latter may be taken in water, or added to other bitter infusions. Cascarilla is used in the formation of pastilles, its spicy pleasant odour rendering it a valuable deodorant. Some of the bark thrown on a shovelful of hot cinders will soon remove the unpleasant odour of a sick-room.

CASSIA.—See CINNAMON.

CASSIA PULP is obtained from the pod of a species of cassia by boiling. It is purgative in its effects and seldom used alone, and it forms a constituent of a very useful preparation, the confection of senna.

CASTILE SOAP is a hard soap, compounded of soda and olive oil, and is used in medicine for making pills, plasters, &c. It is sold both white and mottled; the former is preferable.

CASTOR OIL—the well-known aperient, is obtained from the seeds of the *Ricinus communis*, or castor oil plant, by expression either hot or cold, or by boiling in water. Cold drawn castor oil, or what is sold as such, is most generally used in this country. Castor oil is one of, if not *the* most certain and safest of our aperients; in most persons it acts quickly, without pain, clears the bowels effectually, and does not require the dose to be increased in consequence of repetition. From earliest infancy to old age, castor oil may, as a general rule, be given with perfect safety; but yet there are some persons who cannot take it. Some stomachs will not retain the oil, however disguised; in a few individuals it acts almost drastically, and produces a painful sensation of piles, and occasionally it causes, during its action, deadly faintness. These, however, are but exceptional instances.

In consequence of its gentle but effectual action it is most valuable as an aperient, in properly regulated doses, for persons of weak habit of body. Its certain action, and the circumstance that the dose requires rather to be diminished than increased by continued use, renders castor oil peculiarly adapted for those who suffer from habitual constipation. In all conditions of body in which it is desirable to clear the bowels, effectually, but without much disturbance, the oil is invaluable, in pregnancy more particularly. Irritation of the mucous lining of the bowels, whether inflammatory, or in the form of simple diarrhœa, is in many cases more quickly relieved by castor oil than by any other remedy.

The great objection to castor oil, its sickly nauseousness, has given rise to a variety of modes of taking it. Floated between brandy and water, in barley-water, or some aromatic water, are favourite modes with many; others take it best in hot fluids, tea, coffee, or gruel, the heat getting rid of the feeling of oily consistency so disgusting to some. A piece of orange or lemon peel chewed just previous to taking a dose of castor oil, blunts the acuteness of the nerves of taste. Castor oil may be taken in emulsion, made with mucilage or milk; but rubbed with yolk of egg is the best form of mixture. In this way it is not so active an aperient as when uncombined; but in irritable and inflamed conditions of the lining membrane of the bowels, it is especially valuable when combined with opium. Six drachms, by measure, of castor oil, are to be well triturated in a mortar with the yolk of one egg, and to this soft water, or some aromatic distilled water, is to be added *gradually*, to the extent of six ounces. If an aromatic water is not used, a few drops of some essential oil, such as cinnamon, may be added before the water. The mixture resembles custard in consistence. The dose an ounce—two table-spoonfuls.

A good mode of administration for children is to simmer a small quantity of milk and sugar with cinnamon, till the flavour is well imparted, and then to shake up the castor oil and hot flavoured milk in a bottle. Another mode is recommended by M. Martin. The quantity of oil required is put in an earthen pan; an egg is broken on it; the pan is then heated, and the oil and egg shaken up together, so as to produce an *œuf brouillé*. A little salt is then added. "I have given," he says "to a man an omelette made of three eggs and forty-five *grammes* of oil, and he has eaten it without finding out the oil." In China, we are told, castor oil is daily used in common cookery.

"In some parts of Central America, where the castor oil plant grows abundantly, it is scarcely, if at all, used as a medicine, being considered poisonous, or to cause fever. Its effects cannot be calculated on with certainty. This might be useful to emigrants."—*Vigne's Travels in South America.*

The usual dose of castor oil alone, is about

half-an-ounce, or one table-spoonful.—See *Diarrhœa—Dysentery.*

CATALEPSY is a rare and peculiar affection of the nervous system, caused generally by sudden and violent mental emotion. Sensibility to external things, and the power of voluntary movement is lost; the limbs become rigid, and retain what position they may be placed in. The signs of life are, in this affection, occasionally so obscured, that the person has been accounted dead. After a time, varying from a few minutes to hours and even days, the fit passes off and consciousness returns. In some foreign countries persons are said to have been buried alive in the cataleptic condition, but such statements are always very doubtful. Stimulants—ammonia to the nostrils—should be used, and stimulant enemata, with continued friction over the body, particularly down the spine.—See *Electricity.*

Refer to—*Death, Signs of.*

CATAMENIA.—The female monthly discharge.—See *Menstruation.*

CATAPLASM.—A poultice.—See *Poultice.*

CATARACT is an affection of the eye which produces opacity of the crystalline lens, and more or less obstructs vision according to the extent of the disease. The affection is most common in persons advanced in life, but may occur at any age. An individual who is becoming the subject of cataract, complains of seeing objects, as it were, covered by a mist or veil; vision is sometimes better in an obscure light, when the pupil becomes dilated. When the disease is a little advanced, anything placed a little to one side is better distinguished than if it is directly in front, the first opaque spot of cataract occupying usually the centre of the lens, or the axis of vision, in which situation it can be detected by examination.

When cataract is in its incipient stage, its progress may perhaps be arrested by judicious treatment, and for this reason the case should, as quickly as possible, be placed under medical care; in the interim, the bowels must be attended to, stimulants avoided, and a blister applied to the nape of the neck. When cataract occupies the whole circle of vision, and produces blindness, it may be removed by operation. An oculist or surgeon should always be consulted on the case.

CATARRH is inflammatory irritation of the mucous membrane lining the air-passages—the nostrils and bronchi. It usually commences in the former, and extends to the latter. Catarrh, or "a cold," as its popular name implies, is generally the result of cold combined with damp, but quite as frequently of checked perspiration, in consequence of the individual passing from a heated room to a current of cold air. Catarrh commences with feverish symptoms more or less severe, shivering followed by heat. A peculiar dryness and heat of the lining membrane of the nostril, is followed by discharge of thin, acrid, watery fluid, "a running at the nose," and with this, there is intense headache between the eyes. Or the throat may be first affected, or the chest itself may be directly attacked, though, if not, it will quickly become so; the windpipe feels as if raw, there is frequent cough, dry and harsh, or with thin expectoration, and the breathing is oppressed; there is, in fact, sub-acute bronchitis.

The evil of a "neglected cold" has become proverbial, and justly so—it is great. The attack ought to be checked at first. The first measure in incipient cold, is to restore, and excite the action of the skin to get free perspiration. This is best accomplished by the vapour or warm-bath, but if these cannot be had, the best remedies are hot water to the feet, a warm bed and hot diluent drinks, along with diaphoretic medicine. A draught consisting of half an ounce of spirit of mindererus, one to two drachms of paregoric, and ten to fifteen drops of ipecacuanha wine, with water sufficient to fill a wine-glass, should be given with five grains of Plummer's pill, on getting into bed, and about an hour after, a warm drink composed either of gruel or barley water; in the morning, some gentle aperient, senna, or castor oil, or Seidlitz powder, is to be taken. If there is much irritation of the chest at night, a fomentation, a mustard plaster, or friction with a stimulant liniment may be employed. A pill composed of six grains of Dover's powder or a one-grain opium pill will often relieve the symptoms. Should the cold not disappear, the treatment above recommended may be followed up for two or three nights in succession, confinement to the house, low diet and demulcent drinks, such as barley water, &c., being superadded. When catarrh is not checked, it runs on to cough, in fact to bronchitis, more or less severe.

Catarrh is unquestionably the effect in many cases of unavoidable atmospheric changes and influences, but it is much oftener the result of carelessness or imprudence—of carelessness in not guarding the body against the effects of our changeable climate (for catarrh is a very English disease), and particularly the neglect of wearing flannel or some woollen material next the skin, which is the very best preservative. Over-heated rooms and exposure to the air insufficiently clothed, are fertile sources of catarrhal affection, especially in children. Insufficient protection to the feet and dampness is another. There is, too, in females, the exposure of the chest, after heated ball rooms, public amusements, &c. The use of fur round the neck is not unfrequently the cause of cold affecting the throat: whilst close to the skin, it produces warmth and perspiration, but when the covering is thrown back, a chill at once ensues. The writer would not be understood as disapproving of the use of fur, so requisite in this climate, but as guarding

against the incautious and sudden relinquishment of the protection.

Refer to—*Bronchitis—Influenza.*

CATECHU—an extract obtained principally from trees of the acacia genus; is brought chiefly from the East Indies and Singapore. It is powerfully astringent, and is met with in masses of various sizes, either of a dark brown or of a pale reddish-brown colour. It is used both externally and internally, its astringent property being due to the presence of an acid very similar to tannic acid and known by the name of Catechu tannic acid. In most forms of diarrhœa, catechu, used either in the form of infusion, compound tincture, or lozenge, is serviceable, and also in the form of infusion as a gargle in relaxed sore throat, or elongated uvula. In the latter cases, a convenient mode of employing catechu, is to permit a few grains to dissolve in the mouth—for this purpose the pale catechu is the pleasantest. In sponginess of the gums, powdered catechu forms a good dentifrice. One of the most valuable external applications of catechu, is in the sore and chapped nipples of nurses; it must be used in the form of tincture, put on the nipple each time after the infant has been nursed, by means of a small paint brush or feather, and wiped off with the wetted corner of a towel before the child is put to the breast. To make the infusion of catechu, a pint of boiling water is to be poured upon six drachms of the powdered extract, along with one drachm of bruised cinnamon, and the whole infused for an hour; the dose is from two to four table-spoonfuls. The dose of the tincture is from one to two teaspoonfuls, of the powder from ten to thirty grains or more, and three or four of the lozenges may be taken at a time.

CATHARTICS are medicines which stimulate the bowels to increased action, such as senna, castor oil, Epsom salts, &c.

Refer to—*Purgatives.*

CATHETER—an instrument used by surgeons, and with slight exception to be used by them alone, for drawing off urine from the bladder, when it is retained in it in consequence of disease. The male catheter is a long curved tube, varying in calibre according to requirements, the female catheter is shorter and easier of introduction. All good nurses should be capable of using the female catheter in the absence of the doctor. Some peculiar cases are entirely dependent upon the use of the catheter for relief, and remain so for years; under these circumstances, the patient ought to learn to employ the instrument for himself, and many do so; with this exception, it must be used by professional hands alone, for even in these it requires both skill and care, and may do serious mischief. In cases which require a catheter to be regularly passed, the operation generally becomes easier. The passage of the catheter being simply a mechanical operation, requiring tact, and a correct knowledge of the parts of the body implicated, and of the direction of the urethra, may of course be acquired by any one who will take the trouble to educate himself upon these points.

Refer to—*Bladder.*

CAUL.—The old name for the omentum or covering of the intestines. The term is also applied to a portion of the uterine membranes, which is sometimes carried along with the head of the child at birth, and covers it like a veil. The caul is frequently preserved. Much superstition used to be attached both to the circumstance and to the object itself.

CAULIFLOWER, a vegetable of the cabbage tribe, agrees better than most other vegetables, with those of weak digestion. The addition of melted butter is injurious to delicate stomachs.

CAUSTICS are substances which destroy organised tissues by combining with their constituent elements. The mineral acids, strong acetic acid, potassa, lime, nitrate of silver, belong to the class, and may be referred to under their respective heads.

CAUTERY.—Any agent which is capable of producing and retaining great heat, and which on being brought into contact with the skin or internal passages, destroys living textures. The cautery is employed to check hæmorrhage, to destroy superfluous and diseased growths, and to produce counter-irritation. The actual cautery is a knob of iron which is applied at a red or white heat, but it

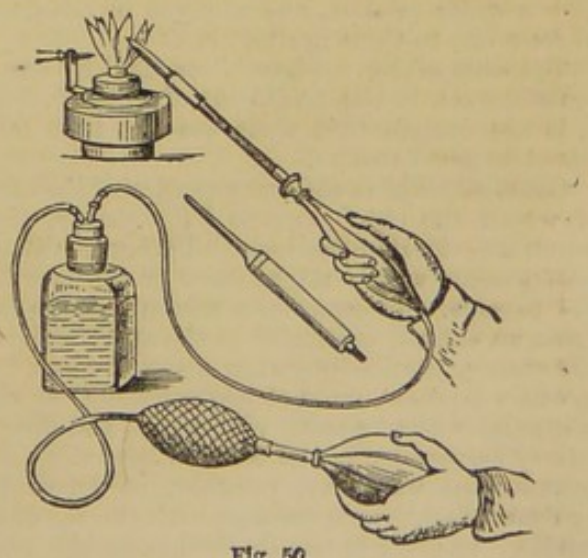


Fig. 50.

is being rapidly superseded by the galvanic cautery. Paquelin's benzoline cautery (made by Mr. Coxeter, of Grafton Street, East,) is a useful little instrument, which produces intense heat, and is often employed instead of the actual and galvanic cauteries, being more portable and in many respects more convenient. The illustration shows how the hollow instruments intended for operation may be kept at a white heat by passing a continuous current of air over the benzoline in the bottle through the tubes and instruments.

CAYENNE.—See *Capsicum.*

CELLULAR MEMBRANE or CONNECTIVE or AREOLAR TISSUE, is the reticular membraneous web, which connects the various portions of the body, and fills up the interstices. It is made up of numberless little fibres and bands crossing each other in every direction, and enclosing small spaces, which freely communicate throughout the body. The most familiar exemplification of cellular tissue, and of its free inter-communication, is seen in the blown-up veal of the butcher. In the living body, the areolar tissue contains a thin water or serous fluid, which, when it accumulates in undue quantity, constitutes one form of dropsy, finding its way by permeation through the cellular meshes to the most dependent part of the body.

CEREBELLUM.—The lesser brain.—See *Brain.*

CERIUM.—Several of the salts of this metal have been used in medicine, though it has not been thought advisable to admit any but the oxalate into the British pharmacopœia.

These preparations have been principally used to allay vomiting, especially that occurring during pregnancy, and during the course of pulmonary consumption. The late Professor Simpson, of Edinburgh, recommended the oxalate to be used for the vomiting of pregnancy, and it has been extensively used for this purpose, with a certain amount of benefit. It is a white powder, and is given in the dose of from one to three grains.

The salts of cerium have been used by some practitioners in the treatment of epilepsy, but it is not certain that their use has been followed by good results.

CERUMEN is the waxy matter of the ear, of which the chief purpose is, probably, the repulsion—by its bitterness and other qualities—of insects which might enter or harbour in the passage. It sometimes accumulates to so great an extent, especially in the aged, and in the young, particularly after acute diseases, as to cause deafness, more or less complete, which is generally accompanied with noises and other uneasy sensations in the affected organ. The accumulated wax may, possibly, be detected, by examining the ear-passage with the aid of a candle. In order to remove the hardened mass, a small portion of warm olive or almond oil must be dropped into the ear for two or three nights in succession, for the purpose of softening and loosening the wax; after that has been done, the passage must be thoroughly syringed out with warm water, by means of a two-ounce syringe, till the wax is detached and washed out. Some persons become faint and giddy on having the ears syringed; in such cases the operation is best undergone in the horizontal posture.

Refer to—*Ear Syringe.*

CHAIRS, INVALID.—Easy and luxurious chairs of every variety and description are made for persons in health, and may often be used by the invalid; but, as a rule, they are unwieldy, and cannot be employed for carrying patients from one apartment of a house to another, or into the open air. One of the first steps towards convalescence is a change from the depressing influences which more or less pervade a sick room, to a more cheerful apartment, and on the facilities with which the change can be effected, depend much the comfort of the patient and the convenience of the attendants. The removal is easy of accomplishment by means of a carrying chair made expressly for the purpose. There are several kinds in use in public establishments, most of which have long poles slipped through brackets on each side of the chair when in use, but for private households there is nothing better than the carrying chair manufactured by Mr. Carter, of New Cavendish Street. This chair is furnished with sliding handles which can be pushed backwards under the seat; one of the main advantages of the chair being its ready adaptation to narrow passages or winding staircases. A modification of this chair, made with a reclining back and leg-rest which draws out from under the seat, combines in one piece of mechanism the ambulance stretcher and chair, and is advantageously employed for invalids or injured persons who prefer either the horizontal, reclining, or the sitting posture. The most useful invalid chair, however, is that in which the patient may propel himself about from room to room, or in the open air, as in the garden or on the sea beach. This is best managed by providing the carrying chair with a wheeling platform; or for rough usage, a couple of large wheels with a small guiding wheel behind may be fixed on an ordinary Windsor or cane-bottomed chair, without the addition of the platform. For a person recovering from a broken limb a leg-rest may be easily adjusted to the seat. Among other novelties in chair manufacture, Mr. Carter has designed a patent exercising chair, with horse, lever and rowing action combined, by attaching a couple of handles or levers to the sides and centre of the seat, which is made to move up and down. The effort necessary to move the levers to and fro, is similar to that required in the exercise of rowing, while the undulating and oscillating movement given to the seat has some kind of analogy to the motion conveyed by a sharp trotting horse, over a rough country, to the rider. These exercising chairs are made to suit children, as well as adults, and for children suffering from debility, paralysis of one or both inferior limbs, and who cannot take exercise in the open air, daily exercise in a chair of this description may be safely recommended.

CHALK.—Carbonate of lime occurs abundantly in various parts of the world; it is used in medicine as an astringent and antacid. For medicinal purposes it requires to be levigated, by which process the finer particles are separ-

ated: when dried, the preparation constitutes the "prepared chalk" of the shops. As a general antacid, chalk is scarcely to be recommended, but in cases of diarrhœa, especially in children, where much acidity exists, it is highly useful. For the latter purpose, from twelve to eighteen grains of chalk rubbed up in an ounce and a half of dill water, form a mixture of which a tea-spoonful may be given to an infant six weeks old, every few hours if requisite.

In the case of adults, the ordinary chalk mixture is an excellent preparation; it may be made with prepared chalk two drachms, powder of gum acacia two drachms, cinnamon water, or water simply, eight ounces; a drachm and a half of sugar may be added, but is quite as well omitted; better, if the climate is a warm one, as it causes fermentation. To the above mixture, rhubarb, laudanum, &c., may be added if requisite. The dose, two or three table-spoonfuls, repeated more or less frequently, according to the amount of diarrhœa. The aromatic powder of chalk—dose thirty to sixty grains—and the same powder with opium—dose five to twenty grains—are both useful and easily carried preparations, which ought to form part of the domestic medicine chest of the emigrant, or, indeed, wherever the usual sources for procuring efficient medicines are far distant. The powders ought to be procured ready prepared. Forty grains of compound powder of chalk and opium contain one grain of opium. Chalk forms an ingredient in the grey powder, a combination of mercury and chalk. The practice of sprinkling chalk powder upon sores, for the purpose of absorbing discharges, &c., is not to be recommended. Prepared chalk is used universally as a dentifrice, either alone or more commonly with an aromatic as camphor, orris root or cinchona bark.

CHALK-STONE—is the concretion deposited around and in the joints of those who suffer from chronic gout. It consists mainly of urate of soda, a comparatively insoluble salt. The liability to the formation of chalk-stone, is a reason why those who are subject to gout should, when an antacid is required, make use of the potash carbonate, which, in union with lithic acid, forms a much more soluble salt than soda does.

Refer to—*Gout—Uric Acid—Urine.*

CHALYBEATES—are medicines containing iron. The term is well known in connection with mineral waters. The most generally used chalybeate springs in this country are those of Tunbridge-wells, Cheltenham, and Scarborough; Leamington and Harrogate also possess chalybeate waters, and there are many others, including Hartfell, and Peterhead, in Scotland, scattered throughout the island. In chalybeate waters the iron is generally in combination with carbonic acid, the taste of the water is inky, and if it be one of those—and they are the most general—in which the metal is in combination with carbonic acid, when the water has stood exposed to the air for some time, it lets fall a yellowish sediment. Chalybeate waters are, by virtue of the iron they contain, powerful tonics, and well adapted as curative agents in diseases of debility generally; but they are not to be lightly and unthinkingly used, or without professional sanction. Many persons do themselves serious injury by unadvisedly drinking mineral waters, under the idea that if they do no good, they cannot do much harm. To persons of full habit, and with any tendency to head affection, even a short course of chalybeate water might be most seriously dangerous.

Refer to—*Iron.*

CHAMOMILE, the *Anthemis nobilis* of botanists, is too well known to require description. The flowers, either fresh or dried, are deservedly classed amid the most useful, safe, and generally employed domestic remedies. They are often used in making fomentations, with or without poppy heads. A handful or two of the flowers are boiled in the water intended for fomentation, and after straining, the flannel dipped in the liquid is applied to the part. Chemists now sell a concentrated preparation of poppy and chamomile ready for immediate use. The infusion taken internally is an aromatic bitter of undoubted tonic properties, and without nauseousness. In simple debility of the stomach and loss of appetite, chamomile tea, if not used too frequently, and for too long time at once, is a safe and good remedy. Half an ounce of chamomile flowers may be infused like common tea, in half-a-pint of boiling water, or, if time be given, in cold water, which makes an equally efficacious and pleasanter dose. Chamomile tea drunk warm is often employed as a gentle emetic by itself, or to aid the action of other medicines of the class; alone it is very uncertain, unless made very strong. From five to ten drops of the essential oil of chamomile, dropped on sugar, is a useful, and not unpleasant carminative.

CHAMPAGNE, the well-known wine, contains about twelve per cent. of alcohol, a much less proportional quantity than the strong dry wines, such as port, sherry, Madeira, &c. When effervescing, however, it exerts a powerful but transient intoxicating effect. It is an excellent restorative, and may be taken and retained by the stomach when other wines are rejected. Hence it may be used for the great nervous prostration following surgical operations, also in exhausting diseases and in convalescence from fevers. Champagne is often accused of causing gout, indigestion, &c., but perhaps these are more likely to be the results of the other luxuries which accompany a champagne dinner, than of the wine itself.

CHANCRES—are small ulcers, the result of inoculation with the venereal poison. They

commence in a form of small pustules, which, after breaking, degenerate into yellowish grey-looking sores, around which the skin feels firm or hard. They may be single or multiple and vary very much in position, size, appearance, and progress. As in almost all cases their presence is followed by general constitutional disease, the result of syphilitic poison absorbed at the site of the chancre, recourse should always be had at once to skilled medical advice. Until then the chancre should be kept clean by pouring water over it once or twice daily, and afterwards dusting thoroughly with iodoform.

CHAPPED HANDS, so troublesome to many in frosty weather and during cold dry east winds, may partly be avoided by care in thoroughly drying the skin after washing. The following lotion will be found useful: take of borax two scruples, glycerine half-an-ounce, water seven and a half ounces. This may be used twice a day. An ointment prepared with Goulard solution, oxide of zinc, and glycerine, a drachm of each, with two ounces of lard or vaseline, makes an excellent application, and may be used every night.

For this very common complaint, numerous remedies have been suggested; a few more prescriptions are appended :—

Benzoate of zinc, . .	one drachm.
Oil of almonds, . . .	one drachm.
Cold cream, ...	one ounce.

Mix. To be applied to the hands every night.

Or,

Oxide of zinc, . . .	one drachm.
Carron oil, ...	half-an-ounce.
Simple ointment, . .	half-an-ounce.

Mix.

Vaseline, either alone or with a small quantity of sugar of lead added to it, is very useful, and ought to be applied to the hands of those who suffer much in this way, after each time they are washed.

Those who are obliged, from the nature of their occupation, to wash their hands frequently, are the great sufferers from chaps, the chaps or cracks themselves becoming dangerous, in some occupations, from their liability to absorb poisonous substance into the blood.

CHARCOAL.—See *Carbon.*

CHARPIE.—The loose fibres from scraped linen, used to absorb the discharge from sores. It is more used in France than in this country.

CHEESE is the curd or caseine of milk mixed with a proportion of butter, pressed, salted, and dried. A general and nutritious article of diet, it is not one suited to weak stomachs. A meal of bread and cheese alone requires a thoroughly strong digestion to dispose of it comfortably. Many, however, who cannot eat cheese in this way, may take it in small quantity with impunity, and when old almost with advantage, at the close of a moderate meal. Much of the indigestibility of cheese arises undoubtedly from its toughness, and the cohesion of its particles, this diminishes as it verges towards decay, and is not observable in the soft cheeses, which owe their digestibility to the larger amount of butter they contain. The toughness is much increased by toasting, which renders the article decidedly unwholesome. Cheese is said to assist the digestion of other articles of diet; and there is an old rhyme :—

> "Cheese is a peevish elf,
> Digests everything but itself."

Probably, the power put forth by the stomach for the solution of the cheese acts more readily upon the less tenacious substances submitted to it at the same time. The habitual use of old cheese in any quantity is injurious, and may occasion cutaneous eruptions. In Germany, a pecular kind of decay in cheese has occasioned symptoms of irritant poisoning.

The caseine, or curd of milk, which forms the basis of cheese, very closely resembles albumen in composition; its nutritive power may be known from the fact, "that from caseine alone the chief constituent of the young animal's blood, as well as its muscular fibres, membranes, &c., are formed in the first stage of its life."

The contrast afforded by tough indigestible cheese to the milk curd adapted for easy solution in the stomachs of the young, is a good example of the manner in which an article of diet, nutritive and wholesome, may be modified as regards its digestibility, by preparation. Caseine is found in the vegetable kingdom chiefly in seeds.

Refer to—*Milk.*

CHELTENHAM.—The climate of Cheltenham is considered particularly adapted for health, there being neither great extremes of heat, nor of cold. To those, however, with whom a dry and bracing atmosphere agrees, its climate is less favourable than some other localities.

"The mineral springs of Cheltenham are exclusively employed for internal administration. They, for the most part, resemble each other as to the nature of their component parts, yet present considerable differences in the relative proportions of their ingredients. They are rich in the chlorides and in sulphate of soda. Several of them contain a small proportion of iron, and iodine has been lately detected in them. They are but slightly gaseous, and though two or three of them have, when first drawn, a slight odour of sulphuretted hydrogen, it soon passes off, and is probably dependent upon the springs passing through a layer of mud, or matter in a state of decomposition. It must not, therefore, be supposed that the so-called sulphuretted wells are analogous in their action with the class of sulphurous springs. . . . . Besides its saline springs, Cheltenham possesses two chalybeate ones, which, like others of the same class, have a disagreeable inky taste, and are somewhat dark coloured. From their not containing much carbonic acid, they do not

sparkle, and are soon decomposed on exposure to the atmosphere.

"There are many diseases in which the Cheltenham springs may be used with advantage. Persons who have lived in India and other tropical climates, who have been accustomed to take large doses of mercury, will generally derive benefit, less from the aperient than the tonic properties of the waters. For gouty patients, also of a plethoric or irritable habit, they are advisable. And in cases of amenorrhœa and chlorosis they do good service, where with it a faulty condition of the digestive organs exists."

For the substance of the above article, and of others similar to it, the author is indebted to the work of Mr. Edwin Lee on the *Watering Places and Mineral Springs of England*, and those who desire further information cannot do better than have recourse to the publication itself.

CHERRY.—The fruit of the *Prunus cerasus*. Like other stone-fruits it is apt to disagree.

CHEST, or, in medical language, the thorax, is the important cavity situated between the neck and the abdomen (fig. 51)

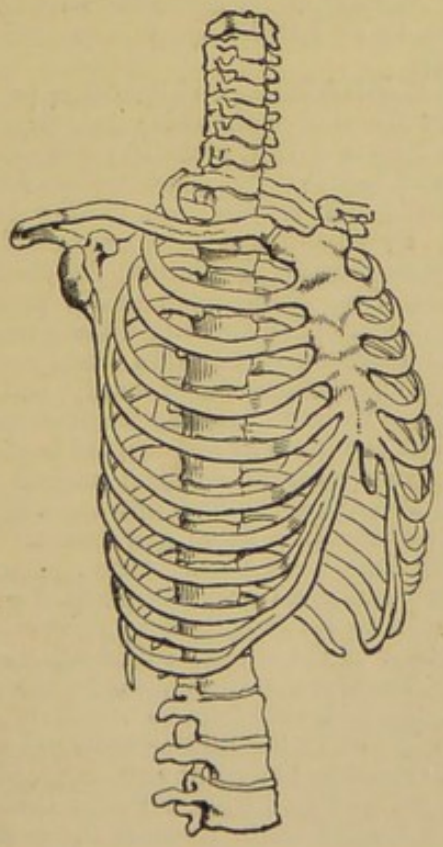


Fig. 51.

which contains the heart and large blood vessels and the lungs. It is separated from the abdomen by the diaphragm, it is bounded by the breast-bone anteriorly, laterally by the ribs, and is supported posteriorly by the spine. It is singular how much ignorance there is among the uneducated regarding the situation of what is called the chest; generally it is referred to the pit of the stomach; and what is called "a pain in the chest," is in many instances, a pain in the former situation. In ordering applications, leeches, blisters, and such like to the chest among the poor, it is absolutely requisite to indicate with the finger the exact spot on which they are to be placed, otherwise the chances are, that if simply the chest is named, the pit of the stomach will be understood; a serious mistake in many of the acute affections of the chest, particularly in children.

The form of the chest itself is, or ought to be that of a truncated cone or bee-hive, broad below, narrow above (fig. 51). It is true it *appears* the reverse of this, even naturally, and is made to do so still more by the absurd ideas about small waists; but the greater apparent width at the upper part of the chest in the living person is due to the shoulders and arms; when these are removed, the contrary is seen to be the case, and the cavity itself, as exemplified in fig. 52, is evidently much more capacious in its lower than in its upper part.

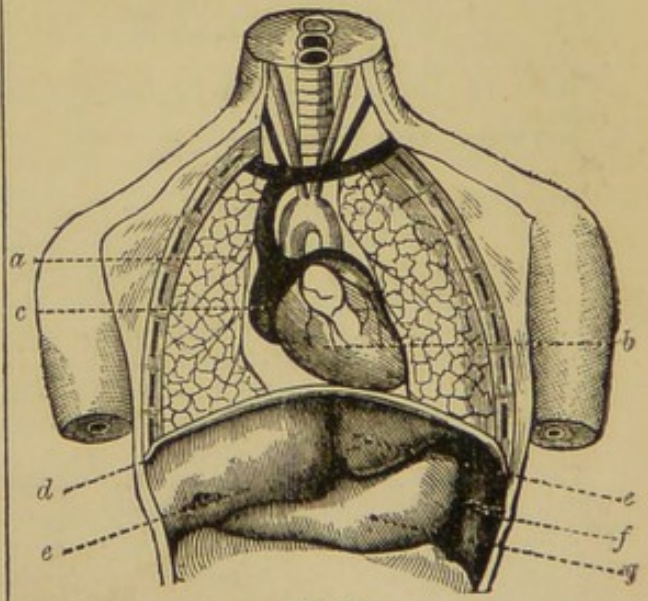


Fig. 52.

a. Right lung.
b. Right ventricle of heart.
c. Right auricle of heart.
d. Diaphragm.
e, *e*. Liver.
f. Spleen.
g. Stomach.

When, by tightly-laced stays or other contrivances, the lower part of the chest is compressed, the contained viscera must find room somewhere; the diaphragm yields more readily than the long ribs, and is pressed down upon the liver, stomach, and bowels, disordering their functions, and laying the foundation of disease, whilst at the same time the free play of both lungs and heart is impeded. In other words, the possessor of that most desirable physical conformation, a capacious chest, is doing all that is possible to render it otherwise; or should the cavity be naturally small, to make

it still more deficient in size, by artificial restraint, instead of every means being used to augment its capacity. A small chest always gives a greater liability to disease; all tendency therefore to contraction, stooping of the shoulders, &c., ought most sedulously to be watched and attended to, particularly in young people, whilst the bones are still soft and yielding; disease may be either the cause or the consequence; the spine too should be well examined. Exercises, which from moderate exertion call for full expansion of the chest by respiration, and full play of the arms are generally useful. The elastic "chest expander," made of vulcanised india rubber, is a most excellent contrivance for the purpose. Some trades, particularly that of shoe-making, tend in the course of time to affect the conformation of the cavity of the chest.

The physical examination of the chest as regards measurement, the sounds elicited by tapping upon it in various ways with the fingers, and heard by the application of the ear, either directly, or mediately by means of the stethoscope, are most important aids in the investigation of disease, and should never be omitted or objected to. For the purpose of facilitating description, the cavity is mapped by vertical and horizontal lines, in a similar manner to the abdomen.

Refer to—*Abdomen*—*Heart*—*Lungs*—*Respiration.*

CHEST—WATER IN.—See *Dropsy—Pleurisy.*

CHESTNUT is the fruit of the *Castanea vulgaris;* it is nutritious, contains much starch, and no oil, like many others of the nut tribe. It is certainly indigestible from its firm and coherent substance, but is rendered much more unwholesome by being converted into flour, in which state it is largely used on the continent. Roasted chesnuts are more wholesome than raw, but are not fit for weak stomachs.

CHICKEN POX is a mild eruptive disease which spreads by infection, and chiefly attacks children, occurring once during life. It is preceded in most, but not in all cases, by slight feverishness, for one or two days. The eruption first appears in the form of conical pimples with a white head, on the breast, shoulders, and neck, more sparingly on the face, and on the body generally. On the second day, the vesicles appear like little globular blisters, but with very slight surrounding inflammation; on the third and fourth days, the fluid they contain becomes opaque or whey-like; they now either break or shrivel up, forming thin puckered crusts, which fall off piecemeal in one or two days more, seven or eight days being the whole time occupied by the course of the disorder. Little or no treatment is required beyond a gentle aperient repeated once or twice, and care taken that the child does not irritate by scratching.

Chicken pox might be mistaken for modified small pox by the inexperienced; it is distinguished by the absence or extreme mildness of premonitory fever, and by the rapid development, course, and different form of the vesicles, particularly in the absence of the central depression, which characterises the true small pox vesicle. The antecedent history, whether or not the child has been exposed to the contagion either of small pox or chicken pox, will also assist in throwing light on the matter.

CHICORY.—The *Chicorium intybus,* the root of which, when roasted and ground, forms the well-known adulteration of coffee. Some persons consider the admixture of chicory with coffee an improvement, and at all events harmless, but it has been proved that it contains certain narcotic properties which occasionally produce a sense of weight and depression combined with languor and headache. A strong infusion of chicory occasionally acts as an aperient, at other times as a diuretic. In consequence of chicory not containing essential oil, it has not, when roasted, the fragrance of coffee, its infusion has a "sweetish and mawkish taste, and is dark coloured, thick and glutinous." But although chicory is used as an adulteration, there are many to whom it is grateful and who prefer their coffee mixed with it on account of its agreeable flavour. It is always to be bought apart from coffee.—See *Caffeine.*

CHILBLAIN.—A chilblain is an inflammatory affection of the skin, more particularly of the fingers or toes, caused by alternations of cold and heat, and is characterised rather by irritating and troublesome itching than by pain. Persons of fine skin, scrofulous constitution, or languid circulation, are most liable to suffer from chilblains, and old people and children more than those of middle life. The sudden exposure of the skin when very cold, to a high temperature, is generally, and justly, considered to be an exciting cause of the affection, but one quite as frequent, is keeping the surface in a state of artificial warmth by the use of sleeping socks and hot applications in bed, or of fur-lined shoes and foot-warmers in the day-time. All these appliances keep the skin in a continual state of unnatural perspiration, weaken its tone, and so render it more susceptible of the effects of cold when exposed to it. To prevent chilblains, in the predisposed, the feet ought to be regularly bathed with cold—or, in the case of the aged, tepid—water, or salt water, every morning, and afterwards well rubbed with a rough towel, and exercise trusted to, to preserve the warmth of the extremities rather than artificial heat. When chilblains have formed and the skin is unbroken, stimulant applications are requisite; numerous remedies are employed; spirit, such as brandy, camphorated spirit, glycerine, or even turpentine, will any of them be of service, applied by means of a piece of linen, or gently rubbed on. When the skin of a chilblain breaks, an ulcer is the consequence, which

discharges a thin slimy fluid and is often difficult to heal. In this case, the inflammation should be subdued in the first place by means of a poultice, and afterwards an ointment used, made either with forty drops of goulard, or ten grains of red precipitate, to the ounce of lard. Of course all friction or pressure from boots or shoes must be guarded against.

Chilblains, when the skin is unbroken, are frequently quickly cured by the following:—Take of tincture of iodine, two drachms; chlorinated solution of soda, six drachms. Apply over inflamed parts twice or thrice daily, drying in before the fire.

The following ointment is also very good, and may be used whether the skin is broken or not:—Take of benzoate of zinc, one scruple; fresh lard, one ounce. Mix. To be applied night and morning.

The following domestic remedy is also sometimes of service:—Shake well together in a bottle, spirits of turpentine, white vinegar, and the contents of an egg, in equal proportions. Rub gently when the chilblains are in a state of irritation, and until the redness and swelling are dissipated.

Two parts of glycerine to 100 of collodion make an excellent protective application.

When there is great pain and irritation, the following powerful remedy may be used:—Take of tincture of aconite, an ounce and a half; atropia, two grains; rectified spirit, half an ounce. Mix. Mark Poison. Twenty drops to be rubbed into the affected parts night and morning. *N.B.—It is not to be applied where the skin is broken.*

CHILD-BED.—The term may be applied either to the actual labour itself, or to the confinement generally, from the first commencement of the symptoms to the completion of convalescence. It is in the latter sense it will be considered in this article.

The process of child-birth consists of a series of the most beautiful adaptations to the mechanism, the structural and vital endowments of the human frame, with every providential provision for the safety both of the mother and infant, during the trying but important event.

When the full period of pregnancy is completed, the process which is to free the womb of its contents, commences with the preparatory relaxation of the various parts connected with the passage of the child into the world; shortly, the long-closed orifice, or "mouth" of the organ begins to open or dilate, allowing, in the first place, the protrusion of the membraneous bag which contains the fluid, or waters, in which the infant floats, and which protrusion forms a soft wedge, dilating the maternal structures preparatory to the passage of the hard head of the infant, which follows as propelled by the expulsive efforts of the womb. Sooner or later, however, this membraneous bag gives way under the pressure, the waters are discharged with a gush, and the head itself becomes, in great measure, the dilating agent. Although not in the position at the commencement of labour, at its conclusion, the head of the infant should pass from the mother with the face looking directly backwards, and in the great majority of cases it does so, attaining the position by a series of turns which cannot be profitably explained to the unprofessional. In some cases, however, the position of the head is reversed, so that it passes with the face directed forwards, causing a more protracted and painful labour. Moreover, the head may not come forward, or "present" first, at all, but some other portion of the child, causing an irregular or cross birth.

Most women form, or endeavour to form, a calculation as to the period at which they may expect to be confined, and while some do it with considerable apparent exactness, others get far wrong, much to the inconvenience of themselves and of those appointed to attend upon them. The most usual calculation as regards the duration of pregnancy, is forty weeks from the last menstrual crisis, and this is generally made the basis of the calculation; but as more cases fall within the period than extend beyond it, it is safer for expectant mothers to arrange their preparations for the thirty-eighth week than later. By some it is thought, that the duration of pregnancy in the case of a male child is longer than in that of a female. As, however, cases of premature confinement of living children are not uncommon, it is always desirable that essentials be provided for, as early as possible.

While with many women no indications of the approach of labour are present until slight pains from the contraction of the womb occur, with others, usually about three weeks before confinement, there is a well-marked descent of the abdominal swelling, giving rise to some diminution in the waist measurement, and increased comfort and freedom in breathing and walking. This is occasionally accompanied by some irritation of the bladder and increased frequency of passing water, the womb apparently pressing somewhat on the bladder and diminishing its capacity. During this stage the comfort of the expectant mother is much promoted by attention to the regular daily action of the bowels, either by enemas of warm water, or by laxatives, such as liquorice powder or confection of senna. The actual confinement commences with pains resembling slight colic, felt in the abdomen and sometimes also in the back, and recurring at more or less regular intervals. These are not unfrequently accompanied by a slight discharge which may be simply slimy mucus, but which is often stained by blood.

As time advances, the pains become more defined and regular, and when these, the "grinding" pains, have fairly commenced, the first stage of labour may be considered as established. This stage lasts, on an average, from six to twelve hours, but may, of course,

much exceed, or fall short of this stated period. During its continuance, the mouth of the womb undergoes "dilatation," or full opening. Towards the close of the first or dilating stage of labour, the pains are altered in character, and become expulsive, or as they are popularly termed, "bearing down," at first slightly so, but as the process advances, their forcing character is more strongly marked, and in most instances, the nearer the birth of the child, the more powerful and more frequent they become, until at last the infant is expelled. Generally towards the middle of the expulsive stage, the "waters" are discharged; the sudden gush sometimes causes alarm to the inexperienced, who ought on this account to be forewarned of the circumstance. The whole process of labour, in the case of first children, averages from twelve to thirty hours; it is, however, not only as regards time, but in every other respect, liable to great variation. Attacks of spurious pain, resembling true labour, are not uncommon during the last month of pregnancy, but these may be known by the absence of the previous sinking, and of most of the other symptoms above enumerated, as characteristic of the real process. The attack is often the result of confined bowels, or of indigestion, and is removable by a table-spoonful of castor oil with ten drops of laudanum, or by a dose of rhubarb and magnesia. Occasionally, active labour commences with a species of spurious spasmodic pains, which want the regularity of the true ones, and only tease and exhaust the patient, who is herself conscious that they are "doing no good." In such a case, the best treatment is to administer five-and-twenty drops of laudanum, and to keep the patient perfectly quiet, so that she may sleep, if possible; if she does so, in all probability she wakes in a few hours with real labour in full activity; but sometimes even if sleep does not intervene, the anodyne seems at once to convert the spasmodic into the real useful labour pain, and contrary to its usual effect, actually to stimulate the progress of the case. Occasionally, when labour has reached a certain stage, pain becomes suspended without obvious cause, and continues so, for a longer or shorter period: in such cases patience is the best resource, unless the cessation of pain appears to be connected with some of the complications of child-birth to be hereafter noticed. The discharge of the waters is sometimes the first sign of the commencement of labour, or perhaps, more correctly, their discharge from imprudent exertions, such as shakes, jumps, &c., hurry on the process, which, in such cases, is often lingering. This premature discharge not unfrequently occurs, when some other portion of the child than the head is first in the birth. It being presupposed, that every female in expectation of her confinement, if inexperienced herself, will, under the advice and guidance of female friends, provide for, and make those arrangements most suited to her individual case and circumstances, as soon as the first symptoms of approaching labour exhibit themselves, the female attendants ought certainly to be summoned; but should a medical man be engaged, it is proper before sending for him, to feel assured that the process has commenced in earnest. When, sinking pains recurring regularly every ten minutes or quarter of an hour, are accompanied with slight "show," as the discharge of slimy mucus is termed, the medical attendant may be safely summoned, and he will, or ought to, see to all subsequent details.

When female attendance is trusted to, these details require to be carefully and judiciously insisted upon:—

A lying-in chamber ought to be as roomy, and, whilst free from draughts, as well ventilated as circumstances will permit (see *Bedroom*); it ought too to have a fireplace, which it is ascertained beforehand can be used without half suffocating the patient with smoke—not an uncommon annoyance. The bed should be of such moderate height, that an attendant can conveniently give assistance to the patient. A mattress is always preferable to feathers, and curtains, as in beds generally, are better dispensed with. In addition to the ordinary furniture, a night-chair and bed-pan should be provided; and a vessel of some kind which can be used as a bath for the infant. Some waterproof material is requisite for "guarding" the bed against injury from moisture. Formerly, a prepared skin used to be the general material, but there are now many waterproof articles, quite as well or better adapted for this purpose. Sheet gutta percha answers well, and is cheap. An easy chair, a bottle for pure water, a little brandy, a fan, and bottle of smelling salts, cups and vessels, including a sick-feeder (see *Bedroom*) for administering either food or medicine, are all advantageous additions to the numerous little etceteras; these are, sponge, washing flannel, and starch powder; a little vaseline, or cold cream, soft towels, and abundance of napkins or doubles; four ties or ligatures, each six inches long, and composed severally of four plies of stout linen thread; a pair of blunt-pointed scissors *that will cut*, and a flannel receiver for the infant. A little laudanum and sal volatile ought always to be at hand; but when a medical man is in attendance, he more generally carries these with him.

One female friend, and no more, in addition to the nurse, should be present at the accouchement; but it is advisable to have another female in the house, though not actually present in the room, particularly if a midwife only has charge of the case. Mothers ought never to be present at the confinement of their daughters.

As soon as labour commences, the chamber should be prepared, all extraneous articles removed, and whatever may be wanted put in order; the guard placed upon the bed, and the

latter so arranged, that when the patient lies upon her left side near the edge of it, there may be plenty of room for those about her to pass and act. The patient herself ought to be encouraged to walk about, and her mind kept occupied and cheerful by conversation; light nourishment, such as a cup of tea or gruel, being given as desired, in small quantity at once; at this time too, if the bowels are at all confined, they should be unloaded by a dose of castor oil, or better still, by an enema, consisting of a pint of thin gruel, to which a tablespoonful of olive oil is added. As time advances, and as soon as the pains exhibit signs of "bearing down," the patient if not previously undressed, should now be so, and the *folded binder* (see *Binder*) *placed on the abdomen, so as to give gentle and equal support.* The patient may still continue to walk about a little, but as soon as the pains become decidely expulsive, she must be placed in bed upon her left side, and remain so, unless raised up for necessary purposes, until the infant is born. During all this time the room should be kept moderately cool—if regulated by a thermometer, about 60° Fahr. The patient, most likely, particularly towards the end of her labour, will become extremely hot, and then the occasional and moderate use of the fan is very agreeable. She should be induced, from time to time, to take a few spoonfuls of gruel; but the stomach is not to be overloaded, and above all things, the pernicious and too prevalent custom of giving stimulants, brandy, rum, &c., is to be avoided. A case which *really* requires such aids, requires also the presence of a medical man to sanction and regulate their use; if given when not required, feverish heat, headache, thirst, general uncomfortableness, and, it may be, after bad consequences, are the only results. Amid the poorer, and indeed among some of the better classes in the country, it is customary for patients to be "put to-bed," in their day-clothes; independent of the uncleanliness of the proceeding, it is not at all times free from danger, when, after the confinement is over, it becomes requisite to remove these clothes, and substitute the night-dress; the usual excuse, that it is for the support given by the stays, is quite inadmissible when the binder is used, which amply supplies the place of the above undesirable articles; besides, the presence of the stays and clothes may seriously interfere with measures which must be taken in some particular cases, such as those of flooding. Another practice which is often followed by midwives cannot be too strongly condemned, it is that of delivery being effected with the patient kneeling on the floor; it is highly dangerous. Such attention must always be given to the bladder that it may be duly emptied, although, in most instances, the sensations of the patient herself ensure this point.

When the last strong pains of labour are expelling the head of the child, the midwife who has, or who ought to have, sufficient experience to be aware of the progress of the case, should elevate the upper knee during the occurrence of each pain, for the purpose of affording free space; this mode of proceeding is preferable to the pillow placed between the knees, which heats, and is always getting displaced. A towel or some such material is frequently attached to the bed post or some fixed point, and many women appear to derive comfort from holding it during the paroxysm of pain; it may be permitted, if it does not encourage too great efforts at straining. The feet must be kept warm; cold feet may retard the frequency and force of the pains.

It cannot be too strongly impressed upon the minds of all, that child-birth is a natural process, and one fully competent in all ordinary cases—and in more extraordinary ones than might be imagined—to accomplish its end, safely and unassisted. And without assistance or any attempt at assistance, it must and ought to be completed as far as female attendance is concerned.

As soon as the head of the infant is born, the attendant midwife ought to pass her fingers around its neck, to ascertain, as sometimes occurs, that the navel cord is not twisted around it; should it be so, she must endeavour gently to slip it over the head, otherwise the neck may be so strongly compressed as to occasion fatal strangulation. The cord may be coiled once, or two or three times around the neck. At this period also, the mouth and nostrils of the child—if there is any delay in the passage of the body—should be kept as free as possible from the surrounding discharges, which may be drawn in by the efforts to breathe. Neither ought the body, or even the legs of the infant to be *drawn* from the mother, *their expulsion should be left to the natural efforts of the womb*, for if too suddenly emptied, its natural action becomes embarrassed, and irregular contraction, accompanied with unnecessary pain and discharge, may be the consequence. The infant being fully born, the navel cord must be tied by the ligatures, which have been ready provided; the first being placed about three fingers' breadth from the body of the child, and the other about an inch and a half further; the intervening portion of cord being divided by the scissors. The infant now separated from the mother is to be placed in the flannel, in the arms of the nurse, and put in a moderately warm situation.—See *Childhood.*

In tying the navel cord one or two cautions are requisite. The first ligature must not be placed nearer the body than the distance above-named; and before the second is put on, it is well—to prevent spurting—to squeeze the blood up towards the body of the mother, out of the intervening portion. For cutting the cord, a pair of blunt-pointed scissors should be used, and care taken at the moment, that no

other portion of the child is intruded between the blades; it has occurred that a finger or toe has been lopped off by a careless attendant. After the cord is cut through, the *cut extremity attached to the child must be carefully examined*, to make certain that it does not bleed, particularly if the cord be thicker than usual, in which case the tying must be most carefully performed. From careless tying and neglect, infants have bled to death from the navel vessels immediately after birth. Should the infant not appear to breathe as soon as born, it is well to delay the severance of the cord for a minute or two, whilst at the same time the mouth and nostrils are freed from all adhering mucus, and efforts are made to rouse, by blowing upon the face, or by two or three smart taps on the back. As soon as the infant is separated from the mother, it is proper to ascertain by the hand placed upon the abdomen that there is not a twin child; if there be, the remaining bulk will indicate it in a way that can scarcely be mistaken, and should it prove so, the recurrence of the pain which is to effect the expulsion of the second child, must be quietly waited for, unless hæmorrhage, or some other occurrence, dictates a different course. In most cases of twin children, the second is quickly and easily born after pain sets in.

As soon as the child is born, the nurse should place her left hand on the abdomen, underneath the binder, and grasp gently but firmly the contracted womb, which can be felt easily as a hardened globular swelling inside the abdomen. This grasp should be kept up until the after-birth is thrown off, and for a few minutes afterwards. When the hand is taken away, the binder should be tightened at once, and a warm diaper applied. At this time, chilliness, succeeding the profuse perspiration, is often complained of, and should be counteracted by some additional covering. The female must now be allowed to remain quiet, but *not left alone*, and so far attended to, that any symptoms of faintness, or undue discharge of blood—flooding—may be detected. If all goes well, in the course of half an hour, if desired, a cupful of gruel or arrow-root may be given; in the course of another half-hour, a dry, warm, open, flannel skirt, and dry napkins should be substituted for those which have become wet; by this time, everything ought to be arranged and quiet for the patient's repose.

Such are the incidents of natural and regular labour; and could we calculate upon the process following undeviatingly the same course in all cases, it might safely and at all times be left to the care of judicious and instructed females; but, as too well known, accidents and difficulties of the most formidable nature will arise, which tax to the utmost the skill and nerve of the well-educated practitioner; and with some, this is an argument why every case of confinement should be attended by a medical man—in many situations at least, a physical impossibility. As, therefore, many cases must be left to female care, the foregoing directions will, it is trusted, lead to their safer and better management, whilst those which are to follow, are intended to point out *what cases ought never to be trusted to a female attendant*, and what symptoms occurring in a case under female care, indicate the approach of such difficulty or danger as requires the attendance of the male accoucheur. As a general rule, in a first confinement, it is desirable to have the attendance of a medical practitioner, and especially so, should the female be the subject of any deformity, such as curvature of the spine, should she in early life have suffered from any tendency to rickets, or been the subject of epileptic fits at any period of life. Also, if there exists any suspicion of heart or other organic disease. If a previous confinement has in any way been irregular, or has required instrumental or artificial delivery of any kind; if convulsive fits have occurred; or if there has been flooding, either from difficulty with the after-birth, or any other cause, the woman ought never to trust herself in the hands of a female.

When a midwife, either professed or otherwise, is in attendance upon a case, fainting coming on at any period, any symptoms of wandering or delirium, or of convulsion, any unusual discharge of blood whilst the process is going on, should at once be the signal for summoning medical assistance; also, should the labour be more than usually protracted, without obvious cause, provided the pains are *regular*, sufficiently numerous or forcible; should the navel cord, or anything unusual, such as the infant's hand, be felt protruding externally; and lastly, if after the child is born there is any difficulty with the after-birth (see *After-birth*) either with or without flooding.

In protracted labours, or in what may be termed the accidents of labour, delivery by means of instruments is much more readily had recourse to than formerly, and many a life, both of mother and child, has been saved by their use, of course, in educated and skilful hands. Powerful for good, they are also powerful for mischief, if clumsily applied. The prejudice against the use of instruments has greatly died out, and women who have experienced the benefit in one confinement, will frequently ask for instruments to be used in another.

In the interval which must or may elapse in many cases before medical assistance can be obtained, should fainting come on, the female must be laid on the bed with the head on a level with the body, air should be freely admitted around her, and smelling-salts used to the nostrils, whilst brandy, or sal volatile is administered by the mouth. It ought to be ascertained whether there is any discharge of blood externally, and if so, cloths dipped in cold or iced water are to be freely used to the lower part of the bowels. Wandering or delirium, or convulsion, must be soothed by the most per-

fect quiet, and by the free use of cold applications to the head, and mustard plasters to the calves of the legs; whilst, if *the person be of full habit, and if the face is full and flushed*, from six to a dozen leeches are to be applied to the temples. In all cases of unusual discharge of blood, the measures recommended under the article *Abortion* are to be employed, and it must be borne in mind, that if the accident occurs after the birth of the child, the womb should be grasped firmly by the hand through the walls of the abdomen, and gently kneaded, while napkins wrung out of cold water are applied repeatedly to the external parts. In a case of sudden and profuse outward flooding after the birth of the child, occurring in a thin individual, much may be done to arrest it, by some one instantly pressing the hand firmly and steadily upon the belly—at the navel—until the pulsation of the great main artery, or aorta, is felt, and felt, as arrested by the pressure, to beat up to the hand, but not beyond it. Women of full florid habit have more tendency to flooding, especially internally, than those of spare make.

It must, however, be kept in mind that alarming, and even fatal loss of blood—internal hæmorrhage as it is called—may be going on within the womb, and yet be unmanifested by any outward flow, the first signal of the mischief, probably, being faintness, and if the abdomen is now examined, it will be found to have enlarged more or less since the birth of the child. This dangerous condition requires the most energetic and well-directed efforts of a medical man to save life, and not one moment should be lost in procuring the assistance. In the interval, the binder well spread over the bowels, and two or three folded napkins placed underneath it, to assist the pressure, is to be tightened well up, and in addition, firm pressure must be exercised with the expanded hands of an attendant on the outside of the binder. By this method, the ordinary attendants will do much to retard the further filling of the womb with blood; at the same time cold is to be used to the lower part of the bowels, and absolute rest maintained. The medical man, on his arrival, will take much more active measures which could not properly be employed by others. The above dangerous accident of the lying-in chamber will sometimes occur in spite of every care, but it frequently results from bad management, such as too sudden emptying of the womb by abstracting the child, instead of allowing the natural efforts to accomplish the entire process; by impatience with the after-birth, neglect in putting on the binder insufficiently, or not at all, or by moving too soon after delivery. The existence of cough has a tendency to promote its occurrence. The occurrence of internal flooding is sometime indicated by *continued* pain complained of in the bowels or back, different from the usual intermittent after-pain.

Lastly, whatever accident may occur in the lying-in room, it should be the endeavour of those around to avoid the excited hurrying, which too often seeks to do everything, and does everything but what is right. This is one reason at least why it is proper to exclude all but the necessary attendants, and especially mothers, from the scene; they communicate their own alarm to the patient, and aggravate the danger, if it exists, by so doing.

When a female has enjoyed a few hours' repose after her delivery, if the bladder has not been relieved, it should now be so; a little light nourishment, such as gruel, taken, and *the infant applied to the breast, whether it appears to contain milk or not* (see *Breasts*). If the confinement be a first one, the after-pains will scarcely give trouble. When they are severe, twenty drops of laudanum may be given in a little water (see *After-pains*). Perfect quietude is to be observed.

Sponging the parts involved in child-birth with a weak lotion of Condy's fluid is very desirable, and should be repeated two or three times daily for the first few days after confinement, and twice daily for at least a week after.

It is not probable that the bowels will act of themselves, particularly if opium has been given; it is therefore right on the morning of the third day after confinement to give an aperient. Castor oil is almost universally prescribed; but when the person is of full habit, and if there exists any tendency to fever, a common black draught is preferable. After the bowels have been moved, the patient, if going on well, is to be allowed an improved diet; a little meat soup, or light pudding; and now, provided it can be done without putting the person in the erect posture, the bed may be made, and the night-clothes changed. According to the state of the patient, a little solid animal food is to be allowed with the moderate use of stimulants. At the end of the week, if all goes on well, the female may get on the sofa, towards the tenth day begin to put her feet to the ground, and gradually return to her usual mode of life. During the whole of the convalescence, there is no greater comfort, or more salutary practice than the free use of tepid water, so as to preserve the strictest cleanliness; by the use of waterproof sheeting, drawn under the patient, it may be fully employed without wetting the bed.

When a confinement has been a moderately favourable one, if the foregoing directions are attended to, there are few cases that will not progress regularly to complete convalescence; it is true, that among the poor, some of the means and conveniences cannot be carried out or procured so fully as could be wished; but the most essential, fresh air and cleanliness, are mostly at command, and might be more freely taken advantage of than they are, and in all cases something like moderate care ought to be observed—which is too often not the case. As regards comforts and conveniences, in

no way can the charity of the more fortunate be applied to the relief of their poorer sisters, than in the bestowal of articles of food and clothing, suitable to the time of trial, when poverty is often so severely felt.

But recovery after child-birth does not always preserve the smooth course. The accession of the milk may be accompanied with feverish excitement. This, if not extreme, is to be allayed by means of aperients, castor oil, black draught or Seidlitz powder and effervescing saline draughts, to each of which may be added five grains of nitrate of potash. Within the first few hours or days after delivery, the woman may be attacked with shivering, or rather shaking so severe as to shake the bed, succeeded by heat of the skin, thirst, delirium, and with or without severe pain in the bowels; she is attacked with child-bed fever, and cannot be too quickly seen by a medical man. In the meantime, the diet must be kept at the lowest ebb; if time must elapse before efficient aid can be got, there should at once be given a pill composed of one grain of opium and five grains of calomel, and the dose of opium repeated regularly every six hours; if pain is severe, a dozen of leeches at least, if they can be procured, must be put on the abdomen, and if not, *light* fomentations continually applied. If the bowels have not been moved, they must be opened by an enema of gruel and castor or olive oil. The thirst is to be relieved by toast-water freely allowed. But the above active measures are not to be the substitutes for a medical attendant; the attack threatens life, and may require all that skill can do for its removal; if only a few hours are likely to elapse before aid is procured, the fomentations, a single dose of calomel and opium, and the enema, should only be resorted to.

If a woman, at any time during the first few weeks after her confinement, becomes excited and talkative, if she wanders slightly, if the eye becomes restless and wild-looking, and if sleep is absent, she requires immediate attention, for an attack of child-bed mania is probably impending. A medical man should be immediately summoned. In the meanwhile, the most perfect quiet is to be preserved around the patient, who should be placed in bed, in a room with the light slightly shaded; cloths dipped in cold or iced water are to be applied to the head, the feet kept perfectly warm, and the bowels, if confined, opened by a gentle aperient, but not purged. This, perhaps, is all that it is desirable should be done before the case is seen by a professional man, but on an emergency it may be requisite, without this aid, to resort to the use of opium—Battley's sedative solution is the best—of that ten drops, or of laudanum, fifteen drops, along with a grain of ipecacuanha powder, should be given in a little water, every half-hour, till quiet sleep is procured, or till at least four doses of either of the above have been administered.

Occasionally, shortly after labour, the skin of the patient becomes covered with a "miliary" eruption, consisting of numberless points resembling minute blisters. This is generally the result of over-heating or stimulating, and was much more frequently met with in former times than now, that a more cooling and rational system has been adopted.

The principles to be kept in mind in the domestic management of child-birth, by those in attendance are:—to have everything in order and ready at hand; to exclude all useless attendance; to encourage the mind of the patient; to preserve the moderate temperature of the room, and its free ventilation; to abstain from giving stimulants, and from loading the stomach with food; to have the bowels clear; to avoid all meddling interference; to summon medical assistance on the first appearance of anything unusual; lastly, let the patient be assured, that the process, though a painful, is a natural one, and He, who has ordered its marvellous arrangement and adaptations, will be present in the hour of travail.

CHILDHOOD.—Infancy. The period of childhood, including infancy, may be said to extend from birth to the thirteenth or fourteenth year, and truly may it be said, that the child is the father of the man, for upon the original constitution, and upon the physical and mental training of this most important epoch of human life, depends in great measure the usefulness, and consequently the happiness—it may be the eternal welfare—of the future man and woman. The subject of the management of childhood, all important as it is, can, however, be but briefly treated of in a work like the present; and the reader who wishes further information than is to be found under the head of this article, is referred to the admirable work of the late Dr. Andrew Combe.

Infancy (continued from Child-birth).—When an infant is born, should it, in consequence of protracted labour or some other cause, not draw breath, and appear purple on the surface, it is advisable in the first place to pass the end of the finger, covered with a piece of thin calico or linen, into the mouth, for the purpose of clearing away the stringy mucus which not unfrequently obstructs the passage of air into the lungs. If, under these circumstances, the navel cord continues to pulsate, it should not be tied for at least two or three minutes, during which efforts are to be made to rouse the child, by blowing sharply on the face, or by one or two slight slaps on the back; at the same time an attendant ought to be getting a warm bath (temperature 98° Fahr.) in readiness. If, after the lapse of time above mentioned, animation still seems suspended, the cord should be tied without further delay, and the infant at once removed and placed in the warm water up to the neck, the body being well supported, and the mouth and nostrils carefully kept from being accidently submerged.

The mouth and throat having been cleared from obstructing mucus as above directed, some one, whilst the nostrils of the infant are closed, should, by placing their mouth over that of the child, endeavour to inflate the lungs with their breath, and then withdrawing the mouth, to empty them by pressure exerted upon the abdomen and sides of the chest. The direct effort to inflate the lungs having been repeated a few times, the artificial respiratory movements—alternately pressing upon the ribs and abdomen, and allowing them to recover by means of their own resiliency—should be persevered in for a considerable period. In these cases of suspended animation in infants, electricity is unquestionably a powerful restorative; but hitherto the difficulties attending its ready application just at the moment, having rendered it almost unavailable. Most medical men now possess in comparatively small compass an electrical apparatus of some kind, which is always serviceable in cases of suspended animation.

When an infant exhibiting full signs of life is separated from the mother, and placed in the flannel receiver, it must not be covered up too closely—the caution is not superfluous, for infants have actually been smothered in this way by the extra carefulness of the nurse; it must, too, be placed where it will be warm. As soon as the child can be attended to, it ought to be examined all over, to ascertain whether it be perfectly formed; and the tying of the navel cord should be seen to be secure. Washing with warm soft water (temperature 98°), soap, and soft flannel, is the next requisition. The skin of a newly-born infant is covered with a white unctuous matter, which is to be removed; this should be done as gently and effectually as possible, without fraying the skin, the arm-pits and other folds of the body being particularly attended to. The child, after being washed, is often dried upon the receiver, placed on the nurse's knees; a better plan is, to have placed on the lap a moderately soft pillow, covered with two or three large warm napkins, on which to lay the child. The drying, which should be done, in cold weather, in front of a warm fire, having been effected gently, without scrubbing, a little starch powder should be dusted into the folds of the groin and arm-pits, but not elsewhere, unless the skin appears frayed. The portion of the navel cord remaining attached to the child, is now to be wrapped in a piece of soft linen, which is kept in place by a binder of fine flannel, five inches wide, and long enough to pass twice round the body of the child, so as to give support without pressure, and fastened by needle and thread—not by pins: *if too firmly applied the respiration of the infant is interfered with.* The remainder of an infant's clothing is so much regulated by custom and other considerations, that it is unnecessary to mention it here, further than to impress the rule that it should be perfectly loose and easy, and fastened entirely by tying or sewing. A cap should never be placed upon a child's head, which is naturally hot enough to do without artificial covering. When the infant has been dressed, it should be laid to rest in the cradle, or place prepared for it, perhaps beside its mother, but at all events where it will be sufficiently warm. It will probably sleep for some hours. It ought not to be fed for the first few hours after birth. As too frequently practised, the unfortunate baby is dosed with "rue tea," "sugar and butter," or some such mess, or stuffed with soaked bread or gruel, and the first foundation laid of the disordered bowels, wind, screamings, &c., which are so general in young infants. When the infant wakes from its first sleep, or, at all events, in the course of four or five hours after birth, it should be put to the breast; even should there not be sufficient secretion of milk to satisfy the child, it is well both for it and the mother, that it should be thus early induced to take the nipple. If, as may occur, the milk-flow is delayed, it will be necessary to give the infant the artificial support of cow's milk, unskimmed, but diluted with nearly half water, and very slightly sweetened, this may be given, either from a common nursing bottle, or by means of a spoon, but the former is preferable. On no account should anything like bread, gruel, or the like be allowed to pass the lips of a newly-born infant, unless under the pressure of extreme necessity, such as might happen on board ship, and then, the powder of grated biscuit, or of twice-baked bread, softened in water, is the least hurtful substitute. The first milk of the mother is thin and serous, and is generally considered to exert an aperient action upon the infant's bowels, by which the slimy olive-green discharge named "meconium." which first occurs from them, is carried off. Should the bowels not act within twenty-four hours after birth, from six to eight drops of castor oil should be given, mixed with a small quantity of moist sugar. Should this have no effect, it may be repeated; but should the infant appear to make the straining effort to relieve the bowels, without its being effected, the vent ought to be carefully examined by a medical man, as it may happen that closure of the bowels, complete or partial, exists, but which may, nevertheless, be remediable. The case is not common, but its possibility is not to be forgotten.

The majority of mothers are able, and ought, as a sacred duty, to nurse their own infants; but cases occur in which, from illness succeeding the confinement, or from general weakness of constitution, a female is unable to do so, either with benefit to herself or the child. When she cannot, it becomes a serious question, whether the duty of nursing is to devolve upon another, or whether the infant is to be brought up by hand. The general voice says the former, the author confidently

asserts that the latter is preferable. In the first place, it is requisite to provide a nurse, whose own infant is of the age, or nearly so, of the infant to be wet-nursed; it will not do to put a young infant to the breast which has been nursing for many weeks or months. This is the first but the lightest difficulty. But there is a much more serious consideration. We have yet to learn the full measure of influence, both *physical* and *mental*, which may be exerted upon the child by the peculiar physical and mental constitution of the foster-mother from which it draws its first nourishment. It is true, the physical development is generally rigorously scrutinised, but how are passions and mental tendencies to be measured?—and we do know that the class from which wet-nurses are often selected, are certainly not in the habit of controlling their appetites and passions; and farther we know, that the physical qualities, at least, of the milk, are very liable to be affected by the mental emotions of the nurse; here at least is one source of danger, were we sure, which we are not, that there is no deeper, more lasting, life-felt influence exerted. And withal, it is quite possible, that some physical taint, venereal perhaps—it has happened and may happen—has escaped the searching examination of the selecting physician. These are all serious considerations for a mother before she submits her child to draw its first nourishment from the body of a stranger, one too, who must either be suffering from the intense grief which every mother feels who loses her infant from her breast, and whose milk must be affected by that grief, or who must have been compelled by poverty, and all its physical evils, to undertake the task; or one whose mental constitution is so unscrupulous, that, without necessity, she will consent for gain to cast aside her own infant, and, at the risk of its welfare, give its *birthright* to a stranger. Are any of these the qualifications which a mother will choose for the nurse of her child, even if she has the selfishness to tempt another to desert her own legitimate offspring? Medical men often witness the painful sight of one infant declining away, whilst the mother is nourishing another into strength. The system and importance of wet-nursing has been much over-rated; for it is perfectly possible, if *the care and trouble requisite will be incurred*, to bring up a child by hand, as well and healthily as at the breast of a *foster-mother*. Care and trouble it does involve, but if these are grudged, the child had better go to its grave at once.

In bringing up a child by the hand, milk must be its only nourishment for the first three or four months. Ass's milk, or goat's milk, may be employed, but more generally cow's milk will be used, either with or without the cream removed, according to its richness, and according—as the first few days' experience will show—to its effect upon the infant. The milk is to be diluted with one-half water, and just perceptibly sweetened. It is not to be given by spoon, but by means of a common nursing-bottle, which should always be of glass. There are many varieties of feeding-bottles in use; the old-fashioned form without tube is still a good deal used among the poor, but it is being gradually superseded by others of various shapes, fitted with flexible tubes which pass through the cork or stopper of the bottle, and terminate in its interior in a glass tube through which the fluid is drawn, while the other extremity of the india rubber tube is furnished with a teat and shield. Perhaps the best form of feeding-bottle yet brought out is that known as the "Ne plus ultra," the invention of Mr. Day, the late resident medical officer of the Royal Hospital for Children and Women, in London. In this bottle, the tube and cork are made of one solid and continuous piece of india rubber, affording facilities for cleaning and adaptation, while the air has always free access to the bottle, and fruitless sucking, in consequence of the faulty construction of many bottles, is entirely avoided.

Of these bottles there should be two, both

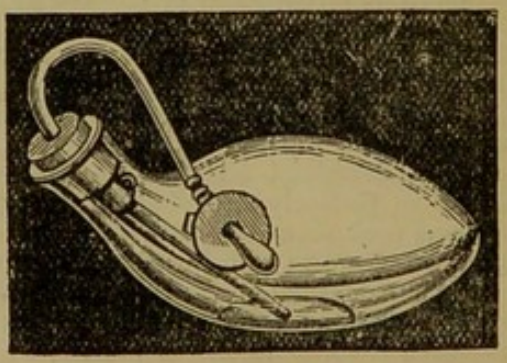


Fig. 53.

on account of accidents, and also, that the unvarying and essential cleanliness may be observed. Without the most scrupulous care—and on this depends the success of bringing a child up by hand—the purity and wholesomeness of the food cannot be preserved. The milk and water should be mixed fresh, at least twice a day, and, in summer, kept in vessels immersed in cold water; it is to be given to the child at nearly the temperature of the body—about 98° F. Again it is repeated, that the most thorough cleanliness, in milk-can, bottle, teat, and tube, is to be observed, and *must, except in rare instances, be a mother's care*. Another caution is requisite. In feeding children from some bottles, careless nurses may frequently be observed to incline them the wrong way, so that the infant goes on for a time sucking wind. Thick food may be given with most feeding-bottles by using a differently perforated leech-bite teat. Where the old forms of feeding-bottles are used, one little matter requires special attention, namely, the ball valve at the top. This little valve is generally formed by a pea of metal, and should this metal be of such a

nature, for instance lead, as to be slowly acted upon by the milk, the most serious consequences may arise; in fact, an infant may be slowly undergoing lead poisoning, without any one in the least suspecting the cause of the illness. Such a case occurred within the writer's knowledge, and was only detected by the acumen of the physician called to consultation.

For the first three or four months this milk and water food is *all* that is requisite, with the addition, if at any time the bowels should be too much relaxed, of a portion of isinglass, from one to two small tea-spoonfuls dissolved in the half-pint of fluid. About the fourth or fifth month, a small portion of arrow-root or wheat-flour may be boiled in the water before it is added to the milk, and about the seventh or eighth month, the spoon may be used to give some of the more solid milk and farinaceous preparations. In bringing up by hand, the child will, as at the breast, require feeding about six or seven times in the four-and-twenty hours for the first three months at least, about four table-spoonfuls or one ounce and a half on the average being given at once at first, and the amount gradually increased. Small delicate children, however, will scarcely take half the amount above stated, and great care must be taken, both with them and others, not to allow the stomach to be overloaded. If an infant is habitually sick after feeding, the quantity allowed at once must be reduced, for, though happily the infant stomach relieves itself easily of superfluous food, it is better to avoid the superfluity, than trust to the sickness, notwithstanding the popular fallacy that sickness is a sign of infant health.

The system of rearing by hand is much more prevalent in some parts of Germany than in this country. The following passage from the work of Dr. Andrew Combe, the substance of which he says he derived from the German work of Dr. von Ammon, is so full of practical instruction, that the author makes no apology for quoting it at length:—

"In some constitutions, however, cow's milk does not agree when merely diluted and sweetened; but answers perfectly well when a large proportion of water and a small quantity of any well-prepared farinaceous substance is added. In this case, it is a common custom in some parts of Germany to dilute the milk with a weak infusion of any light aromatic, such as linden tree flowers, instead of pure water. But after the first month or two, where diluted milk does not agree, a small proportion of well-boiled arrow-root, grated Dutch rusk, or well-baked or toasted bread, sometimes forms a very useful addition wherewith to thicken the milk to the consistence of thin gruel. Briand, indeed, remarks that milk diluted and boiled for a length of time with any light farinaceous substance, is more easily digested by some infants than pure milk: and that when the use of milk alone is followed by white and curdy evacuations, a change to a *bouilli* made of milk and farina, often restores them to a healthy colour and consistence. For this reason, he recommends panada, made by boiling for a length of time in water, or milk and water, thin slices of bread, previously well dried in the oven. Another of which he speaks highly, is the *crême de pain*, made by infusing in water for several hours well-baked bread, previously dried in the oven in slices, and boiling it gently for some hours more, adding water from time to time to prevent it becoming too thick. It is then strained and sweetened, and a few drops of orange-flower water are added. For infants a few months old, arrow-root, sago, or semolina, may be used in the same way. The *bouilli* in common use in France as the first food of infants, is made by gently roasting the best wheat-flour in an oven, then boiling it for a considerable time, either in water, or in milk and water, and adding sugar to it. When carefully made, not too thick, and free from knots, it is considered an excellent food, especially where the use of milk excites a tendency to diarrhœa, or colicky pains. On changing to the *bouilli*, the digestion immediately improves, and the evacuations become healthy and unattended by pain.

"In some instances, especially when the bowels are sluggish, barley water or thin gruel, with or without the addition of weak chicken-tea, or beef-tea, answers best; and the grand rule ought to be to follow what seems best suited to the individual constitution. In soft flabby children, the chicken or beef-tea is often most useful; while in thin, active, and irritable infants, the milder milk and farinaceous diet answers best. But in trying the effect of any alteration, we must not be too rash, and because no advantage is apparent within a day or two, conclude that therefore it will not agree. In many instances, the effects of a partial change of diet show themselves so gradually, that it is sometimes only after an interval of a week or two, or even longer, that we can tell positively whether benefit will result from it or not."

When the infant is to be nursed at the breast of its mother, it ought, as above directed, to be put to it, unless some cogent reason forbids, within six hours after birth, and from that time it will require it every three or four hours for the first few months. It may be requisite, either from weakness of the child, or some other cause (see *Breast*), to have the nipple drawn out either by a stronger or older infant, or by some other means. Should the mother not be able to nurse her infant entirely, the extra feeding must be conducted upon the rules laid down for bringing up by hand.

It not unfrequently happens that a mother, for some time at all events after the birth of her child, especially if it be her first, is unable to suckle it without great pain, owing to the nipple being so exceedingly tender, that when the child continues its efforts to suck, darting

pains are felt through the whole breast. Some nurses are ignorant and foolish enough to believe, and to tell young women that this is good for them, and ought not to be relieved, when the fact is that many women are seriously injured, and run a great risk of abscess and fever from the excessive irritation they are forced to endure. In such cases immediate relief may be obtained by using one of Maw's glass nipple shields, with elastic tube and mouthpiece attached. Nothing could be more simple and perfect. The mouthpiece is just the shape of a well formed nipple, and the glass shield fits over the nipple, supports it equally, and allows of the free, gentle, and painless flow of milk through it. A small brush, attached to a wire, is supplied with each, for the purpose of keeping it quite clean, and the whole is so cheap as to be quite at the service of the poorest of poor patients. Special attention ought to be paid to keep the tube and teat perfectly clean, else the child is sure to suffer in health. They ought to be thoroughly cleansed after each time they are used.

The *first few weeks of an infant's life* are spent principally in sleeping and taking nourishment, movement is but little indulged in, and consequently the power of sustaining the animal temperature is but slight; for this reason care is always requisite that sufficient heat be preserved, both of clothing and of situation, during the day, and by the infant sleeping with its mother or nurse during the night, for the first few weeks of its life at least. Equally important with temperature, nay even more so, is the purity of the atmosphere which a young child breathes; errors in this respect have led to the most deplorable loss of infant life. One instance is sufficient to illustrate the point: it is the well-known one of the Lying-in Hospital in Dublin, in which, at one period, one child out of every six died within the first fortnight of existence, but by the adoption of proper means of ventilation, this very great mortality was at once reduced to one death for every nineteen or twenty children born. It is unnecessary here to repeat what has been said in the article *Bed-room*, upon the means of ventilation, &c., and to that article the reader is referred. The *cradle or swinging cot* in which an infant sleeps should not be smothered up with curtains, and it is better, for some time at least, without sheets, light blankets only being used or an eider down quilt.

The mattress should be hair if possible, but where economy is requisite, cotton-wool will answer the purpose; it should be protected from wet by means of waterproof material of some kind. A pillow too large and soft is not advisable, for by allowing the head to sink into it, an injurious amount of heat and perspiration is promoted, and the child rendered susceptible of cold when taken up. The skin of an infant requires the most scrupulous care; by its powerful agency it frees the body from matter which must be noxious if retained, and which is especially apt to act injuriously upon the susceptible infant nervous system. The skin ought to be washed with tepid water and soap, night and morning, and after each washing, reaction promoted by gentle friction with the hand for a few minutes. Care must always be taken that the situation for washing is sufficiently warm, but not, as is too often the case, before a scorching fire; draughts of air are especially to be guarded against. Before leaving this subject, it is requisite to notice the filthy custom prevalent amongst the poor, of allowing the scurf, the oily secretion, and the dirt, to cake upon the skin of the head, under the idea that it preserves from cold. The habit is not only disgusting, but is productive of disease—perfect cleanliness is as requisite here as elsewhere.

In fat children, the creases or folds of the skin require extra attention, from the liability of the opposed surfaces to become inflamed, and to pour out an irritating moisture; dusting with starch-powder, or the intervention of a piece of soft linen spread with simple ointment, may either of them be used as a remedy. *The portion of navel cord* which is left attached to the child, will require attention. This separates by a kind of moist decay; it may come off entirely by the fourth day, or take a fortnight to do so; it must never be hurried. Generally, when the navel separates, it leaves the puckered closing of the skin perfectly complete, it sometimes, however, occurs, that bleeding or inflammation and ulceration take place at the time of separation; such cases ought at once to be placed under medical care. When actual bleeding occurs, the condition is all but hopeless. When the opening at the navel does not thoroughly close at birth, protrusion of a portion of the bowel takes place when the child cries. This state of things, apt to occur when the cord has been of more than average thickness, requires much attention, as the comfort and safety of the individual, especially of a female, in after-life, may be considerably interfered with, if the malformation is not, as it may be, cured in childhood. The belly-band or binder, has of course considerable power in preventing the protrusion through the navel opening; but in these cases it is not sufficient; and for the first few weeks, one or two graduated compresses, made of folded linen, should be placed over the navel, underneath the binder; and when the child is a month or six weeks old, the following apparatus must be used:—from a cork, the diameter of which is about half as large again as that of the protrusion, a slice the eighth of an inch thick is to be cut, flatly padded, covered with linen, and affixed to two cross pieces of plaster by stitching (see fig. 54). The plasters being warmed before application, are used to retain the padded cork directly over the opening of the navel; above all, the binder is applied. The plasters will probably require

renewal every few days. It is better to trust to the linen pads alone, as long as any tendency to inflammation of the skin exists, using at the

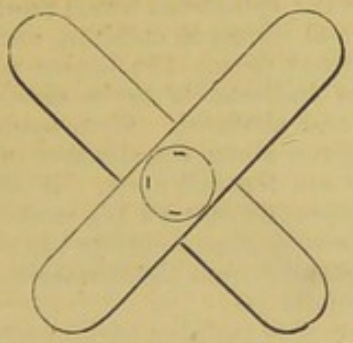


Fig. 54.

same time, water dressing with a thin piece of gutta percha foil or oil silk next the skin. Instead of either linen or cork pad, one of vulcanised india rubber, filled with air, might be substituted. Elastic belts and pads are now to be had at the instrument makers for the same purpose. The treatment of navel protrusion, or hernia, in infants, and the management of the apparatus, involves some amount of care and trouble, but not more than the necessity and importance of the evil demands for its rectification. In such cases, the infant should be kept from crying by all reasonable means, the best preventive being the careful attention to the rules of health laid down in this article.

Rupture at the groin may occur in children at birth, and may be suspected to exist, when unusual fulness or swelling is observed in this situation, and if the fulness and tension is increased when the child cries, the case should at once be seen by a medical man.

Any malformation with which an infant is born, ought as soon as possible to be submitted to the judgment of the surgeon, so that he may have full opportunity of fixing the appropriate time for its rectification or removal. The operations for hare-lip, distorted joints, such as club-feet, are now performed at a much earlier period than they used to be formerly. In the case of vascular nævus, or mother-mark, which often increases rapidly from a mere perceptible point to a large size, surgical interference as early as possible is most important. These nævi are composed of so thick a network of capillary vessels as to be almost spongy, and should they be accidentally wounded, bleed freely, and if of any size dangerously; they vary in colour from bright red to purple; if the finger be pressed upon a nævus, it becomes emptied of blood, and pale; but the instant the pressure is removed, the blood, and consequently the colour instantly return. There are various methods employed for their removal; but the one used in each case must depend upon the surgeon; a simple, painless, and frequently successful mode of cure, is vaccinating upon the nævus, which is dispersed by the inflammation which takes place in the progress of the vesicle. The possibility of this being done is an additional reason why the disease should be seen as early as possible by a medical man. The continued use of the compound tincture of iodine to a nævus, the surface being painted over with it night and morning, will, sometimes, *if perseveringly adhered to*, be successful in removing it; the application being intermitted for a few days should the skin become sore.

Tongue-tie in infants is not uncommon; it depends on too great prolongation of the "frænum," or bridle which retains the tongue in place. It is easily rectified by a snip of the surgeon's blunt-pointed scissors.

The time at which an infant may first be taken out of doors after birth, must depend, of course, greatly upon the time of year; in fine warm summer weather, in the course of ten days or a fortnight, it will be safe to make the change; in winter it can scarcely be prudent to do so for a month or six weeks, and then only on a fine day. In either case, free exposure in the house should first be practised, the first airing should not extend longer than twenty minutes, and the eyes, especially at first, must be shaded from the glare of the sunlight: of course, either the chill of morning, or the damp of evening, must be avoided. A young infant should not be taken out during the prevalence of east wind.

The principal ailments, likely to come under domestic management, to which infants are liable, are thrush, red gum, colicky pains in the bowels, and diarrhœa. For the first—thrush—the reader is referred to the article "*Aphtha.*" Red gum is a mild species of "papular" eruption, to which many children are subject soon after birth. It is quite devoid of danger, and requires no treatment if the bowels are in good order, if not, a dose or two of castor oil may be given. The usual friction after washing must be moderate during its continuance. Inflammatory swelling of the breasts in infants is not unfrequent (see *Breast*). Most infants are troubled, more or less, with wind, or colicky pains in the bowels, and not unfrequently with diarrhœa, but these are much aggravated by the errors in feeding so universally prevalent, particularly among the poorer classes; sometimes when the child is nursed entirely at the breast, particularly of a wet-nurse, they are caused by the nurse's transgressions in diet. Attention to the rules already laid down under the head of feeding, will greatly prevent the above ailments; but when they do occur, they must be rectified as simply as possible, but never by the dangerous and baneful quack carminatives so extensively sold and used. Pain, and wind in the bowels in children, are generally connected with superabundant acidity; for the correction of the cause and its consequences, either of the two following mixtures may be used moderately, both with safety

and good effect:—No. 1,—Take of calcined magnesia twelve grains, dill water one ounce and a half. No. 2,—Take of prepared chalk ten grains, dill water one ounce and a half, and to each of these mixtures add twelve minims of chloric ether. Of either of the above mixtures, a small tea-spoonful may be given, and repeated if requisite. The first, or No. 1, is to be selected, should the bowels be at all confined: the second, No. 2, should they be too relaxed. It is not recommended that either of these medicines, simple as they are, or any others, are to be given too freely to infants, and on every slight occasion, but it is better to give them than to allow a child to suffer; *they, or something similar, ought to be the substitutes in every nursery for the secret quack nostrums.* It is true they will not either as quickly stop pain, or soothe a child, as mixtures which contain opium or poppy syrup; but they cannot, like them, either put it into its last long sleep by an over-dose, or injure not less fatally, when frequently used, even in small doses, by gradually disordering the brain and nervous system. When either of the mixtures above recommended is given to children, or indeed whenever magnesia or chalk is given habitually, it is always prudent to give an occasional dose of castor oil, as cases have occured in which concretions of the above antacids have accumulated in the intestines. The dose of castor oil for a young infant may be from ten drops to half a tea-spoonful. In cases of diarrhœa, should the affection be slight, and the infant be a hand-nursed one, the addition of isinglass to the milk food will, in most cases, stop the tendency at once, particularly if assisted by a few doses of mixture No. 2, and by a warm bath for five or six minutes, at a temperature of 98°, *regulated by a thermometer.* Should the affection be more severe, the emulsion of castor oil with yolk of egg (see *Castor oil*) must be given. To one ounce and a half of the emulsion, made with a tea-spoonful or drachm of castor oil; two drops of laudanum are to be added, and one tea-spoonful, or twelfth part, given once in six hours. And here the opportunity is taken, to warn, respecting the administration of opiates to children. They are most susceptible of the influence of the drug, and accidents are continually occurring—more frequently perhaps than comes to light—from its effects: a single drop of laudanum has been known to prove fatal to a young infant. The above treatment is given, not as an inducement for parents, who can readily procure medical aid, to take the treatment of their children, when ill, into their own hands, but it is because it may be of service in situations when skilled assistance is not readily procurable. Many of the diseases of children commence insidiously, but after attaining a certain stage, run their course rapidly. No parent, therefore, who either values his child's life, or his own peace of mind, should delay procuring medical assistance when real illness shows itself; but at the same time, the very same reason ought to induce every parent to inform himself upon the nature of the symptoms which most generally usher in real illness in children, and also, how and by what means the illness which these symptoms indicate, is to be most effectually retarded and obviated. More upon this head will be given when the diseases of childhood generally are touched upon. *Within the first three months of an infant's life, vaccination ought to be performed,* that is, before the constitution is liable to suffer from the irritation of teething. —See *Vaccination.*

The period of teething varies extremely, and not less so in the manner in which it affects children. For information upon the mode in which the teeth are developed, the reader is referred to the article *Teeth.* Some children cut the two front teeth of the lower jaw—which generally appear first—as early as the fourth or fifth month, whilst others, apparently equally strong, do not have them developed within the year. The usual, and popularly received sign of approaching tooth-cutting, is watering of the mouth, but this may continue for many weeks before the teeth appear. Before the teeth come through, the gums flatten on the top, look semi-transparent and full, and are sometimes extremely swelled and inflamed. The constitution of the child always sympathises more or less with the cutting of the teeth, most simply and beneficially so by the occurrence of mild diarrhœa, which is always—unless it goes to an undue extent—a safeguard, and is better not interfered with. When the gums are much swollen and inflamed, and must be very painful, the susceptible brain and nervous system of the child is strongly and injuriously affected by the irritation. The little sufferer is fevered, flushed in the cheeks, and peevish, sleep is disturbed with moaning and starting, and the fingers are constantly in the mouth, or the lower jaw is moved from side to side. In such cases, lancing the gums *thoroughly,* warm baths, and aperients if the bowels are not relaxed, are *the* remedies, the first especially, without which the others are useless or nearly so. The popular idea, that lancing the gums is beneficial, by assisting the passage of the teeth through them, is quite erroneous, and may lead to an erroneous method of performing this simple little operation, which every parent who lives at a distance from medical assistance, and particularly in emigrant life, ought to know how to do. The real benefit is derived from the relief which the incisions afford to the tense and distended gum, and from the slight flow of blood which follows, and on this account it is advisable, not only to cut the upper surface, but also the side of the gum, so as to divide the vessels freely. The operation is most conveniently and safely done by a "gum lancet" made for the purpose (see fig. 55), but a common penknife may be employed on emergency, the blade

being wrapped with a piece of linen, to within a short distance of the point, to prevent any chance cut to the lips. It is superfluous to

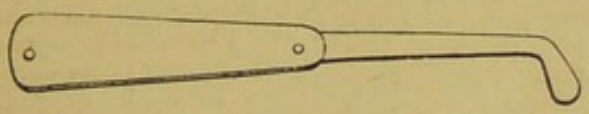


Fig. 55.

describe this simple proceeding, *it should be seen done once*, or at least the method shown. It is not recommended, of course, that the gums are to be lanced for every slight irritation of teething, but when the child exhibits the graver symptoms above described, it ought to be done at once, and, if requisite, repeated again and again. In addition to lancing the gums, a warm bath for ten minutes will be found eminently serviceable in soothing the irritated system, and aperients should be given—a couple of grains of grey powder at night, followed by a *small* tea-spoonful of castor oil in the morning, or if stronger action be thought requisite, a powder composed of one grain of calomel to two of powdered scammony is to be given at bedtime to a child of six or eight months old. If the irritation attendant on teething produces convulsion, medical aid *must* be had as soon as possible, and in the meantime, those remedies employed which are suitable.—See *Convulsion*.

In judging of the diseases of children, it ought to be borne in mind that the pulse of an infant is always quick, averaging from 120 to 130 in the minute, and that at the end of the first year its average is still considerably above 100.—See *Pulse*.

The regulation of the exercise of young children is of much importance. At first, the mere respiratory movements, occasional crying, and the effort of sucking, are exercise sufficient, if *gentle* nursing movements be employed; but gentle they must be; the system so often adopted of jerking infants about is much to be condemned, and may be extremely hurtful. In the course of a few weeks after birth, the infant begins to show signs of increased power of movement, and evidently experiences physical pleasure in the exercise of its limbs; as time goes on, its next effort is to sit up in the nurse's arms, till, if a vigorous healthy child, at about fourteen months, generally, it tries to walk;—all these movements will come spontaneously to the child, when its frame and muscular powers are adequate to the exertion, but they *should never be forced*. It is astonishing what an amount of practical ignorance prevails on the above point; children are put to sit in chairs, held upon their feet, or put in go-carts of various construction, long before the bones are fit to bear the weight, and curved spines and distorted legs are the consequences. Again, it is repeated, every advance of the child towards walking and the upright posture, can only be safe when spontaneous. When a child first commences walking it must get falls, but it is surprising how little material injury the head, which most generally suffers, seems to receive. At the same time, in families in which tendency to head affection exists, extra care must be taken—a padded band round the head is a useful and frequently used protection.

When a child begins to walk, and to attempt to talk, the period of infancy may be considered as ended, and childhood begun. Many of the directions applicable to the former are equally so, in a modified degree, to the latter, and *vice versâ;* but *Childhood* requires further remark. When distinct nursing is no longer requisite, the child becomes more truly the inhabitant of *The Nursery*, and much of its health and happiness for the next few years of its life, will depend upon the proper regulation of this important department of the household.

Whatever is said respecting the necessity for pure air, and proper ventilation, either in this article or in any other, such as *Bed-room*, applies of course to the nursery, or rather nurseries; for every parent, whose means will admit, should provide a night and a day nursery for his children, and in neither, should such operations as washing clothes, cooking, &c., ever be carried on. The double room will allow of all necessary airings, washings of floors, &c., to be perfectly carried out without the health or comfort of the children being interfered with. Should one nursery only be available, the children should be taken out of it as soon as possible after rising in the morning, the windows thrown wide open, and all necessary cleaning performed before they again enter it, and, both now, and at every period of the day, all kinds of slops removed. Should any action of the bowels take place during the night, the receptacle should be put out of the room at once. The observations respecting the sanitary regulation of the nursery, are more particularly applicable in the case of the middle classes, who want the abundant accommodation of the wealthy, and whose children, in towns at least, do not have the same free access to the open air, as those of their poorer neighbours. *The situation of a nursery* in the house is important; it *must*, if possible, be in the upper stories, it should have a south aspect, and be abundantly supplied with light—the latter is a most necessary consideration. A guarded open fire-place is the best means of warmth, and the heat, *regulated by a thermometer*, should be kept as near 60° as possible.

But, however salubrious the nursery arrangements, children must have as much open air as possible; when the exercise can be taken as play, in summer, upon the grass, or otherwise, it is quite the most beneficial; when weather and other considerations forbid, and walking is had recourse to, it must not go to the extent of real fatigue. At all times it adds much to the beneficial effect of exercise if the mind be engaged pleasurably in it,—and therefore, all

active plays, either in-doors or out, are preferable to the mere walk, which few children enjoy.

The clothing during the whole period of childhood, in a changeable climate like that of Britain, requires much attention; woollen texture next the skin, both winter and summer, is indispensable for health; during the former season, it should cover the chest and abdomen, and come at least half way down the thighs; in the latter, it may be a lighter material, and not extend so far over the chest; woollen stockings extending over the knees ought always to be worn in winter, and at all times should the entire clothing be such as will keep the surface of the skin comfortably warm; there is no greater or *more fatal* error than that which exposes children lightly clad to the influences of our variable climate, with the view of hardening them.

Thorough purification of the skin must be maintained. A child should be washed all over with soap and water at least once a day. In the case of strong children the water may be cold, in the weaker, tepid, and in both friction with a tolerably rough towel should be used after the bath, both to cleanse and to promote reaction. If a child continues chilled and cold-looking, and appears languid after a cold bath, it is a sign it does not agree, and the temperature of the water should be raised, or the washing should first be performed in tepid water, and just at the last, a little cold water dashed over the body.

The food in childhood claims care, equally with air, clothing, exercise, and cleanliness; its regulation in infancy has already been sufficiently noticed. For strong healthy children, particularly those inclined to full or gross habit, the milk and farinaceous diet—such as rice, sago, bread, &c., cannot be exchanged for a better, for the first fourteen months at least, but if children are delicate, and incline to the lymphatic constitution, the use of animal broths ought to be commenced even as early as the sixth month. The broth made from fowl, mutton, beef, or veal, should not be too strong, should be free from fat, and is better thickened with arrow-root or sago for a young child, or with rice or bread crumb for an older one. Towards the twelfth month, a lightly-boiled egg may be given, but quite the best method of giving the powerful nutriment of egg to children, is to break the raw egg into some one of the milk preparations, whilst the latter is quite hot, and to beat up together. In this way, the albumen is sufficiently cooked, but not hardened. When the teeth of a child are sufficiently advanced to masticate it, animal food in the solid form may be given, but the quantity and frequency must entirely depend upon the constitution of the child. Strong ruddy children are better with it only twice or three times a week, weaker children should have it once a day at least, and in the more advanced stages of childhood, perhaps twice, but this is a point which should be settled by a medical adviser. Potatoes, and the more wholesome vegetables, ripe fruits in their season, may all be allowed to children, in moderation, after the first eighteen months, and particularly should there be a tendency to costiveness, or to eruptions on the skin and other affections depending upon gross habit of body; weaker children may also partake of them, but more moderately, and provided they do not become substituted for more indispensably nourishing food. Children at any age are better without baked pastry of any kind, but boiled paste puddings are not unwholesome,—cheese, and all sorts of spiced and seasoned dishes are quite objectionable. A healthy child should never have an alcoholic stimulant within its lips, and tea or coffee, if allowed, should be very weak, and made with much milk; but there are some delicate children, nay infants, who may derive much benefit from a portion of alcoholic stimulant, carefully given as medicine, and as medicine requiring so much care and consideration, that it should only be employed when and as advised by a medical man. Children should not be made to wait long without some nourishment in the morning; the rapid changes which go on in their systems render them peculiarly sensitive to any, even temporary, want of nourishment. Regularity in meals is important even from the earliest period of existence; it is always advisable that the principal meal be taken early in the day.

Physical training, however, and the closest attention to physical regulations, require the addition of mental training to carry out thoroughly even the physical education of a child. For the infant a cheerful nurse is most valuable. As childhood advances, whatever may depress or frighten ought especially to be guarded against, and all threats or practices which excite undefined terror especially avoided. Affection of the brain may be the result. Undue precocity in a child should always be regarded, if not with alarm, at least with suspicion. Many scrofulous children are unusually precocious, and as a general rule in such instances, the brain is more prone to disease, which may end life, or predispose to mental affection. In such cases it is of the highest importance not only to avoid everything which can stimulate to mental effort, but to excite them to such moderate and regular physical exertion, as will in some degree draw off from the brain itself, both the activity of circulation and of nervous energy.

There are some diseases which are more particularly considered as those of childhood, such as measles, hooping-cough, scarlet fever, and chicken-pox; not that they do not occur in adults, but more generally, being passed through but once, it is in the earlier years of life. In addition to the above, such affections of the brain and its membranes as acute inflammation ending in effusion of water, convulsive

disease, croup, diphtheria, inflammation of the lungs, and diarrhœa, are the most common acute affections of children. These and other diseases may be referred to under their proper heads. Children quickly exhibit the general symptoms of illness, but it often requires much more tact and discrimination to make out its exact seat and nature than it does in the case of adults; it is, therefore, always desirable to place them under proper medical care, as quickly as possible. At the same time, the following ought to be some guide as to the site of the affection, and to its *provisional* treatment.

When in a child complaining of illness, or appearing ill, the eyes look heavy, and are wholly or partially closed against the light, if the brow is contracted, and if with these symptoms there is general fever, some acute affection of the head is to be dreaded, and the indications should not be neglected for an hour; if sickness is present with the above, so much the worse. *Oppression* of the breathing, along with general appearance of depression, is often the forerunner of severe inflammatory affection of the chest, which may be considered as established, if heat of skin, general fever, *rapid* breathing and cough succeed. In the chest affections of children, the movements of the nostrils are much affected. Constipation, which can scarcely be classed as a disease, is almost natural to some children, but requires correction, and this should be effected if possible by food or by gentle friction (see *Circulation — Constipation*). Brown or whole meal bread should always be employed, and fruits, either cooked or ripe, such as *roasted apples*, given in moderation; honey and treacle are useful, but nothing is more so, than the daily use of porridge made from Scotch oatmeal. When the tendency to constipation in children cannot be overcome by diet or friction, the next best remedy, is the use of a small enema of gruel simply, or medicated with castor oil, senna, or any simple aperient, or made with soap water, but the simple gruel ought always to be tried first. When an infant is being brought up by the hand upon ordinary milk, diluted, as it should be, with one third water, constipation may frequently be corrected by the addition of about a table-spoonful of raw cream to the half pint of the mixture. An enema for a child of six years old, should not exceed twelve ounces, and ought to be administered slowly. When medicine *must* be given, as general aperients, castor oil or infusion of senna are most useful: caution must, however, be exerted in forcing the former medicine—as sometimes must be the case—upon very young children; death has been occasioned from its getting into the windpipe. Rhubarb is a most excellent and safe aperient medicine for children, but its bulk and nauseousness frequently make it difficult to get it taken satisfactorily: magnesia is easily given in milk, and may be useful either in the solid or fluid form where active effects are not required, but the former especially ought not to be long continued. Calomel and grey powder, given alone, are too much employed for their aperient action; they should not be administered except under medical sanction.

The general establishment throughout the country of hospitals for sick children is likely to do much to improve the system of nursing and caring for children. In connection with this subject, we may state that those who wish to know more upon it should read the admirable little work by Dr. West, called *How to Nurse Sick Children;* intended especially as a help to the nurses at the Hospital for Sick Children, for the benefit of which institution it was published. It contains directions which will be found of great service to all who have the management of the young, whether healthy or sick; and is from the pen of one whose name is a sufficient guarantee for its excellence. Dr. West tells us that between thirty and forty young women are trained every year as nurses in the children's hospital, and no one but a medical man can know what a great boon this is to the community at large; seeing that there is often no greater difficulty than to get a clever child's nurse. We make the following extract, as showing the sort of observation and knowledge required by those who would be skilful nurses for children:—"The signs of disease differ, as well according to the age of the child as according to the disease from which it is suffering. Cries are the only language which a young baby has to express its distress; as smiles, and laughter, and merry antics tell, without a word, of its gladness. The baby must be ill, is all its cries tell one person; another, who has seen much of sick children, will gather from them more, and will be able to judge whether its suffering is in the head, or chest, or stomach. The cries of a baby with stomach-ache are loud, and long, and passionate; it sheds a profusion of tears; now stops for a moment, and then begins again; drawing up its legs to its stomach, and, as the pain passes off, stretches them out again; and, with many little sobs, passes off into a quiet sleep. If it have inflammation of its chest, it does not cry aloud, it weeps no tears; but every few minutes, especially after drawing a deeper breath than before, or after each short, hacking cough, it gives a little cry, which it checks apparently before it is half finished; and this either because it has no breath to waste in cries, or because the effort makes its breathing more painful. If disease is going on in the head, the child will utter sharp, piercing shrieks, and then, between whiles, a low moan or wail, or perhaps no sound at all; but will lie quiet, apparently dosing, till pain wakes it up again." This is quoted as an instance of the kind of observation that is required, and to show how much a skilful nurse in such matters may help the doctor to find out quickly

what is the matter with his little patient who cannot speak for himself. It is very often the case that, when a child's nurse is asked what sort of a night he has passed, she either can give no answer at all, or one which is quite unsatisfactory. How important a question this is, however, may be in some degree realised by reading the following, also from Dr. West:—"With the approach of night very many diseases get worse; and while you expect this to be the case, you must carefully notice what are the signs of increased illness which, in each instance, manifest themselves. Fever is generally higher—you must notice if it is very much so; the dull, heavy state of many children suffering from inflammation of the brain, or from some forms of fever, in which they lie dosing during the day, is often succeeded by delirium and loud outcries for some hours at night; or, if the child sleeping, talks much in its sleep about its lessons or its play; and the observation that these things have happened will serve to help the doctor in his judgment. If, though these things do not occur, yet the child is restless, you must try to ascertain from what cause. It may be from pain, or it may be from thirst, or from cough which disturbs the child, or from difficult breathing, whith grows worse whenever the child falls asleep, and then wakes him up again every few minutes; or it may be from that sleeplessness which illness brings with it. If, then, you are to give a useful report to the doctor at his visit, you must not merely be able to tell whether the child slept or was restless, but you must have watched so attentively as to be able to describe exactly the manner in which the night was passed; to report when the child slept, and how—when it was restless, and why." A good nurse further observes all particulars relating to the breathing of her little patient, cough, &c.; whether there is any tendency to sickness, or to excessive thirst; whether there has occurred anything like a convulsion, drawing in of the fingers or toes, squinting, or twisting of the features, flushing of the face, any eruption on the skin, or any fact whatever which may be of importance.

One of the most common and troublesome matters to deal with in the case of infants, is a tendency to excoriation and redness of the skin in those suffering from diarrhœa. Now, this is very troublesome; and from the excessive irritation gives rise to great suffering. It can be almost entirely prevented by extreme cleanliness and good management after the bowels are moved. Soap must not, however, be used, as it increases the irritation, but very thin starch should be employed instead. The child should then be carefully dried with a soft napkin, and the parts dusted with fullers' earth or with zinc powder, and afterwards dressed with an ointment made with one drachm of benzoate of zinc to an ounce of lard. The ointment must be kept quite fresh, as rancid ointments never fail to increase the irritation and soreness.

Many children are destroyed by being too much moved about when suffering from exhaustion owing to excessive sickness, purging, or some severe disease. In such cases the little patient is lifted by its mother or nurse from its cot many times in an hour, whereas it should never be removed from the recumbent posture at all. By turning it from side to side it may be shifted and changed, and even a new night-dress may be put on in this way, if it is slit up the back and run together afterwards by means of a few stitches.

Sickness and diarrhœa are among the most frequent troubles of children, especially those that are brought up by hand; in fact, many children at one time or other of their existence are reduced so low by them that, to an inexperienced spectator, it would seem almost impossible they could recover. Now, in checking the tendency to these, the nurse can do a great deal by means of a little common sense, and can greatly aid the doctor. Foolish and inexperienced nurses, when a child is either sick or purged after everything that he takes, go on cramming him with food under the idea that as what he has had has come back or gone through him, it can have done him no good, and therefore he had better have some more. It is painful to see the poor little creatures sometimes in this state, vomiting taking place every time they are moved. The obvious indication under such circumstances is to give the tired and irritable stomach an hour or two's rest at a time, and then cautiously at first, and *without moving the child*, give only a small tea-spoonful of cold water, to be followed, if that is retained, by a little cold milk and water, or something of the simplest description, *small in quantity and cold.* If that is retained, a gradual return to its accustomed food may be attempted.—Chlorodyne is a most useful addition to our medicines for children's diseases, especially diarrhœa. It requires, however, to be very carefully and cautiously used.—See *Chlorodyne.*

As a general rule, in giving medicine to children, deception should not be practised; but whilst the child knows that it is medicine which it takes, it ought to have it in as palatable a form as may be, without interfering with the efficacy of the drug.

Refer to—*Bath—Bed-room—Breast—Chairs—Clothing—Diet—Electricity—Exercise—Milk—Rupture—Skin—Teeth—Vaccination—Ventilation—and to the articles on Diseases and Medicines generally.*

CHIMNEY.—A chimney, by intention the channel by which the smoke and fumes of fire are conveyed away, also performs the no less important office of a ventilator. In former times, when the chimney formed almost a separate chamber, *in* which persons sat round the fire, or indeed as long as it retained its ample dimensions, the people enjoyed an effici-

ent means of ventilation, although in ignorance of the benefit. By change of fashion, the chimney has been gradually contracted and lowered to the model of the present modern fire-place; whilst this has been done, from ignorance of the necessity for pure air, no provision has been made to supply the loss of the efficient ventilating power of the old-fashioned construction, and consequently health must have suffered, and does suffer materially from the omission, although it is to be hoped that the diffusion of popular knowledge upon this and other points of sanitary regulation, will not allow such to be the case much longer. The chimney, however, is a notable instance of society enjoying ignorantly an arrangement conducive to health; and of that ignorance, whilst making alterations more consistent with comfort and convenience, doing away with one great advantage, of which it remains for science to point out both the loss and the means of reparation. As whatever goes up, or ought to go up, the chimney, are vapours and gases which cannot remain down without injury to health, it is a matter of importance that the chimneys of a house draw well, more especially those of bed-rooms in which fire is used. As a means of ventilation simply, *independent of the fire*, the importance of a chimney is so great, that rooms in this climate which are destitute of one cannot be considered healthy, although it must be confessed, that this secondary office appended to the original intention, is rather a clumsy method of effecting so important an end; it is one, however, of which it is requisite to make the most, and therefore chimneys ought to have a thorough good draught for smoke, ought never to be stopped up when not in use, unless other means of efficient ventilation are possessed, and, when possible, should be fitted with some efficient mechanical contrivance for increasing their ventilating power. —See *Bed-Room—Ventilation*, &c.

CHIN-COUGH.—See Hooping-Cough.

CHIRETTA or **CHIRATA,** is an Indian plant, the stems of which are imported in bundles about three feet in length; they are of small calibre, and have generally their roots attached. It is an admirable tonic, improving the appetite, and giving tone to the stomach. Hence it is useful in cases of indigestion with debility, and in convalescence from disease. It is very similar in its action to gentian, and is probably not superior to that drug. It is often called bitter-stick. The infusion and tincture of chiretta are now in the British Pharmacopœia. The dose of the former is from half an ounce to an ounce and a half, and of the latter from half a drachm to a drachm.

Chiretta is much used in India as a substitute for gentian. It contains a bitter principle, and very little volatile oil; hence it is a more simply intense bitter than gentian. Lozenges made with chiretta are exceedingly useful in relaxed throat and loss of voice.

In India chiretta, or, as it is variously called, chirayta, chirayita, chirata, and chiraeta, has been used instead of quinine as a remedy in intermittent fever or ague, and it has also been prescribed by some in preference to sarsaparilla in cases in which that drug is specially used. It is also said to be peculiarly beneficial in cases of want of tone dependent upon affections of the uterine system.

CHLORAL HYDRATE, Hydrate of Chloral, or, as it is more frequently termed, simply Chloral, is a compound produced by the action of chlorine gas on alcohol after treatment with sulphuric acid and lime, and the subsequent addition of water. It is an excellent remedy for producing sleep, and has now largely taken the place of opium for this purpose. In cases of nervous disturbance in which sleeplessness is a prominent symptom, such as hypochondriasis, chorea, delirium tremens, &c., it is especially valuable, as the inconvenient effects which often follow the administration of opium are thus avoided. The dose of chloral is from ten to thirty grains in water. There is also a syrup prepared from the drug which may be taken in doses of from one to two drachms. Unfortunately, the properties of chloral render it liable to great abuse, and many persons have seriously injured their health by frequent and large doses; in some instances death has resulted from one overdose, inadvertently or intentionally taken.

CHLORINE is a gas of a green colour. It is an important agent in manufactures, on account of its bleaching properties, and its powers as a disinfectant or destroyer of the noxious emanations from decomposing bodies, whether vegetable or animal, render it a most valuable assistant in sanitary arrangements. When undiluted, it exerts an extremely irritating effect upon the lining membrane of the respiratory organs, and as serious and even fatal accidents have occurred from this cause, caution is requisite in its use. A small proportion of chlorine gas diffused through the atmosphere, very quickly and thoroughly destroys not only the smell, but the injurious properties of floating emanations, which are capable of engendering disease. Chlorine gas is obtained in various ways, but the great magazine for its supply is common salt, which is composed of chlorine and sodium. For sanitary purposes, various preparations, calculated to yield chlorine simply and easily, have been used; of these the chloride of lime now called chlorinated lime is the best known. This and most of the preparations, however, have the disadvantage of, when alone, yielding the gas too slowly and sparingly to be of much service, and when mixed with an acid, of pouring it out in quantity so great as to affect disagreeably or injuriously any persons exposed to its influence, particularly the sick. Though, in consequence, chlorinated lime has been banished from general use in private houses,

the same objection does not hold good where it is employed in outhouses, privies, or dung heaps. Other preparations require sprinkling about the place to be purified, and as this is often done in ignorance of its colour-destroying powers, much damage is done to furniture, &c. A preparation, known by the name of Collin's disinfecting powder, seems to be free from the above objections; when a portion of it is exposed to the atmosphere in a plate or saucer it keeps up a certain, but sufficient exhalation of chlorine for some days, as it continues to absorb moisture. It is quite the best, most effective, and agreeable method for employing chlorine in the chambers of the sick which the author has met with.

The principal preparation used in medicine into the composition of which chlorine enters, is the liquor chlori, which is a solution of the gas in water, and which, diluted with eight or ten parts of water, may be used as a gargle for affections of the mouth and throat, attended with fœtor and sloughing. Hydrochloric acid is a gaseous compound of chlorine with hydrogen gas, but is usually met with in solution of a yellow colour. It has a suffocating odour and gives off pale yellow fumes when exposed to the air. It is, of course, a powerful corrosive poison when swallowed alone; its antidotes are the carbonates of potash, chalk, or magnesia in any form, or milk, or white of egg, whichever is first at hand, until the antacids are procured. In the absence of any of these, soap water may be given; but, in poisoning with any acid, it should be remembered, that mortar or whitewash, rubbed up finely with water or milk, may be used on emergency as an antidote; the lime neutralising the acid. Of course the other antacids, particularly magnesia, are to be used if procurable at once. Of the latter, a dessert-spoonful may be given every ten minutes, and repeated according to the effect and probable amount of acid swallowed.

Hydrochloric acid is used in medicine as an unstimulating tonic, particularly in diseases such as malignant scarlatina, which are accompanied with tendency to putrescency; it is also used as a mouth-wash or gargle in the same disease. The diluted hydrochloric acid is given in doses of ten drops, in a wine-glassful of water sweetened with sugar, or it may, if preferred, be taken much more largely diluted, and then forms a pleasant drink. It may be used as a gargle, in the proportion of two drachms to the pint of water. As in the case of acids generally, unless largely diluted, the doses should be sucked through a quill or glass tube, to preserve the teeth from corrosion, and it is likewise a useful precaution, for the same purpose, to rinse the mouth with a diluted solution of carbonate of soda. In the absence of means for procuring chlorine, if fumigation is required, hydrochloric acid gas may be used as a substitute, as it is disengaged by mixing equal weights of common salt and oil of vitriol —sulphuric acid—care being taken against inhaling its irritating fumes in too concentrated a state.

CHLORODYNE.—There are few remedies which have proved more general favourites than the above. It is said to consist of prussic acid, in combination with morphia, chloroform, and Indian hemp as its principal components, and it possesses, combined in an eminent degree, many of the best properties of an opiate and an antispasmodic. It is agreeable to the taste of many persons, and can be given either alone in water, or combined with other remedies. Perhaps its greatest value has been in cases of irritating cough, as in consumption, and in irritation of the bowels, accompanied by pain and diarrhœa. In the former case, five or ten minims in an ounce of camphor mixture three times a day; and in the latter, the same dose in an ounce of chalk-mixture may be given. In cases of acidity, with much irritation of the stomach, an excellent prescription is, ten or fifteen drops of chlorodyne with fifteen to twenty grains of bicarbonate of soda, in a wine-glassful of water, two or three times a day. From its warm, aromatic taste, and comforting action in cases of griping and uneasiness in the bowels, it is generally a favourite remedy with patients; and although, in the strictest sense of the word, a quack medicine, and, of course, not allowed a place in the British Pharmacopœia, yet it is very much prescribed by some medical men. Either alone, or combined with other remedies, it has proved of eminent service in cases of sea-sickness which have resisted many other kinds of treatment. It has been extensively used, both in this country and abroad, by domestic as well as by regular practitioners, in the treatment of diarrhœa and dysentery, and it has been authoritatively stated that it is one of the best of known remedies for cholera. One thing is certain, that its uses are so varied and general that it should form part of the equipment of every domestic medicine chest. Chlorodyne of known composition can now be obtained, so that those who have a very proper objection to using remedies, the constituent parts of which are kept secret, may employ it without further scruple.

Of course, as it has the action of a powerful opiate, it must be given with extreme caution to young children, and in all cases where opiates are likely to exert an undue action.

Infantile Diarrhœa.—For a young infant twelve grains of bicarbonate of soda in five minims of chlorodyne and an ounce and a half of water, form an excellent mixture where there is griping and flatulence; one tea-spoonful may be given twice or thrice in the twenty-four hours. When diarrhœa is present, chalk may be substituted for soda.

CHLOROFORM is a transparent heavy fluid possessing an agreeable, fruity flavour and

sweet taste. It is prepared by the distillation of rectified spirit off chlorinated lime, and purified by redistillation.

Its power of producing "anæsthesia," or insensibility to pain, when inhaled, is now too universally known to require comment. It is, however, too potent an agent to be trusted in unprofessional hands, except, indeed, under direct medical sanction and direction in each particular case. In the more painful and the larger operations of surgery it is one of the greatest boons conferred upon suffering humanity, and its use tends to diminish the average mortality after them. Fatal cases *have*, however, followed its inhalation, and although these have been in very small proportion compared with the numbers in which it is daily and hourly administered, still the fact of their having occurred, is sufficient to make us pause before incurring even the remote chance of so serious a result, for the sake of avoiding a momentary though sharp pain. Moreover, cases do occur, in which very disagreeable effects, such as headache, sickness, hysteria, &c., have succeeded the use of chloroform. No one should ever be tempted to inhale this agent, without the previous assurance of a competent medical man that in his or her case no contra-indications are present.

On account of numerous fatal results from the employment of chloroform singly, it is now frequently administered in conjunction with sulphuric ether, which possesses similar anæsthetic properties. Different inhalers are employed for the purpose, from the towel or pocket handkerchief to the more elaborate apparatus introduced by Mr. Clover, consisting of a large bag charged with the mixture, to which a bellows is attached, the object of the inhaler being to reduce and dilute the strength of the vapour that it may be administered with greater safety.

The late Sir J. Y. Simpson, who first introduced the anæsthetic uses of chloroform to the notice of the medical profession, employed it largely in midwifery practice, and in this branch it has been attended with most beneficial results, and with apparently less danger. Its power of relaxing the muscles and producing unconsciousness has caused it to be used extensively in lock-jaw, convulsions, in colic, and in the passage of renal and biliary calculi, and in other spasmodic affections. The greatest care is required in the administration of chloroform, and it should never be attempted unless under the guidance of a medical man. Should any threatening symptom appear in the course of inhalation, such as faintness or great difficulty of breathing, it is necessary to desist for a time and resort to means of artificial respiration.

Although chloroform by inhalation is not to be carelessly indulged in, yet its external application, in the form of liniment or as an addition to other liniments, may be employed with perfect safety in numerous neuralgic affections, and in some skin complaints attended with intolerable itching. It has also been found serviceable as a stimulating liniment to produce a certain amount of counter irritation on the chest, in cases of bronchial and pulmonary disease.

CHLOROSIS is a form of anæmia or bloodlessness which occurs most commonly in young women between the ages of 15 and 25, and is characterised by a peculiar greenish pallor of the skin of the face, and to some extent of the body also. Among the more prominent symptoms resulting from the impaired quality of the blood are breathlessness on very slight exertion, palpitation of the heart, lassitude, and frequently mental depression, headaches, and absence of the usual menstrual periods. In severe cases considerable swelling of the feet and legs may be present, with pitting or pressure. Constipation of the bowels is usually a prominent symptom, and has by some physicians been regarded as the main cause of the condition. The gums are exceptionally pale and colourless; the interior of the lower eyelids also are noticeably white, and the small blood-vessels ramifying there almost invisible. The treatment consists in attention to the regular action of the bowels, as much exercise in the open air as can be taken without overfatigue, and the administration of tonics containing iron.—See *Anæmia*.

CHOCOLATE.—See Cocoa.

CHOKE-DAMP.—See Carbonic Acid.

CHOLERA—Asiatic or Malignant.—So far as our knowledge goes, the first commencement of Asiatic cholera among our countrymen in India occurred in the year 1817, when it took its rise in a swampy district at the mouth of the Ganges, from whence it spread over India to various parts of Asia and Europe, and finally reached England in the year 1831, where it continued till the end of 1832, disappeared for seventeen years, and re-appeared in a more virulent form than before in the year 1849, in which latter visitation it carried off, in London alone, 15,000 people, and in the entire kingdom, not less perhaps than 80,000. Another epidemic of a less extensive character occurred also in the year 1866, since which time the disease has been absent from this country until the years 1892-93 when, each autumn, a limited number of cases occurred. Cholera is endemic in India, and especially Lower Bengal, and when it appears in this country it is invariably imported; on its transit it has been fairly conclusively proved to follow the lines of human communication. Dirt, bad air, bad water, bad food, insufficient clothing, and irregular and vicious habits, are all the favourers of cholera, and were it not for these, singly or combined, it would, in all probability, pass comparatively lightly over our land. Although, since 1866, the sanitary surroundings of the people have vastly improved, we have by no means reached

the stage when we can afford to view with composure the approach of the disease towards our shores, and it is greatly to the credit of our sanitary authorities that the country has been saved from another serious epidemic, seeing the extent to which the disease prevailed on the Continent in 1892.

Symptoms.—As a rule, a person who is attacked with cholera feels unwell previously, and often suffers from slight diarrhœa for a day or so before; when the disease sets in earnestly, however, which in the large proportion of cases it does during the night, the patient vomits, and is purged with more or less frequency and violence, the evacuations quickly coming to resemble thin gruel or rice-water; cramps of the limbs succeed, the surface becomes cold, blue, bathed in sweat, and has, particularly the fingers, a peculiar shrunken sodden appearance, the tongue is cold, the pulse imperceptible; the urine is suppressed, and the voice acquires a peculiar pitch of tone. Many die in this, the collapse stage of the disease, but if it is passed through, reaction comes on, the surface gets warm, the thirst continues, the quick pulse becomes perceptible, the tongue is dry and brown, and delirium is present; in short, fever is established, and may end either in recovery or death.

Management.—During the prevalence of cholera it is not well to make any change in the ordinary mode of living, provided no indiscretions have been indulged in. Of course, if a man is aware that he is habitually indulging in practices injurious to health, such as intemperance, debauchery, &c., he only acts wisely as regards his physical safety, in changing those habits; but it is hazardous to alter regular modes of living, which have hitherto been found compatible with good health, it being understood, that whatever tends to lower the standard of health, favours the attack of the disease. There is, however, one important precaution which ought to be observed, at all times indeed, but more particularly during the epidemic of cholera—the perfect purity of the drinking water should be ascertained, and its freedom from all decomposing organic matters made certain. Care is also to be observed not to take active purgatives, particularly salines, which produce watery evacuation; if aperient medicine is required, it ought to be of a simple character, such as castor oil; for whatever produces free action of the bowels, apparently increases the susceptibility to attack. For this reason, too, the slightest tendency to diarrhœa should at once be arrested, by chalk-mixture, repeated as often as requisite, with the addition of from five to ten drops of laudanum to each dose, and the use of milk and farinaceous preparations, containing gelatine, for food. The speedy adoption of these measures, in places distant from medical assistance; and their enforcement by the clergyman or some intelligent individual, might do much to check the disease.

With regard to the actual treatment of the disease itself, when fully established, many different methods have been proposed and practised, and few of them, perhaps, without apparent advantage in some cases; but as yet no treatment which can be called decidedly successful—a cure—has been discovered. Of course, in so formidable a disease, proper medical assistance ought to be obtained as quickly as possible; but as far as our present knowledge extends, those around the patient would be fully justified in using every possible method of hot application to maintain the temperature of the body, and in permitting the gratification of the intense thirst to the full, by iced cold water. In doing this there will be at least the consolation that the comfort of the patient is promoted; everything further must be left to medical judgment.

The following summary of the precautionary measures which should be adopted may prove useful:—

As cholera is not a disease which is likely to be conveyed from person to person, like scarlet fever and small-pox, those in contact with the disease need not fear any risk of contracting it, provided ordinary precautions are observed. These precautions we give below in the form of Rules, and also refer the Reader to the section on *Enteric Fever*, for the channel by which both diseases are conveyed is practically the same, the discharge from the patient in both cases being the poison carrier. Safety lies in scrupulous care with regard to cleanliness both of person and surroundings, and the destruction or disinfection of all articles which have been in contact with the patient and of the excretions. The process of disinfection must be carried out precisely on the lines indicated in the article on *Enteric Fever*. Those in attendance on cholera patients must remember that they are responsible to the public generally in the management of the case, so that the disease may be prevented from spreading; and it must be remembered that carelessness in the observance of the rules regarding disinfection may lead to a needless and terrible sacrifice of life.

A few simple Rules may be of service (*a*) to the nurse in charge of cholera patients, and (*b*) to the general public.

Precautions for the Nurse.—1. The nurse should carefully attend to her general health by observing the ordinary rules with reference to diet, exercise, and rest. Wholesome food at regular intervals, daily walking exercise, and eight hours rest in bed, are indispensable requirements.

2. No meals should be partaken of in the sick-room, and only such food as is necessary for the patient should be kept there.

3. The nurse alone should be held responsible for the disinfection of all articles (utensils,

&c.) used by the patient, and the instructions laid down in the section on *Enteric Fever* must be adhered to even as regards the smallest detail.

4. After attending to the patient, and having carried out any necessary act of disinfection consequent upon such attention, the nurse must invariably wash her own hands in soap and water containing a disinfectant, and this precaution should be observed on all occasions before leaving the room.

5. As regards the room, no articles used in cleansing the patient should be allowed to lie about. Those which are of no value (rags, &c.) should be burned, and other articles (towels, &c.) which are of value, should be plunged at once into a covered utensil containing a disinfectant, and kept there until such time as they can be sent to the laundry. The room itself must of course be kept thoroughly clean and well ventilated.

6. On the termination of the case the room should be disinfected in the manner laid down in the section on *Disinfection*.

General Precautions.—The general public, when cholera is prevalent, should observe the following rules :—

1. Special attention should be paid to the general cleanliness of houses and premises. Water should be freely used to cleanse yards and out-buildings, and to keep the drains thoroughly flushed. Rubbish should not be allowed to accumulate, and particularly in those cases where frequent removal of refuse is not provided for by the sanitary authority, the kitchen fire should take the place, as far as possible, of the scavenger.

2. As water is the chief agent by which cholera is conveyed, it is essential to *boil all water* which is used for domestic purposes ; the same rule applies in the case of *milk*. Domestic filters must not be depended upon for purifying water, boiling alone will remove all danger from this source.

3. All indiscretions in diet or conduct which are likely to interfere with the healthy functions should be strictly avoided. Excessive eating or drinking, late hours and irregular habits, in fact, any departure from a wholesome *régime* should on no account be permitted. Fresh and well cooked meat, well boiled vegetables, milk puddings and stewed fruit may be partaken of. On the other hand, tinned foods of all sorts, uncooked vegetables, unripe or decaying vegetables, and indigestible articles generally, should be avoided.

4. Attention should be paid to the regular action of the bowels ; simple aperients, such as castor oil, may be taken if necessary, and any tendency to diarrhœa should be checked by simple astringent remedies if it should continue; but it is well to obtain medical advice if ordinary remedies fail to have the desired effect.

5. Not the least important precept is to avoid apprehension of danger, and to have confidence that the observance of the Rules laid down will, under Providence, prove a safeguard against the risk of contracting the disease.

CHOLERA, BRITISH—an aggravated form of diarrhœa.—See *Diarrhœa.*

CHOREA.—See St. Vitus's Dance.

CHRONIC—a term applied to diseases of slow progress, in contradistinction to *Acute.* —See *Acute.*

CHYLE is the milk-like fluid which is separated from the chyme, or digested food mass, after it has passed from the stomach, and been acted on in the small intestines by the bile and pancreatic fluid. The vessels by which the chyle is absorbed from the intestine have been named lacteal, from the milk-like or white appearance of this fluid, which they contain abundantly after a full meal; the characteristic whiteness being more particularly apparent, if the food has contained much fat. The lacteals convey the chyle to the chyle receptacle, and from thence it is carried direct to the venous circulation.

Refer to—*Absorbents*—*Chyme*—*Digestion*——*Pancreas.*

CHYLOPOIETIC is a term applied to the viscera which assist in the formation of the chyle.

CHYME is the pultaceous, grey-looking, acid substance, to which food is reduced by digestion in the stomach, before it passes—in the healthy state at least—into the small intestines.

CICATRIX is the scar or mark left upon the skin or upon an internal organ, at the place where separation of substance, either from violence or ulceration, has been healed. Cicatrices arising from burns, unless carefully treated, often produce great disfigurement and deformity, which it may be necessary to remedy by surgical operation. Cicatricial tissue is very difficult to heal, when cut or injured, and is often the seat of chronic sores and cancer; it is apt to be both troublesome and painful, particularly in cold weather.

CIDER — a fermented beverage obtained from the juice of apples, contains from five to nine per cent. of alcohol. It is a wholesome drink, and is largely consumed instead of beer in districts where apples are abundant. Care ought to be taken that lead is not used in the process of preparation, as it is acted on by the malic acid, and is liable to cause colicky pains and other intestinal derangement. In some cases of rheumatic gout, cider acts beneficially, and wherever the tendency exists, is a much safer beverage than any form of malt liquor.

CINCHONINE.—The hydrochlorate and sulphate of cinchonine, especially the latter, as well as cinchonine itself, have of late been much recommended as substitutes for quinine. They have certainly this advantage, that they are much cheaper, but pretty extensive experience of them in hospital practice, has not warranted physicians in coming to the conclusion

that they are to be considered equal to quinine, either as tonics, or as antiperiodic remedies. The Madras Commission, however, of 1868, reported that quinidine and cinchonine were only a little less efficacious than the corresponding salts of quinine, and there can be no doubt, that they are worthy of a more extensive trial than they have yet received at the hands of the medical profession. Quinine is a somewhat expensive remedy, and, of course, it would be a great boon to the poor if a cheap substitute equally efficacious could be obtained, and it is far from improbable that some of the other alkaloids obtained from the bark will be found, which will take its place.

CINNAMON—the well-known spice, is the bark of a tree. It is brought from Ceylon and the islands of the Indian Archipelago. It is largely used in medicine for the same purposes as other stimulant aromatics; chiefly as an addition to correct the nauseant, or add to the aromatic properties of other more active medicines. The distilled water made from the bark is well known. In consequence of the high price of true cinnamon, a coarser description, the cassia bark, is very generally sold in place of it in this country, and though not so fine in flavour as the true bark, is equally well adapted for medicinal use. True cinnamon is thinner, lighter in colour, and consists of more quills one within another, than cassia bark. The dose of the oil is from one to five minims on sugar.

CIRCOCELE—an enlargement or varicose condition of the veins of the testicle.

CIRCULATION OF THE BLOOD is

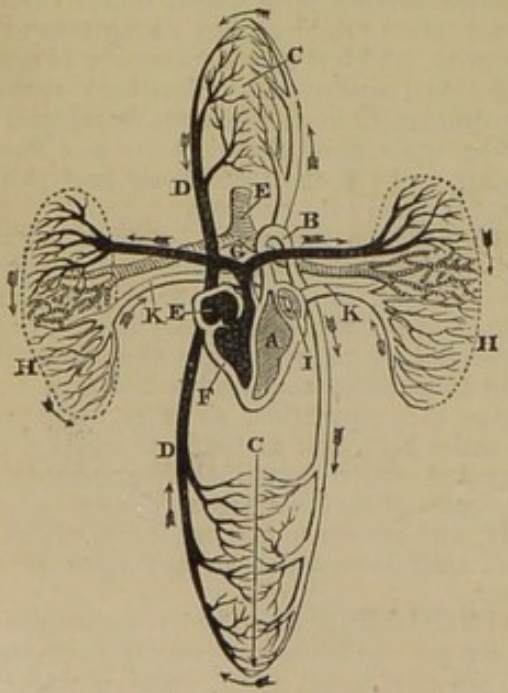


Fig. 56.

the entire course of the fluid from its leaving the heart to its return to that organ. In man, and in warm-blooded animals generally, including birds, there are two complete systems of circulation (see fig. 56), the one through the body at large, the other through the lungs, and this double circulation involves the presence of a double propelling organ, that is, a heart consisting of four cavities.

The structure and requirements of our animated bodies as they have been constituted by the Creator, depend for their maintenance in healthy existence and action, upon the continual passage of arterial blood throughout every portion of their structure; for this the circulation provides. The heart, which is muscular, consists of four cavities, two auricles, and two ventricles; of these, the left ventricle (A) which gives the first propulsion to the arterial wave of blood, is considerably the most powerful. When it contracts, the blood contained within it at the moment, is forcibly propelled into the aorta (B), or main blood-vessel of the body, from which it diverges into the secondary branches, until at last, by the division and subdivision of the vessel, it is conducted into the capillaries (C), in which it comes into more intimate connection with the elementary components of the body, and undergoes such chemical change, that when it emerges, it is an altered fluid; instead of the bright red arterial, it is the dark black-looking venous blood, unfit for the maintenance of the vital functions. It is now collected by the veins (D) and conducted back to the heart, the *right* auricle of which (E) it enters; from this cavity it passes into the *right* ventricle (F), and is propelled by its muscular power into the pulmonary artery (G), and through the lungs (H, H), in its passage through which it is brought into contact with atmospheric air, casts off the carbonic acid with which it has been laden, absorbs oxygen, and being chemically changed is once more the bright arterial fluid, which, returning through the pulmonary vein (K) to the left auricle of the heart (I), is transmitted by it to the left ventricle, to be sent once more upon its mission of life.

Although the forces which circulate the blood, namely, the muscular propelling power of the heart, the muscular and elastic contractility of the arterial coats, and the suction power exerted within the chest, are sufficient of themselves, during health, to maintain the vital current, which flows, and must flow from the first moment of life until death; their power and efficiency is much assisted by the muscular movements of the body, by exercise, which, quickening the respiration and the action of the heart, sends the blood with increased force and frequency throughout the frame, and stimulates every function to increased action. Thus, provision has been made by the Creator, that whilst the powers which circulate the blood can, of themselves, carry on that necessary process sufficiently to preserve life; high health and vigour can only be attained by the active exercise of our limbs.

In the aged, and in those exhausted by disease, who are long confined to a horizontal posture, the circulating powers become too feeble to overcome the force of gravity, and the blood tends to accumulate, more particularly in the lungs, in the most dependent part; for this reason change of posture is advisable. In those whose circulation is feeble generally, and in certain cases of bed-ridden patients, friction by the warm hand of the attendant, moistened with a little oil, is often of great service. The spine should be rubbed daily with very gentle pressure, from the nape of the neck downwards. This simple remedy is very effectual in the case of delicate children, and often removes a tendency to curvature of the spine, as well as to constipation.

Refer to—*Artery—Blood—Heart—Respiration, &c.*

CISTERNS.—The importance of maintaining the cisterns of a house in good working order, and of preventing the water contained in them from being contaminated with impurities, has induced us to insert the following useful directions issued by the "Society for the Sanitary Inspection and Construction of Houses." The recommendations refer to the connection with the cisterns, and to house fittings generally:—

"1. In cleaning out water cisterns, great care must be taken not to allow any of the deposit to get into or pass down the service pipes; these must be plugged, and the residue of water must be taken out with sponge and bucket. If the cisterns are of lead, or lined with lead, they must not be scraped.

"2. After the cisterns have been cleaned out, the covers (if any) should be replaced, the efficiency of the ball-taps should be tested, and the ball, levers, and cranks oiled.

"3. Examine whether there is a stopcock in the main service; if so, its description and working condition.

"4. Examine whether the cisterns are covered; whether they have overflow pipes, and if such overflows discharge into the open air or into any soil-pipe, closet, or drain.

"5. Examine the service pipes and valves of all water-closets, to see whether they act properly, and note from what cistern the water comes, *i.e.*, whether there is a separate cistern for drinking water, or whether the same cistern supplies the water for drinking and domestic purposes, as well as for the use of the water closets.

"6. Examine the nature and condition of the safes, traps, soil, and waste pipes, &c., connected with all water closets, baths, and sinks, to see if they are in good working order or otherwise.

"7. Examine the soil-pipe throughout its course, to see whether it is air-tight or not; any points of leakage should be noted.

"Useful hints to householders are, that all houses should be supplied with a stop-cock, so that in case of severe frost, or in the event of repairs, the water can be easily turned off without having to hunt for the regular official, and causing great inconvenience to neighbours by having to turn off at the main. All water cisterns should have a properly fitted cover. It is advisable, when practicable, to provide a separate system for the storage of water for drinking and household purposes, distinct from the cisterns that supply the water closets. The frictional parts of all sanitary fittings should be kept regularly oiled. The seats of water closets should be loose or fixed with hinges, so that the apparatus underneath can be examined without disturbing the woodwork. It is of great importance that all pipes and fittings should be easily come-at-able. To prevent the bursting of pipes in severe frost, the water should be turned off at the main, and the supply for immediate daily use should be stored in buckets. Covering cisterns and pipes with thick boiler felt, or casing them in sawdust, will generally prevent the water from freezing.

"*N.B.*—The pipes burst from the expansion of the water in the act of freezing, and not after it is frozen. Water will rarely freeze if it is kept slightly running from the tap. In order to secure clean and wholesome water for drinking and cooking purposes, all water cisterns should be cleaned out at least twice a year."—See *Houses—Traps—Water.*

CITRATE OF IRON—AND AMMONIA, is a compound of citric acid and a salt of iron, precipitated by ammonia from the sulphate. 160 grains of the compound, added to a pint of orange wine, forms the *Vinum citratis ferri* of the pharmacopœia. It is a pleasant tonic, and the wine may be given to children in two-tea-spoonful doses. The dose of the citrate which is also given with water is from five to ten grains.

Citrate of iron, like the tartrate, dissolves freely in the "solution of potash" (*Liquor potassæ*), and in this form is an admirable mode of administering iron to children. Twenty-four grains of the citrate or tartrate, two drachms of potash solution, with sufficient distilled water to make up two ounces, is a convenient form, of which one tea-spoonful may be given in half a wine-glassful of milk, twice daily to a child four years old.

CITRATE OF QUININE AND IRON is a compound of iron, citric acid, and quinine, and is an elegant and highly useful form of tonic; it may be given in a similar way, and in doses similar to the above.

CITRATES.—Compounds of citric acid with salts of potash, magnesia and soda, are agreeable forms in which these remedies may be administered. The citrate of magnesia forms a cooling and aperient drink, that of potash a saline febrifuge which helps to increase the secretion from the kidneys, and the effervescing citro-tartrate of soda, an agreeable

and useful aperient as well as a pleasant drink in fevers.

CITRINE OINTMENT is composed of the nitrate of mercury, with lard and olive oil. From its bright yellow colour it formerly went by the name of golden ointment; it is used in some skin affections, and is also frequently employed in inflammatory affections of the eyes. In its ordinary form it is too strong; and should be mixed with once or twice its weight of lard. Iron utensils or spatulas must not be used in its manipulation. It is an ointment which very quickly spoils.

CLARET is one of the most wholesome of the light wines. It contains about 15 per cent. of alcohol. In convalescence, from acute febrile disease in which wine is admissible, but where there exists tendency to febrile action from slight causes, claret is most useful, and preferable to the stronger and heavier wines. In diabetes, claret has been recommended as superior to every other form of stimulant.—See *Wines*.

CLAVICLE — The Collar-bone — extends from the upper part of the breast bone to the point of the shoulder. It is particularly liable to fracture from falls upon the shoulder; the accident is easily detected.—See *Fracture*.

CLERGYMAN'S SORE THROAT is a peculiar affection of the throat and organs of voice to which public speakers are liable; according to the late Mr. Macready, actors, who have to assume feigned tones, are more liable to it from that cause. The seat of the disease is the mucous follicles scattered over the membrane of the throat, larynx, &c., being extended to the latter from the former. The commencement of the disease is insidious; it begins with an uneasy sensation, as if there was something in the throat which required to be hawked up or swallowed down; at the same time the mucous secretion is viscid. As the larynx becomes affected the voice is changed, becomes hoarse, unequal in tone, or quite extinguished; there may be slight pain about the parts, but not much cough in the earlier stage of the disease. All the symptoms become aggravated by cold, by vicissitudes of temperature, or by exertion of the voice in reading, speaking, &c. The above sources of aggravation are, of course to be guarded against, and the general health attended to. Good diet, cold bathing, and change of air, with some astringent lotion for the throat, are generally sufficient to check an attack of clergyman's sore throat. If they do not suffice, it may be necessary for the medical man to touch the parts with a pencil of lunar caustic, or what is better with a solution of nitrate of silver, by means of a sponge fixed to a piece of whalebone. The liability to the recurrence of the affection may be diminished by wearing the beard, and benefit is derived from the use of cayenne, tannic acid, and other medicated lozenges. Brown's bronchial troches have acquired a considerable reputation in relieving the hoarseness. One of the best and simplest remedies is the inhalation of steam, either from an ordinary inhaler, or better, by means of Siegle's spray producer, the spray being mixed with some astringent, such as nitrate of silver, sulphate of zinc, or alum.—See *Inhaler*.

CLIFTON lies within a mile of Bristol. Sir James Clark speaks highly of its climate: "In its local advantages and geographical position, it yields, perhaps, to no place in the kingdom as a residence for a large class of invalids. Within its own limits it affords a sheltered winter, and an open airy summer residence; while it is surrounded by numerous places of agreeable resort in the fine season, suited to the various classes of persons who may seek its shelter during the winter. Compared with the south and south-west coasts, the spring is the period of the year in which this climate appears to the greatest advantage. For consumptive patients, and those labouring under irritable affections of the bronchial membrane, the softer and more humid air of Devon will be found more soothing, while for invalids whose constitutions have suffered from long-continued derangement of the digestive organs, or a congested state of the mucous membrane, with copious secretion; and also for young scrofulous persons, and those of relaxed habits of body, generally, Clifton will prove a preferable climate.

"The spring termed Hotwell rises at the base of the lofty St. Vincent's Rock, and is said to yield as much as forty gallons of water in a minute. . . . . The temperature of the water is 76° Fahr. Like the springs of Bath and Buxton, the salts of lime predominate. The following table exhibits the proportion of the saline constituents in a gallon of water:

	Grains.
Chloride of magnesium, . .	7·25
Chlorinated lime, ...	3·80
Sulphate of lime, ...	7· 5
Sulphate of soda, ...	16·15
Carbonate of lime, ...	13· 5
	47·30

"A gallon also contains, according to Dr. Carrick, thirty cubic inches of carbonic acid gas.

"The water emits a few gas bubbles when drawn into a glass. Taken internally, it generally acts upon the kidneys, and occasionally produces vertigo and headache. It is recommended in various states of deranged health. The baths are not much used. The internal use of the water is considered to be very efficacious in cases of dyspepsia with acidity, in affections of the kidneys, as diabetes, gravel, and tendency to stone."

CLIMACTERIC DISEASE is an indefinite term, usually applied to denote some radical change in a person's bodily condition, which change may be productive either of disease or premonitory of a break up of the

vital powers. The change seldom occurs before fifty years of age, and is more common in men than women, for one reason, probably, that its most frequent exciting cause is over-work and anxiety of the mind in business. The person who is becoming the subject of climacteric disease, complains of weakness coming on gradually, the appetite gives way, sleep is deficient, the bowels sluggish, the pulse quick, and the tongue furred; the flesh falls away, and the altered countenance assumes an aged look in a short period: in other words, the "constitution is breaking up," and the individual's friends remark that "he ages very fast." Swelling of the limbs, eruptions of the skin, and mental apathy, are further concomitants of the disease, which, if unchecked, may run on to a speedy fatal termination; whilst it also renders the patient liable to sink easily under any attack of acute illness, even of a common cold, which, too, it may be observed, is often the first traceable commencement of the climacteric attack. Another very frequent cause, is grief caused by the loss of friends or relatives, who have been much mingled in the affections and habits of daily life. It is a question whether many climacteric symptoms are not due to gout of an atonic character.

When an aged person exhibits the symptoms described above, they should immediately be attended to: the case *must* be put under medical management, and will require tonic treatment, generous living, complete relaxation from the cares and anxiety of business, and, if possible, change of climate.

CLIMATE is the condition of the atmosphere which generally prevails over any particular tract of country, a condition which is, of course, regulated and modified by a great variety of circumstances. The latitude, the elevation, the proximity to, or distance from the sea; the soil, the absence or presence of water, including the drainage, the amount of wood, and the shelter or otherwise from prevailing winds, all exert important influence upon the characteristic climate of any locality, and have to be considered in the recommendation given to, or plan of action adopted by invalids. The subject is quite too extensive to admit of profitable consideration in this work, and the decision respecting the climate to resort to which is likely to benefit each individual case, is so much matter of judgment, and is really so important, that medical opinion ought always to be taken, when change of air or climate is seriously sought as a remedy in illness. Very much precious time is often lost, and real injury inflicted, from want of due care upon this head, and from persons acting upon their own ideas, or upon insufficient advice. Those who desire to get for themselves the most complete information upon the subject of climate, will find it in the valuable work of Sir James Clark.

There are few diseases, perhaps, which do not derive either temporary or permanent relief from change of air and climate, but some are more strikingly benefited than others; they are particularly diseases of a neuralgic, intermittent, or spasmodic character, of which hooping-cough and asthma are good examples. Chronic rheumatism, scrofula, weakness of the constitution generally, including pulmonary consumption, and dyspepsia may also be mentioned. As a general rule, benefit appears to result from change to a climate presenting characters which contrast with those of the one in which the individual is or has been generally resident; the dyspeptic or consumptive patient will derive advantage by removing from the colder to the more genial region; the fever-stricken resident of the sultry or vaporous plain, will regain health and strength in the bracing air of the hills, and even the country child, in whose constitution hooping-cough lingers, will probably lose it if transferred to city air for a short period. Perhaps no air exerts such universally tonic effects as that of the sea, but to some it is too stimulating in certain particular localities, though not so in others; but in fact, the differences in climate, and its effects, are so numerous and varied, that it is impossible here to pass beyond the general consideration of the subject. Unquestionably some amount of the beneficial influence of change of climate is due to the stimulant effect upon the mind, which excitement and change of scene produce, this being more particularly the case, if the condition of the individual permits or calls for the continued change of travelling from place to place.

The error is frequently committed, of resorting to the change of climate as a last resource, which, if earlier had recourse to, might have proved of essential or real service. Another error, is trusting too much to the curative power of climate; and invalids, by throwing aside the restraints of the regimen to which they have been previously subjected, and neglecting the other accessory adjuncts to recovery, fail to derive the full measure of benefit which they ought: and this, more especially if they do not consider and endeavour to accommodate themselves to the modes of living, and other requirements, adapted to the climate in which they are resident for the time.

Sir James Clark divides the "mild region of England" into four districts or groups of climate; that of the south coast, comprehending the tract of coast between Hastings and Portland Island; the south-west coast, from the latter point to Cornwall; the district of the Land's End; and the western group. In Scotland, the Island of Bute, situated in the Firth of Clyde on the west coast, is a remarkable instance of climate modified by situation: surrounded by sea water, and sheltered by lofty hills, its climate is remarkably mild and

equable, so much so, that snow rarely lies above a few hours. It is much to be regretted, that the beneficial effects of change of air are so little attainable by the poor, particularly in recovery from acute illness, when it is frequently all that is requisite to re-establish firm health, and to hasten an otherwise lingering convalescence. The establishment and support of convalescent homes for the poor, especially on the coast, constitutes a useful means for meeting the difficulty; and it is to be hoped that the efforts made for this purpose by many benevolent individuals and societies, will obtain increased support.

The question of acclimatization is one of great importance in many respects, and one demanding the closest attention of naturalists, of political economists, and of scientific men generally throughout the world. For a time the idea seemed to have acquired a pretty firm hold of the public mind, that men and animals, after passing say from an arctic to a tropical climate, acquired, after a certain time, an immunity from the evil effects which the change was calculated, in the first instance, to produce. Many careful observations and experiments have been conducted in this country and (with regard to animals especially) in France, with a view to determine, if possible, how far we are justified in relying upon this hypothesis. Now, although wonderful results were at first obtained—so wonderful that it seemed likely that the power of certain animals to endure changes of climate was almost unlimited, it must be admitted that recently our ideas have been forced to undergo a revulsion on this subject, as we have found that, in many cases, the endurance was only a temporary one; and, more especially, was not likely to be followed out by the propagation of a vigorous progeny.

That man can live and flourish in very cold or in very hot temperatures (provided that in the latter cases there be no malaria or marsh poison) is proved by the fact that the Esquimaux, when well nourished, are a remarkably strong and healthy race; and that the same observation applies to many of those tribes inhabiting regions of the world characterised by the highest temperatures. Experience has now abundantly proved, to the satisfaction of all, that our emigrants in the North American States, living in a climate with a much lower temperature than that to which they had been accustomed, not only enjoy good health, but transmit it to their progeny. In fact, it is questionable whether, if the external conditions surrounding the emigrant be favourable, he is not improved in health, mentally and physically, so that he may become the progenitor of a superior race. A similar certain toleration and possible improvement cannot so confidently be expected from Europeans emigrating to hot climates, although we have seen how well many thrive in certain parts of Australia and New Zealand; while it is a melancholy and well-known fact, that residence in a country much hotter than our own is incompatible with the long preservation of health. Dr. Parkes, in his work on *Practical Hygiene*, in speaking of this subject, says,—"There is a general impression that Europeans do not flourish in countries much hotter, *i.e.*, with a yearly mean of 20° Fahr. higher, than their own—as in many parts of India; that the race dwindles, and finally dies out; and, therefore, that no acclimatization of race occurs. And certainly it would appear that in India and in the West Indies sickness and mortality increase with length of residence; and there is some evidence to show that the pure race, if not intermixed with native, does not reach beyond the third generation. Yet it seems right to say, that so many circumstances besides heat and the other elements of climate have been acting on the English race in India, that any conclusion opposed to acclimatization must be considered as based on scanty evidence. We have not gauged on a large scale the effects of climate, pure and simple, uncomplicated with malaria, bad diet, and other influences adverse to health and longevity."

For some remarks as to the peculiar effects of heat, the reader is referred to the article upon *Sunstroke*.

The effect of winds, or of movements of the body of air, whether hot or cold, with which we are surrounded, is very remarkable. In cold climates, a very low temperature, which has easily been borne before, becomes then unendurable. The movement, on the other hand, of hot air over the surface of the body is said, by greatly aiding evaporation from the skin, to chill the body, in spite of the warmth of the air.

It has long been a matter of dispute among medical men whether mountain air—that is, air rarified, or exerting a less pressure—is favourable to health, or the reverse. There seems now to be little doubt of the fact, however much wrangling there may remain as to the explanation of it. Not only in such situations are consumption, scrofula, and similar diseases, very rare in occurrence, but their progress is actually arrested in the case of strangers who go to reside in the localities. The high Alps of Switzerland, and mountain ranges of Thuringia and Silesia, and of Mexico and Peru, may be mentioned as typical examples of places where consumption is unknown to originate, unless from some special social habit or vice, or from want of food, &c.

Much remains to be done in the way of observation and experiments to enlighten us as to the relation of the presence of ozone and to other conditions of the atmosphere, as well as of the soil, to a healthy climate.—See *Ozone*.

It would be impossible to conclude this subject without a word upon the question of malaria or marsh poison, now known to be the

cause of so many diseases, especially fevers of different kinds. The popular idea is, and it is so far correct, that these poisons are to be met with in low situations, and that an elevation of a few feet will, in many cases, give a protection from their evil consequences; but it should also be known that, in other situations, they have been found in active operation at an elevation of 6000 feet; and that in some instances their favourite locality is in elevated plains, at elevations varying from 1000 to 3000 feet. As a general rule, the greater the elevation the greater the security; and it may be assumed that, although exceptional instances occur, yet a moderate elevation of, say 1000 feet, will generally be sufficient to afford promise of immunity. The whole subject, however, is one of deep interest, and is always undergoing full and highly necessary investigation at the hands of competent observers.—See *Health Resorts.*

Refer to—*Atmosphere—Convalescence, &c.*

CLOTHING.—The protection of the body from the influences of climate, by means of clothing, is most intimately connected with health, more especially in a climate like that of Britain, subject to the numerous and sudden vicissitudes of temperature, moisture, &c. The form of clothing must ever vary with fashion; the principle ought always to continue the same, that is, it should involve complete and thorough protection of the surface of the body, and especially of the cavities of the chest and abdomen, from cold or sudden chill. This is best insured by a covering of woollen material next the skin; the habit should be commenced from the earliest childhood, and continued through life in every season of the year, varying only the thickness of the flannel, or other woollen texture, according to the average temperature. No outward clothing can be so uniformly efficacious as the inner one of wool, as a protection against our variable climate, and yet very many there are, who, both in their own persons, and in those of their children, neglect this real preservative of health, and therefore, this real economy, although the cost at first may seem much to the poor. In addition to the inner clothing, the outer ought of course to be sufficient, and in winter, an addition made on going from the warmth of the house into the open air. In this respect, men are generally better provided, under all circumstances, than women and children. Women, from the nature of their dress, and from the pernicious custom of exposing the chest and arms—not always, which would be less hurtful, but occasionally—suffer much from errors in clothing; they subject themselves to the extremes of fur and thick shawls in the morning, and of thin dresses at night, added to which there is often exposure to currents of air when heated, and without any protection against their effects. Any article of clothing, such as fur, &c., which keeps up a more than average degree of heat, and even induces perspiration, and which is liable to be thrown off or put on easily and as fancy dictates, is hazardous and injurious. Children are in many cases most insufficiently protected from the weather; numbers are without a single article of woollen under-clothing, either in consequence of carelessness, or from the erroneous idea of rendering them hardy; a system which *may* answer in the offspring of hardy parents, whose children are hardy in every other respect, but which can only be productive of injury to health in those who spend most of their time in warm, perhaps too warm, rooms and nurseries. The surface of a child, from the neck downwards, ought to be kept warm by clothing; exposed chests, bare legs, and thin insufficient coverings, are synonymous with croup, inflammation of the lungs, and scrofula. For the same reason that furs for the neck are unsafe articles of dress for women, comforters and woollen neck wrappers are not advisable, except under particular circumstances for boys; they heat the neck, and if thrown off carelessly, predispose to cold or bronchitic affection. Vests of chamois leather constitute a most important protection against changes of temperature. They are best worn over a thin merino vest, and should be perforated to allow escape of perspiration.

The clothing of the feet is a matter of the highest importance to all; dryness and warmth must be attended to by those who value health. On the other hand, the head is often, in infants and children especially, kept too hot.

CLOVES are the undeveloped flower-buds of a tree originally a native of the Molucca Islands, but which is now cultivated in various parts of the tropics. They are well known as a spice, and used as a stimulant aromatic in medicine, their properties depending upon the volatile oil, which is intensely acrid. The oil of cloves is occasionally used as a topical remedy for toothache, and is a useful adjunct to purgatives.

CLUB-FOOT.—See DEFORMITY.

CLYSTER.—See ENEMA.

COAGULATION is the conversion of the whole of a fluid, or of some of its constituents, into a solid. The solidification of the white of an egg by heat is an instance of the former, that of the clot in blood, or of the curd in milk, of the latter. The coagulating power of the blood is the great safeguard in bleeding, which could not be *permanently* stopped by any appliances, without this property of the vital fluid; and it is the loss of this property that gives rise to the occasional cases of danger or death from bleeding, in consequence of comparatively slight wounds, such as those from leech bites, or from the extraction of a tooth.

COAL GAS.—See CARBURETTED HYDROGEN.

COAL TAR.—This is used in several forms

as a disinfectant, and is the material from which carbolic acid and many other articles, used both in commerce and in medicine, are derived. Its value as a remedy in many skin diseases is well known, and there is an excellent soap made from it much used by persons liable to eruptions of the face and hands. The *Liquor carbonis detergens*, or concentrated alcoholic solution of the active principles of coal tar, is used as a dressing for putrid sores, in the form of emulsion with a little water, and is a favourite remedy with many in skin diseases, especially of a scaly character. Its antiseptic or preservative qualities have made it a favourite with those interested in the collection of specimens of natural history.

COBRA DI CAPELLO.—The name of a snake common in India, and very destructive to the native population on account of the deadly nature of the poison it emits. The bite of the reptile should be treated vigorously by the excision of the wounded part, and the application of caustic, but it too frequently happens that those remedies are without avail.

COB-WEB, employed as a styptic, to arrest bleeding from simple flesh wounds, or from leech bites, is often used in the country, but its virtues can be better supplied with rag or cotton wool.

COCCULUS INDICUS is the fruit of an East Indian shrub. It resembles a large brown shrivelled pea in outward appearance. The kernel is intensely bitter, and on this account is sometimes said to be used fraudulently in the manufacture of beer, instead of the hop; also with the view of increasing the intoxicating power of the beverage. This power of stupefying has occasioned cocculus indicus to be popularly used by poachers as a fish poison.

COCHINEAL, an insect which yields the well-known colouring matter, carmine, is brought from Mexico, being gathered from various species of cacti, on which it feeds. It is used chiefly as a colouring agent; but has been employed, especially as a domestic remedy, in hooping-cough. Its powers are very doubtful.

Refer to—*Hooping-cough.*

COCOA—CHOCOLATE.—Cocoa is prepared from the seeds or beans of a tree—the *Theobroma cacao*—cultivated chiefly in the West Indies and South America. The beans are roasted to develop the aroma and free them from the husks, which are comparatively innutritious, though frequently mixed up with the prepared cocoas of commerce. Cocoa, when genuine and properly prepared, is a wholesome and nutritious article of diet; it is made up of one half of fat or butter and one fifth part of albuminoid matter, besides starch, &c., and a peculiar principle, "the theobromine," which, according to Liebig, nearly approaches theine and caffeine—the characteristic principles of tea and coffee. It is consequently highly nourishing, as it contains both heat-giving and flesh-forming elements in fair proportions and in a concentrated form. Cocoa does not, however, affect the nervous system in the same manner as tea and coffee, and may therefore be taken in cases when these are inadmissible. Cocoa, as a food, ought to be prepared only from the crushed beans themselves, or "nibs," as they are called. As a beverage, cocoa requires to be deprived of a good deal of its fatty matter and to have starch added to it, when it is known as soluble cocoa. Flake and red cocoa are made from the nibs and whole seed, combined with the husk, and then manufactured into paste.

Chocolate is professedly a manufactured article, and should be made with the kernels of the cocoa bean, perfectly free from husks, and reduced to a smooth uniform paste with sugar, and starch of some kind, such as arrow-root; vanilla or cinnamon being used to impart flavour. Tallow is said sometimes to be used in the preparation of the cheap forms. It need scarcely be said that those who make use of chocolate ought always to procure it from dealers on whom they can depend. That of French make is generally to be preferred. As an article of diet, chocolate is extremely nutritious, but, on account of the oil it contains, is apt to disagree with weak stomachs, particularly if too great heat be used in preparing; moreover, the addition of vanilla or bitter almonds is apt still more to increase its indigestibility.

COCOA-NUT.—The well known fruit of the palm, is, in its ordinary state, extremely indigestible, from the same cause that most other nut kernels are so, the solidity of the structure and the oily constitution, a combination which strongly resists the digestive powers. The reduction into paste or flour probably remedies the objection. The milk of the cocoa nut is a cooling and nourishing fluid, much valued by the native population of districts where the palm abounds.

CODEIA is one of the alkaloids derived from opium, and has been used, in the form of lozenge, for the purpose of allaying irritating cough, in cases in which it was not thought desirable to produce the full and characteristic effects of opium itself upon the constitution. It is well known that some persons cannot take opium in any shape without unpleasant effects, and it is to such persons that the above lozenges may prove valuable as a means of soothing cough that has resisted other more simple methods of cure. It is of doubtful efficacy as an anodyne, and its soporific effect is small. Used hypodermically, codeia is an effectual preventive of incipient influenza cold, and its beneficial effects in diabetes are now acknowledged, but of course its administration requires educated medical supervision.

COD-LIVER OIL is obtained from the liver of the common cod-fish and other allied species; it was formerly employed in medicine in this country, fell into disuse, was revived

as a remedy in Germany, and again brought into public notice in Britain, by Dr. Hughes Bennett of Edinburgh in 1841, since which time it has advanced rapidly, and deservedly, in the estimation both of the profession and of the public. It had never, however, been entirely abandoned as a domestic remedy in rheumatism; and among the sailors, particularly those connected with the northern fisheries, had been regularly used both internally and externally, in the above disease. Now, it is principally employed and celebrated for its curative powers, especially in pulmonary consumption, in scrofula, and in all diseases connected with the scrofulous constitution, or depending on general debility. In the atrophy or wasting of the flesh in young children, connected with enlarged glands in the belly, when the latter becomes tumid and hard, feels knotty, and with the veins of the surface enlarged, cod-liver oil, given internally, a tea-spoonful twice a day, and well rubbed into the skin of the belly two or three times a day, will in many cases relieve in a way which no other remedy we are acquainted with could do.

For some time, the dark, heavy, strong oil was considered to be most efficacious; but now, especially since more care has been bestowed on the manufacture, the purer and lighter oil, almost colourless, is to be preferred, and is the preparation admitted into the British pharmacopœia. The dose for an adult is generally one table-spoonful twice or three times a day; it is, however, by some given much more largely. It is always advisable at first, to begin with smaller, such as tea-spoonful doses, till the patient and the stomach become accustomed to the remedy, which even children quickly do, although sickness is sometimes produced at first. Tastes differ much as to the best method of taking cold-liver oil; floated in a little bitter beer answers well, or the dose may be shaken up with half the quantity of syrup of marsh mallow, and swallowed at once, or it may be taken in water, simple or aromatic. Every means should be taken to conceal the nauseating taste of the oil, to secure its being taken regularly—especially in the case of children, and in addition to the above vehicles, orange wine, strong coffee, or a flavouring of bitter almonds or cinnamon, are all occasionally employed. A compound of the oil with malt extract is an agreeable preparation. The following form of administration will suit some persons who cannot take the oil otherwise:—Rub down two ounces of loaf sugar in a quart mortar to fine powder, add the yolk of an egg, and blend thoroughly with the sugar, adding three drops of oil of cinnamon; add two ounces of cod-liver oil by small quantities, and rub with the above till thoroughly incorporated; finally add, still rubbing, an ounce of orange-flower water. The dose—one table-spoonful, thrice daily, before meals. It is said that shaking the oil with cherry-laurel water is a good method of correcting its smell and taste; of course, the laurel water is separated before taking the oil. With many, cod-liver oil acts slightly upon the bowels. In some cases of chest affection, the breathing is certainly apt to become more difficult for the first few days of its use, but this effect passes away where the oil is persisted in. There cannot be stronger evidence of the nutritious power of cod-liver oil, than the way in which patients increase in weight and strength after they have taken it for some time, a restorative effect which no other remedy we are acquainted with possesses.

Refer to—*Scrofula*, &c.

COFFEE.—Coffee is the berry of a shrub, the *Caffea arabica*, indigenous to Abyssinia and afterwards introduced into Arabia, and now cultivated in the East and West Indies, in South America, &c. Though long known and used elsewhere, it was not introduced into this country till the middle of the seventeenth century. It contains a considerable amount of essential oil, and a peculiar principle, caffeine, which is identical with "theine" the characteristic principle of tea. The berry requires roasting to develop the well known fragrant aroma.

As an article of diet, coffee is for most persons wholesome and stimulating, but when there exists any tendency to head affection, or when the biliary secretion is apt to be overabundant, it ought not to be used. Dr. Paris remarks, that coffee, "if taken after a meal, is not found to cause that disturbance in its digestion, which has been noticed as the occasional consequence of tea; that on the contrary, it accelerates the operations of the stomach." When strong, it most undoubtedly exerts much influence over the brain and nervous system, producing watchfulness and feverish symptoms; it is thought, too, to affect the skin, and the sallow hue of the Parisians has been ascribed to their excessive use of coffee. Coffee is more suitable for most persons for the morning meal than tea, which is more likely to affect the nervous functions. A cup of strong coffee taken immediately after rising, is considered a good protective from the effects of malaria. In poisoning by opium, coffee is one of the most useful antidotes, but in this case ought to be fresh, pure, and strong, and taken without milk or sugar. The infusion of one ounce taken every twenty minutes is considered a suitable dose.

Coffee should always be infused, never boiled; when made with half milk, it is more nutritious for the weak, if it agrees with the stomach in this form. The adulterations of coffee are numerous; for that with chicory, which is the most prevalent, the reader is referred to the article *Chicory*. The only real security is, for persons to grind their own coffee, not too much at once, and to preserve both the whole berry and the powder in canisters, or wide-mouthed, well-closed bottles. In

the West Indies, an infusion of raw coffee is used by the negroes, and found serviceable, it is said, in promoting the flow of urine.

Refer to—*Diet—Tea, &c.*

COLCHICUM.—*Colchicum autumnale* is the botanical name for the autumnal crocus, or meadow saffron, found wild in many parts of England, south of the Trent. The root and bulb and the seeds are used in medicine, particularly in gout and rheumatism, but the drug requires too much care, and its improper use is too liable to produce evil consequences, to make it a safe domestic remedy, unless previously sanctioned by medical authority. In some persons, particularly, it acts most powerfully upon the liver and bowels, even in small doses. The preparations chiefly used are the tincture, the wine, and the extract, the dose of the tincture and the wine varies from ten to thirty minims, and of the extract from one half grain to two grains. According to Dr. Christison, two drachms, or tea-spoonfuls, of the wine of colchicum has proved a fatal dose. The symptoms produced by an over-dose of colchicum are, vomiting, purging, colic, heat in the throat and abdomen, general depression, headache, and stupor or delirium. The remedies to be used until medical assistance is procured are, diluents, such as barley-water, linseed tea, or thin gruel, and laudanum or opium in some form.

Refer to—*Opium.*

COLD is generally considered to be a negative result of the absence of heat, rather than an active principle; in consequence, however, of its energetic influence upon the living body, either in health or disease, it is usually spoken of as an active agent. The animated human frame is endowed with the power of maintaining a certain average temperature, which—except in rare instances—is higher than that of the surrounding medium, and this power is adequate to resist all ordinary impressions of cold; but when, from great intensity, or long continuance, and especially when combined with moisture, the depressing action of *cold* is much augmented, the powers of life sink, and disease or death is the consequence. This power of the living body to resist cold is in great measure dependent upon the supply and proper assimilation of a sufficiency of nourishment; the ill-fed and the dyspeptic always suffer most from the effects of cold. But in order that full benefit may be derived from the power of food to protect against low temperature, particularly when at all severe or long continued, it is requisite that more or less muscular exercise—according to circumstances—be engaged in, for the purpose of quickening the functions of respiration, circulation, and metamorphosis of tissue; in other words, for the purpose of increasing the supply of oxygen taken into the system, and thereby facilitating the consumption of the internal fuel (see *Animal Heat*), either obtained directly from the food, or from the compounds of carbon and hydrogen already existing in the body. This is no more than common experience testifies; for all know that of two men exposed to a continued degree of intense cold, even if equal in other respects, should one persevere in muscular exertion and the other give way to indolence or torpor, the former will be much more likely to survive the effects than the latter. And even under exposure to cold, not so immediately dangerous to life, and especially if combined with moisture, the most ignorant are aware that "as long as they keep moving," there is comparatively little danger of those bad consequences which almost invariably result if rest is indulged in. In fact, as long as the muscular movement is kept up, the circulation, respiration, and change of tissue go on with sufficent activity to maintain temperature adequate to resist the cold, which, however, prevails as soon as inactivity permits the cessation of the resisting forces. Thus we have a point of every day experience confirmed, and its *rationale* explained, by the researches of modern science.

In northern latitudes, however, the internal means of resisting cold are of themselves insufficient for the purpose, and therefore clothing, shelter, or habitations, and the production of artificial heat, are resorted to, and these, indeed, in some degree stand in the place of nourishment; for the man who is sufficiently well protected from the effects of cold certainly requires a less supply of food to maintain health than he who is not. As regards food, habitations, and fuel, most who have it in their power are inclined to use their protecting influences sufficiently; it is in clothing that the chief errors and negligences are met with, and the reader is referred to the subject itself for their exposition. There may, certainly, be such over precaution in guarding against cold, that it is impossible to keep up the protection on all occasions, so that an accidental omission in dress, or exposure, after being habituated to air of too high a temperature, at once gives rise to disease; but the abuse is no argument for the non-employment of sufficient rational protection against the influences of weather, especially in latitudes like our own, in which a low temperature frequently prevails, and that, too, combined with moisture, whilst at the same time, the vicissitudes from heat to cold are often extreme and violent. It may safely be asserted that a large proportion of the diseases to which the inhabitants of this country are liable, are, either directly or indirectly, the result of cold. It is sufficient to mention inflammatory attacks, general and local, apoplexy and paralysis, rheumatism and neuralgia, scrofula with its long train of disease, and consumption, as diseases, among many others, traceable to the influences of low temperature—to convince the most careless of the necessity of due protection against an agent so potent for evil. In many warm

climates, the principal danger from cold is incurred by exposure to the chill dews of evening after hot days.

The effect of extremely low temperature acting upon a limited portion of the body, is rigidity of the muscles, blistering of the skin, particularly from grasping metallic bodies with the bare hand, and frost-bite or death of the part affected. The *general* effect of extreme continued cold, is depression of the nervous system, of the functions of the respiratory organs and skin, deterioration of the blood, torpor, insuperable drowsiness, and death. In *case of frost-bite*, as of the fingers or toes, although the part may appear quite lifeless, pale, and shrivelled, it may often be saved by proper treatment, and the principal thing to be attended to is, that the temperature be not suddenly raised; circulation, nervous power, and heat, must be very gradually restored, and probably the method followed in countries in which this accident is common, will be found safest and best, that is, continued friction of the part affected, with snow, till reaction is established; at all events, friction should be used; after-inflammation may be soothed by tepid poultices.

When, in consequence of long exposure to extreme cold, drowsiness comes on, both mind and body must be exerted to keep off the influence; to indulge it is death; muscular motion must be kept up—a harmless stimulant, tea, coffee, hot milk, or Liebig's extract of meat should be administered: only in extreme cases should alcohol in any form be resorted to. Experience proves, that those who are likely to be exposed to great continued cold, should provide abundant nourishment, particularly of a fat or oily character; they may have a flask of spirits in reserve, but should never have recourse to it, except as a last resource. The sudden application of cold, even if it be not intense, may be very serious, in case the nervous powers are at all exhausted; of this, the cramp to which bathers are subject is an example, and likewise the fatal accidents so frequent during harvest, from persons drinking largely of cold water. The fatal effect is usually ascribed to the heated state of the body, but much is also due to the shock communicated to the stomach and its numerous nervous connections, while the system generally is exhausted. The effect of cold, not extreme, but long continued, especially if combined with moisture, is one of the most fertile sources of diseases, some of which have been already enumerated. The young and the aged are more peculiarly liable to suffer, and for this reason require especial protection. The partial application of cold, particularly by a moving current of air, most generally produces disease of a neuralgic or rheumatic character, partial paralysis, especially of the face, or erysipelas. All these injurious influences are more readily exerted, if the body is at the time in a state of heated excitement combined with nervous exhaustion, the result of previous exertion, and at rest.

The partial application of cold and wet, may produce inflammatory action in the immediate vicinity of the part exposed, or, as in the case of wet feet, in some distant organ.

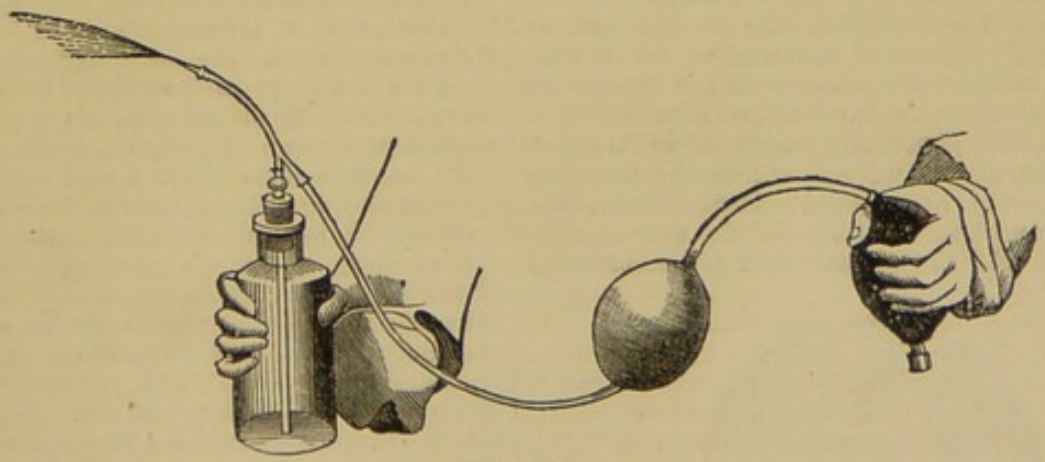


Fig. 57.

The most effectual remedy for the effects of "a chill," is warmth with moisture, in the form of bath, hot air, vapour or warm, or of hot bricks or hot water bottles, and the free use of warm diluent drinks, such as tea, gruel, &c., and in case of much depression, wine and hot water.

Cold is sometimes used for producing local anæsthesia; ice and salt in a muslin bag applied to the part, or what is better, the spray from sulphuric ether, will in a short time freeze the tissues, which may then be submitted to painless operation. An apparatus for producing local anæsthesia by freezing the skin, was introduced some years ago by Dr. Richardson, in his spray producer, the mechanism of which is represented in fig. 57. It consists of a bellows and bottle containing ether, into which a tube continuous with that which terminates in the nozzle of the instrument is

inserted, and by working the hand bellows, the ether, atomized into a fine spray, is made to play on the part to be operated on. Most of the hand Spray-producers now in use for antiseptic dressings are worked on similar principles to the above.

The use of cold as a hygienic agent, or in the treatment of disease, is invaluable. When, either as cold air or cold water, it is adapted in intensity and continuance, to the resisting power of the constitution, it is a most admirable tonic. In certain conditions of the system, a bracing atmosphere, which means fresh and comparatively cold air, is recommended, especially in recovering from illness and to throw off the depression consequent on luxurious living. When used to subdue certain forms of excited and inflammatory action, the temperature must of course be suited to the case, but ice-cold is most generally useful, care being taken, in the application of ice itself, that the part is not, as has happened, actually frozen or killed. Various forms of evaporating lotions, made with spirit, &c., are employed, but as the additions are made simply to increase the cold by increasing the evaporation, if a sufficient supply of ice can be procured, it is all that is requisite; the best mode of application is, by india rubber bags, and by renewing the ice again and again by a *careful* nurse. When, from circumstances, this cannot be done, the next best method is, to keep up a continued system of irrigation, by means of a vessel of cold water placed a little higher than the part to be cooled, the fluid being conducted from the vessel to the part by an elastic tube, to which are attached bundles of woollen thread, or thin strips of flannel, care being taken, by means of waterproof material of some kind placed underneath, to carry off the superfluous water; in this way, the head, or a broken limb, may be kept constantly under the influence of a stream of cold water, without the necessity for constant attendance. There has always been considerable difficulty in the application of cold to the head in a person confined

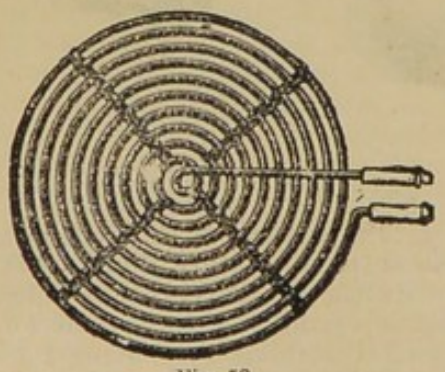


Fig. 58.

to bed; this is in a great measure removed by the ice caps and pillows manufactured for the purpose. An ingenious cap or helmet, made by Messrs. Krohne & Sesemann of india rubber tubing alone, and fed by an iced-water supply from a vessel placed over the bed; or a similar contrivance, made of pliable metal tubes (Leiter's, see illustration, fig. 58), which may be adapted to any part of the body, are the best apparatus for the application of cold when it is necessary to keep it up for an indefinite period.

Refer to—*Animal Heat.*

COLD CREAM is a pleasant cooling ointment, made by melting four ounces of white wax in a pound of almond oil, by means of gentle heat, and mixing gradually with a pint of rose water in a warm mortar.

COLD IN THE HEAD, or CORYZA, is an inflammatory affection of the membrane lining the nostrils; it is accompanied with more or less fever. It commences with a sense of dryfulness or obstruction of one or both nostrils, which is quickly succeeded by watery discharge of an acrid character, and there is frequent sneezing. The membrane of the eyes and their lids, being continuous with that of the nose, is also affected, and from a similar cause, extension of the irritation to the membrane lining the frontal sinus, there is more or less headache. If simple cold in the head be not renewed, which it is extremely apt to be, it gradually subsides within the week; more generally, however, as it leaves the nostrils, it travels downwards into the lungs, and ends in catarrh, cough, &c. Coryza is a concomitant of some other diseases, such as measles and influenza.

From its tendency to recur, and also to produce and keep up irritation of the bronchial tubes, coryza is not only not to be neglected, but should be checked at first, if possible, and for this purpose various methods of treatment are recommended. A dose of opium either in the form of a large tea-spoonful of paregoric, or six or eight grains of Dover's powder, or quarter of a grain of morphia, when taken at bed-time, will often check a cold in the head at once; and the usual system of hot foot-baths, confinement to bed, low diet, and diluent drinks, along with diaphoretic medicines, such as spirit of mindererus, antimonial wine, &c., is certainly calculated to mitigate the disorder, and may be followed with advantage. The following mode of treatment was recommended by the late Dr. C. J. B. Williams. He says,—"It is the common practice to drink copiously of tea, gruel, or some other diluent during a cold; as long as this promotes perspiration, it is of some utility, and although it augments the flow from the pituitary or nasal membrane, it has the effect of diminishing its acrimony by dilution. It is the acrimony of this discharge which reacts on the membrane, keeps up the inflammation, and its accompanying disagreeable symptoms. On this circumstance depends the efficacy of a measure directly opposed to that just noticed, but to the success of which we can bear decided testimony,—we mean *a total abstinence from liquids.* To those who

have the resolution to bear the feelings of thirst for thirty-six or forty-eight hours, we can promise a pretty certain and complete riddance of their colds, and what is, perhaps, more important, a prevention of those coughs which commonly succeed to them. Nor is the suffering from thirst nearly so great as might be expected. This method of cure operates by diminishing the mass of fluid in the body to such a degree, that it will no longer supply the diseased secretion. Any thing that will contribute to reduce the quantity of fluid in the body will assist in the plan of cure, and shorten the time necessary for it to take effect. It is, therefore, expedient to begin the treatment with an aperient, followed by a diaphoretic, as is usual, and this is the more necessary when any fever attends; but beyond this, no further care need be taken, and the individual can devote himself to his usual employments with much greater impunity than under the ordinary treatment. The coryza begins to be dried up about twelve hours after leaving off liquids: from that time the flowing to the eyes and fulness in the head become less and less troublesome, the secretion becomes thicker and between the thirtieth and the thirty-sixth hour ceases altogether: the whole period of abstinence need scarcely ever exceed forty-eight hours. It is then as well to return to the *moderate* use of liquids, as the first indulgence is apt to be excessive. It is not necessary to limit the solid food any more than to that which is plain and simple, except where there is an acceleration of the pulse, or gastric irritation, in which cases animal food should be proscribed. For the sake of comfort in mastication, the food should not be of the driest kind. Thick puddings and vegetables, with or without meat, will be the best dinner; and toasted bread or biscuit, *merely moistened* with tea or other liquid, for other meals. A single cup of tea is sufficient to bring back the coryza immediately, after twelve hours abstinence has removed it. We doubt not that it will be said that this plan of cure is worse than the disease, and so it may be in some instances. It may be called always a choice of evils; but we do not believe that any one who is liable to severe colds, after once experiencing the amount of good and evil resulting from this method, would hesitate between them, and it is for them that we make it known.

"We have never witnessed any evil from this abstinence from liquids for the time prescribed; but it is not unlikely that it may do harm in persons with irritable stomachs, or in those liable to urinary disorders. Moderation in liquid food, which may be assumed as a corollary from what has been already said, is one of the best preventives against the bad effects of exposure to cold. When there is a large quantity of liquid in the system, there must be increased perspiration, and therefore greater risk from the effects of cold."

If coryza be not in itself a disease of importance, its tendency to frequent renewal, and as often as it is renewed to the reproduction of irritation in the lungs, renders it really a disease of consequence, and one not to be neglected. Moreover those individuals who are most susceptible to repeated attacks of coryza, are those who are most likely to suffer from frequent or continued irritation within the chest.

Refer to—*Catarrh—Cold—Codeia, &c.*

COLIC is the painful spasmodic contraction of the muscular fibres of the bowels, particularly of the colon, occasioned by the presence of an undue amount of wind, or of some irritating matter, such as accumulated fæces, undigested food, acrid bile, overdoses of strong purgatives, or poison; it may also be brought on by exposure to cold. The pain of colic comes on and goes off suddenly, is of a rolling or twisting character, is referred chiefly to the umbilical or navel region, and is relieved by pressure; there may or may not be vomiting. In some cases of colic, the spasmodic contraction of the bowel is so complete and permanent, that inverted action takes place, and the fæcal contents are vomited; to this form, the name of ileus, or iliac passion, has been given. The above symptoms distinguish colic from inflammation, the pain of which is of a more persistent burning character, and is aggravated rather than relieved by pressure; in the latter case, too, febrile symptoms are present from the commencement. The distinction is, of course, requisite for active medical treatment; but many remedies, which may be used safely and effectually to relieve the one, will also be beneficial in the other, and, indeed, in other spasmodic or inflammatory attacks within the abdomen, which might be mistaken for colic.

The sudden accession of an attack of colic, its peculiarly painful character, and the danger that, if continued, it may pass on to one of inflammation, render immediate relief imperative. The first remedy is heat, either locally to the abdomen by warm fomentations, as hot as they can be borne, or by the hot bath of the temperature of 100°, if not undesirable on other accounts. The use of heat, if promptly and effectually carried out, will often of itself relieve the attack at once, particularly if it is the result of cold; but even should it do so, it will be well to give a dose of castor oil or rhubarb and magnesia, to ensure the freedom of the bowels from irritating matter, a few drops of laudanum being added to either medicine should the spasm show a tendency to return. Should the pain not be relieved by the employment of external heat, as recommended, a warm enema, temperature 102°, should be administered, and a cup of tea or of some unstimulating fluid taken, as hot as it can be swallowed. If the pain still remains, ten drops of laudanum must now be given, and repeated every quarter of an hour, until relief

is obtained, or until forty drops, or even more, have been administered. If the case is violent, an enema containing twenty drops of laudanum may be given. These means, if thoroughly carried out, will scarcely fail to afford relief until the arrival of medical assistance, which should always be procured, if the case is at all severe or continued; it may depend on causes which a medical man alone can discover or remove. Alcoholic stimulants are scarcely to be recommended for use in non-medical hands, not because they are not serviceable in colic, but because, should the case be mistaken, and prove one of inflammation, they would prove most injurious, which the remedies above prescribed could not. Still, in a case in which no doubt could exist, a table-spoonful of undiluted tincture of rhubarb, or a glass of hot brandy and water, with or without laudanum, are either of them good remedies.

In severe colic, however, nothing affords such certain and speedy relief as a small dose of morphia given hypodermically.

Painter's colic, or dry bellyache, is a disease to which persons are subject who work much among lead; it is also occasioned by drinking cider prepared in leaden vessels. It is severe colic, accompanied with obstinate constipation. The disease, either in itself or from concomitant constitutional affection, may prove fatal, and should always be treated by a medical man if possible. The treatment is much the same as that for common colic as far as allaying pain goes, but the obstinate constipation which accompanies it, requires the laudanum and other means to be combined with active purgatives, castor oil, senna, compound colocynth pill, &c. Much might be done by those engaged in employments connected with lead to avoid, not only this, but other bad effects, by due attention to cleanliness, particularly of the hands at meal times. The use of lemonade, acidulated slightly with sulphuric acid, or of aromatic sulphuric acid, in water, would probably be additional protection. Lead colic has been induced in whole families, by the use of water which acted strongly upon leaden pipes or cisterns; and it is well to bear in mind that very pure water is more dangerous when conveyed through lead, and especially new lead, than water which contains a tolerable amount of impurity. The introduction of lead into the system and its results are often occasioned by means little suspected. Many cases are narrated where the long-continued use of snuff which had been imported in coverings made of thin sheet lead, had produced the usual symptoms of lead poisoning.

Those who have once suffered from an attack of colic should pay particular attention to the bowels. The colocynth and hyoscyamus pill of the pharmacopœia will be found the most useful aperient.

Refer to—*Lead*—*Water*, *&c.*

COLLAPSE—the term applied to a state of sinking, or prostration of the powers of life.

COLLAR-BONE.—See CLAVICLE.

COLLIERS, DISEASES OF.—Miners as a class, are short-lived and unhealthy, breaking down prematurely from a variety of diseases, but principally from those engendered by the circumstances under which their work is carried on. Light and fresh air are both essential to health; and if many have sufficient difficulty in preserving vigour "with all appliances and means to boot," what must be the disadvantage under which the collier labours when deprived of both essentials? A large number of the mines of this country are insufficiently ventilated, and accidents from choke-damp and fire-damp are of too common occurrence, and it is to be feared will continue so, unless an unlimited supply of air be afforded for the consumption of the men, horses, and lights. It is an established law, that to preserve the body in a state of health, not less than 3000 cubic feet of air should be supplied per hour to each individual; and it has been shown by inquiries into the the condition of collieries, that, in the vast majority of instances, nothing approaching this amount is obtainable. Mr. Robert Stephenson even thought that 100 cubic feet per man per minute would not be enough. This includes, of course, all the air wanted in the mines for horses, lights, &c.

Miners suffer much from the inhalation of particles of carbon, coal, charcoal, or dust, in the pursuit of their occupation. These being swallowed, produce dyspepsia, or still worse; and, as is more frequently the case, being inhaled, and becoming lodged in the lungs and air passages, give rise to bronchitis and inflammation of the lungs, and to a peculiar disease now well known as miners' lung or colliers' phthisis, in which innumerable atoms of charcoal are incorporated with the substance of the lung itself, the epithelium of which has actually grown over them.

The collier also suffers much from the damp, and from the constrained position in which he is often obliged to work for whole days together.

The grand remedy is efficient ventilation of the mines, which is at once a preventive of the sudden explosions, and of the continual deterioration of health to which our colliers are ever subjected. In addition, it is of great importance that employers should endeavour by all means in their power to elevate the moral and social character of those who, being debarred from the employments and enjoyments of open day, are too apt, in times of recreation, still further to enfeeble their health by debauchery and excess of all kinds.

Some idea of the difficulty of effectually managing the ventilation of mines may be acquired when it is known that, in many cases, the air has to travel immense distances through

the various long winding galleries, before it arrives finally at the up-cast shaft, as it is called. The method employed is on the same principle as the ordinary fire and chimney; that is, a fire is lighted at the bottom of one shaft, up which the air rapidly flows, after having been made to traverse down the other shaft and along the various galleries. Double doors and partitions are used, and much skill is shown in directing the current of air for such incredible distances. In mines in which there is only one shaft, this is divided in two, a fire being lit at the bottom of one half, while air descends down the other.

COLLIQUATIVE—a term applied to any profuse exhausting evacuation, more particularly the diarrhœa and perspirations of pulmonary consumption.

COLLODION is made by dissolving two scruples, or forty grains of gun cotton, in three ounces of ether, and one ounce of rectified spirit. It is a very useful application to cuts, small wounds, and abrasions, chapped hands, or chapped nipples, &c. It should be gently applied by means of a hair pencil. The ether evaporates, and a thin layer of cotton is left as a covering, which is not removed by washing in water. Collodion may also be applied to leech bites, or small wounds of any kind, to stop the bleeding, which it does, owing to the contraction of the film of cotton constricting the vessel of the bleeding part.

Combined with canada balsam and castor oil a better preparation for medical purposes called flexible collodion is manufactured, as it obviates the tendency which pure collodion has to crack on being stretched on the skin.

A mixture of two parts of glycerine, to 100 of collodion, makes an excellent protective application to chilblains, burns, bed-sores, &c. It has also been applied as a protective covering in many cases of disease of the skin, accompanied by great pain, itching, or irritability. It forms a good covering for pills, the unpleasant taste of which it conceals, without in any way interfering with their action.

One of the best known ways of applying a liquid blister, is to paint the surface of the skin over with collodion, in which cantharides or cantharidin, the active principle of the fly blister, is dissolved. It may be applied with a brush directly, which saves the trouble of spreading a blister, and vesication is as quickly produced as with the ordinary plaster, while it is much less bulky, and more convenient in every way for general use.

Collodion is a very good application to small cuts after they have been strapped or stitched up, when it is desirable to exclude the air, and to let them heal, if possible, by what is called primary union or the first intention. It causes a little smarting for a few seconds, but this soon passes off, and a pellicle is left which forms an admirable protective covering for the wound, and allows the healing process to go on below undisturbed. Collodion is best kept in a stoppered bottle, the stopper of which may be fitted with a camel's hair pencil, to allow of its ready application.

COLLYRIUM—a lotion for the eyes.—See *Eye.*

COLOCYNTH, or Bitter Apple, is the fruit of a creeping plant, and is brought to this country, chiefly from the shores of the Mediterranean. An extract made from the dried pulp is used in medicine. It is a powerful irritating purgative, never used alone, and only likely to be employed domestically in its well known combinations, the compound colocynth and the colocynth and hyoscyamus pill, two of the most universally useful purgatives we possess, of which the dose is from five to ten grains.

Refer to—*Pill.*

COLON.—The large bowel.—See *Alimentary Canal.*

COLOTOMY.—The operation of opening the colon to form an artificial anus, sometimes had recourse to in obstruction of the bowels.

COMA—a state of insensibility, resembling sound sleep, from which the person either cannot be roused at all, or only to partial consciousness. The condition is generally the result of pressure on the brain, either from injury to the skull, or from effusion of blood or watery fluid, or of matter, within the head. In apoplexy, poisoning by narcotic drugs, and complete alcoholic intoxication, the comatose condition exists: it may also occur as a symptom preceding death in various diseases, especially of the brain and kidneys, and is not uncommon in the contagious fevers. In coma the action of the heart continues sufficiently perceptible; in fainting it does not.

Refer to—*Apoplexy, &c.*

COMPLEXION—the hue of the face. Much information may frequently be obtained of the existing constitutional condition, by observation of the complexion; but, in judging, it is requisite to consider the original temperament, and the family descent of the individual. In fair races, such as the Anglo-Saxon, a certain amount of colour is usually associated with our ideas of health, and in some respects truly so; the reverse, a perfectly pallid face, can scarcely be consistent with a sound bodily condition. But colour may be too high at all times, and the capillary vessels of the face, partaking of the fulness of those of the body generally, may indicate that from some cause, such as over-feeding, or indolence, combined with good digestive powers, the system of the individual is too full of blood; for the colour is not confined to the parts naturally tinged, but is diffused over the face generally, and even the white of the eye is covered with distended vessels. Such a state is one of danger, it is often accompanied with headaches, giddiness, confusion of thought, sleepiness; and when these occur, apoplexy may be dreaded.

A high or brilliant colour, also, may accompany the consumptive constitution, but in this it is very generally associated with a fine skin, and often with light or red hair, with freckles, and also with a pearly or blueish appearance of the white of the eye. This appearance of high health is apt to deceive the inexperienced, but the colour is generally not equal or persistent; it varies much, being easily heightened by excitement, or depressed by the reverse, and it continues to add beauty even to the last stages of the hectic of consumption. In the dark haired, and dark complexioned, colour is less commonly developed. The complexion of disorder or disease is very varied; it may be muddy, pallid, pasty, white, sallow, cachectic, yellowish green, and purple.

The muddy complexion may be the natural one of the skin, but it frequently accompanies dyspeptic ailments, and is directly dependent on depressed nervous power, and languid circulation of blood; it is most strongly marked in the dark depressions underneath the eyes. Whatever lowers or exhausts the nervous power, will produce this complexion, which may be seen in perfection, when the light of morning shines in, either upon the votaries of a too protracted dance, or upon the weary watcher beside the bed of sickness. Sleep is the best restorer of the exhaustion of nervous power indicated by this condition of complexion; but if rest is impossible, it is one of those cases in which stimulant, hot tea or coffee first, and then alcoholic stimulant, is perfectly requisite. The pallid complexion is often the result of too close confinement to the house, and especially of deficient exposure to diffused daylight: it is well marked in miners. The pasty complexion accompanies the lymphatic constitution; the subjects of it require a good allowance of animal food, in preference to milk and grain preparations, puddings, &c., of which they are often too fond. They almost invariably derive benefit from preparations of iron. A marked white complexion not natural to the individual, is often indicative of serious disease, probably of the kidneys or heart, and when it appears in persons advanced in life, the cause ought most certainly to be investigated by a medical man. The sallow complexion is very generally a natural one. The cachectic accompanies a diseased state of the system, and often of the abdominal organs—it is muddy, and accompanies emaciation of the features. The yellow complexion may be the bright hue of jaundice, or the muddy yellow associated with malignant disease, especially cancer. In the greenish yellow skin of chlorosis or green sickness, there is also extreme pallor of parts usually coloured—such as the lips. A purple complexion is indicative of deficient oxygenation of the blood, either from disease of the heart or lungs; generally of the former.

Refer to—*Skin—Countenance, &c.*

CONCRETION is a term applied to the unusual aggregation of any substance or substances within the body, as in the gall bladder, kidneys, joints, and urinary bladder, but here we refer chiefly to them as they are found in the intestines. Persons who have been in the habit of taking large and repeated doses of magnesia, have not unfrequently suffered from its concretion into hard lumps or balls in the stomach or intestines. Any substance which possesses the power of felting or matting together, is liable to form a concretion in the bowels; one has been found of ends of thread matted together, another of human hair, which the female had been in the habit of biting off and swallowing when at work; but perhaps the most common cause of the intestinal concretion is the felting of the bran of the oatmeal as used in Scotland, when too exclusively employed as food, and in too dry a state. Well boiling and diluting, and mingling with other articles of food, particularly of an oily nature, is the best preventative. Intestinal concretions are frequently found in the bowels of cattle, caused by their licking each other's backs.—See *Biliary and Urinary Calculi.*

CONCUSSION.—A term applied in medicine to the *effects* of a severe blow, over some of the more important organs of the body, especi- of the head and spine.

For concussion of the brain see *Brain.*

Severe concussion of the chest affecting the heart, or over the region of the stomach, may prove fatal immediately, or at least produce much alarming faintness and collapse; in the latter case, the use of stimulants, such as ammonia or spirit, internally, or stimulant injections, and the dashing of a jug of cold water over the chest and face, immediately following it by hot applications, mustard, &c., would be the most appropriate treatment.—See *Brain—Spine.*

CONDIMENTS are substances which are not of themselves nourishing, but which are taken along with food as seasoning, and to promote its digestion. Salt is the most extensively used, and also the most necessary condiment, if indeed it can be classed as a condiment, seeing the important uses it serves as a mineral food. Many of the lower animals are not only fond of it, but seek it instinctively as a necessity, and improve in health and appearance when they have access to it. Other condiments are obtained from the vegetable kingdom, and owe their properties to certain vegetable oils which they contain. The vegetable acids, vinegar, &c., are useful and wholesome in moderation, particularly with oily food. The aromatics and spices, such as cayenne, white or black pepper, ginger, mustard, &c., are all useful when *used in moderation* by healthy individuals; in debility of the stomach they are often of service, and they seem especially adapted to counteract the effects of a warm

climate upon the digestive organs, and also to the constitution, acquired or otherwise, of the inhabitants. They are, however, generally used along with other vegetable productions.

Refer to—*Salt—Vinegar—Aromatics, &c.*

CONDYLE—the extended extremity of a bone which forms the joint.

CONFECTION—a term applied to medicinal preparations generally made with sugar or honey. The most common are almond confection, aromatic confection, cassia, rose, and senna confections. Of these the most useful is the confection of senna, prepared as it is with numerous fruits and aromatics, combined with senna in fine powder and sugar. Dose for a child one or two teaspoonfuls.

Refer to—*Almond—Rose—Senna, &c.*

CONFECTIONERY, literally, "things made up," is not necessarily unwholesome, if used in moderation; it is, however, too often deleterious if made with much butter, of bad materials, or mingled with poisonous ingredients.

Baked Confectionery, in which the butter or grease, is rendered empyreumatic and acrid by the heat employed in its preparation, is always liable to disagree, and especially so when, as often happens, bad materials are made up and disguised with flavours of various kinds, which are often in themselves unwholesome, particularly those so largely used, such as the oil of bitter almond, peach, kernel, and laurel flavouring, which are actual poisons, when taken even in not very large quantity.

In reference to sweetmeats, a recent writer (Wynter Blyth on *Foods*), says,—"A large proportion of those most commonly sold contain nothing but sugar, for the manufacturer, by careful heating, is able to impart a quite surprising scale of colours from the purest white to fawn colour, straw colour, reddish brown, or brown, to almost a jet black, by this agent alone. Sugar-candy is simply crystals of sugar obtained in a particular way. . . . . The ice-coating of cakes is composed of white sugar and albumen. A great many sweets are acidulated with citric acid, and a few have cavities within them supposed to contain alcohol, but really a little syrup. Gum tragacanth, citric acid, fruit sugar, gelatine, albumen, fatty and flavouring matters, with the following colouring matters, make up the usual harmless ingredients of the confectioner's shop:—

"*Red.*—Cochineal, carmine, the juice of beet, and of red berries, such as cherries, currants, &c.

"*Yellow.*—Saffron, safflower, turmeric, marigold, Persian berries.

"*Blue.*—Indigo, litmus, saffron blue.

"*Green.*—Spinach juice and mixtures of yellow colours with blue.

"*Black.*—Chinese ink.

"Besides these there are the aniline colours which, when pure, have not been proved to be injurious."

Cases of injury, however, have arisen from coloured confectionery and sweetmeats having been tinged with deleterious substances; the greens with arsenite of copper or Scheele's green, verdigris, or a mixture of chrome and Prussian blue; the yellows by chromate of lead; the reds by vermillion, a compound of mercury, or by oxide of iron; and the whites by carbonate of lead, oxide or carbonate of zinc, chalk, or sulphate of baryta. These facts ought to be sufficient to make people cautious in the use of such articles, particularly with children; and in case of sudden unaccountable illnesses, they should not forget the possibility of such causes. The colour of a sweetmeat would afford some clue to the nature of the poison, and reference to the proper article in this work will show the measures proper to be adopted in the interval of procuring medical assistance.

CONGESTION—a morbid accumulation of fluid, such as blood, in its own proper vessels. Such a condition usually precedes inflammation, and is marked by heat, pain and swelling of the part, caused in the first instance by activity, and afterwards by a passive condition of the circulation giving rise to obstruction. This retardation of the natural current occurs mainly in the venous capillaries, is dependant on the various causes which give rise to inflammation, and is to be dealt with *locally* by the application of leeches and hot fomentations, and *constitutionally* by attention to the general health and the employment of those measures which are necessary in cases of inflammation.

CONJUNCTIVA is the membrane which lines the eyelids, and is folded from them upon the fore part of the eyeball, which it covers, extending over both the white and the clear portion, or cornea. In its ordinary healthy condition, the conjunctiva is a transparent membrane, with perhaps one or two tortuous vessels seen upon it.

Refer to—*Cornea—Eye, &c.*

CONSERVE is a compound of some fresh vegetable substance with sugar. The conserves are now classed with the confections.

CONSTIPATION, or COSTIVENESS, is due to a sluggish or torpid action of the bowels, and consists in the retention of the fæcal contents, and their evacuation in a harder and drier condition than natural. The state is one, in great degree dependent upon habit and constitution, for that which would be considered constipation in one person, would not be so in another, and *vice versâ*. As a general rule, however, the bowels ought to relieve themselves *thoroughly*, once in the twenty-four hours; when such is not the case, the condition may be said to be one of constipation.

With some individuals, a single evacuation of the bowels, once every three or four days, seems to be sufficient, and perfectly compatible with their enjoyment of perfect health; and,

when such is the case, it is of course superfluous to endeavour to correct it, and it is better to let well alone. If, however, in conjunction with this condition of the bowels, the persons suffer from headache, from languor, from distention of the abdomen, if the breath is disagreeable, and the tongue furred, the state is *not* compatible with health, and should be corrected.

The causes of costiveness are very numerous, the nature of the food, as might be expected, exerts considerable influence; bread badly made, and especially if alum be mixed with it, cheese, milk with some persons, farinaceous articles, such as arrow-root or ground rice, and food of too concentrated a character, all tend to constipate. Deficient exercise, particularly if combined with much exertion of mind; any drain upon the system, as in suckling, abundant perspirations, loss of nervous power, and old age, have the same effects. Pregnancy, and tumours in the abdomen, constipate by mechanical obstruction, and in the same way, contraction of any portion of the alimentary canal. The colon or large bowel is very frequently the seat of the constipation, it loses tone, allows itself to be distended, sometimes to an enormous extent, or contracts to a very narrow calibre in some portion of its course. Lastly, a very common inducing cause of costiveness, particularly in females, is inattention to the intimation of nature to relieve the bowels.

Perhaps there is no ailment to which the human body is subject, which is more frequently mis-managed than constipation. Every effort should be made to correct the disorder *without the aid of medicine*. In the food, all those articles which have been enumerated, or which are known to constipate, must be avoided; the bread used should be made of coarse flour or whole meal; if vegetables and fruits agree in other respects, they may be freely consumed, and cocoa substituted for tea or coffee: food is not to be taken in a state of too great concentration, but so that, by the bulk of its refuse, it may afford substance to stimulate the action of the bowels. In addition, there are various articles of diet which exert an aperient effect, and which may be used or not according to the taste of the person: such as Scotch oatmeal in the form of porridge, honey, prunes, &c. Exercise, whether on foot or horseback, is another valuable aid in the removal of the costive state; it not only quickens all the functions, but it assists by the mechanical motion it communicates to the muscles of the abdomen; a similar effect may be produced by frequent flexion of the thighs, calling into play the same muscles, as in the action of moving up and down stairs. Prisoners who have a certain amount of work to do daily on the tread-mill rarely suffer from constipation. Glycerin Suppositories* often afford great relief, and the use of such mechanical means is preferable to the constant taking of medicine. They can be safely employed (cut to a proper size) even for infants, and are helpful in the constipation of old age, producing easy evacuations. Another very important point is regularity in the time of evacuating the bowels; not waiting for the urgent sensation, but retiring for the purpose at one set period of the day, when time can be given. The bowels are greatly influenced by habit, and they can be trained to act periodically by persisting to make them act at a stated time each day. Persons who are liable to costiveness should give themselves at least a quarter of an hour, or even longer for the daily evacuation of the bowels. Lastly, as constipation is so frequent an attendant upon the sedentary life of the student, and upon the anxious-minded man of business, a holiday both from books or desk, and change of air and scene, is both a good and pleasant remedy.

In children, who occasionally suffer from constipation, a little fluid magnesia mixed with their milk, or a tea-spoonful or two of confection of senna, or the same amount of castor oil will usually meet the requirements. Further, a very good remedy, which often supersedes the use of medicine, is friction of the back and limbs—the spine being rubbed gently by an attendant, from the nape of the neck downwards, with a little olive oil daily for ten minutes, as recommended under *Circulation*.

When neither diet nor regimen will effect the cure, other means must be had recourse to. If there is simple costiveness, without disorder of the digestive functions, the best remedy will be the regular use of a harmless aperient, as cascara tabloids, the colocynth and hyoscyamus pill, or saline mineral water, such as Hunyadi or Friedrichshall; if, on the other hand, furred tongue, with acidity of stomach, flatulence, pain between the shoulders, headache, &c., betoken deranged digestion, special medicine to meet the case will be required, at all events in the first instance; the liver is probably at fault, and five or six grains of blue pill, or of compound colocynth and calomel pill, followed in the morning by the black draught, or by castor oil, will be requisite.

When the bowels have been well cleared by the above medicines, it is requisite to *keep* them open, otherwise a few days will see all the symptoms return, and, in fact, such is too often the case: persons are content with taking a dose of strong opening medicine every few days, or once a week, as the case may be, and rest content with this, as it is called, having a good clearing out—albeit they are under the necessity of increasing the strength of the doses. The practice is one incompatible with sound health, and is most injurious to the stomach and bowels themselves; many cases of obstruction, and even inflammation of the bowels, are produced by it. The principle to be proceeded upon in the treatment of costiveness is, that it is more

*As made by Parke, Davis & Co., 21 North Audley St., London, W. Suppositoria Glycerini (Supp. aperitiva).

easy to keep the bowels in action than to excite them to it when they have become thoroughly torpid, and therefore the individual should not rest content without the daily evacuation. If simple constipation, depending upon inaction of the lower bowel, exists, the use of a salt water enema will in all probability be sufficient; but medicine may be required, perhaps daily, for some time, or it may be used alternately with the enema. Some medicines are more than others adapted to the treatment of habitual costiveness, and of these castor oil, aloes (alone, or in its combinations), senna, and Epsom salts are the principal; their great advantage is—not losing their effect by continued use. When castor oil can be taken regularly, in most cases it answers extremely well, and if taken regularly, the dose requires rather diminution than increase; it is a medicine, moreover, which never seems to injure the tone or the mucous coat of the bowels. In the constipation of pregnancy, castor oil is so well known as the best and safest aperient, that it scarcely requires mention. Aloes is peculiarly well adapted to relieve certain forms of costiveness, particularly that of the sedentary, and may be taken in the form of pill, in combination with soap, in the compound rhubarb pill or compound colocynth pill; any of these are most excellent combinations. If there is debility of stomach, the addition of a quarter or half a grain of quinine to each pill increases the efficiency of the medicine and gives tone to the stomach. The quinine must not be continued for more than a fortnight at a time. The dose of aloes when regularly taken does not require to be augmented. When quicker action is required, the compound decoction of aloes may be taken with advantage instead of pills, or a pill containing one sixth of a grain of the extract of nux vomica and five grains of the compound colocynth pill. The principal contra-indication to the use of aloes is the occurence of piles, which, if inflamed, or if the dose be too strong, are apt to be aggravated by the medicine; in this case, castor oil, or infusion of senna, or the enema, should be substituted, for a time at least. In some cases, on the other hand, when the piles are not inflamed, aloes taken regularly in small doses, seem to exert a beneficial and curative action upon them; probably in consequence of keeping the intestinal veins from becoming over-loaded with blood. Senna, either in infusion or electuary, is a medicine well adapted for the relief of costiveness; it is perfectly safe, and does not seem soon to lose its effect. Ipecacuanha, not alone, but in quarter or half-grain doses, added to the aloetic pills, exerts a most beneficial effect in cases of habitually confined bowels. A weak solution of Epsom salts, a drachm to the half-pint of water, with or without the addition of five or ten drops of dilute sulphuric acid, when taken on first rising in the morning, will prove effectual with some, and forms a change from the use of the other aperients. As age advances, the bowels become more sluggish, and require to be assisted in their action by aperients. When the ordinary remedies mentioned above fail, it is necessary to employ drastic purges such as we have in croton oil, gamboge, and elaterium. Again, it is repeated, keep the bowels free, by food, by exercise, by habit, if possible; by injection or medicines, if necessary; but *do not let them become costive.*

In some individuals, in whom the walls of the abdomen are very flaccid, and do not afford sufficient tonic support to the contained bowels, costiveness frequently exists, and is much remedied by the use of an elastic or other belt, worn to support the entire abdomen.

Refer to *Alimentary Canal—Aloes—Enema—Digestion—Laxatives—Suppositories, &c.*

CONSUMPTION, or PULMONARY CONSUMPTION, as its name implies, is a disease of the lungs, or at least one in which the lungs are more prominently affected than any other organ. It is rightly termed *consumption*, as the vital process of combustion or consuming, goes on rapidly at the expense of all the tissues of the body, and cannot be counteracted by ordinary means. In Britain, its fatality and frequency render it but too familiar, as year by year it numbers for its victims, the young, the good, and the fairest in the land. The registration of deaths from all causes, shows that in England it accounts for one-tenth part, or about the same proportion as small-pox a century ago.

Consumption is a portion only of a constitutional malady, which very frequently develops its intensity in the organs of respiration, but may do so in other modes, and in other organs of the body. Its constitutional nature requires to be impressed upon the mind of people in general; for regarded only as a disease of the lungs, alarm is not taken, nor are remedies generally resorted to, until its effect upon these organs becomes manifest; the antecedent period, in which the constitution is giving way, is overlooked, and that time is lost in which the first indications of disease might have been successfully attended to. Consumption owes its origin to a deposit of new matter called tubercle, in the substance of the lung texture, which is infiltrated or studded over the organ in minute granules, like millet seeds or of larger size, but rarely larger than peas. These deposits are most frequently found in the upper parts of the lungs immediately under the collar bone, and after lying dormant for a while, become converted into yellow cheesy masses, which breaking down in the substance, involve the surrounding healthy tissues, giving rise to rupture of some of the small blood vessels, and to abscess, and accounting for the cough being accompanied in most cases with expectoration of blood and purulent matter. A similar tubercular deposit occurs in other parts of the body, especially in the glands connected with the intestines, causing

abdominal or intestinal phthisis. Consumption has its acute and chronic features; it may carry off its victim in a few weeks (rapid consumption), but it is more likely to continue for years with intermissions.

Causes.—In 1881, Koch discovered that a special micro-organism, *Tubercle bacillus*, is to be found in tuberculous material. This bacillus is the essential factor in the disease. The *development* of consumption, however, is favoured by all the causes which occasion debility, not excepting the most frequent of all, hereditary predisposition, that tendency to the disease which exists so strongly in some families, that no care or precaution can ward it off, nor prevent it seizing in succession member after member of a household. Fortunately, this intensity of hereditary transmission is not so very frequent, but there are few families in this country in which the tendency does not more or less exist; there are few which cannot number amid their deceased relatives some victim of consumption. With a susceptibility so widely diffused, it becomes a serious consideration with all by what means this tendency is encouraged, and how it may be diminished. The first consideration that presents, is marriage. There can be no question, that from errors in the contraction of this great engagement of life, much of the hereditary tendency to consumption is developed, and especially when the union is between parties nearly related by blood; doubly so if the predisposition already exists in the family. Delicacy of either parent, particularly of the father, is very apt to entail consumptive tendencies upon the children; and the same follows if the parents are either too young, or if the father be advanced in life. The mistake is a very common one, that marriage and child-bearing act as a check upon the progress of consumption, and the step is often advised, even to the comparatively young, with this view. The error is a serious one; nothing can be more trying even to a healthy female, in this country, than having a family before the constitution is formed; and most certainly it is so to the weak. It is true, apparent temporary amendment of consumptive symptoms sometimes occurs, but the powers of life are sapped by the too early call on their exertions. In the management of the children of even the most healthy parents, doubly so of those who are the reverse, much may be done either to weaken or to fortify the constitution, to pull down the one to the level of the scrofulous diathesis, which ripens into consumption, or to infuse into the other such strength and vigour that it may resist during a long life any development of the disease. For information respecting the management of children, the reader is referred to the article itself.

As the period of puberty approaches, care is required with all, but doubly so in the case of those who have displayed any scrofulous or consumptive tendency. The development of the body which is going on, requires a full supply of the most nutritious food, animal food particularly. The secretions should, if possible, be kept in healthy activity, and more especially, all sources of exhaustion most strictly avoided; youths, especially, must be warned against the evil of prolonged physical exertion, and not less so against the mental efforts, which those, especially, who partake of the nervous and excitable constitution of the hereditary consumptive, are apt to give way to in competitions at school or college.

At any period of life, mental anxiety or over-exertion, intemperance, or dissipation, *the habitual breathing of vitiated air*, a low damp situation, insufficient clothing, and exposure to the weather, or peculiarity of employment, particularly that which necessitates the inhalation of irritating matters, or any continued drain upon the powers of the constitution, such as suckling, may any of them develop or induce consumption.

Two very opposite conditions of physical development are found to exist along with the scrofulous and consumptive tendency; in the one, there is the fair fine skin and bright red complexion, the fair hair, the light eye, with its pearly-looking white, and the tapering fingers; in the other, the dark hair and skin, the latter almost dirty-looking, and the swollen-looking upper lip. Consumption varies much in its initiatory stage; sometimes it steals upon the patient most slowly and imperceptibly; at others, developed probably by some acute attack, it appears to start at once into activity. Generally, for a considerable period before marked symptoms — or at least symptoms which attract general attention—show themselves, the person has felt weak, languid, and *complained much of cold*, probably has lost flesh, and short dry cough has come on, apparently without cause, or there has been continued dyspepsia; if the patient is a female, the monthly discharge has become irregular, or stopped; it may be that these symptoms have been aggravated during winter, and disappeared partially or entirely with the advent of warm weather. Such symptoms may go on for a longer or shorter period, ebbing and flowing, but still gaining ground, or they may progress more unremittingly, though still slowly, or become suddenly aggravated by some adventitious circumstance, such as cold taken, some unusual fatigue, or the like. The emaciation becomes too evident to escape notice, the cough is unabated and becomes troublesome, the voice assumes a peculiar hollow sound, the breathing is quickened, and it may be that spitting of blood, profuse night perspirations, or even diarrhœa, have set in before the patient's condition excites either alarm in his own mind or in that of his friends; indeed, it very frequently happens that the patient is the last to take the alarm, the last

to entertain the idea of the fatality of the disease, of which this hopefulness of recovery is a well-marked symptom.

Threatened consumption is no disease for domestic treatment. On the first suspicion of its presence, the person should at once be examined medically: the above symptoms may excite alarm, may afford most grave ground for suspicion, not only to the friends, but also in the mind of any medical man, but their certainty cannot possibly be pronounced upon, without the examination which educated medical skill alone can conduct.

As regards the prospect of recovery from consumption—for recovery does undoubtedly take place—much depends upon the original and existing constitution and the habits, past or present, of the individual, and the worldly means within his power.

Prevention.—The prevention of so fatal a disease is a more important subject, in a work like the present, than its treatment; and in those predisposed, the preventive or prophylactic system must be continued life through, even into old age. *It is a popular error, that by the time middle life is reached, the liability to consumption is over.* Such is not the case, for even the "three-score and ten" is sometimes terminated by the disease.

Climate.—When the children in a family evidently inherit or display consumptive tendencies, it should become a question, how far permanent removal to a more genial and drier climate than that of Britain, might be desirable. To the rich, who have it in their power to change their residence as and when they may, the consideration is perhaps of less immediate consequence; but to the labourer, the mechanic, or the man of small income, it must be a question of paramount importance, whether, by emigration to such a climate as that of Australia, he may not only save himself the constant sorrow, of seeing his family drop one by one into their early graves, but also save the constant drain upon his resources, which a sickly family necessarily entails.

Occupation.—But in any condition of life, the question of tendency or not, to consumptive disease, should always influence the choice of field for exertion, and also of the nature of the business of life. Any occupation which renders the inhalation of irritating substances unavoidable, is to be eschewed by the consumptively inclined man, and not less so that which involves confinement in a constrained position, or in a close room. Of the former class, grinding or polishing of metal or stone, especially if dry, flour-grinding, &c., are examples; of the latter, the occupation of the tailor, the shoemaker, the seamstress, or the compositor. The most eligible employments are those which require muscular exertion of not too exhausting a kind, and without too great exposure to the weather; the gardener, the carpenter, the butcher, the farm servant, are all less likely to be the victims of the disease.

Hygiene.—In whatever situation or grade of life, however, a person may be placed who is predisposed to consumption, much may be done to maintain the powers of resistance, by keeping up the general health to the highest possible standard, by diet, early hours, attention to the skin, and avoidance of all kinds of dissipation and intemperance; smoking too much tobacco should be shunned as particularly injurious. Regular exercise is to be taken—the chest and shoulders should be bathed every morning with cold salt water, and rubbed afterwards to promote reaction. Cheerfulness of mind, and moderate mental exertion are important, whilst perfect temperance in the use of alcoholic stimuli is indispensable, but any change to their total disuse cannot be made in many cases without danger. All the usual sources from which "cold is taken" are to be shunned, particularly wet feet, sitting in damp clothes, crowded ball-rooms, and public assemblies; and, lastly, when exposure to cold air, especially to east winds or to the foggy atmosphere of night, is unavoidable, the protection of a respirator should be resorted to.

Diet and Treatment.—As regards diet, there is the greatest variation, some being most comfortable with a milk or farinaceous diet alone, whilst others require the constant use of wine or porter, and consume animal food in good quantity. Cod-liver oil should be given from the first appearance of the disease, and should be continued unremittedly. Some persons, however, cannot take cod-liver oil in any form, and then the various forms of maltine will be found most useful, especially in combination with the various hypophosphites. For allaying the troublesome cough, demulcents of various kinds may be tried with or without the addition of small doses of morphia, laudanum, paregoric, or chlorodyne. When tendency to perspiration exists, and there is no diarrhœa, the following is a very useful and palatable mixture, which allays both nervous irritability and cough:—Take of dilute hydrochloric acid thirty drops, muriate of morphia one grain, refined sugar two drachms, water six ounces; of this mixture a tablespoonful may be given every few hours. In the latter stages, when the cough is partly spasmodic, and expectoration difficult, much relief is often experienced by the inhalation of steam, along with the vapour from a few drops of sulphuric ether, put in the boiling water. The perspirations may be kept in check by fifteen drop doses of dilute sulphuric acid in a wine-glassful of water; but when diarrhœa is present, this cannot be persevered with. To relieve diarrhœa, the abundant use of isinglass or gelatine will be found serviceable, also chalk mixture with opium; five-grain doses of the sub-nitrate of bismuth, with a quarter of a grain of powdered opium, is often a useful remedy. Acetate of lead, gallic acid, &c., are

also used, but mainly with the view of arresting hæmorrhage from the lungs. Inhalations of various kinds have now come largely into use in the treatment of pulmonary consumptions, and many forms of inhalers have been used; but in point of convenience, efficiency, and comfort, the small respirator form recently introduced by Dr. Coghill, is the best.

Infection.—Consumption is now regarded as a communicable disease, but the risk of infection to healthy persons is slight. As has been well said by a recent writer (Dr. J. Ed. Squire, *Hygienic Prevention of Consumption*): "Let us thoroughly understand that sufferers from consumption need not be shunned as dangerous to their neighbours, nor isolated like small-pox patients. Direct infection is rare, and only possible under certain easily avoided conditions. . . . The experience of the nurses at the Brompton and other large consumption hospitals may be taken as a proof of the small risk of direct infection to healthy persons in continued residence amongst consumptive patients, *so long as due hygienic precautions are followed out.*"

What these precautions are, and wherein the danger lies, will be easily seen from the following extract, also from Dr. Squire's work: "Almost all authorities seem to agree that the most potent cause of tubercular infection, and certainly the most frequent source of consumption or pulmonary tuberculosis, is to be found in the dust derived from the dried expectoration of phthisical persons. It seems probable that such infection may cling about rooms which have been occupied by consumptive persons, and retain its virulence for a considerable time. There is evidence pointing to the existence of infected houses and infected workshops; and our knowledge of the infective power of dried sputum dust, shows how indiscriminate expectoration may be a source of danger. Amongst the more careful and more cleanly portion of the community the danger is minimised by the use of spittoons for the patient, and by the frequent removal of dust from the rooms. But there are persons who are less cleanly in their habits. . . . For such persons it is necessary to seize any opportunities which may present themselves to instruct them as to the danger to others of indiscriminate expectoration by consumptives, and to teach them how this danger may be avoided. With this object the North London Consumption Hospital has adopted the following regulations, based upon suggestions by the author:—

'*Directions to Out-Patients.*—As it is now known that the phlegm coughed up in consumption contains the seeds of disease—

'Do not swallow your expectorations. This habit may lead to consumption of the bowels.

'Do not spit about the floor, nor into any utensil unless it contains a disinfectant.

'Do not spit about the streets.

'Indoors, use a special spitting-cup or other vessel in which is some disinfectant.

'Outdoors, use a pocket handkerchief, or else use a piece of rag or paper, which must be burned as soon as you get home.

'You can get some disinfectant from the dispenser for use in the spittoon.

'The contents of this spittoon should be mixed with some more disinfectant before being emptied.

'The spittoon should be emptied into the pan of the w.c. or into a bright fire, but *never* anywhere else, not even into the dustheap.

'If you spit into a pocket handkerchief, it must be boiled for five minutes as soon as it is done with.

'Keep your room well aired, throw the window wide open when you leave the room, and keep it open a little at the top all night.

'If there is a fireplace in the room, do not stop up the chimney, but always keep it free for the passage of air.

'Keep your room clean; do not allow dust to remain on the floor.

'Consumptive patients should sleep alone.

'Consumptive mothers should not suckle their children.'"

The clergy, nurses, district visitors, and others who come much in contact with the poor, might do excellent service by making Dr. Squire's simple rules widely known.

Refer to—*Chest—Children—Inhalation—Lungs—Respiration—Scrofula.*

CONTAGION is sometimes used to express the actual agent by which disease is propagated; but more generally the propagation itself. Properly speaking, the term ought to be confined to the propagation of disease by actual contact, in contradistinction to infection; but it is now used in the more extended sense of "infection" likewise. Contagious diseases may be communicated only by actual contact of individuals, as in the case of itch; by inoculation, as in the case of small pox; or through the direct medium of the atmosphere, as scarlet fever, small-pox, typhus, &c.

This power of propagation through the atmosphere, however, does not (independent of epidemic and endemic influences) extend far from the patient. Certain circumstances influence the extent of contagious diffusion Of these, the most distinctly ascertained are atmospheric impurities; for it is ever observed, and we believe it may be predicated of every disease possessing the property of remote contagion, that its contagious matter is propagated more readily in a dirty, crowded, and ill-ventilated apartment, than in one of which the air is pure. The same principle applies to articles of dress and furniture; those which are contaminated by animal secretions and effluvia being much more readily impregnated with contagious matter than those which are clean. Peculiar atmospheric conditions, certainly, also favour the propagation of disease by con-

tagion; sometimes these conditions are inappreciable, at others they are evidently connected with a superabundance of warmth and moisture; and also we have good reason to conclude, with certain states of electrical disturbance. Actual contact, however, or even immediate vicinage, to a person labouring under a contagious disease, is not requisite for its propagation to others; this may be effected by means of substances to which the contagious matter clings; these substances are more generally clothing and stuff furniture, which have been about or near the bodies of those labouring under the disorder. They are apt to be impregnated with the poison in a very concentrated condition, and are capable, not only of retaining it for a long period, but of transporting it from place to place. A sofa, on which a patient labouring under scarlet fever had lain, has been known to propagate the disease six months afterwards; and clothes which have been about the sick are constantly ascertained to have been the media of conveying fever, &c., to distant localities. Wool and cotton seem particularly apt to attract and retain contagious emanations; but, indeed, all loose textures appear to have the property; whilst, on the other hand, polished and hard surfaces and substances are much less likely to act as matrices, if they do so at all. Everything of unnecessary drapery or clothing should be removed from the chambers of those sick of contagious maladies, or, indeed, of any malady; for a sick chamber must always, in a lesser or greater degree, have an atmosphere containing unhealthy emanations, which it is expedient, both for the good of the patient and of others, should find no unnecessary attractions or lodgments. Further, it is advisable to have the furniture as much as possible of hard and polished substances; and the dresses of those in attendance upon the sick, especially if habitually so, might with advantage be made of cotton with a glazed surface. Those substances which have necessarily become the harbour of contagious matter, ought to be scrupulously freed from it by complete and lengthened exposure to the open air, by boiling or by exposure to the fumes of chlorine or of sulphur vapour, in a close apartment. Indeed, those persons under whose management a case of contagious disease has occurred, ought, as a Christian duty, to make sure that every article of stuff furniture, clothing, &c., has been fully and carefully purified, before others, either in the way of social intercourse, or in occupation, particularly that of the washerwoman, come into contact with them. The following is the most systematic course of action when the generation of contagious matter has ceased in an apartment, either by the death or recovery of the patient, premising of course, that throughout the illness, measures have been, or ought to have been, resorted to, to preserve purity. During the day, the door being shut, the windows should be open to their full extent, and the infected articles freely exposed to the air. After this, the windows and doors and every chink and crevice of the room being thoroughly closed, a pound of sulphur placed in a shovel over a chauffer or stove in the centre of the room, should be allowed to burn slowly until every corner of the apartment is thoroughly impregnated with the sulphurous vapour. A more convenient plan of generating sulphurous acid, is adopted in many places. Instead of the pure sulphur, a compound of sulphur and carbon, the bisulphide of carbon, is employed for the purposes of fumigation. This is an inflammable liquid, which when put into a cup (it had better be made of iron) and placed on a tripod at a safe distance from the floor, in the middle of the apartment and lighted, throws off, according to requirement and quantity, sufficient sulphur-vapour to destroy every particle of contagion in the atmosphere. All textile fabrics and the like should be removed; those that are capable of being washed put into boiling water, others placed in the open air. All articles of furniture left in the room, also the floor and oil-painted wood-work, should be well scoured. If the chamber be a white-washed or coloured one, it should be "re-done;" if papered, it is only a safe precaution to re-paper it. The bed requires the greatest amount of care; if of wool, it is better destroyed altogether; if of hair or feathers, these should be exposed to the heat of re-baking, that is, at least to a temperature of 230° Fahr.; and the ticking either thoroughly fumigated and washed, or entirely renewed. These directions may appear minute and troublesome, but they are far from being too much so when put in comparison with the fearful scourge of a contagious disease which has established itself in a household or community, and which perhaps might have been checked at the outset by the adoption of prompt and vigorous measures. The poor and the ignorant cannot or will not adopt, in most instances, effective precautions; it remains for the rich, for the well-informed, to point out their necessity, and lend a helping hand to their fulfilment, not only as an act of Christian charity, but as a means of safety for themselves; the disease which takes its origin in the cellar of Lazarus, not unfrequently ends by establishing itself in the mansion of Dives. It is not a necessary character of contagious disease that it has itself sprung from contagion—some of the most virulent and spreading fevers, such as those of the ship, or of the old jails, had no such commencement; but had their origin in the decomposing emanations from the bodies of numbers of individuals confined in unventilated and insufficient spaces. In addition to the disinfectants already mentioned, air, boiling water, sulphur, chlorine, and many others, are and have been used, such as the vapour of vinegar, of pitch, or of tobacco, or camphor; large fires also used to be a favourite method; none of

these last mentioned are to be depended upon. Chlorine gas, generated from chlorinated lime to which some hydrochloric acid has been added, may be used instead of sulphur, but the latter does not require repetition, which the former does. In many instances, particularly in the case of clothes, and other textures which will not wash, dry heat might be used more extensively than it is at present by means of the disinfecting oven. Refer to *Air*, *Bedroom*, *Disinfection*.

CONTUSION.—See Bruise and Concussion.

CONVALESCENCE is the transition period between the cure or cessation of severe disease, whether acute or chronic, and the re-establishment of health. The commencement of convalescence, or the point at which the characteristic symptoms of disease cease, is sometimes distinctly marked, more especially after acute disorders; frequently, however, the tendency towards health, particularly after chronic disease, is much more insensibly established; in the latter case, too, the progress of the convalescence is slower than it is in the former. Its rapidity or protraction, moreover, is much influenced by age, and the nature and treatment of the previous malady. Children convalesce rapidly, old people the reverse; but in all cases the natural power or resiliency of the constitution exerts much effect. In no case, perhaps, is convalescence more tardy and unsatisfactory than after illness in which much loss of blood, or of its constituents, has taken place, either as a consequence of the disease, or of accidental hæmorrhage.

When convalescence from acute disease commences, the previously quick pulse falls to the natural standard, the tongue begins to clear, the skin becomes cool, sleep is refreshing, the mind acquires a more healthy and hopeful tone, and the person *looks* better. There is nothing which more assures a medical man of the condition of his patients, than the look, the expression of the countenance, to which the first glance, as he enters the room of sickness, is almost instinctively directed. The look of convalescence is tranquil, placid, not the heightened colour and bright eye of hectic, which so often deceives the inexperienced with delusive hopes. When the brain has been much affected, however, the condition of the mind, and consequently the countenance, assumes its natural look more slowly.

The management of convalescence is extremely important; errors in this respect frequently expose the already weakened patient to attacks of other disorders, or induce relapses to the diseased actions which had just been cast off. The convalescence after some particular diseases is more liable to such accidents than it is in others. That after fever is peculiarly so; and after scarlet fever, the tendency to cold and its consequences, dropsical swelling, and affection of the kidneys, is so very common, and so frequently fatal, that the greatest possible care is requisite. During convalescence from acute disease, and especially of an eruptive character, many of the disorders characteristic of the scrofulous constitution show themselves: the eyes become the seat of chronic inflammation, purulent discharge from the ears occurs, and chronic eruptions show themselves upon the skin, of the head especially. Moreover, these disorders, now, perhaps, for the first time apparent, are apt to continue even after convalescence, properly so called, is over. Further, relapse in convalescence often occurs from too soon employing actively the previously affected organ; the liability to this mishap must be evident to the common sense of every one. In the case of the eye, it is evident to the senses, after inflammation of that organ, its undue exercise, or even its exposure to full daylight, will often be followed by a return of the disease. Such is the case elsewhere, and whether it be the eye, or the brain, or the stomach, which has been affected, return to the ordinary exertions of health must be made with the greatest caution.

The clothing of a convalescent patient requires particular attention; there is much susceptibility to cold and to atmospheric vicissitudes. For the requisite information, the reader is referred to the article *Clothing*. General exercise is to be resumed cautiously, and should never be carried to the extent of fatigue. Diet, however, is the great source both of error and mischief, the greatest difficulty which the medical man has to contend with; that is, in getting it properly attended to, and his orders properly carried out, particularly among the poor. Whilst disease is in progress, and alarm is felt, directions are tolerably well, or indeed strictly obeyed; but no sooner does the patient begin to get better, than irregularities commence. The popular idea seems to be that convalescence must advance in proportion to the amount, and often to the stimulant qualities of the food given; and many a hopeful case sinks back into fatal relapse, from the wilful and injudicious kindness of friends. The point is one which requires to be strongly enforced, not only on the minds of the poorer and more ignorant, but on those of people generally, that in diet, as in everything else, convalescence must be gradual, and that nothing is more dangerous, more likely to induce relapse, than the injudicious use of solid animal food, or of stimulants. Milk, and the various farinaceous preparations with which it is usually combined, such as arrow-root, sago, rice, bread, &c., is perhaps the most generally useful article of diet in convalescence; next come the broths made from fowl, mutton, veal, or beef, alone, or mixed with some of the farinacea; next in succession, eggs lightly boiled; and lastly, solid meats, of which tender mutton is probably the best, are to be permitted. Ripe fruits in

their season, if not contra-indicated by the nature of the previous disease, and if they do not occasion flatulence or diarrhœa, are both grateful and serviceable. If alcoholic stimulants can be dispensed with, it is the safer plan, and when requisite, the time of their employment, and the kind used, are best left to a medical attendant. A good deal must depend upon the previous habits of the person. Gin, in cases in which the urinary secretion is deficient, is most suitable; or light sherry, if the circulation is excitable; and port wine or porter in extreme debility. One of the most useful of the alcoholic stimuli, in convalescence, is the bitter beer or pale ale; the amount of alcohol it contains is not large, its bitter exerts a beneficial tonic effect upon the stomach, whilst the narcotic principle of the hop tranquillises the nervous system, often so painfully irritable. In whatever form nourishment is given to the convalescent, it should be in small quantity at a time, but as frequently repeated as natural appetite requires. The atmospheric purity of the chambers occupied by persons recovering from sickness requires great attention, and the temperature ought to be kept as nearly as possible about 60° Fahr. Lastly, when convalescence has reached a certain point, there is no remedy which so surely promotes perfect recovery, and confirms health, as change of air. Almost any change is beneficial, but in many cases much more advantage would be derived, if persons thus seeking health acted upon competent medical advice. It is to be regretted, that so many of the accessories which promote speedy and certain convalescence, have hitherto been unattainable by the majority of the poorer classes in this country. Care, and good nursing, and the highest medical skill in the country are bestowed upon the poor inmate of the hospital up to a certain point, and convalescence is barely established, when too often the patient has to return to his home and his work, to help to make due provision for his family. Convalescent homes are now established in many parts of the country, where, on the recommendation of a subscriber, or by a small payment, patients may be accommodated for a limited time. These are excellent institutions, and are doing an infinite amount of good, but much more requires to be done to render them universally accessible. Their extension in larger numbers at the sea side is especially desirable, and charitable bequests and donations might be worse directed than into this channel.

Refer to—*Air—Bedroom—Clothing—Cookery—Diet, &c.*

CONVULSION is a state of alternate violent contraction and relaxation of the muscles, independent of the influence of the will; those under its direct control are most frequently affected, but not invariably so; the muscular fibres of the stomach, and other involuntary muscles, are often the seat of convulsion, but in this case the term spasm is generally applied to the disorder. Convulsions are classed by medical men as "tonic," or those in which the state of contraction is maintained for a considerable period without alternation with relaxation; and as "clonic," or those in which the two states succeed one another with more or less rapidity. When the relaxations and contractions are very slight, and very rapid, the condition is tremor. The first of these, or the tonic convulsion, occurs in lock-jaw, in cramp, and in cholera; the second, or clonic, in epilepsy, chorea, and hysteria; the third is seen in the persons of hard drinkers, when not under the influence of their stimulant.

Convulsions may be either general or partial, affecting only the muscles of the eyes or eyelids, of the face, or of one of the extremities, or of one side of the body, or they may shake the whole frame in convulsive agitation, such as occurs in epilepsy. Some of the most characteristic local convulsive actions occur in the muscles of the face and orbit, causing squinting, &c., or the peculiar "sardonic smile," or grin, which is caused by forcible retraction of the corners of the mouth, exposing the teeth.

Sometimes an attack of general convulsion is forewarned by a local affection, the eye is unnaturally turned, or the thumbs, as often occurs in children, drawn across the palm of the hand; or hiccup, which is a convulsive affection of the diaphragm, precedes the more widely diffused affection. In partial convulsion, the mind is probably unaffected; but when the affection is widely distributed, or general, there is frequently no outward sign of consciousness, and when the convulsion ceases, and consciousness does return, there is no recollection of the past paroxysm.

In children convulsions usually affect the whole body, and often occur without warning. The child becomes suddenly stiff, with eyes staring, head thrown back, limbs stretched out rigid, hands clenched, and breathing temporarily arrested. The eyes are often turned upwards, and little more than the whites are seen; sometimes they diverge or converge, and appear to squint. After a few seconds, convulsive movements of the face, arms, and legs commence. The face, usually livid, is twitched in different directions. The mouth is moved irregularly, and, if the child has teeth, the tongue may be bitten, and froth mixed with blood appear. The eyes usually roll from side to side, the eyelids being widely opened. The arms and legs twitch usually in a marked manner, every part of the limbs being so affected. The child is unconscious throughout the attack, and often for some little time after it. When the spasms cease the muscles relax, the child becomes pale, and may draw a long sigh, and gradually recovers. A slight attack lasts one or two minutes only, a severe one some hours.

In adults partial convulsions, with consciousness, are the more frequent, unless due to

epilepsy or to organic disease of the brain or the spinal cord. In such cases the convulsive movements of the limbs, and the distortion of the features are truly terrible to witness; but there is every reason to suppose that in many instances, and it is a great consolation to do so, the trial is mainly to the spectators, and that the cerebral disorder which causes such violent commotion of the body, extinguishes for the time any consciousness of suffering. Of course, when the mind is unaffected, as it is in lock-jaw or tetanus, or in hydrophobia and other cases, the pain of the convulsion is severely felt. The length of time a convulsion continues may vary from a few minutes to many hours, but generally the period is short, the paroxysms returning after intervals of cessation. The fit of convulsions may terminate in apoplectic stupor, in a state of extreme nervous exhaustion, in lethargy, or in prolonged sleep. For some time after, there is usually much languor, both physical and mental, and the faculties of the mind are confused and incapable of being exerted. There may remain permanent lesion of the nervous functions, such as paralysis, or disordered nervous action, such as St. Vitus's dance; a squint often dates from an attack of convulsions in childhood. In some cases bleeding from the nose or ears, or vomiting, or diarrhœa, appear to terminate the attack.

Convulsions are the most frequent and fatal of the diseases to which the nervous system is liable, and childhood suffers in a higher ratio than in after life, the disease appearing as a common cause of death from birth up to the seventh or eighth year, boys suffering in larger numbers than girls. After the eighth year convulsions are less frequent as the nervous system becomes better organised and developed. They are the result of a great variety of causes. The brain itself may be the organ primarily affected; there may be disease of its structure, or pressure or irritation exerted upon it, by disease or accident; there may be too great determination of blood to the head, or the reverse condition may exist, and the supply of blood to the brain may be inadequate. But convulsions quite as frequently arise from irritation of distant organs affecting the brain and spinal cord; in childhood, the irritation of teething is a most prolific source of convulsions, and perhaps not less so, irritation of the stomach and bowels: causes which might, in the adult, produce transient headache, in the susceptible nervous system of the child may cause convulsion. In females, irritation connected with the generative system is a frequent source of convulsive action, and, indeed, one of the most formidable phases of the disorder occurs in the process of childbirth. Strong mental emotions of any kind, such as joy, fear, &c., are apt to cause convulsion. Suppression of accustomed discharges likewise are often followed by an attack of the malady. Worms in the intestinal canal cause it; and the onset of acute disease, small-pox in particular, but also febrile disease of any kind, is, in many instances, heralded by an attack. In fact, with those who are susceptible, there is scarcely an agent, from a carious tooth or the scent of a flower upwards, which has not the power of exciting convulsive action—or something nearly approaching it—of the human frame.

Some persons are much more liable to be affected than others, and children, as a general rule, especially so; it is therefore very important, that the premonitory symptoms, either in them or in individuals of excitable temperament, should be carefully noted and attended to, and the exciting cause, if possible, discovered and removed. In children, the state of the gums, and of the secretions from the bowels, are especially to be watched; the first may require lancing, or the second clearing out by an active purgative, such as calomel and scammony; but when, from the occurrence of warning symptoms, and especially if the child, or any other member of the family, have previously suffered from convulsions, an attack is supposed to be impending, medical advice should be procured. A point of great importance to be determined is, whether the disordered condition is connected with excess or deficiency of circulation in the vessels of the head and spine; for, if the former, it is evident that the lowering treatment which it requires must be injurious should the latter condition prevail, for this must be corrected by tonic medicines, or even by the exhibition of stimulants such as sal volatile, or brandy in minute quantity. It must be clear to all, how important it is, either in the preventive or in the actual treatment of convulsions, whether in children or adults, that this point should be clearly ascertained. And as it is one which sometimes requires considerable medical acumen and experience satisfactorily to determine, it must be equally clear, that it must render non-professional interference in such cases a matter of hazard, and not lightly to be undertaken. At the same time, the sudden and alarming nature of convulsive attacks, renders it necessary that some means of discrimination, and some safe rules of treatment, should be known to all who are likely to be appealed to in such cases, particularly if resident in places far removed from immediate medical assistance; and it is reiterated that the two opposite states must be kept in mind, the one arising from excess, the other from deficiency of vital energy, and the treatment modified accordingly.

If convulsions be threatened in a child of full habit, with firm flesh and good colour, if teething is going on, the gums must be looked to, and lanced if requisite, the bowels may be freely purged with calomel and scammony, or with grey powder at night, followed by senna in the morning, the diet being at the same time reduced; and should there be much heat about the head, and the symptoms remain un-

abated, leeches—one, two, or more, according to age—may be applied to the temples, and cold to the head generally. If, on the contrary, the child, even though fat, be pale, and the flesh loose, and if it is of feeble habit, anything like lowering must be avoided; the gums ought, of course, to be attended to, and if the bowels are disordered, the secretions must be gradually corrected by a couple of grains of grey powder, given every night at bedtime, and, if requisite, a small dose of castor oil in the morning; likewise, in either of the above cases, an antacid will probably be of service, such as three or four drops of potash solution, or a tea-spoonful of fluid magnesia, in the milk food, given twice a day. In judging of the energy or weakness of the cerebral circulation in infancy, as long as the opening of the head is unclosed it affords a guide to judgment. When, at this point, the scalp and subjacent parts appear depressed, the condition is one in which anything like lowering measures are inadmissible. *Keeping the already given cautions in view, and remembering how often, both in child and adult, convulsion is threatened in consequence of irritation, not in the brain or spine, but at a distance from them*, when it is suspected that an attack is impending, and when medical assistance cannot be at once procured, attention should be directed to any possible source of irritation, and should any such be found, its removal *should, if possible, be effected.* If no appreciable source of irritation is discovered, to which symptoms of threatened convulsion can be referred, and if the brain itself be suspected to be in fault, the same cautions respecting excess or deficiency of vascular action must still be remembered. If plethora is undoubted, if the individual is of full habit, florid, and with a strong pulse, leeches and cold to the head, and free purging, with low diet, may be resorted to with every prospect of advantage; on the contrary, if the habit is feeble, the more negative system will be most safely pursued; the bowels must be regulated but not purged, the diet attended to as regards digestibility, not lowered, and every source of nervous exhaustion, either fatigue of body or mind, or of a sexual character, most scrupulously avoided. If the extremities are cold, as they often are, their warmth must be preserved; if the head is hot, the moderate use of cold will allay nervous excitement, as well as vascular action. Provisional measures like the above, will, if used with judgment, be most valuable even in unprofessional hands, but they are not to supersede medical examination, which *must* be submitted to.

In the *treatment of an attack of convulsions* the above directions must equally be borne in mind and acted upon. *When a child is seized with convulsions* the most generally available remedy is the warm bath, and if used with judgment it is a good one; the temperature should be about 98°. If the child is strong and plethoric, it should not be immersed above the waist, and while in the bath, cold should be applied to the head; if the child is weak, it may be put in the water above the shoulders; in either case the immersion is to be continued for twenty minutes. The gums are to be lanced if requisite, and leeches applied to the head, under the cautions already given as to the abstraction of blood, and under the same cautions, purgatives are to be resorted to, either the more powerful ones of calomel and scammony, or calomel and jalap, or senna, or indeed the first efficient medicines of the class at hand, or the milder agency of castor oil; in addition, an aperient injection may be administered with advantage. In many cases of convulsions, especially in children, it is impossible to get remedies swallowed. When this occurs, chloroform may be given carefully by inhalation, or a small dose of chloral hydrate by injection. In the former case, for a child three years old, fifteen minims on a piece of lint will suffice at first for inhalation; or, fifteen drops of syrup of chloral injected into the bowel in an ounce of thin gruel for an enema. Should there be great depression, a few drops of aromatic spirits of ammonia combined with the same amount of ether, may be administered on sugar. When the child is taken out of the bath, it should at once be wrapped up in warm blankets, and laid in its cradle, or in bed, and cold used to the head, or not, as thought well; and if the fits still continue, mustard plasters, made with half oatmeal, may be applied to the legs, but must be removed as soon as the skin is well reddened.

When an adult is seized with convulsions, the treatment, conducted upon the same principles, must be very similar to that recommended for a child, with exception of the bath, which cannot be conveniently used; in its stead, a warm bed, with hot applications to the feet, limbs, &c., must be substituted, and mustard-plasters may be used more freely. If there is much heat or excited action about the head, it should be shaved, or the hair cut close off, and cold or iced applications freely employed. In following out these directions, the non-professional will be doing much, indeed all they can legitimately, to relieve during the longer or shorter interval that must necessarily elapse before the case is seen by a medical man. Lastly, it must be borne in mind that convulsions are not unfrequent in extreme intoxication, and also in poisoning from narcotics, such as opium; their occurrence from such causes would of course materially modify the treatment. In children particularly, they are unquestionably the frequent result of the administration of laudanum, and more frequently still of quack soothing and carminative medicines and elixirs.

Refer to — *Apoplexy — Bath — Children — Enema—Croup—Spasmodic — Head — Lockjaw —Spasm—Teeth— Worms—Epilepsy*, &c.

COOKERY for the sick and convalescent. The best methods of preparing suitable nourishment for the sick is a matter of so much consequence, that its consideration here cannot be out of place. Its importance is, perhaps, scarcely sufficiently appreciated by any class; and amongst the poor almost fatal ignorance prevails respecting it. Even when the needful materials are abundantly provided, they are prepared in such a barbarous and uninviting fashion, that the fastidious appetite of an invalid turns loathing from them, simply from lack of knowledge, or of attention in the process of cooking. Constantly is the medical man told,—"I could eat, but I cannot fancy such food as we have here,"—and this, when material is amply provided, but nicety wanting. For example there is no disease which requires more careful dieting than dyspepsia, and yet there is none on which people are so much "at sea." When a person complains that fat, potatoes, meat, and every conceivable food-stuff disagrees with him, it is a difficult matter for the doctor or the nurse to discover what is the best remedy. As a rule the only device is to fall back on the simplest food containing the two essential elements of heat-giving and flesh-forming material, such as we know to be the most nutritious, and to be taken without unduly taxing the stomach. Milk, all the better for being boiled, farinaceous substances, arrow-root, tapioca, and ground-rice do not remain long in the stomach, and are quickly absorbed into the circulation; all supply the kind of food necessary for warmth and energy; while (when they can be borne with impunity) chicken or roast mutton will supply the nitrogenous element necessary for the repair of the wasted tissues. Then again in fevers, and in fact in all inflammatory disorders, there is great diminution of assimilative function in the stomach and bowels, and fluid food is the only aliment that can be indulged in. Even the simplest forms of fluid are rejected at times, in numerous dyspeptic disorders, and then there is no other resource than to fall back almost haphazard on the numerous modifications of farinaceous diet at our disposal, and carefully to avoid such as, after trial, are found to disagree. To tempt a sickly appetite is the province of both doctor and nurse, and in no way can this be better done than by attention to the minor details of cookery for the invalid. It is perhaps better to be perfect in the preparation of a few articles of domestic use rather than to be ruler over many, and the reader is referred to the separate articles which treat of the various forms of food for further information; but the following recipes are a few of the most directly useful:—

Sick-Room Articles of Diet—and here, it may just be hinted, that neatness in serving up, as well as care and perfect cleanliness in preparing, makes sick-room cookery more likely to be attractive to an easily-offended appetite.

Arrow-Root.—Not quite a table-spoonful of arrow-root powder is to be mixed slowly and smoothly in a basin with a little cold water—and when done, a pint of boiling water added; it should then be sweetened to taste, and put on the fire to boil for five minutes, stirring well the whole time. If wine is permitted, it should be put to it after the arrow-root is poured into the basin. The same quantity of arrow-root is used when it is prepared with milk instead of water.

Oatmeal Gruel.—A dessert-spoonful of meal must be mixed smoothly with two of cold water—a pint of boiling water poured on, and the whole boiled on the fire for ten minutes, well stirring for the time—sugar, or pepper and salt being added, as may be agreeable to or proper for the sick person.

Sago requires thorough washing in cold water, to take away its earthy taste; after doing so (a table-spoonful will be a suitable quantity) put it in a pint of milk, and boil it slowly till it is quite soft and has thickened the milk—ten minutes, or a quarter of an hour, is sufficient time—sweeten to taste, and add wine, or flavour with lemon peel, according to circumstances. Some invalids prefer tapioca to sago. It is prepared in the same quantity as the other, but does not require the previous washing, and takes only half the time for softening on the fire.

In all preparations for the sick, let the constant stirring whilst on the fire be attended to, whether directed or not. A burnt flavour renders sick-cookery perfectly abominable.

Ground Rice Milk.—A table-spoonful of ground rice, a pint and a half of milk, and half-an-ounce of candied lemon peel. Mix the rice very smoothly with the milk, then add the lemon peel cut into very small pieces; boil for half-an-hour; and strain as soon as off the fire.

This is an excellent nutritious beverage for the sick when strict abstinence is not required, and for early convalescence.

Simple Bread Panada.—Put a moderate quantity of grated or soft stale bread into enough boiling water to form a moderately thick pulp; cover it up, and leave it to soak for an hour—then beat it up with two or three table-spoonfuls of milk, and fine sugar to sweeten—boil the whole for ten minutes. This preparation is occasionally acceptable to the invalid, when milk dietary alone is rejected.

Carrageen or Irish Moss.—One ounce of it, boiled in a pint and a half of water, is sufficient to form a semi-transparent, moderately consistent, nearly tasteless jelly, which, when sweetened and acidulated, or when mixed with milk, forms an excellent diet for invalids who require to have the strength supported. The gelatine, now so commonly used, is a very palatable preparation, combined with either water or milk, and may be taken dissolved in tea, coffee, or broth, without impairing the flavour of one or other.

Jelly from Gelatine.—To rather more than an ounce of gelatine, add half a pint of cold water to soften it, then pour over a pint of boiling water, and stir till the gelatine is dissolved; pare very thinly the rind of one lemon, and add, with the juice of three or four (if acids are permitted), one pound of loaf sugar, the whites and shells of three or four eggs, thoroughly well whisked together, and stirred into the whole: let it come to the boil upon the fire without more stirring,—*if wine is ordered with it, it should be added after coming off the fire;* pour it through a thick flannel jelly bag,—what runs through at first will not be clear, and should be returned to the bag again; let it stand till cold, and you will have a clear, sparkling jelly, which few invalids will refuse.

Gelatine with Milk.—An ounce of gelatine is to be soaked in half-a-pint of cold milk; when softened, a pint of boiling milk stirred well with it, till it is quite dissolved, it may be sweetened to taste, and put upon the fire to boil up altogether. It may be flavoured with lemon peel, or cinnamon, or brandy, as is most liked, or most suitable. It will be quite solid when cold.

White Wine Whey.—Boil a pint of milk; add to it one or two glasses of sherry wine, and sugar enough to sweeten; let it boil till the curd has separated, then strain through muslin. If the wine does not possess sufficient acid to turn the milk, a little rennet, or a teaspoonful of lemon juice, or three or four grains of tartaric acid may be added.

Barley-Water.—See *Barley.*

Lemonade.—The juice of two lemons, the rind of one, added to a quart of boiling water, sweetened moderately, and kept in a covered jar or jug, is a useful drink for those suffering from cold or slight fever.

Toast-Water.—This simple beverage is seldom well prepared. Let the water with which it is made have been boiled and become cold. Toast thoroughly of a fine deep brown, but not black, half-a-slice of a stale quartern loaf; put it into a jug, and pour a quart of the water over it; let it stand two hours, and decant the water from the bread. A small piece of either orange or lemon peel added with the bread is an improvement to toast water.

Linseed Tea.—One ounce of linseed *not bruised*, two drachms of liquorice-root bruised; pour over one pint of boiling water; place the jug—covered jugs with perforated spouts should always be used for drinks for sick people—near the fire for three or four hours, then strain off. When linseed tea is ordered to be continued it should be made fresh every day.

"*Milk and Soda Water.*—Heat, nearly to boiling, a tea-cupful of milk; dissolve in it a tea-spoonful of fine sugar, put it into a large tumbler, and pour over it two thirds of a bottle of soda water. This is an excellent mode of taking milk when the stomach is charged with acid, and consequently feels oppressed by milk alone.

"*Rice and Gravy.*—Let the rich gravy from a leg of roasted mutton, or sirloin of beef, stand till the fat forms a cake on the surface, remove it, and heat the gravy with as much well-boiled rice as will make it thick. A tea-cupful of this is very strengthening in the early convalescence of delicate children."—*Dr. A. T. Thomson.*

Concentrated essence of beef or beef tea is the most nourishing beverage of the sick-room. It gets its name from the supposition that it is an infusion of beef, but in nine cases out of ten when made, it is a decoction (see *Beef tea*). There are numerous beef essences for sale prepared in various ways, some containing all the essential elements of the meat, very costly but very good, and there are others such as Liebig's *Extractum carnis* and Whitehead's extract, made by chemical processes in countries where meat is excessively cheap, and by which the meaty flavour and the salts of the meat are retained, but not a particle of the albumen, fibrin, or fat so necessary for forming flesh and making heat. Notwithstanding this serious drawback, Liebig's extract is very much used, and beneficially so, for invalids, as it is both invigorating and refreshing, and can be made ready at a moment's notice. Its action as a nervous stimulant and restorative is not unlike tea or coffee, and when farinaceous vegetable substances are added to it, or when it is mixed with wine or brandy, its virtue is greatly enhanced.

There is a good method of making essence of beef with vegetable juice:—Take slices of undressed beef, free from fat and skin, and slices of turnips pared. Lay them alternately in an earthen pipkin till it is half filled. Then cover the pipkin with a bladder, tied so close down as to exclude water and air; then put the pipkin into a large vessel full of water, and let it boil two or three hours. Half a cupful of this very strong essence may be given at a time to a delicate person, or a smaller quantity of it may be given to a child.

Strong Veal Broth.—Take two pounds of veal, free from fat, and a quarter of a pound of pearl-barley. Boil them till they become like a cream, and can pass through a sieve. It may be taken warm or cold, with salt.

Charvil Broth.—Take a liver quite fresh, cut it into slices, add to it two good handfuls of charvil, and boil them in two quarts of water till reduced to one quart; strain. A tea-cupful may be taken warm every day.

Gloucester Jelly.—Take one ounce of sago, one of rice, one of pearl-barley, and one of candied eryngo root; put them into a small pan, with two quarts of water; let it boil till it is reduced to one quart; strain it through a sieve, and give the patient a tea-cupful three or four times a day, with wine and lemon peel if desired.

Strengthening Jelly.—Take two calves' feet,

well cleaned; put them into a jar; to which add one ounce of isinglass, two ounces of sugar candy, with two quarts of new milk. Then bake it with some bread over the jar. When done, strain it off, and take a tea-cupful, just warmed before the fire, twice or three times a day.

Egg Soup.—Take some *very* strong stock, make it quite hot; mix the yolk of an egg to about the quantity of a wine-glassful of the stock. Put it in small cups, and steam it as you would a pudding for ten minutes. Serve it very hot.

Cow Heel Jelly.—Put one cow heel into a pan, with three quarts of milk, and a little sugar, mace, and cinnamon. Let it bake for six hours, then strain off, and let it cool.

Pounded Meat.—Take a piece of raw mutton, quite free from skin and fat; cut it into small pieces, and pound it in a mortar. Then put it into a saucepan, and warm it over the fire for ten minutes or less in its own gravy (of course without water). If too dry, add a spoonful of *clear* gravy (not stock), or a little beef tea. It should be served very hot.

Toasted Mutton.—Cut slices as thin as possible from the prime part of a fresh loin of mutton, toast them with a toasting fork before the fire. It is very light of digestion when prepared after this most simple fashion.

Chicken Panada.—Cut up a chicken or young fowl, take off the skin, put it into a stewpan with a table-spoonful of water, and cook on a slow fire. When the chicken is hot through, put in a tea-cupful more water. Stew it for half-an-hour or longer, till quite tender. Take the meat off the bones, pound it well in a mortar, and rub it through a sieve. Use the gravy to moisten the meat in the mortar.

Chicken Broth, with every particle of fat or grease carefully taken off by blotting paper when hot, may be drunk cold or iced, and will at times be retained when the stomach rejects everything else, especially in sea-sickness, or the sickness of pregnancy. It should be seasoned with a little salt, and taken from a glass feeder, when the patient is lying down. It is a refreshing and supporting drink even in cases of fever, and should be given quite cold or iced, *not lukewarm.*

Concentrated Fowl.—Take an old fowl, split it, and wash thoroughly under the pump, till all traces of blood have disappeared, then put it into a covered preserve jar, add three pints of water, let it stew in the pan till the meat comes off the bones, and the water is reduced to a quart.

Calf's Foot Custard.—Take one calf's foot, put it into a quart of new milk, let it simmer till reduced to a pint, beat up the yolks of two eggs with a little pounded sugar, mix all together, boil for a few minutes, let it stand, and skim well. It should have the chill taken off before eating it.

Port Wine Jelly.—Port wine may be given in the form of a jelly, according to the following excellent form:—Take two ounces of isinglass, one ounce of gum arabic, a bottle of port wine, loaf sugar and spices according to taste. Let it simmer until it is perfectly dissolved. Then put it in a shape. To be eaten when cold, two or three times a day, in cases of great debility where port wine is ordered.

COPAIBA, or COPAIVA, or BALSAM OF COPAIVA—is a fluid resin obtained from trees native to Brazil. It is principally used in the treatment of chest and venereal diseases.—See *Balsam.*

COPPER, the well known metal, is used in medicine, principally in the form of its sulphate, better known by the name of "Blue-vitriol," which occurs in crystals of a beautiful blue colour. It may be used internally as an emetic, and in small doses as a tonic; and externally as a caustic for wounds. As an emetic its action is quick and violent, but sulphate of zinc in emetic doses is preferred to it in cases of narcotic poisoning. As an astringent, for indolent sores, a lotion composed of two grains of the sulphate to an ounce of water will be found a good application. It may also be used without water as a caustic application to flabby and bleeding granulations, though its use in this and other ways is being superseded by other remedies.

All the salts of copper are poisonous, but those which are most generally known and used as poisons are, blue vitriol and verdigris; another combination, the arsenite of copper (a compound of arsenic and copper), also known as Scheele's green, is a deadly poison, and has already been noticed under the head of arsenic. In addition to the above, poisoning by copper frequently occurs in consequence of the use of copper vessels in cooking, &c.

Blue vitriol is sometimes taken to procure abortion; its strong metallic taste, however, would prevent its being administered without the knowledge of the person taking it. It has been taken for the purpose of suicide, and the author has witnessed one case of the kind which proved fatal in ten hours, to a woman above seventy years of age, who swallowed a large dose in order to commit self-destruction. The poison produces, in the first instance, violent vomiting, and in this way life may be saved by the emetic action of the salt itself; purging succeeds, followed by extreme depression of the vital powers, cramps in the limbs and severe pain in the bowels; occasionally jaundice has occurred. The matters ejected are tinged with the blue colour of the poison. In a case of poisoning by a salt of copper, the object must, of course, be to get the stomach freed from it as quickly as possible. Its own emetic action should be assisted by warm drinks, warm water, or milk, or mucilaginous drinks of some kind, such as linseed tea or barley-water; sugar has been found useful in these cases as an antidote, and should be added in good quantity to the fluids which are administered. After the

stomach has been well cleared by the vomiting, raw eggs should be given largely; and if sickness does not recur, which it probably will, it should be reinduced by putting a feather down the throat, or by the administration of a scruple of white vitriol in a little water. Of course medical assistance should be obtained, but the above measures may advantageously be had recourse to in the interval. When poisoning by copper occurs in consequence of its presence in food which has been prepared improperly, or in badly cleaned copper vessels, the amount of the poison may not be sufficient to occasion death, but it produces severe symptoms similar to those above detailed. Copper vessels, unless protected by tinning, and even then, unless the protection is in a perfect state, cannot be considered desirable cooking utensils, and when they are used, the strictest cleanliness is requisite for safety; even if water is allowed to stand in a copper pan for any length of time, a poisonous salt is formed, but if the water contains an acid of any kind, such as vinegar, if it holds common salt in solution, or if there be oily or fatty matter present, poisonous compounds are quickly formed, consequently, food which contains any of these ingredients should never be prepared in copper vessels. The same objection, of course, holds good as regards preserving fruits, which all contain more or less acid, and are therefore liable to act upon copper. There is, however, less danger as long as the active operations of cooking are going on, than there is from allowing the articles above enumerated to stand for any length of time in a copper utensil, freely exposed to the air. Many of the cheaper pickles owed, formerly, their bright green colour to sulphate of copper, which was added to them to make the colour appear finer; the adulteration may be detected by introducing a perfectly clean plate of iron—a table knife—into the suspected article; if copper is present, it will be deposited upon the surface of the former metal, in the form of a fine metallic film or coating. It has been the practice, on the Continent, to add a small proportion of sulphate of copper to dough in the making of bread; the practice is not known to be followed in England. Copper has been detected in mussels which have caused symptoms of poisoning, but it is not considered to be the invariable cause of the injurious results which occasionally follow the use of this shell fish as food. It should be remembered that some of the green colouring matters and pigments, at present in general use, are compounds of copper, and therefore care should be observed in permitting children to have access to them. A child has been poisoned by a cake of green paint from a toy colour box. Copper coins are sometimes swallowed by children, and may pass away by stool without any apparent bad consequences; but this is not always the case, and severe epileptic fits have ensued in consequence of the accident. In the event of a child being known to have swallowed a piece of copper, salt, acids, and fatty matters should be excluded from its food, which ought to consist of thick milky preparations, such as hasty pudding and the like, well sweetened with sugar, gentle doses of aperients being administered. The thickened food should be given as soon as possible after the accident.

Refer to—*Arsenite of Copper.*

CORDIALS are stimulants generally of an alcoholic nature, the name is derived from the old idea that they "strengthened the heart." They certainly stimulate the circulation, and are useful in cases of depression from any cause, where such an effect is required. Brandy is, perhaps, as good and as generally attainable a cordial as any; the compound tincture of cardamoms, and the aromatic spirit of ammonia, constitute two of the best medicinal cordials.

Refer to—*Excitants.*

CORIANDER SEEDS are produced by a plant, a native of southern Europe; it now grows wild in Britain. They are a pleasant and powerful carminative, the property depending upon the volatile oil which they contain. In medicine, coriander is principally used to correct the griping properties of senna. Coriander seeds, roasted and ground like coffee, and afterwards infused and drunk with cream and sugar, are employed in South America as a soporific.

CORN.—A corn is a thickened state of the epidermis, or outer or scarf skin, caused by irritation, such as pressure or friction, acting upon the true or sensitive skin, which causes an increased growth of the flattened cells of which the epidermis is composed. The corn, produced in the first place by external pressure or friction, soon becomes, in itself, an additional source of irritation, and, by its hardness, increases proportionally the inflamed and sensitive condition of the true skin underneath. If the causes are removed, the disease gets well, as any one who has suffered from corns can testify, after having been confined by illness for any time. Tight shoes are undoubtedly the most general originators of corns, but badly-made, ill-fitting ones, also give rise to the affection, not by pressure, but by friction. Soft corns generally form between the toes, and are very troublesome and painful: they are kept soft by the continued perspiration of the part.

The most efficient cure for corns is, of course, to get quit of the cause,—the offending boot or shoe; but as some persons are so liable to the affection, that if they wear boots or shoes at all they must suffer from corns, the best palliative is keeping the hardened mass well pared down in the centre. Acetic acid (as prepared by Coutts) applied to a corn every evening will sometimes effect a cure, a little olive oil being smeared over every morning. Various corn-plasters are used; the most effective and rational are those which are made

thick, and have a hole cut in the centre for the corn, which is thus preserved from pressure. Soft corns should be cut with scissors and the roots touched with strong acetic acid, and cotton wool placed over them afterwards to protect the adjoining toe from the effects of the acid, and the strictest cleanliness observed. A peculiar kind of corn occasionally forms under the corner of the nail of the great toe, and causes much pain and irritation; if discovered, by slightly elevating the nail, the thickened mass may be turned out.

Refer to—*Skin.*

CORN.—See GRAINS.

CORNEA.—The transparent, glass-like portion of the eye.—See *Eye.*

CORROSION.—The term, when applied to the living body, means the gradual destruction of any of its tissues by chemical action.

CORROSIVE SUBLIMATE. — See MERCURY.

COSMETICS are external applications used to alter and improve the appearance of the skin and the hair. Their employment is always to be condemned: moreover they frequently contain deleterious matters, such as corrosive sublimate of mercury, salts of lead, &c. Indirectly they are injurious, by leading the mind from the only true cosmetics, obedience to the laws for the maintenance of physical health, which the Almighty has linked with our existence—cleanliness, temperance, abundant fresh air and exercise, and early hours, and the cheerfulness which results from the healthful occupation of the mind in legitimate pursuits, are cosmetics which no art can imitate or supply.

COTTAGE HOSPITALS, or VILLAGE HOSPITALS, as they are sometimes called, have been set in operation within the last few years in many of our populous neighbourhoods, and have met with such a measure of success as to make it probable that very many more will shortly be founded throughout the length and breadth of the country.

To appreciate the advantages intended to be conferred on the poor by their introduction, it must be reflected that many of our most populous villages and neighbourhoods, in fact, many of our thriving towns, are at a considerable distance from an hospital, rendering it perhaps dangerous for the patient to be removed so far, and even if not dangerous, very disagreeable, inasmuch as he is removed from his friends who, possibly, may not be able to afford the time or expense necessary for visiting him. Again, many have a great objection to going into a large hospital, where their imagination paints to them all the horrors so generally and so falsely believed by the vulgar to obtain with regard to many of our charitable institutions. It is also a well-known fact that hospitals in large towns have not kept pace in numbers or accommodation with the great increase of population, and it is now generally understood that small hospitals surrounded by open spaces and placed in healthy situations, are attended with better results to their inmates, than those placed in the midst of a dense population. It will, then, probably be admitted by all, that a cottage hospital, small in extent, not situated in a crowded district, but, if possible, in the country, not overworked as to its staff, and not likely to be much abused or imposed upon, presents many advantages over those conducted in the midst of our most crowded cities. Of course, it is quite necessary that hospitals should exist in the last mentioned localities, especially since they are the seat of the occurrence of severe accidents; but what we wish to contend for is, that it is hard that these should be the only places where a poor man can go to, especially when he has to make the sacrifice of fresh air, and many of the conditions necessary to health.

It is incalculable how much advantage might accrue to a district, and how much good might be done by establishing such an institution as a cottage or village hospital, where the poor might receive all the benefit attending upon first-rate nursing and lodging, and, in short, all the benefits of hospital treatment, without its disadvantages. In most places a cottage or house, with sufficient accommodation for six to twelve beds, can be rented at a moderate rate. Further, if good cause were shown to any of the heads of the leading sisterhoods and nursing establishments in the country, it is probable that nursing of the very best description would be given by them, so that the required outlay would evidently not be large, and might in special cases be fabulously small. Such a plan affords facilities to all. The influential people of the district have the poor treated upon the spot, instead of having to subscribe to distant hospitals, the clergy also are enabled to visit the sick when they perhaps most require it, and the charitable and bountiful throughout the land have a better opportunity of immediately dispensing, to their poor and suffering brethren, some of the blessings with which they have been favoured.

These tiny hospitals have been found especially valuable in the treatment of diseases of children, and it is easy to conceive how much more agreeable to the feelings of both mother and child such a system is likely to be, than one necessitating a cruel separation, and that, too, just at a time when the tender heart of the child is yearning most towards home and its ties; while, on the other hand, the anxious parent is scarcely able to rest without seeing her poor, sick child.

Mr. Burdett in his book on *Cottage Hospitals*, gives a wealth of information on all details respecting their construction, organisation, and support. These useful institutions have grown immensely during the last twenty years, and are still on the increase, and it need scarcely be said that they are attended with the best

results to the communities among which they are planted. The first cottage hospital was instituted at Cranley, Surrey, through the exertions of Mr. Albert Napper, surgeon in the village. At the same time, the author of this Dictionary may here remark, that previous to Mr. Napper's successful attempt to establish the Cranley Village Hospital, he endeavoured to bring the subject of cottage hospitals to the notice of the public through the pages of the journal of the British Medical Association, but at that time the public was not alive to the importance of the measure, and he could not obtain the requisite support.

COTTON WOOL is the hairy seed of various species of gossypium, much used either in its carded state or in sheets of wadding, for various purposes in medicine. It is one of the best means of protecting inflamed or injured surfaces from the air, and is largely employed in erysipelas, and in burns and scalds. It is also extensively used for wrapping round rheumatic joints to prevent pressure, and for padding splints and other apparatus for fractured limbs and diseased joints. Wool is sold by chemists medicated with chloralum or boracic acid for applying to offensive sores, and an absorbent wool is prepared which answers the purpose of sponges. Gun cotton is made with wool and nitric and sulphuric acid, and is used in medicine in the preparation of collodion.

Refer to—*Lint—Burns, &c.*

COTYLEDON UMBILICUS, or NAVEL WORT, is the name given to a plant which grows in this country upon walls and rocky places. Various parts of the plant have been recently used in medicine.

The leaves have been applied to wounds and sores, to piles, and to inflamed parts of the skin, &c., owing to their soothing and emollient properties.

The juice has been tried in the treatment of epilepsy, but the success obtained is, to say the least, doubtful. The flowers have been used in certain diseases of the urinary organs, connected with a tendency to the formation of stone, and it is also said that they are used with good effect in the treatment of dropsies.

COUCHING is an operation performed upon the eye, by which the lens, when it has become opaque from disease, is shifted or depressed to another part of the interior of the eye-ball, and thus removed from the axis of vision which it obstructs.

Refer to—*Eye.*

COUGH consists in the violent expulsion of air from the lungs through the air passages. In most cases it must be regarded rather as a symptom of disease than as a disease itself. Cough may arise from a great variety of causes. From direct irritation of the air tubes themselves by the inhalation of cold and damp air or of irritating vapours, by the mechanical irritation of foreign substances accidentally introduced into them, by the pressure of tumours, or by irritation of the throat and fauces, particularly when there is relaxation of the uvula, and also in consequence of disease, inflammatory or otherwise, of the lungs themselves. Further, cough may be sympathetic with disorder in the stomach, or liver, or with irritation in the bowels occasioned by worms or other irritant agents, or it may be the result of nervous derangement such as hysteria, or be spasmodic, like hooping-cough. So numerous are the ailments and diseases of which cough is a symptom, that it frequently requires considerable discrimination to determine the real cause of the irritation. Many of the acting causes are undoubtedly trivial, but many are deeply seated and fatal diseases; and therefore, whenever an individual becomes the subject of cough, which cannot be readily accounted for by cold or some other direct cause, a medical examination ought to be submitted to, and even if the cough has been in the first instance the result of cold, should it continue "hanging about" a person, without obvious reason, medical advice ought to be taken; mischief may be brewing, and be the cause of the irritation, or the cough, excited by some trivial and easily remedied cause, may itself be causing disease in the lungs of a predisposed person.

Cough is spoken of both medically and popularly as dry and moist. A dry cough may be the result of direct temporary irritation of the air-passages, but more generally it is symptomatic either of incipient disease connected with the chest, or of sympathetic nervous irritation, probably connected with the abdominal viscera. Moist cough is generally connected with direct affections of the chest, such as common catarrh, and with inflammatory affections, or with asthma or consumption.

It has already been said, that a cough should never be allowed to continue for any length of time without the cause being ascertained by medical examination; till this is done, it can scarcely be expected that the proper remedy can be applied. In the first instance, however, simple remedies may be tried. If the cough be clearly traceable to cold or catarrh, it may be treated according to the directions given under these heads; if it be very dry, demulcent medicines, such as the mucilage and tolu-mixture, or barley-water, or linseed tea, may be taken freely, with from five to ten drops of ipecacuanha wine two or three times a day, to which may be added fifteen or twenty drops of tincture of henbane to allay irritation. Opium and its preparations are not generally desirable in dry cough—unless, indeed, it be spasmodic—as the drug itself exerts a drying effect upon the mucous membrane of the lungs. The inhalation of the steam from boiling water is sometimes highly beneficial. In dry, and also in moist cough, counter-irritation, by rubbing with hartshorn and oil, or some other stimulating embrocation, on the anterior part of the chest, or between the shoulders, is often of

much service, sometimes great benefit is derived from the application of a mustard poultice or a mustard leaf to the chest. The surface of the chest should be well protected by flannel next the skin, by a dressed hare skin, or by a warm plaster, either in front or behind. In moist coughs, the amount of fluids, and of demulcents, must be somewhat more restricted than in the above. The preparations of opium may be given in small quantity, either alone or in cough mixtures, but none answers better than paregoric, taken in one or two tea-spoonful doses in water; this allays the irritation and teazing frequency of the cough, and to each dose, if expectoration is difficult, five or ten drops of ipecacuanha wine, and the same of tincture of squill may be added. The author has found the following pill most extensively useful in coughs depending upon irritation in the bronchi or air passages:—Take of powdered opium five grains, of powdered squill sixteen grains, of powdered ipecacuanha twelve grains, of powdered camphor eighteen grains, of powdered gum ammoniac twenty-four grains, of powdered rhubarb twelve grains; make into a mass with syrup, and divide into thirty pills: of these, one or two may be taken for a dose.

The foregoing remarks apply only to mild cases of catarrhal cough; of course the treatment of the affection, as it arises in connection with other disease, either acute, such as inflammation of the lungs, or chronic, falls under the general management of these disorders. When feverish symptoms occur along with cough, all stimulation, either in diet, or by stimulant expectorants, is to be avoided; indeed, as a general rule, when cough exists, the diet should be as little stimulating as circumstances will permit, and the usual allowance of animal food curtailed; but in old people, and those who have lived freely, the lowering system must not be carried too far; it may be requisite even, at times, to stimulate, and to support strength by strong meat soups.

Again, it is repeated, a cough ought not to be allowed to continue; if not relieved by some of the simple remedies mentioned above, medical advice should be sought, *particularly in the case of the aged*, and if there is much secretion of phlegm or mucus, the least continued impediment to the expectoration of which, in an old person, may rapidly induce dangerous or fatal embarrassment of the lungs, often most unexpectedly.

The possibility of a relaxed or elongated uvula being the cause of cough must not be forgotten; an examination of the throat will detect it, and the state may be relieved by the use of some astringent gargle, by a small fragment of catechu allowed to dissolve in the mouth, or by touching the uvula once or twice a day with a camel's hair brush dipped in a solution of perchloride of iron.

Refer to—*Catarrh—Cold—Counter-irritation—Expectorants—Lungs, &c.*

COUNTENANCE.—The expression and aspect of the human face is much and peculiarly affected by the various diseases which affect the body, and the first view of a countenance often conveys to a physician who has studied the subject, immediate, valuable, and certain prescience as to the nature of the disease for which his patient is about to ask advice. The indications are partly due to the changes of complexion which are associated with different forms of disease; but expression is equally significant.

Physiognomical indications of different varieties of disease have indeed been classified in connection with the various organs of the body, but it is impossible to define the conditions in too rigid a manner, as many circumstances may combine to render a first impression erroneous. Some general facts relating to the appearance of the countenance and expression are, however, well ascertained guides in diagnosis. Pallor, as it occurs in anæmia and chlorosis, presents a different appearance from the same symptom when it is preceded by the shock of an accident, or when it accompanies consumption or scrofula; and the pallor of Bright's disease and some affections of the heart is peculiar on account of the glazed look and puffiness about the eyes, characteristic of dropsy. The expression of features suggestive of fear and anxiety is marked in heart disease, in croup and diphtheria, in persons liable to periodic attacks of epilepsy or asthma, or who may be suffering from malignant disease of some kind. A morbid indifference to external objects is the common expression of persons suffering from melancholia; while a reverse condition is peculiar to those about to suffer from delirium. The red mark on the cheek, "the spot which autumn makes upon the faded leaf," is characteristic of the hectic of consumption, or the hectic fever accompanying any other complaint of a severe type. A dull expression on one side of the face, while the other is marked, it may be, with a sardonic grin, is peculiar to some forms of paralysis. The purple or blue colour of the lips and cheeks is noticed in cyanosis or the blue disease, and in other affections of the heart and blood-vessels in which the blood is not sufficiently aerated. A sunken pinched expression of the features is peculiar to peritonitis in its last stage, and also to cholera; and is often premonitory of approaching death in other diseases. The *Facies hippocratica* is marked with a dry, livid, and dark skin, hollow eyes, the skin of the forehead rough and distended, and the ears abnormally cold. There is little difficulty in tracing jaundice and other irregularities in the biliary secretion from the marked yellow hue of the skin, and children and others suffering from scrofula are marked with the thick upper lip, delicate skin and fair complexion, peculiar to that disease.

COUNTER-IRRITATION is irritation

or excited action in one portion of the body, which counteracts or withdraws analogous action going on in another portion. It may be naturally or artificially established, and it may be called into action within the body, as well as without; but the term is now generally applied solely to counter-irritant action artificially excited upon the skin. There are many various modes of exciting counter-irritation; some may be, and are used, popularly, with perfect safety, others are only admissible in medical hands.

Counter-irritants may simply produce reddening of the skin, or they may blister, or they may cause discharge of purulent matter, or even mortification of the surface. Heat, according to the temperature at which it is used, may give rise to any or all of these effects: mustard will redden smartly, and may blister; ammonia will do the same, according to strength; camphor in solution, either in spirit or oil, will redden.

Of the blistering counter-irritants the Spanish fly is the best, and almost universally employed. Steam, or metal heated in boiling water, have all been used for the purpose, and might be, on emergency. Counter-irritation by croton oil, or tartarised antimony, takes the form of pustules or pimples. The salt is applied either in the form of ointment, or as a saturated solution, used as hot as can be borne, and rubbed upon the skin by means of a piece of flannel. The pustules formed by the latter mode are said to heal speedily, and to leave no scar, which sometimes happens after the ointment. When a common blister is irritated, "kept open," secretion of purulent matter takes place; but the system is a bad one, and is productive of much unnecessary pain and irritation.

Issues and setons cause discharge of matter. The seton, though not so much adopted as formerly, is still occasionally employed in cases of Ophthalmia and in chronic diseases of the head. It is usually introduced through the skin of the nape of the neck, and irritation and discharge from the part are kept up by the skein of cotton threads carried through the part with the seton needle, and retained there.

Iron heated to a red or white heat, moxas, and other applications which *destroy* the texture to which they are applied, fall under the head of cauterants, and can never be used as domestic remedies. There is, however, one application of the hot iron, introduced by Dr. Corrigan, of Dublin, which might safely be used by the non-professional, and as the instrument can be made by any blacksmith, might prove a valuable resource in remote districts, for the relief of nervous and rheumatic pains, such as lumbago, sciatica, &c., in which it is often of essential service.

The instrument (fig. 59) consists of an iron portion (1) about four inches and a half long, which ends in a disk (2) half an inch in diameter, and quarter of an inch thick, and a wooden handle (3). When it is used, it is grasped so that the point of the fore-finger



Fig. 59.

may rest upon the bend at 4. The disk is then to be introduced in the flame of a spirit lamp, or of a piece of burning paper, and held till the metal (at 4) becomes uncomfortably hot; the handle is then to be grasped, and the disk applied lightly, and momentarily, and at short intervals, to the skin over the affected part. Each touch of the disk produces a shining mark on the skin, and very shortly the surface becomes reddened and slightly inflamed.

As regards the use of counter-irritants generally, it is often serviceable to excite the skin by friction or heat, before using them. *When fever is present and inflammation is going on*, non-professional persons will do quite as much, if not more good, and be much less likely to do harm, by using the mild counter-irritation of moist heat, than by applying blisters, mustard, &c., particularly close upon the seat of the disease. If a blister is put on in these cases, it should be done through medical advice. For further information respecting the counter-irritants individually, the reader is referred to the various articles — *Antimony* — *Blister*— *Mustard*, *&c.*

COUP DE SOLEIL, or **SUN-STROKE.** —See Heat, Effects of.

COW POX is the disease affecting the cow, which, transferred to the human subject, confers in the majority of cases immunity from attacks of small pox, and in those in which it does not give complete protection, renders the attack of that usually virulent disease comparatively mild.

Cow pox shows itself upon the teats of the cow in the form of blueish or livid-looking vesicles, surrounded by a ring of inflammation; whilst at the same time, the animals are feverish, and the milk diminished. At first the vesicles contain clear fluid, but ultimately become pustular, or filled with matter. The cow is liable to other forms of pustular disease affecting the teats, but they do not present the same characters, nor follow the same course as the genuine cow pox, which is, moreover, a constitutional disease, sometimes extremely severe, and even fatal to the animals.—See *Vaccination.*

CRAB, the well known shell fish, is an article of diet unsuited for those of weak digestion. In some constitutions it causes griping when eaten, and in others a cutaneous eruption.

CRAB LOUSE, the vulgar name of the insect which infests the pubes of dirty people, and which gives rise to intolerable itching and sometimes to sores on the part. The insect is easily destroyed by some mercurial preparation, or by rubbing the parts with carbolic oil, and afterwards keeping them clean with soap and water.

CRADLE.—The old form of child's bed, is now nearly superseded by the more convenient swinging cot or bassinette. Either, if well arranged, should have a tolerably firm mattress, a *firm pillow*, a piece of protective waterproof cloth over the mattress, and soft blankets, but *no curtains*, which are quite incompatible with the health of the child. Rockers beneath, if they allow only very gentle motion, are admissible, but not otherwise. An eider down quilt is the best covering for a child's cot.

Refer to—*Children.*

CRAMP is a spasmodic, involuntary, and painful contraction of the muscular fibres. The term is generally applied to the affection of the voluntary muscles, in contra-distinction to spasm, applied to that of the involuntary. Any muscles may become affected with cramp, but those of the legs and arms, of the former especially, are most liable to be so, doubtless from the greater liability of the nerves supplying the lower extremities, to irritation and pressure, two great exciting causes of the disorder. The cramp may be confined to one or two muscles, such as those of the calves of the legs, or may be more general, as happens in cholera. The affected fibres are drawn in hard knotty contractions, and maintain this condition for a longer or shorter time. The most frequent causes of cramp, are the presence of indigestible food in the stomach, or of acid in the bowels, or the pressure exerted on the nerves by overloaded bowels. A similar acting cause in pregnancy and labour, the weight and pressure of the child, also occasions painful and troublesome cramp. The disorder is often associated with the presence of worms. When cramp affects the arms and fingers, it may be connected with disease of the heart and great blood vessels of the chest. The power of the application of sudden and prolonged cold in producing cramp, is often sadly exemplified in the case of bathers. The best immediate remedy for cramp is friction with the hand, or better still, with the soap, chloroform, or opium liniment. When the legs are affected, it is always expedient to take medicine, rhubarb and magnesia, with a tea-spoonful of sal volatile, or fifteen grains of carbonate of soda, with sal volatile, or a little ginger; and afterwards to clear out the bowels with some active aperient, such as castor oil, especially if there is any existing constipation, or a possibility of their being loaded. Any other disorder of the digestive organs ought of course to be attended to. Some persons find relief to the immediate attack of cramp, by tying a band of some kind tightly round the limb, between the affected part and the body, whilst others are in the habit of standing upon some cold substance. The first process is perfectly safe, and may be tried; the second certainly is often effectual, but it is not devoid of danger. Active friction is quite the best temporary remedy. Cramp affecting the arms is always to be regarded with suspicion; if it recurs, a medical opinion should be taken.

Refer to—*Convulsion—Spasm, &c.*

CRANIUM.—The skull containing the brain.

CREAM is that bland oily portion of the milk which separates and floats on the top as the liquor cools; its composition is akin to that of fat. It is a constituent of the milk of all animals. As the amount of cream contained in cows' milk, especially, varies considerably, the proportion may be ascertained by allowing the milk to repose in tall cylindrical glasses. Good milk should contain not less than twelve per cent. of cream, and 100 parts of cream ought to consist of thirty-six parts of milk fat, six of casein, two and a half of sugar of milk, and fifty-five parts of water.

Cream is consequently highly nourishing, but not suited for weak stomachs, except in *small quantity,* mixed with other articles of diet, such as arrow-root mucilage, when it may sometimes be advantageously substituted for a larger proportion of milk. It is often used as a substitute for cod-liver oil when the latter disagrees with the stomach.

Refer to—*Milk.*

CREAM OF TARTAR, or BI-TARTRATE OF POTASH.—See POTASH.

CREASOTE obtains its name from its powerful antiseptic properties. When pure, it is a colourless fluid, of a strong penetrating odour, which is known to most persons from its being extensively used as a palliative in toothache. It is obtained from tar, and, for that reason, is sometimes called "spirit of tar." For allaying the pain of toothache, its power is superior to that of most remedies. A single

drop of creasote, rubbed up with a little sugar or gum, in an ounce of water, will often allay obstinate vomiting. In cases of consumption or of chronic bronchitis, inhalations of creasote are especially useful.—See *Inhalers*.

It makes into pill very nicely with crumb of bread: but the pills should not be kept for more than three or four days; it may also be given with spirit of juniper, or with acetic acid —vinegar—which dissolves it. It disgusts some patients, but others like the smoky flavour; it is a specific against sea-sickness, and rarely fails in the vomiting of pregnancy. It is an admirable ingredient for pomades for chilblains, threatening, incipient, or ulcerated, five or six drops being rubbed up with the ounce of lard. The late Sir J. R. Cormack, in his treatise on creasote, brought forward many arguments and facts to prove that the Egyptian mummies owed their preservation, as well as their medical virtues to creasote; and upon the occasion of the unrolling of an Egyptian mummy in 1850, the same author addressed a very interesting communication to the *Athenæum* of June 15, 1850, in which he seemed to establish beyond doubt that the essential part of the mummifying process was the application of heat to bodies filled with bitumen. He showed, upon the authority of Royer and others, that large quantities of bituminous substances were *always* introduced into the body, and that the strong heat was then *always* applied. Creasote is the basis of an extensively sold antiseptic agent known by the name of "Jeye's perfect purifier." It is a convenient liquid for household use, as it is said to have no poisonous properties, and is certainly an excellent deodoriser.

CREATINE, or KREATINE, is a crystallisable, highly organised substance, existing in the flesh of all animals.

CRESSES in the various forms of land and water cresses, are wholesome salads, but like other vegetables which are eaten uncooked, are not likely to agree with those of weak digestion.

CRETINS are individuals in whom deficient development of the brain, and of the body generally, is associated with mental imbecility. Cretins are met with in various quarters of the world, and even in this country, but their peculiar location is in the dark, deep valleys of Switzerland. The condition is often associated with the existence of bronchocele, and the two diseases have been considered as connected, but it is probably not more than coincidence of exciting cause.

The most characteristic features of cretinism are, the stunted stature, which seldom exceeds four and a half feet, the deformed head, large belly, and distorted limbs, the countenance being an index of the imbecile or idiotic condition of the mind. There are, of course, various grades of cretinism. The malady is instructive in showing how strong an influence is exerted upon the development of the human frame, by circumstances such as surround these unfortunate beings in their childhood; deficiency of light, and living in the damp malarious atmosphere of the deep valley. It is also to be feared, that it exemplifies the power exerted by the habits of the parents upon their offspring, and that drunkenness and debauchery of the former often entail cretinism upon the latter. There is no chance of amelioration, either physical or mental, unless the cretin is removed from his native home to the free air of the mountains above. The various grades of cretinism run from a state of comparative intelligence to complete idiocy, and the physical deformity usually accords with the mental degradation. There seems no doubt that much may be done to train and educate the more intelligent class of cretins, and thus improve their condition, but it is to be feared that frequent intermarriage among those predisposed to the malady is the prolific factor in its continuance.

CRISIS in disease, means a sudden change, tending either to recovery or death. Much more importance used formerly to be attached to the critical periods of diseases than there is at present, although, in some, undoubted periodical changes do take place, but not with sufficient certainty or regularity to admit of much calculation. A crisis has generally been considered to be denoted by some well-marked circumstance, such as profuse perspiration, discharge of blood, cutaneous eruptions, boils, abscesses, or the like, or by the appearance of copious deposits or sediment in the urine; and there can be no question, that decided and persistent improvement in the character of a disease does often follow immediately upon the occurrence of these "critical" ejections.

Refer to—*Fever, &c.*

CROTON OIL—is obtained by pressure from the seeds of a shrub, the *Croton tiglium*, a native of Hindostan, Ceylon, &c. The oil, when good, should be of a pale amber colour, about as thick as castor oil. It is very acrid, and so powerfully cathartic as to be a very unsafe remedy for domestic use internally, and, indeed, should never be so resorted to, except in the one case of apoplectic seizure, when medical assistance is at a distance. In such a case, a single drop of croton oil—if it is procurable — mingled with a little sugar, might be placed on the tongue, as far back as possible.

As a counter-irritant, croton oil is extremely useful; it may be made into a liniment, with equal parts of the strong solution of ammonia and water, or it may be used alone. It brings out a thick crop of pustules, when rubbed on the skin in small quantity; it sometimes, however, affects not only the part to which it is applied, but causes a general cutaneous eruption, with swelling of the eye-lids, and

occasionally will exert the latter effect upon persons who happen to be near whilst the oil is used. It is not improbable, that what are said to be concentrated preparations of castor oil, contain croton oil.

CROUP is an inflammatory affection of the upper portion of the windpipe. It is peculiar to children—males are more liable to it than females—and when one in a family suffers from the disease, the rest almost certainly have a tendency to it. The malady seldom occurs during the first year of life, but is more frequent from the second to the seventh year; at puberty the tendency to it ceases, although cases of genuine croup have occurred after that period. The rapidity with which croup at times progresses to a fatal termination, and the distressing character of the malady, always render it a dreaded disease; fortunately, it is one which, if taken in time, is greatly under the control of well-directed treatment. Its dangerous nature must ever make proper medical advice a necessity, but the importance of early active remedial measures renders it at the same time highly desirable that treatment should be resorted to without the slightest delay. Croup is not readily distinguishable from diphtheria, and medical men still differ much as to whether they are not really different phases of the same disease. The probable explanation of this is that there are two forms of croup, one, which is purely inflammatory, in which the hoarseness, stridulous breathing, hoarse cough, and paroxysms of breathlessness are due solely to inflammatory thickening of the mucous membrane lining the interior of the larynx and windpipe, and to spasmodic action of the small muscles underlying that membrane; the other in which there is present on the surface of the inflamed lining a false membrane resembling thin leather of an ash colour, such as is found in the throat in cases of diphtheria, which aggravates and intensifies the symptoms mentioned above, and makes the disease in every respect more serious. That the latter form is truly diphtheritic is evidenced not only by the similarity of the constitutional symptoms, if the patient survive long enough to exhibit them, but also by the presence of the true diphtheria bacilli in the membrane coughed up.

Inflammatory croup may begin apparently suddenly; a child goes to bed to all appearance perfectly well, and in the course of two or three hours comes a cough, which strikes even the most unobservant as peculiar, and falling upon the ear of the anxious parent, who has never heard it before, tells at once of danger. The child seems as if it coughed through a brazen tube. Perhaps, at first, the little invalid is not awakened, and if now visited, is found flushed and fevered, moaning slightly perhaps, and restless, the breathing slightly quickened; the cough comes again, the child awakes or is awakened; if it speaks, the voice is hoarse, if it cries, hoarser still. Should the disease be neglected at this time, or go on uncontrolled, the cough, still retaining its peculiar character, becomes more frequent, the breathing quickened, is also accompanied by the characteristic dry wheezing or crowing occasioned by narrowing of the passage through which the air is drawn, and frequent paroxysms of spasmodic coughing of a suffocating character, followed by exhaustion, occur. These paroxysms are attended with risk of fatal collapse; but, except for this risk, inflammatory croup, although a serious disease, is not often a fatal one. Symptoms of improvement first present themselves in greater ease in breathing and a modification of the hoarse character of the cough, which becomes looser and more moist. The spasmodic attacks become slighter and less frequent, the fever diminishes, and the voice becomes less hoarse. There may, however, in the progress of the disease be intervals of comparative ease, alternating with paroxysms of spasmodic obstruction to the breathing, threatening, and sometimes causing, immediate suffocation. The average duration of a fatal attack of croup is from three to four days, but it may, and does, terminate much more speedily. When, under proper treatment, the disease is checked, the first best sign is the cough beginning to "loosen," the breathing at the same time becoming tranquil, and the skin moist; the pulse changes from its hard quick beat to one of a softer and a slower character.

Diphtheritic croup usually commences more gradually than inflammatory croup, being often preceded for two or three days by general lassitude and malaise, with, perhaps, slight fever. The early local symptoms are similar to those of inflammatory croup, but the spasmodic attacks are not so severe; while, on the other hand, the continuous obstruction of the breathing tends to become more marked as the false membrane increases, and gradually narrows the larynx; the lips, consequently, become blue, the skin dusky, and the consciousness impaired. The pulse becomes quicker and feebler, and if the breathing is not relieved the child dies in a state of almost unconscious suffocation, and frequently in convulsions.

The distinction between inflammatory croup and diphtheritic croup is not always easily made at the outset; but, as a rule, the former begins more suddenly. The small patches of glistening whitish-grey membrane sometimes observed on the tonsils or soft palate, or back of the throat, in diphtheritic croup, are never present in inflammatory croup. As the illness progresses, the severity of the symptoms, and especially the continued and increasing difficulty of breathing, affecting both inspiration and expiration, indicate the diphtheritic character of the malady; and, in many cases, small portions of membrane may be coughed up, or may be displaced by induced vomiting.

The remedy, in inflammatory croup, is tartar

emetic given in tolerably full doses, either in the form of solution in water, or rubbed up with sugar, but never as antimonial wine. The form of a powder, one or two grains of sugar with the appropriate dose of the remedy, is the best form for keeping, as the solution decomposes and becomes inert, and the latter is perhaps the most quickly efficient form of administration. In a house which contains a child liable to croup, six or eight of the powders ought to be ready at all times, and also means for the local application of heat. To a child of two years of age, the eighth of a grain is to be given at once, to one of four years the sixth; and this dose is to be repeated every ten minutes or quarter of an hour, till full free vomiting is produced. At the same time a warm bath may be got ready, into which the child is to be immersed for a quarter of an hour, as soon as possible; or what will in the author's opinion answer equally well, large poultices of linseed meal should be placed over the upper part of the chest and fore part of the throat, whilst the child is kept in a sufficiently warm situation. In the habitations of the poor, especially, the latter mode of treatment is certainly preferable to the bath, which cannot always be procured without delay, nor managed without danger of after chill. An hour after the vomiting, the dose of tartar emetic is to be repeated, and vomiting again excited, and its subsequent repetition at the end of one, two, three, or more hours, must depend upon the continuance and urgency of the symptoms, the poultices being continued. The child may be allowed to drink freely of toast or barley water, or thin gruel, but not tea—which decomposes the tartar emetic—unless the infusion is extremely weak. If a case of incipient croup be thus treated, it will, in all probability, be subdued without medical assistance, though it is certainly safer to have it; but if the fever is extremely high, and if the breathing has any approach to a crowing sound, medical attendance *must* be procured if possible, and with the shortest possible delay. If it *cannot* be procured, and if the attack does not seem to yield after the second or third dose of tartar emetic, leeches must be used—one, as a general rule, for each year of the child's life—not on the throat itself, but over the upper part of the breast bone, on each side of the throat, in which situations a blister may require to be placed, later in the disease. If, after tartar emetic has been used for four or five hours, the disease progresses, the frequency with which the remedy is given must now be diminished, and sickening doses given at longer intervals, otherwise there may be danger of depressing too much; but calomel must be begun, and to a child of two years of age, a grain is to be administered every four hours; the strength, if it seems to fail, should be supported with *weak* animal broth—that made from veal or fowl is the most suitable—given in small quantity and at short intervals.

As soon as diphtheritic croup is indicated, all depressing remedies must be stopped, and treatment suitable for, and described under *Diphtheria* be adopted. If any emetics are called for to assist in the removal of the membrane, they should be of a stimulating character, such as ten grains of sulphate of zinc, or thirty grains of sulphate of alum, in a little glycerine and water. The diet should be as nutritious as possible, strong beef essences, milk and egg, and beef juice being given to the extent the digestion will permit. Stimulants, as a rule, are required early, and are often of much value; port wine, diluted with a little water, or brandy in milk are the most eligible forms. For local relief sprays of some antiseptic lotion, such as boracic acid, dissolved in water, of the strength of ten grains to one ounce, or Condy's fluid, diluted with twenty parts of water, may be used as frequently as can be done without overfatiguing the patient, perhaps once every two hours. As cases of diphtheritic croup are acutely infectious, all the precautions described under the article *Contagion* should be scrupulously observed; and, in addition, where possible, all other children should be removed from the house in which the patient is being nursed. Such must be the general outline of treatment to be pursued in a case of confirmed croup, should it fall to be treated without the presence of a medical man; but again it is reiterated, the first twelve, nay the first eight hours, are the all-important period, which, if lost, can scarcely be recovered; for, though children do recover when the disease has advanced into its second stage, and even sometimes from such desperate circumstances as to make it a duty never to despair of saving life, the chances are but small compared with those which the first few hours hold out, that period, which in some situations *must* elapse before medical assistance can be procured, and which thus places the life of a child in the hands of a parent or guardian. If it is croup, even if it is suspected to be, let there be no temporising but let the treatment now laid down be promptly, actively, *unsparingly*, carried out. If the antimonials act strongly on the bowels, they should be checked with one or two drops of laudanum. In the last stage, to prevent death from suffocation, opening the windpipe holds out the last, and that but a faint hope of saving life. Of course, a surgeon is required for its performance, *if the parent consents to it.*

The causes of croup are almost invariably connected with cold and moisture, and particularly during east winds, hence, on the east side of Britain, the disease is considered to be more prevalent than on the other; but it may also be occasioned by the removal of wrappings from the throat, and exposure to a cool air, when a child is heated. Children liable to croup are still more so after attacks of acute or debilitating disease.

The prevention of croup is, of course, of the

highest importance, and, therefore, the causes of it, just enumerated, must be avoided in every way; slight colds should never be neglected in children or families predisposed, but should be treated by confinement to the house, or to bed if requisite, by milk diet, diluent drinks, and by the tolu and mucilage cough mixture, with the addition of ipecacuanha wine; paregoric should also be given to allay troublesome cough, and, in fact, those measures recommended in *Cold* carried out. The susceptibility may also be lessened, by not clothing the throat too warmly, and by the regular practice of bathing the throat and chest well with cold water every morning, rubbing afterwards with a rough towel till thorough reaction ensues. This practice is, of course, better commenced in warm weather, and not too soon after an attack of the disease. Flannel should always be worn next the skin, and care taken particularly, that bed chambers, and rooms children habitually live in, are not too warm, and never occupied whilst the floors are wet after washing. A residence at a distance from water is to be preferred.

Refer to—*Antimony—Children—Diphtheria—Larynx—Trachea*, &c.

CROUP—SPASMODIC, or CHILD-CROWING, is a species of convulsive or spasmodic affection of the muscles of the larynx, which, by narrowing and closing the chink in that organ through which the air passes, occasions the sound of the breathing to resemble that of the true inflammatory disease. This spurious croup is often an alarming, and sometimes a fatal disease; it generally occurs before the end of the third year of life, and in consequence of irritations acting more or less at a distance from the affected larynx, which receives the impressions through its nerves. Enlargement of the glands of the neck, affections such as eruptions of the scalp, the irritation of teething more especially, or the presence of irritating matter in the bowels, may any of them give rise to the affection. It comes on suddenly, the child is seized in a moment with "catching at the breath," struggles, the face changes colour, and the veins are full; if the spasm be not relaxed, after a few ineffectual efforts at breathing, the child must die; but if the spasm gives way, the air is drawn into the chest with a crowing, croupy sound. It is of much importance that this spasmodic disease should be distinguished from real inflammatory croup, on account of the very different treatment required; it may be known by the absence of fever, the cessation of breathing being much more instantaneous than that which occurs in the real disease. In the affection presenting symptoms so sudden and so alarming, *immediate* remedies must be used; a little cold water should be dashed on the face at once, and, as recommended by Sir Thomas Watson, a sponge dipped in hot water applied to the fore-part of the throat; a few drops of ether or chloroform on a handkerchief and applied loosely over the face to allow of inhalation, will often relieve the spasm, medical assistance, being, of course, procured quickly. Smelling salts should always be carried by the attendant of a child prone to such attacks. After one of these attacks have occurred, the strictest examination as to the probable cause should be instituted by a medical man; the gums lanced if requisite, the bowels cleared with a purgative, and the glands of the neck specially observed, and if enlarged, the cause ascertained and removed.

Refer to—*Convulsion—Glands*, &c.

CRY OF CHILDREN.—The principal distinctive difference in the cry of children is, whether it be that of expiration from, or inspiration into, the lungs. The cry of a strong child, suffering pain, is more of the expiratory; that of a weak exhausted child, of the inspiratory or sobbing character.

CRYSTALLINE LENS.—See EYE.

CUBEBS, or CUBEB PEPPER, is the fruit of a climbing plant, a native of the islands of the Indian Ocean. It is used as a means of arresting discharge and in affections of the urinary organs. The dose from a half to a whole tea-spoonful.

CUBIC SPACE—a term much in use in connexion with ventilation, to ascertain with exactitude the amount of air which a person is at liberty to utilise under certain conditions of existence. In building a hospital, school, barrack, or any public institution intended for the permanent residence of a large number of persons, it is usual to instruct the architect to provide a certain fixed amount of space for each individual. This is called cubic space, because it includes the length, width, and height of the school room or dormitory, and can easily be arrived at by multiplying the length by the width and the product by the height, and then dividing the whole by the number of persons likely to occupy the room. The Local Government Board requires that each sick pauper should not have less than 800 cubic feet of space; and by the army regulations 1200 feet are allotted to each soldier; while in civil hospitals, 1000 cubic feet are generally recognised as being essentially necessary. Of course the larger the amount of space in a sick room the better for the patient, but it matters little whether the space is 500 or 1000 cubic feet, if means are not provided for the continuous renewal of the air in the apartment.—See *Ventilation*.

CUCUMBER—a pleasant article of diet for the strong, but a very unwholesome one for invalids.

CUMIN is the fruit of an umbelliferous plant, a native of Greece and Egypt. The seeds contain an aromatic volatile oil, and are much used in the preparation of curry powders. Cumin plaster is stimulant to the skin, and useful in cases in which very active excitant action is uncalled for.

CUPPING is a process of blood-letting, by which blood is drawn from wounds made for the purpose, by the agency of suction, exerted by a cup or other vessel exhausted of air, or nearly so. It is a very old surgical expedient, and in former times it was, and, indeed among uncivilised nations at the present time, it is still effected by the primitive agency of a sharp flint or knife, and a cow's horn with the tip removed, suction being made by the mouth of the operator. In modern surgery, cupping, *when well performed*, is at once one of the most elegant and most useful of our methods of treatment. For the purpose of wounding the skin, a metallic box, containing a set of lancets, varying in number, is provided; in the box (fig. 60) which is called the scarificator, the

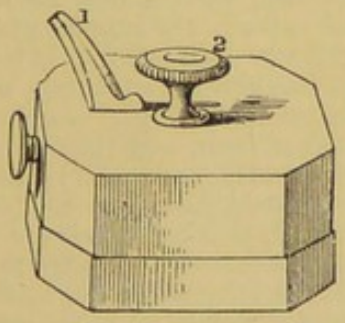


Fig. 60.

lancets are so fixed as to be discharged, when set or cocked, by a trigger (1) and spring, which cause them to pass rapidly through the skin in a semi-circular sweep, so rapidly indeed, that the usual sensation of cutting is not felt. The most convenient number of lancets is twelve, and the depth of the wound made by them can be increased or diminished by turning the screw (2); this must be done while they are fixed at half cock, and protruding from the instrument. The only other essentials for cupping are a vessel from which the air can be exhausted, and kept so when it is applied to the skin, and a flame of some kind, or some other means for exhausting the air. There are, however, sundry other little requisites convenient for the operation, to be mentioned hereafter.

Cupping is applicable in most instances where local abstraction of blood is called for, and may often be substituted for leeches, and even for general bleeding; it is a safe operation when used in proper situations, and most persons may be taught its performance by a few practical lessons; it is, moreover a most useful accomplishment for those who are far removed from medical assistance. It is hoped that the following details may be sufficiently clear, to enable even those who have never seen cupping performed to effect it in case of need; but by all means, let every one who contemplates the possibility of such a requirement get practical instruction, which there can be no difficulty in doing.

Cupping glasses of various kinds are, and have been used, but the most general is the bell-shaped form (fig. 61) of various sizes;

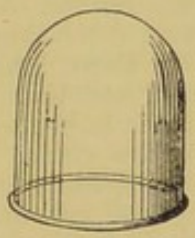


Fig. 61.

some of these are made with brass fittings at the top for the attachment of an exhausting syringe, or an india rubber suction ball; but the most useful form of all, and that most easily applicable by an unpractised or an unprofessional hand, is the leech cupping glass (fig. 62), which is the invention of Dr. Fox,

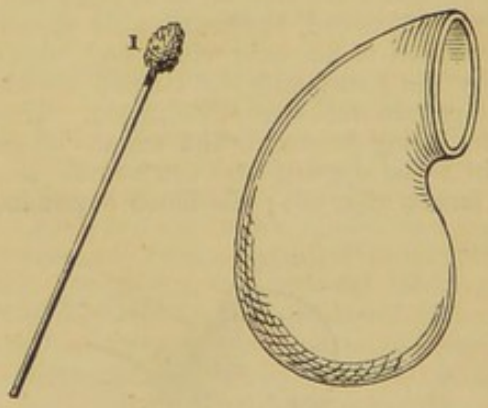


Fig. 62.

of Derby. When this is used, the next instrument, the lamp or torch (fig. 63), is not required,



Fig. 63.

as it is for the application of the bell-shaped glass; this torch is simply a lamp made for burning spirits of wine, by means of a wick which will afford a large flame.

Cupping may be performed in most situations on which it is possible to fix a glass, by a proficient, but the range of unprofessional oper-

ators must be much more limited, partly on the score of safety, but also for the reason, that in some situations they are not likely to draw blood sufficient to effect any good object. As a general definition, an unprofessional person may cup anywhere upon the back of the trunk of the body, from and including the nape of the neck, to the bottom of the spine, and also on the fore part of the chest. In selecting a place within the above limit, it should always be ascertained that there is room for the rim of the glass to be in contact with the skin throughout its entire circle. It being pre-supposed that the abstraction of blood is called for, and it being also pre-supposed that the intending operator is provided with the necessary instruments, he should also have some warm water, a good-sized piece of sponge, or, in lieu of it, a piece of flannel, a light, and some plaster.

The person to be operated upon being conveniently placed, and the skin bared, it should be moistened with warm water, or the circulation of the part excited by means of hot water fomentation applied for some time; an exhausted glass is then to be applied for a few minutes, removed, the scarificator placed upon the portion of the skin which had been drawn up by the glass, and the lancets, which have been put on full cock, discharged. The scarificator being removed, the exhausted glass is again to be applied over the wounds made by the lancets (fig. 64); the blood ought immediately to commence flowing. If the bell-shaped glass is used, when applied, one edge should be made to rest upon the skin (fig. 65), the flame

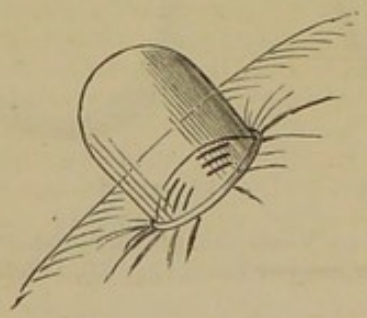


Fig. 64.

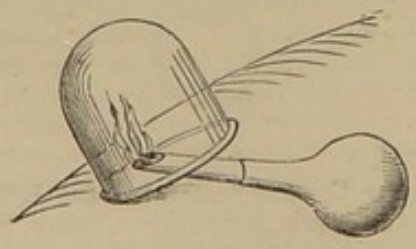


Fig. 65.

of the spirit torch passed rapidly under it, and withdrawn, and the glass at the same instant pressed entirely down upon the skin. This is the point of the operation most difficult to perform well and efficiently by the unpractised; for if the exhaustion is complete, suction, and consequently the abstraction of blood, are so likewise; and in endeavouring to make the movements quickly, there is a liability of burning the skin. Fortunately, an individual can practise the manœuvre upon the skin of his own thigh at any time. Much of this is avoided by the use of the leech cupping-glass, from which the air is exhausted by simply putting into it a small fragment of paper, half-an-inch square, dipped in spirits of wine, or spirit of some sort. A short piece of wire (fig. 65) with a small portion of tow tied to the end of it, and dipped in the spirit, is used to ignite the paper in the glass, the latter being applied to the skin the moment this is done, and the wire withdrawn, the confined air extinguishes the lighted paper in the cupping-glass at once.

In addition to simplicity in application, the leech glass has also the advantage of taking at once a considerably larger quantity of blood than the other form, and thus of requiring to be less frequently re-applied; moreover, the blood, as it flows, gravitates to the bottom of the glass and does not clot over the wounds, as it does with the bell-shaped instrument. These remarks do not refer to the quick, elegant, and efficient manipulation of a professed cupper, but as the operation must be in the hands of the unskilled. When an applied cupping-glass is to be removed, it must be done by pressing down a portion of the skin at its edge with the point of the finger, so as to admit the air, which enters with a hiss. If, after a cupping-glass has been on some time, the blood does not flow freely, but clots upon the wounds, and if it is desirable that more blood be drawn, the glass should be taken off, and—when the wounds have been cleansed with warm water—re-applied. When the operation is concluded, it is only necessary to cleanse the wounds, which will not continue to bleed in the situations indicated for cupping in this article, and to put a little adhesive plaster upon them.

Such is the operation, under the pre-supposition that the operator is provided with the requisite instruments, but in the absence of these, very good substitutes may often be made. To make the incisions, which should be about the eighth of an inch in depth, any sharp instrument will suffice; for the cup, a tumbler or any similar vessel with a *uniform rim*, will do; and to exhaust the air, whatever will blaze freely. In cases of poisoned wounds, the application of a cupping-glass, where it can be done, either with or without enlargement of the original wound, is a good precaution, and will retard the absorption of the poison during the interval of procuring medical assistance. Wet cupping, as the operation described above is called, has of late years been gradually giving place to dry cupping, a most useful remedy;

this is the application of the cupping-glass for from ten to twenty minutes, without any previous scarification. The blood is thus withdrawn from parts in the vicinity of that operated on; and relief afforded, without weakening by actual abstraction of blood. In local congestions of blood, in local pain, &c., it is often of much service.

Cupping is certainly a most useful accomplishment for the emigrant. It is a safe method, and when once practised, an easy one, of blood-letting; but, by all means, let it be practically learned if possible, and then the above, though meant for all, will be more certainly useful in bringing back to the memory the minutiæ which so often escape it.

CURD.—See CHEESE.

CURRANTS—the well-known fruit, either black, red, or white—are extremely wholesome, disagree with few, and are particularly well adapted, either fresh or cooked, to form part of the cooling diet requisite for health in very hot weather. Moreover, the mechanical action of their seeds has a most beneficial effect in exciting the bowels. Some bilious persons say they find benefit from eating a few ripe red currants a short time before breakfast, and that the practice tends to keep off the increased liability to bilious attacks during the hot weather, when currants are in season.

The black currant possesses more astringency than the other varieties, and when preserved, is much domestically used in sore throats, &c.; it also acts upon the bowels. Boiling water poured upon a portion of currant preserve, and the infusion allowed to cool, forms one of the pleasantest and most useful of our fever beverages. Black currant leaves are used, in infusion, as a domestic diuretic. What usually goes by the name of the dried black currant, is no currant at all, but a species of small grape. It is brought almost solely from the islands of the Levant. It is a favourite domestic aperient—particularly in the lying-in chamber—mixed with gruel. It probably acts mechanically.

CURRY is food of any kind prepared with the well-known condiment, curry powder, which is composed of turmeric, cumin, cayenne and black pepper, mustard, ginger, and other spices.

The preparation is not adapted for invalids, and should only be used sparingly by those in health, especially if they have any tendency to irritation of the stomach and bowels, or to head affections. It is probably better adapted, as regards wholesomeness, to give requisite stimulating power to the rice and other foods of hot climates, than as an addition to an animal diet.

CUT.—See WOUNDS.

CUT THROAT.—In this horrible casualty two dangers chiefly threaten life immediately; the one, death from immediate bleeding, if any of the large vessels of the neck have been divided; or if this has not been the case, death from blood finding its way into the windpipe. In the first, few unprofessional persons could possess on the instant either sufficient knowledge or presence of mind to render much efficient assistance, certainly not in the case of the large arteries; but bleeding from a small branch might be arrested by the means suggested in article *Artery*. Should a superficial vein be wounded, and pouring out dark blood, gentle pressure in its course, between the wound and the head, might be of service. To prevent the danger of suffocation, when the windpipe is opened, and when the bleeding does not immediately threaten life, the position of the person is the principal thing to be attended to; this should be either on the side, or on the face, in whichever situation fluids may most easily run off without entering the tube. This being done, and some light gauze material thrown loosely over the wound, nothing more should be attempted before the arrival of that medical assistance which must as speedily as possible be procured. Above all things, no attempt should be made to close the wound.

Refer to—*Artery—Hæmorrhage—Wounds.*

CUTANEOUS.—Belonging to the skin.

CUTICLE.—The epidermis or scarf skin.—See *Skin.*

CYANOSIS, or the BLUE DISEASE, depends on a congenital malformation of the valves of the heart, and the symptoms arise from an obstruction to the natural current of the circulation, causing the lips, face, and hands to present a bluish appearance, due to the presence of an abnormal amount of venous blood in the smaller vessels.—See *Heart.*

CYCLING.—The invention of the safety bicycle has introduced a means of recreation and exercise at once useful, beneficial to health, and economical. It is suitable for persons of all ages, from childhood to mature age; and if enjoyed discreetly is as free from any risk of injury as any of the out-door recreations which conduce so largely to health and vigour in the present day.

The Saddle.—Of the conditions desirable for its safe enjoyment among the most important are that the cycle and the saddle should be suitably adjusted to the rider. The cycle should be of convenient height, with the saddle so adjusted that in sitting on it the ball of the great toe can rest easily on the treadle at its lowest point without any leaning of the body towards one side. The handles should be arranged at a height and distance from the body allowing of them being held easily and lightly, or being left unheld, without any alteration in the position of the body. This condition insures that the rider sits in the saddle in proper relation to the treadles beneath. The saddle should be of such a shape as not to press injuriously on any one place. It is impossible to suggest any particular saddle as suitable for all riders; the different types of saddle are almost innumerable; but the general

condition can be laid down that every saddle which gives rise to discomfort after a ride of moderate distance is unsuitable for the rider, and should be changed. Much injury may result from a badly fitting saddle. Local inflammation may be set up, followed even by abscess; in other cases painful neuralgic affections result, which may give rise to prolonged discomfort.

Curving of the Body.—The most common defect in adjustment among male riders is the tendency to lower the handles in such a way as to render it necessary to curve forward the body. This attitude acts injuriously in two directions. In the first place, it is impossible to bend forward the body in the manner described without reducing considerably the size of the chest, and thus limiting the breathing space. As a result of impaired breathing power much additional strain is put upon the heart, which has to pump the blood at a more rapid pace through a decreased area of lungs; the consequence is that the heart becomes overstrained, and severe palpitation and even sudden fainting may occur, not unattended with danger to life. In the second place, the position referred to puts pressure upon a part of the body which is unfitted to bear it without injury, and much discomfort and some risk of actual disease is incurred.

Too high a Saddle.—In women the chief error of adjustment is in riding with too high a saddle, so that the thigh and leg are somewhat strained to reach the lowest point of the treadle. A high saddle undoubtedly adds to graceful appearance, but this is somewhat dearly bought at the cost of strain of the muscles of the upper part of the thigh, and of injury to the organs which lie in close proximity to them.

Cautions.—Of the risks to be guarded against in cycling the most noticeable are those of **overfatigue** and of **chill.** The exercise is pleasant and stimulating, and there is a tendency to persist even after some sensations of exhaustion manifest themselves. Breathlessness and palpitation are always indications that danger of excess is incurred, and should call for caution and rest. The slightest sensation of **giddiness or faintness** demands imperatively that one should dismount and walk slowly until perfectly recovered. It is not well on such occasions to sit down for a time to rest, as there is considerable risk of taking chill after being over-heated by exertion; a few minutes quiet walk beside the cycle is usually sufficient to restore the breathing and to quiet the excited heart.

Chill is apt to occur from resting in the open air or in a cool room after a long ride when the skin is relaxed with perspiration and the muscles fatigued with exercise. It is a wise precaution, if such a condition is likely to occur, to carry with one a light silk or thin woollen undervest, and to change when one's destination is reached, drying at the same time thoroughly with a dry towel. The risk of chill from evaporation is thus avoided. Young women *should avoid long rides during the menstrual period*, as at that time both the risk of strain and of chill are increased. *Throughout pregnancy cycling should be given up entirely*, and should not be resumed for at least three months after confinement.

Diet when Cycling.—When cycling for long distances it is best to abstain from heavy meals unless a rest of two or three hours can be taken in the middle of the day, during which a solid meal may be enjoyed. Much fluid of any kind should be avoided, and no stimulants should be taken except with a meal. In warm weather thirst is apt to be troublesome; this is best relieved by carrying a small flask of cold tea flavoured with lemon juice, of which a sip may be taken frequently; small quantities of aerated waters also are grateful and harmless. Water from wells and springs on the roadside should always be avoided; it is frequently impure and may give rise to serious illness.

CYNANCHE.—A term applied to affections about the throat, which tend to produce suffocation.

CYST.—A membraneous-like bag, within the body, containing morbid matter, sometimes in a fluid and at other times in a semi-solid condition. The matter varies much in consistence and appearance. Cysts frequently form just beneath the skin, and some persons are peculiarly liable to them. In aged people, cysts often form, and are conspicuous upon the head. Cysts, in superficial situations, are generally quickly and easily removable by the surgeon. The upper eyelid is often the site of a small cyst. Cystic tumours are common to most parts of the body, and they are often found in internal organs, as the liver and kidneys, and attain a large size in the ovary of the female.

CYSTITIS, or INFLAMMATION OF THE BLADDER, is attended with great pain and frequent attempts to make water, which comes away in small quantities; or the person may suffer from a total retention of urine, with a strong desire to void it. Chronic cystitis, which is also termed catarrh of the bladder, is a serious malady, often of long duration. The treatment of the acute stage consists in the hot bath with opiates and demulcent drinks. Much relief is given by hot fomentations to the perinæum and by the internal administration of camphor and extract of hyoscyamus. Alkaline drinks composed of the carbonates of soda or potash are also much employed, with the free use of demulcents, such as barley-water and linseed tea. Various other remedies have found favour in cystitis, particularly infusions of pareira, uva ursi, and buchu. Sir B. Brodie used with much success a decoction made of an ounce of uva ursi to eighteen ounce of water, boiled down to sixteen ounces, and taken daily as a drink.

DALBY'S CARMINATIVE is a quack compound of carbonate of magnesia, with various essential oils. It also contains opium, and this fact alone ought to be sufficient to exclude it from use. Magnesia, carminative distilled waters, and opium likewise, are all, unquestionably, *when properly employed*, useful even for infants; but in the majority of cases, the latter drug is quite uncalled for, and when it is necessary, its administration requires the utmost care and circumspection of the medical man; it cannot, therefore, be a matter of indifference, whether a medicine sold and kept for general use contains so powerful an ingredient as opium, or whether, when a simple mixture of magnesia, or chalk and dill water, will answer every purpose, a medicine—that is opium—is given, which cannot fail to act injuriously, unless positively indicated by the peculiar circumstances of the case. A dose of "Dalby" will undoubtedly "still" a child, perhaps more quickly than a simpler or more cautiously combined preparation; but its very power of action in this respect, indicates its power likewise of inflicting evil consequences. If a carminative simply is required, a simple carminative should be given, in some such mode as that recommended in the article *Children*. If opium is called for, let it be given—under medical sanction—as opium, in known and graduated doses; but it is criminal folly to use it in the indefinite hap-hazard way in which such productions as the one in question are used. "According to Dr. Paris, there are five drops of the tincture of opium to two ounces of this mixture; but in another formula it is stated that this tincture forms one eighteenth part of the liquid. Like most of these quack preparations, it probably varies in strength. An infant is reported to have been destroyed by forty drops of this preparation—a quantity equivalent to little more than two drops of the tincture of opium."—*Taylor's Jurisprudence.*

The possibility of any preparation intended for children, containing a variable proportion of opium, ought to be sufficient to deter those who have the care of the young from hazarding either the lives of the latter, or their own peace of mind, by its administration. Moreover, it is impossible, habitually, to give opium, even in small doses, to children without injury, even if fatal consequences do not result.

Refer to—*Opium*, *Quack Medicines*, *&c.*

DAMP.—Moisture is one of the most prolific and most generally acknowledged sources of disease; in whatever way applied to the body, whether in atmosphere, or clothing, or bed, it is alike apt to be productive of bad consequences, often of the most serious character. When combined with decaying vegetable matter, and more especially when favoured by heat, fever and ague are the results of undue moisture; when cold and damp unite their depressing influences, colds of every kind, inflammatory attacks, scrofula and consumption, rheumatism and neuralgia ensue.

Dampness, or injurious excess of moisture, may depend upon the natural formation of the country, or character of the soil, or upon a superabundant growth of timber, which obstructs the drying effect of the sun's rays, and of a free circulation of air The effects of these conditions are evidenced by the agues of the marsh districts, the cretinism of the low, dark, damp valleys of the Alps, the fevers of the tropical forests and African rivers, or in a lesser degree by the relaxing effect of a damp and somewhat mild climate, like that of Devonshire. The advance of the improvements of civilisation does much, if it cannot do all, to rectify these sources of disease; the cutting of water courses, the clearing of timber, are for the most part attended with increased salubrity of the district. The latter, of course, requires circumspection; for much harm may be and has been done by the injudicious removal of protecting belts of trees; neither must it be forgot, as mentioned in article *Ague*, that the intervention of a wood may prevent the extension of the malaria of a marsh, and that trees and shrubs judiciously planted, besides adding beauty to the landscape, absorb moisture from the earth, and help to keep it dry. The now well-known Eucalyptus has special repute as both a preventive and absorbent of moisture, when planted in damp localities. But the shelter of trees is a different thing from closely encircling a house with them; they *will* retain moisture around more or less, according to the nature of the soil and the denseness of their growth, and in a way which is not compatible with health.

Dampness and moisture, in excess, cannot of course be prevented, when owing to the vicinity of large bodies of water, but in such a case the chief evils to be dreaded are the cold winds which "come off the water," laden with vapour, and which, as happens in many situations, are liable to produce croup in children, and catarrhal affections in the predisposed. If these influences cannot be guarded against, of course, removal is the only remedy.

Damp houses must be unwholesome; if occupied too soon after building, disease, especially of a rheumatic character, is the frequent consequence, and no house should be occupied until fully a year has elapsed from the date of its completion. There are two causes which give rise to permanent dampness in a house; one is due to the influence of the soil, which may be within a very few feet of the ground water, and the other may arise from defective drainage—or both conditions may co-exist in the same building. It has been found that in houses built on alluvial soil, from which water is readily obtained, there is always a greater tendency to consumption, than in those of higher level and on a gravel foundation. The evil may be partially remedied, in

the first instance, in the construction of the house, by having it thoroughly isolated from injury from damp, by a concrete and impervious foundation, and the introduction of what are termed damp-proof courses in the walls, to prevent the moisture being absorbed upwards. The damp-proof course may be made of slate or concrete, or what is better, perforated bricks, or vitrified tiles, with holes in them. Occasionally these tiles are inserted in the walls above the ground-floor level, for the purpose of admitting air into the spaces between the ceilings and floors above, for the prevention of dry-rot. —See *Drainage—House, &c.*

Damp clothes and beds are so generally recognised as causes of disease, that the fact scarcely requires to be insisted on, or indeed the additional one, that when the former are unavoidable, the danger is much if not wholly done away with by continued active motion, which keeps up the animal temperature, and it is probable that this preventive, not being available in the case of the latter, renders a damp bed almost synonymous with disease and death.

Damp, in most instances, acts undoubtedly, by abstracting, either by evaporation or otherwise, heat from the body; but as dry cold does this likewise without producing the same certain injurious consequences, it is probable that moisture also calls into action changes connected with certain conditions of the body, of the precise nature of which we are not at present cognizant. One thing is certain, that moisture is always more apt to act injuriously upon the system when the nervous power is either depressed, or not in its full state of activity, as it is during sleep, or for the first hour or more in the morning, after rising, and before food of some kind has been taken; hence it is always found that fogs and moisture are much more likely to injure during the first morning period, and that the best protection is some warm food or drink, which may support or gently stimulate the system.

Refer to—*Ague—Neuralgia—Rheumatism—Scrofula.*

DAMSON, the well known fruit, is wholesome when ripe; but for invalids should be cooked. It is slightly aperient.

DANCING, *properly so-called*, is the active exertion of the body in sprightly graceful movement, accompanied with exhilaration of mind, and when thus indulged in by the young, is a most beneficial and healthful recreation. It is no argument against dancing in itself, that it is too often connected with many things that are injurious, such as heated rooms, late hours, and the like—these belong to other considerations; but as an exercise congenial both to the mind and the physical requirements of the young, it is, as every exercise in which the mind enters with pleasure and interest into the exercises of the body, a most efficient promoter of health, and it is much to be regretted, that its abuse and associations, in some instances, both with physical and moral evil, should cause its abandonment in any place where there are young people.

DANDELION, or LEONTODON TARAXACUM, the plant native to this country, is too universally known to require description. Its leaves, when blanched, are used as a salad in some parts of the Continent, and the root is sometimes roasted, and mixed with coffee. As a medicinal agent, taraxacum is too much neglected; to be found by every hedge side, it is one of the most certain and active diuretics we possess, whether native or foreign; and perhaps no better proof of its utility can be cited, than that the author always finds patients who have once taken the medicine, recurring to it again and again of their own accord. No doubt something is due to the fact—and it is a consideration of some weight—that it is procurable without expense; it rarely fails to increase very considerably the flow of urine. Various preparations, extracts, &c., of dandelion are recommended and are employed, and are undoubtedly efficient, but the fresh infusion of the recent root is quite the best mode of administration. For this, roots of not less thickness than the little finger should, if possible, be used, and after being washed from the soil, sliced transversely in pieces a quarter of an inch thick. Of these a good double handful, or from two ounces and a half to three ounces, are to be put into a jug, a pint of boiling water poured upon them, and the whole allowed to infuse for an hour or two beside the fire, *but not boiled.* The infusion will have a greenish brown colour, and two or three cupfuls should be taken during the day, until the desired effect is produced. The taste is not very unpleasant, is slightly bitter, and to some mawkish, but may be improved by the addition of a little orange peel. In addition to its action in increasing the flow of urine, taraxacum improves the tone of the digestive organs, and most certainly exerts a stimulant action upon the liver; indeed, it is in disorders of the digestive organs accompanied with deficient action of the kidneys, the urine being scanty, high coloured, and depositing a *pink* sediment, that dandelion exhibits its beneficial influence most apparently. It may advantageously be combined with broom, as a diuretic, and of course with other medicines, such as the tincture of calumba, with potassa, &c. A decoction (a faulty preparation), an extract, and a juice of taraxacum are admitted into the pharmacopœia. The juice is much employed; it is expressed from the root, and to every three parts one part of spirit is added. The dose of the juice is one or two tea-spoonfuls.

Refer to—*Broom—Liver—Kidneys.*

DANDRIFF is the formation and separation of numerous thin white scales, or scurf, from the skin, and is most usual upon the scalp; but in persons of delicate skin, occurs

also upon the face. In infancy it is very common upon the head, and among the poor there is a prejudice against its removal "for fear of cold," so that it is allowed to accumulate along with the dirt, and presents a most filthy appearance. Generally, the skin underneath, at the seat of dandriff, is not much changed, but sometimes it becomes reddened, and slightly irritable. It is common among scrofulous children, and is favoured by their constantly wearing the same flannel until the fabric is worn out. Numerous instances are related of its propagation from one person to another.

In adults, the disease is troublesome, from the quantity of scales, or scurf, which mingle with the hair, and shake from it upon the clothes.

In any case, care should be taken to avoid irritating the skin, the hair-brushes should be soft, and the small-tooth comb—at all times a doubtful substitute for thorough washing—must never be used.

In the case of infants, washing regularly with soap and water, and the use of some simple pomatum, or of an ointment composed of ten grains of red oxide of mercury to the ounce of lard, or vaseline, will remove the inconvenience; and either in their case, or in that of adults, an alkaline wash will be found useful. Sir Erasmus Wilson recommends two drachms of solution of caustic potash to eight ounces of soft or rose water.

DANGER.—See DEATH.

DARNEL GRASS is a species of rye-grass, the seed of which has a beard, or awn, like barley, and which, unlike the grasses generally, is poisonous. It is more common on the Continent than in Britain, and the seeds are occasionally so abundantly mingled with those of barley, or other grain, as to cause symptoms of poisoning in those consuming articles of food made from the meal. Several instances of accidental poisoning have occurred in consequence; these have been more common, however, on the Continent than in this country. When chewed, meal containing darnel grass causes a burning sensation in the throat, and giddiness, headache, and lethargy follow, with great intestinal irritation. An emetic would probably be the best remedy.

DATE.—The fruit of the date palm constitutes a considerable portion of the food of the people of Egypt and Northern Africa, Arabia, and Persia. The nutritive material is chiefly sugar. As imported into this country, dates are not a digestible article of diet.

DATURA STRAMONIUM. — See THORN APPLE.

DAWLISH, in Devonshire, occupies a narrow valley opening upon the sea. The environs abound in walks and rides, and the sea-bathing is good. Dr. Shapter speaks highly of the houses up the valley as a winter residence in pulmonary complaints; "so entirely is it protected from the prevailing winds at this season. During spring, however, this locality is not so favourable, on account of the east winds which then prevail, and to which, from its aspect, it is exposed."

DEAD, DISPOSAL OF THE.—The instincts of mankind in all ages have led them to reverence the dead, but the various methods employed to find them a last resting place have not partaken of much uniformity. The Egyptians embalmed their dead, the Greeks and Romans cremated them, a practice which has many advocates, but few followers, at the present time; the Hindoos still float their dead on the sacred waters or expose them in the silent towers to be despatched by vultures. Nearly all civilised nations bury their dead. The objections to inhumation are that graveyards exhale noxious vapours, and that they pollute the waters in their neighbourhood, and for these reasons burying-grounds and church-yards in large towns have been nearly all closed by the legislature. There is no question that in the course of time, the garden cemeteries which have taken the place of the old burying grounds, will also be filled to repletion, and sanitarians of the future will discuss again the best means of disposing of human ashes. The prejudice in favour of ground burial is so strong, that any other means of disposing of the dead is never likely to be adopted in this country. The speedy removal of a dead person from an inhabited house, especially amongst the poor, and in epidemic seasons, is always advisable. In case of a person dying of contagious disease or of a malignant disease of any kind, it is desirable (to prevent any bad effects which might arise from exhalations from the body) to have it at once secured in a shell or coffin, well pitched inside, and partially filled with saw dust mixed with chlorinated lime, or moistened with a solution of carbolic acid, terebene, or other disinfectant. Care should be taken that the lid of the coffin is also well adjusted, otherwise these precautions are of little avail.

DEADLY NIGHTSHADE.—See BELLADONNA.

DEAFNESS, or deficiency in the sense of hearing, may be either partial or complete, and it may be accompanied with dumbness. The causes of deafness may be temporary or permanent, and the affection may be due to disorder in the brain and nervous system, to disease and disorganisation of the essential portions of the organ of hearing itself, or to causes which interfere with the transmission of sound.

The temporary causes of deafness may be such as have their origin in temporary disorder of the brain, resulting from external violence, or from disorder either local or general, more particularly some forms of fever, of which deafness is a frequent concomitant. Some drugs, quinine particularly, given in too large doses, also give rise to the affection.

Temporary deafness is frequently occasioned by common cold, which seems to cause tumefaction of the membranes lining the passage of the external ear, or when the throat is affected, obstruction of the Eustachian tube—which extends between the middle ear and the throat—either by swelling, or accumulated mucus. These causes often continue in action, and keep up the deafness long after the cold has disappeared.

Permanent deafness may result from disease of the brain, such as paralysis, or from violence, such as severe blows or falls upon the head. The author had one patient, a gentleman afflicted with permanent partial deafness, the result of a dangerous fall when hunting, the effect upon the brain being evidenced by the fact, that his pulse, which formerly ranged at seventy-two, has never since exceeded, in health, which is perfect, forty in the minute. Disease of the ear itself, or its effects, can scarcely fail to cause deafness. The internal portions of the ear are liable to a variety of disorders or diseases, which it would be useless and out of place to notice in this work. Many of these take their origin during attacks of acute disease, particularly measles or scarlet fever. Discharges occur from the ears, and the minute bones contained in the cavity are sometimes discharged. To allow of this, of course, the membrane of the tympanum, or drum of the ear, must be wholly or partially destroyed. This important membrane of the ear being diseased, is often the occasion of deafness. As mentioned above, the obstructions, either in the outer ear passage, or in the Eustachian tube, first arising from common cold, *may* become permanent; in the case of the latter, when the swelling subsides, thick mucus may block it up; in that of the former, hardened wax, or cerumen. This last mentioned cause of deafness is very frequent, is easily discoverable, and no less easily removed, affording most striking relief to an almost total defect of hearing. It is perhaps the only affection of the organ causing deafness, which is likely to be well or safely treated domestically.—See *Cerumen*.

One of the commonest causes of slight permanent deafness is adenoid growths behind the nose. This affection occurs often in young children, particularly in the strumous, and may be known by the peculiar thick sound of the voice, the noisy breathing at night, and the constant liability to cold in the head and quinsy. These people always breathe through the mouth, so that in time the nose becomes flattened from side to side, and the nostrils small. The deafness is due to the swollen membrane blocking up the Eustachian tube. In mild cases of this character, so long as the hearing is unaffected, considerable improvement can be obtained by attention to the general health, occasional change to a drier and more bracing air, and the administration of cod-liver oil and steel wine. Locally the catarrh and tumefaction resulting from the presence of the growths may be diminished by douching or spraying through the nostrils, with a syringe or spray-producer, a solution of salt with bicarbonate of soda in water, of the strength of five grains of each to an ounce of water. The child should also be trained to breathe as much as possible through the nose. As soon, however, as any deafness becomes apparent, the growths should be removed at once by a competent surgeon. If the tonsils are enlarged, as is not unusual, they should be excised at the same time.

The most common cause of deafness is closure of the Eustachian tube, which connects the cavity of the middle ear with the throat, from neglected cold or from any other form of chronic irritation of the throat. The catarrhal irritation causes, first, swelling and narrowing of the tube, and afterwards complete closure, and as a result disease attacks the cavity of the ear and the minute bones in it which convey vibrations from the drum to the nerve of the ear. The deafness resulting is very likely to be overlooked at first, as it usually comes on gradually and insidiously, often without any discomfort whatever in the ear, although sometimes it may be attended by singing or murmuring noises. When it affects only one ear it is seldom noticed until the other ear is temporarily affected. In such cases irretrievable damage often results before deafness is even suspected. Children thus suffering are often unfairly blamed for inattention at school; when complaint is made of this, an examination should always be made of the hearing powers of each ear separately; and if any deficiency is detected, medical advice should be resorted to at once. In the early stages of this affection, relief is afforded by forcing air up the Eustachian tube from the throat, in the following way:—Close the mouth, hold the nose so that no air can escape, and make a forcible effort to blow. The air is forced into the nose, and, if the tube is free, into the ear, when a slight movement will be felt and immediate relief will result. Before repeating the process it is necessary to swallow. This should not be done more than twice in the day. In descending a coal mine, often some fulness is experienced in the ear, owing to the atmospheric pressure; this is immediately relieved by swallowing, which, by opening the Eustachian tube admits air to the ear, thus equalising the pressure on each side of the tympanic membrane.

Among the most common causes of temporary deafness is the accumulation of wax in the outer passage. Those with coarse skins are more liable to this affection, and the tendency is always increased by irritation, or by cold.

A person affected with temporary deafness, if it is traceable to an assignable cause, such as cold, should wait the effect of time for its alleviation. A blister applied behind the affected ear, or, better still, an eruption brought

out just below the ear, by tartar emetic or croton oil, may probably give some relief. If wax be suspected or ascertained to have accumulated, it should be removed, as directed under article *Cerumen*, but never by earpicks or such like dangerous weapons. When no assignable cause for the deafness, whether permanent or temporary, can be discovered, a medical man should be consulted—if he has given special educated attention to aural surgery, so much the better—but unqualified quacks, with nostrums and never-failing cures, must be shunned. No one, surely, can be so credulous as to believe that any application, or variety of applications, put into the outer ear—and strong stimulants are often used in this way—can be remedial for a symptom owing to causes so varied. Some varieties of deafness, are alleviated by appliances to the external ear passage, and some remarkable cases have been published of great improvement in hearing resulting from small pellets of cotton wool, or other substances, moistened and introduced so far into the ear, as to be in contact with the tympanic membrane, which had been perforated by disease. For moistening these, and indeed for moistening the passage of the external ear, when too dry—an occasional cause of deafness—or for moistening hardened wax previous to syringing, glycerine is better adapted than the oil generally in use. Various other modes of treating deafness, with reference to its various causes, have been, and are employed. Its dependence upon obstruction of the eustachian tubes, has originated the practice of passing an instrument, or eustachian catheter, up these passages, for the purpose of clearing them. The operation is one which requires both practice and tact for its safe and efficient performance. While the swelling is slight, air can be forced into the ear as recommended above.

When deafness is confirmed, and cure cannot be obtained, relief must be sought in the various artificial methods—ear cornets, and the like—for collecting and conveying to the ear as large a body of sound as possible. Conversation tubes, ear trumpets and cornets of various designs are made for the purpose, and are usually manufactured either of metal or vulcanite. In numerous cases, where hearing in the ordinary manner is lost, sound can be detected when any vibrating body is brought in contact with the bones of the head. This fact might be taken advantage of in the construction of an instrument for improving the hearing.

With respect to the deaf and dumb, or "deaf mutes," as they are now called, whatever the cause, whether congenital deficiency, or complete deafness brought on by disease or accident before the power of speech had been thoroughly acquired, the education should be conducted in an establishment for the purpose. There are two methods adopted for teaching deaf mutes, one by means of an alphabet made upon the fingers, which is the plan most commonly employed in England, and the other the so-called "German" system. This latter plan has recently been largely developed, and a society for the education of teachers has been formed, and is now established at Ealing. The object in the system is to make the person speak, for in deaf mutes there is no impairment of the voice. The child is shown how to place its tongue and lips so as to form certain letters, and gets some notion of the sound, by placing the hand upon the throat of the teacher. So accurately may the sound be imitated by this means, that even a nasal twang has been communicated to a pupil, the teacher being an American. The deaf mute learns to understand others by watching the lips. It cannot be done at home, but much may be done by the philanthropic and earnest endeavours which have devised, and are now daily devising, new methods for imparting to these unfortunate individuals, the blessings of knowledge. It has probably been an error in the education of the deaf mutes hitherto, that they have been brought up in establishments by themselves, a plan it would seem less likely to fit them for mingling usefully with the world in general in after life, than commingling them with children who have the power of speech. Though a deaf mute can be perfectly educated only in a special school, much may be done at home, by inculcating habits of industry, and by teaching them the alphabet. Great patience is necessary, as the unfortunate child is unable to explain itself and is liable to be misunderstood.

The affection, when it is itself hereditary, is transmitted to the offspring, hence intermarriage is to be avoided.

Dr. Allen Thomson remarks:—"Dumbness is known usually to proceed from deafness, either existing from birth, or arising early in life. The exceptions to this are very rare, and occur only from defective formation of the organs of voice and speech, or from disease of the brain. In the case of dumbness arising from total congenital deafness, sounds can never be associated with ideas, and consequently feelings, emotions, actions, and the names of objects or description of their qualities and states, must find a language in natural gesture, or in conventional written and manual signs. In the second case, that, viz., of total deafness coming on later in life, even if speech shall already have been acquired, it may be gradually lost, in consequence of the want of habit in associating sounds with speech. This occurs, however, only in early life, when the habit of speech has not been fully impressed on the memory. I was informed by the late Mr. Kiniburgh, Superintendent of the Deaf and Dumb Asylum in Edinburgh, that it rarely happens that dumbness is entailed by deafness so late as the tenth or eleventh year, and that the extent to which this may occur, depends very much on the circumstances in which the

individual is placed. In those who become only partially deaf, but to such an extent as to incur the risk of becoming also mutes, it seems probable that much of the power of retaining voice and speech, or of regaining it, may depend on a very small difference in the amount of hearing; and I am inclined to think that much more might be done than has yet been attempted, in a certain proportion of such cases, by assisting the hearing through the hard parts of the head, or by other means."

Refer to—*Ear—Glycerine, &c.*

DEATH.—The departure of the animating spirit from the material body, the separation of the living soul from the frame so "fearfully and wonderfully made," which is no longer fitted to be its habitation or medium of communication with earth and earthly things, is a subject which few can approach without awe and fear, none without interest, though it may be of a solemn kind, as the one event from which no child of Adam is exempt. The possibility or the probability of illness having a fatal termination, devolves a great responsibility, and much anxiety, upon the mind of a medical man, as regards the patient more particularly. There is the preparation of the mind for the great change to be considered; the settlement of worldly affairs, on which may depend the future welfare of others, to be thought of; but there is also the effect of the announcement, nay, of the slightest hint of danger upon some individuals, to be duly pondered, lest the mental shock may put the finishing stroke to what disease has begun, and extinguish the last faint chance of recovery. None but those who have had to bear it, know the weight of anxious thought that such considerations press upon a conscientious mind. It is a position for which no stated rule can be framed, and in which the judgment must be guided by the many contingencies and considerations which surround every case of the kind. It may be requisite on the first symptoms of danger occurring in some diseases, particularly in those likely to affect the powers of the mind, to make the announcement early; in others it may be delayed for some time after the physician has decided in his own mind that the case can have none but a fatal issue, till, indeed, the idea, without being actually imparted, has gradually dawned upon, or been gently awakened in the mind of the patient, and has by degrees ripened into conviction.

The question of encouraging hope of recovery, depends upon considerations similar to those which influence the announcement of necessary death; many of these rest upon religious grounds, which it would be out of place to touch upon here, but in a medical point of view, the tonic influence of this powerful emotion of the human heart must never be forgotten. With some, the hopes of a blissful future may be so strong that they overpower all wishes connected with this world; but these are, it *must* be said, exceptional cases; the love of life is strong, the majority hope to get well; this hope is as it were an anchor and cable, linking them with the life and activity of earth—destroy it, and they sink at once; the emotion is a sustaining tonic which no remedy can supply. It is for this reason that the office of announcing the possibility or probability of death should not be devolved upon the medical attendant, except in certain cases. Coming from him, it takes too much the form of a final sentence; there are, it is true, various ways of breaking the subject, but softened down as it may be, it comes with a depressing force which it has not when friends or ministers breathe the possibility of such an occurrence. To the poor, and even to those who might know better, an important caution is required. Too frequently it happens, that whilst a medical man is examining his patient, or still within hearing, questions relative to that patient's state are put, whether "there is any danger?" whether the person will "get better?" and other interrogatories, which he can scarcely either answer or refuse to reply to, without conveying to the patient information he may not wish to communicate. Every medical man must have felt himself at times thus unfairly embarrassed.

The symptoms of approaching death must of course be liable to great variation, depending upon the cause of the fatal event, and the peculiar constitution and temperament of the patient.

Sudden death is usually considered to be that which occurs without *immediate* previous warning, for there are few cases in which some indications have not been developed of the disorder of the organ, or structure, which at last gives way and snaps the thread, unless, of course, life has been quickly destroyed by some external accidental agency.

Dr. Alison says, "All causes of sudden or violent death operate either by directly depressing or suspending the vital actions of the organs of circulation, or by obstructing the arterialisation of the blood, and thence arresting the circulation at the lungs." The action of the organs of circulation, that is, of the heart and blood vessels, may be fatally depressed by a sudden shock, communicated to the brain and nervous system, and death quickly produced, as in the case of severe blows, extensive burns, and the like; or the depression may be caused by abstraction of the blood itself by hæmorrhage; in such cases, death is the result of faintness. The arterialisation of the blood may be fatally interfered with, and speedy death ensue, from injuries to the nervous system, which interfere with the process of respiration, or by causes which impede directly the access of air to the lungs, causing asphyxia, or suffocation, death being the result of the influence of the unchanged, or it might be called poisonous blood upon the brain. Nearly all cases of

death are, indeed, referable to the above direct causes; but many cases of *sudden* death are most obviously so. Neither is death always owing to one or other of these causes distinctly acting by itself, for they may be variously commingled. The premonitions of approaching dissolution are often strongly marked. Independent of these authenticated cases, in which the mind has been powerfully impressed with the conviction of impending death, independent of, or not directly connected with physical causes, there are others which come under the notice of the physician; such are strange and sudden impulses of the mind, longing after familiar friends or scenes suddenly acquiring unusual force, to be indulged in before the eyes are sealed to the things of this world. As the closing scene draws near, most appear conscious of the coming change; but some hope on to the last, and cherish the idea of a return to earthly joys and sorrows and business, till the latest breath is drawn.

These signs of approaching dissolution are often terrible and distressing to witness in those we have loved, and though, undoubtedly, existence is sometimes terminated in a paroxysmal agony of pain, in slowly approaching death, such as has been described, the sensations are much blunted in consequence of the insufficient change of the blood.

Whether death is slow or quick in its approaches, we usually recognise it as beginning at one of the three vital organs, the brain, the heart, or the lungs, which Sir T. Watson likens to a tripod on which life rests. Of course life ceases when the heart ceases to beat, but the immediate cause of death, the cessation of the heart's action, may be brought about in the three following ways.

(1st.) By arrest of the brain function, causing unconsciousness or coma, as observed in severe injuries of the brain or nervous system; or in the effects of the narcotic poisons, and from loss of blood, acting on the nervous system apart from mere fainting. Such a condition of depression acts on the circulation by impeding the flow of blood and preventing its reaction, and finally by checking the heart's action, the characteristic changes being marked by total loss of sensibility, stertorous breathing, with purpling of the lips and increasing lividity of the countenance.

(2nd.) Death is said to begin at the heart by what is termed syncope or dead faint, in which there is a sudden or continuous withdrawal of blood from the circulation, depriving the heart of its stimulus to contract. Such a condition, though rare, is occasionally met with in persons who die from great loss of blood and of exhausting discharges, and is attended with extreme and uniform pallor of the skin, cold sweats, together with a small and almost imperceptible pulse, and later on, insensibility to all external impressions. A similar condition, causing collapse of the heart's action, but which is quite independent of the supply of blood, occurs in cholera, or may result from a severe blow on the pit of the stomach, in injury of the brain or spinal cord, in cases of death after the inhalation of chloroform, in all of which the supply of blood may be abundant, but there is a paralysis or inability of the heart to fulfil its proper function. Hence, death beginning at the heart may be divided into the two causes, one arising from anæmia or want of blood, and the other from want of power in the heart to contract, a condition termed asthenia. Intermediate between these two opposite conditions, we have deaths from privation, cold and hunger, which may properly be said to involve the heart in the first instance, and are characterised by languor, faintness, great nervous depression, disinclination to be roused, finishing with delirium, coma, and death. Such cases occur among shipwrecked seamen, and others exposed for days and nights to cold, without food or water, and may be classified as deaths beginning at the heart from an arrest of nutrition.

(3rd.) Death beginning at the lungs is a far more common mode of death; it is often termed *asphyxia*, but this word is now very properly replaced by the term *apnœa*, which literally signifies want of breath. In its acutest form this mode of death occurs in suffocation produced by hanging, drowning, or by any other mechanical means which stops the process of respiration beyond three or four minutes, at the end of which interval, life can no longer be sustained. Similar effects are produced by diseases which affect the air passages, especially the glottis, as in croup and diphtheria, when the passage closes on account of a mechanical obstruction; but in the vast majority of deaths from apnœa, the end approaches with the gradual failure of the powers of respiration consequent on the general prostration, and the absence of the inspiratory force requisite to ærate the blood and inflate the lungs.

Such are the modes of death as they apply separately to the functions of the three organs enumerated, but it must always be remembered that the heart, brain, and lungs are so mutually dependant on each other, that the more immediate way in which death approaches will in most cases be exhibited by an impairment of the functions of all three. In no class of persons does this hold better than amongst the old and enfeebled, where, as a rule, all the vital powers are implicated and death arrives in so imperceptible a manner, that it often takes the semblance of a quiet sleep.

The symptoms which indicate that death has actually taken place are, in the majority of instances, perhaps too unequivocal to be mistaken; but sometimes it is not so, and there is a difficulty in determining whether life actually has departed, even hours after any appreciable

sign of conscious existence has been given. The signs of death may be divided into those which precede putrefaction, and the occurrence of that unequivocal evidence itself. Some, indeed, have contended that it alone should be received as evidence of death; but there are obviously many circumstances under which it is impossible to await its occurrence, nor is it necessary to do so.

The absence of apparent respiration is a generally received symptom of death, and a looking glass, or light feather or down, placed before the lips are used as tests. Mr. Harrison, who writes on the medical aspects of death, says both are fallacious, and instances the circumstance represented by Shakespeare, of Prince Henry having been deceived when he carried off the crown from his father's pillow:—

> "By his gates of breath
> There lies a downy feather which stirs not;
> Did he suspire, that light and weightless down
> Perchance must move.'

The light down may be stirred by any passing current, or the mirror may be dimmed by some exhalation from the body, and either prove deceptive.

The most convincing signs of recent death are (1st) the cessation of the pulse and respiration, (2nd) the stiffening or cadaveric rigidity, and (3rd) the cooling of the body. The finger on the pulse at the wrist, or the hand placed over the region of the heart, will usually detect any movement in the circulation, and exposure of the naked chest for a period of two or three minutes, will satisfy a careful observer whether any motion in the lungs remains.

Stiffening or rigidity is a generally received sign of death, on which much dependence is placed. A false rigidity may be present immediately after dissolution, in consequence of death from some nervous affection. It was formerly thought that persons killed by lightning did not become rigid, but the examinations of recent cases have proved this to be erroneous. "The rigidity of death appears to come on with various degrees of rapidity, and its duration is also various. It usually commences in about five or six hours, but it may be deferred considerably longer, even from twenty to thirty hours. When the body is greatly weakened by disease, the rigidity comes on much sooner, but is much more evanescent. It has been known to arise in fifteen or twenty minutes. Its duration varies from twenty-four to thirty-six hours, but may continue many days. In some nervous diseases affecting the living body, rigidity occurs, but scarcely in a way to deceive. When the limbs have become rigid, and the rigidity has been succeeded by flexibility, the fact of death having occurred can never be doubted." Professor Louis, from observations made upon more than five hundred subjects after death, found that the articulations began to stiffen even before the loss of animal heat. Foderé, another authority, has verified the justness of this observation several times in hospitals, and concludes that the flexibility of the limbs is one of the principal signs by which we may judge that a person is not dead, although there is no other sign of life.

The cooling of the body after death from a temperature of 98° Fahr. to that of the surrounding atmosphere, is one of the most marked signs of death. The time occupied in diminishing the temperature is from fifteen to twenty hours, but it varies according to the state of the atmosphere, the amount of clothing on the body, and the mode of death. In cases of sudden death the body has been known to retain its heat for a considerable time longer, than when the person dies of lingering disease.

The occurrence of discolorations on various parts of the body, particularly the most dependent portions, are frequent sequents to death, and the darkening of that portion of the white of the eye which is exposed to light, has also been pointed out as a symptom to be depended upon, and along with it, dilatation of the pupil. The above symptoms, singly, might not perhaps convince of the occurrence of death, but more or less combined, they cannot be doubted. Putrefaction commencing, of course, does away with all doubt.

It may seem to some that it is unnecessary to dwell so minutely upon the evidences of the last great change, but it is a subject on which many entertain great anxiety, and from the fact that a considerable number of ascertained cases have occurred, in which mistakes have been made with respect to death, it is desirable that accurate information upon the subject should be generally diffused. It ought to be remembered that the corpse of a person who has died of a contagious disorder, particularly one of the eruptive fevers, *may* propagate the disease. The influence of season in causing death is well marked. The sudden accession of cold after comparatively mild weather, invariably raises the death-rate of a community, and the effect of great heat in summer tells in a similar way. These effects are illustrated by the weekly tables of mortality, issued by the Registrar-General, and the meteorological changes are more marked in their results on the aged and the very young, than in persons of adult life. It would appear from carefully prepared statistics, that though the hours at which death occurs cannot be specialised, yet on the average, more deaths occur between 6 a.m. and noon, than on any other quarterly division of the day and night.

Lastly, one word as to the treatment of the dying: let quiet attention to every sign, the moistening of the lips, the gently shifted positions, be the attentions; but who can tell how painful the disturbance of the forced stimulant or medicine, the noisy lamentation, or the pulling about or pulling away of pillows, which officious friends are apt to practise, may be to the last moments!

In persons found dead, or apparently so, the first thing is of course to ascertain the real state of the case. If death is doubtful, judging by the signs stated in the early part of this article, the first object must be to ascertain, if possible, the cause of the condition which so nearly approaches to it; this must be the first step, but it must be taken with all possible speed, in order that proper measures for resuscitation may be adopted. The causes may either be natural or violent; of the former, diseased heart, apoplexy, sudden fainting, or suffocation from internal affections, may be in operation; of the latter, suffocation from unnatural causes, poison, wounds, burns, cold, starvation, lightning, include the most probable influences. Some of these, such as burns, wounds, the action of lightning, cold, and many of the usual modes of suffocation, such as hanging, drowning, &c., are too evident, either in themselves or from concomitant circumstances, to be overlooked; but others, particularly those cases of apparent death resulting from natural causes, from some forms of suffocation, and from poisons, are almost beyond the power of the unprofessional to investigate. For the mode of distinguishing, and for the subsequent treatment, the reader is referred to the articles devoted to these subjects. It is repeated, when *a person is found apparently dead, do not let the fact be assumed without investigation*; the spark of life may yet linger in its earthly tenement, may yet be not past recall, beyond which, the loss of even a short time, or the total abandonment of care may quickly place it. If there is the faintest hope that life is not quite gone, whilst the causes of the mishap are investigated, means, such as are recommended under the peculiar circumstances, should be at once adopted, and vigorously—no half measures will turn the scale between life and death. These things are peculiarly important, for often it can only be a fortunate chance that places a medical man on the spot where cases such as the above have occurred. Of course, where it is possible, medical assistance ought to be as quickly procured as may be, but time may or must necessarily elapse, and while it slips by, life slips away, which might be preserved by the knowledge possessed by some intelligent bystander, which might lead him to think that there was still hope—often too readily given up by the crowd—and lead him to direct the adoption of rational and really efficient measures, instead of the useless, or worse than useless, treatment followed, where there is no information to guide, or head to direct.

When persons are found who are undoubtedly dead, there yet remains something to be done, for the cause may be natural, or unnatural, and in the latter case the ends of justice may either be forwarded or retarded by those who first discover the body. The exact position should be noted. The stiffening or not of the limbs. The presence or absence of warmth about the chest or abdomen particularly. The state of the clothes. Whether there are signs of vomited or other matters discharged from the body. Wounds noticed, and the state of the blood upon them, whether fresh, coagulated, but yet soft, or hardened. And, indeed, whatever the circumstances connected with the finding of the body can suggest to the intelligent mind, should be *written down*. On the arrival of the judicial and medical authorities, there are other matters of course to be investigated, which only they can undertake, but as most of those above mentioned are evanescent, the persons first on the spot can best, or only, testify to them, and facts which may appear trivial to note at the moment, may, in criminal cases, be the turning point on which conviction hinges.

Refer to—*Apoplexy—To causes of unexpected death generally.*

DEATH-RATE.—To obtain accurate ideas concerning the health of a community, several methods of calculation have been suggested, but that adopted by the Registrar General in this country appears to answer its purpose as well as any. It is based on the principle of limited districts, either of town or country, and comparing the number of deaths which occur in each, with the population then living in the district, allowance being made from time to time for increase, or, if necessary, for a diminution of the population. Such calculations are of much interest and importance, as they throw light on many questions connected with disease, and the salubrity or otherwise of the town or district of country. The death-rate in England and Wales is thus shown, by lumping town and country together, to amount to 22 in 1000, that is to say, there is an average annual mortality of 22 persons, among every 1000 living, or 1 death in every 45 persons, in the course of the year. The range of the various districts runs from 15, the minimum, to 31, the maximum, per 1000, the larger rates occuring among the dense population of the large towns. London is better off in this respect than most large cities, the death-rate of London, averaging 22 per 1000, while Blackburn, Preston, and other manufacturing places, have a death-rate as high as 30 per 1000. Numerous foreign cities have a death-rate even higher than these. Turin, Naples, Trieste, all range between 30 and 40 per 1000; and St. Petersburg, in the same year that these calculations were made, rose as high as 47 in 1000; but these taken together are the worst figures which Europe supplies. The best figures, as showing a small death-rate in towns in this country, were for the year under consideration, those of Dover and Rochester, which were respectively 15 and 18 per 1000.

DEBILITY, or WEAKNESS, is a falling off from the usual power of the individual to perform those exertions, whether of duty or

pleasure, in which he has habitually engaged, and which, judging from the constitution, mode of life, &c., he might naturally be expected to perform.

Illness and debility may also be said to be synonymous, for it is difficult to imagine the former unaccompanied or not followed by weakness, except in the few exceptional instances, in which apparent debility, caused by the presence of morbid matter in the blood, is relieved by the disorder which carries off the cause of the depression. Such is seen to be the case in mild attacks of bilious diarrhœa, which do not go far enough to affect the general strength, and which are immediately followed by relief to the feelings of languor and weakness which preceded them; indeed, unwonted discharges of any kind, whether in the urine, or from the skin, or even of blood in small quantity, if they do not go too far, are often followed by feelings of strength rather than of debility. In these cases, however, the debility was apparent, not real; that of oppression, rather than of depression. To these and similar sources, then, may be referred all those causes of apparent debility, or in other words of languor or torpor, which arise from impurity of the blood, consequent upon the retention of noxious matters in that fluid, which are from some cause unremoved, as they ought to be, by the agency either of lungs, liver, kidneys, bowels, or skin, or which have been absorbed into the vital fluid from without.

It may be said that these are not cases of debility at all, and perhaps by medical men, understanding and strictly investigating their causes, they would not be considered so; nevertheless they give rise to an appearance of weakness, of which the unprofessional only can judge, and under these circumstances, it is requisite plainly to point out the distinction, which is of no light importance in the modes of treatment and management usually resorted to. A person from some cause or other gets his blood loaded with morbid matter; either he has indulged in too full living, animal diet and alcoholic drinks especially, or he has neglected to take exercise, or to keep the skin in active operation; or the lungs, liver, kidneys, or bowels are oppressed or inactive; he has, in fact, more or less poisonous matter circulating throughout his frame,—he feels low, both in body and mind, languid and listless, thinks himself weak, and takes, perhaps, a little extra animal food, a little more wine or malt liquor, to correct the *supposed* debility. The consequence must be a fit of illness of some kind, "a bilious attack," a fit of gout or gravel, of piles or of some cutaneous eruption, which the system makes a safety valve; or it may be that apoplexy or some other congestive disease is induced. It is surely superfluous to say more respecting the serious tendency of such an error as that which mistakes false debility for real, and induces the individual, instead of seeking strength by the reduction and alteration of his diet, and by the regulation of the excreting functions of the body, either by general or medicinal means, to rush to the other extreme, and, in the endeavour to get rid of the disorder, to add to the causes of it. Of course real debility may co-exist with apparent, the result of impure blood; such happens in acute or exhausting affections of the liver, lungs, &c., and the case assumes a complicated and highly dangerous character.

As apparent debility is referred to impurity of blood, so the cause of real debility must be looked for, in many cases, in its deterioration or deficiency. The vital fluid, which is the medium for supporting our animal temperature, and for supplying plastic elements to the ever-wearing textures of the body, may be deficient in all or any of the elements required for these purposes, or it may itself have been drained away by hæmorrhage. The first office of the blood, the maintenance of animal heat, is so essential, that it seems arranged by the Author and Supporter of our life, that to carry on this, the soft constituents of the body may be sacrificed almost to the extreme limit, but this very circumstance must be a cause of debility during illness, when, to obtain fuel as it were muscular substance is consumed away, whilst muscular motion is unexercised. Again, whatever plastic elements the blood may be deficient in, the organs to which those elements should be supplied become debilitated. This is most strikingly exemplified in the case of the bones in childhood, where food is deficient, which become soft—rickety—for want of the due supply of earthy matter; still more generally is it exemplified in those cases so often quoted, of animals fed, or rather starved, upon certain kinds of food, such as arrow-root, white sugar, bread made of fine flour, &c., which, however wholesome as articles of diet in themselves, do not contain plastic elements sufficient for the building up or sustaining the bodily tissues in strength and healthy active operation; to deficiency, therefore, of the blood, as regards those elements required in the unceasing operations of the living frame, must we look for the most generally operating and palpable cause of debility. But this cause is itself only an effect of other causes. If the blood is to nourish well, it must be nourished well itself; the supplies it is ever yielding to the system must be rendered to it from without; the food must not only be in quantity and quality sufficient to preserve the balance of nutrient materials in the blood, but it must be properly digested, properly fitted for its commixture with the vital fluid; if either food or digestion be deficient, debility, more or less, must be the result.

Many causes, of course, may operate to diminish, or totally prevent, the supplies of food taken; febrile disease of any kind, accident, disorders of the digestive organs, and numberless others do this, and so surely as they do—except,

to be sure, where a little wholesome starvation is required—so surely does debility follow; for although food may neither be taken nor digested, the bodily requirements, heat, movement, and even the power of thought, must be kept going, and if the materials are not furnished from without, they will be taken from within; the body preys upon itself as it were, lives upon its capital, and it is needless to say that debility must result. The body, in such a case, might well be compared to a steamer at sea run short of coal, the inner wood-work of which, even at the risk of weakening the hull, is necessarily broken up to supply the engine, and to enable the vessel to reach the harbour of safety; so the body, suffering under acute disease, and unsupplied with food, must make use of that which constitutes its internal structure, although it may be fearfully weakened, or perhaps destroyed by the process. The supply of proper nutriment, and its presence in the blood, are so intimately connected, that they may be regarded as one and the great source of real strength. Without good blood, neither muscle, nerve, nor any other constituent of the body, can be in its best state of healthy efficiency. Of course, deficiency of the circulating fluid, caused either by loss from hæmorrhage, or any other drain which abstracts all or part of its constituents, must act as a cause of debility equally with those previously mentioned.

Again, the blood may be adequate to fulfil all that is required of it, but some organ fails; it seems to lose its power of appropriating to itself elements fitted for its nutrition, although brought to it in the circulation, even in sufficient proportion to maintain moderate healthy action, or the individual organ may be over-tasked and debilitated, its tissues used up more rapidly than they can be repaired, or its nervous power exhausted. Here we have another source of strength or weakness, real or apparent, the nervous power, the agent through which movement is communicated. The action of the nervous system, as regards strength or debility, must be looked at in connection with its healthy or its morbid operation; in other words, its strength consists in the amount of exertion it is capable of stimulating and maintaining, either generally or partially, without subsequent exhaustion. This limitation is requisite, for were it not drawn, it would make the excitement of the nervous system the measure of strength, it would make the transitory exertions of enormous power exhibited at times by patients in the last stages of real debility from fever, or the almost resistless struggles of the delicate hysterical girl, tests of real strength, instead of paroxysms of morbid excitement, which terminate in the most exhausting, or it may be, fatal debility and collapse.

In the healthy constitution, all the tissues of the body, including the blood, receive and utilise nutriment sufficient for their requirements, and in this lies the true element of strength. To use a simile, the machine must be strong in all its parts, and its moving power adequate to its requirements, to constitute real well-balanced strength.

When the central organ of the nervous system, the brain itself, becomes debilitated, the condition may be manifested by affections of the body, partial or general, or by disorders of the mind. The brain may be debilitated or exhausted by the excessive stimulation of alcohol, opium, and other agents which act upon it peculiarly, also by sensual excesses, over-nursing and the like; but perhaps the most frequent source of weakened brain, is undue exertion of it as the agent of the mind; it is tasked till it gives way, *is used* up. Such is not unfrequently the case among persons who overstrain their minds by occasional fits of hard mental work, and especially among men engaged largely in mercantile speculations, and subject in consequence to alternating fits of excitement and depression, producing irregularity of action in the nerve fibres, and ultimately functional derangement. In persons of irritable and nervous temperament it is not uncommon to find deposits of phosphatic salts in the urine after the mind has been strained, and we can only look to the nervous system and brain as the most probable source of the additional excretion of phosphorus. The subject is undoubtedly an obscure one at present, but it is deserving of notice, from bringing directly and sensibly to the mind, and in a physical point of view, the possible and probable manner in which this wonderful agent of man's intellect may be, and is exhausted.

Having then seen that debility may either be apparent or real, and that in the latter case it may depend upon deficient nutriment or deficient healthy supply of nervous power, it remains to consider the causes which most generally tend to bring about these conditions.

Debility has been divided into original and acquired. The former is witnessed in the children of parents whose constitutions have been weakened by any cause, such as dissipation, advanced life, &c., and also in the children of scrofulous families. The latter or acquired debility, may, of course, be caused by whatever lowers the standard of health. As already mentioned, insufficient nourishment is one great source of debility; likewise, the absence of the usual stimuli of solar heat and light, deficiency of fresh air and exercise, and of stimulation to the mind by a proper amount of healthy active exertion. Again, there is the debility produced by the direct action of injurious agents, a continued damp climate, either warm or cold, poisons gradually absorbed in necessary employment, or accidentally but continually taken into the system, and such like; and also by depressing passions of the mind, such as anxiety, fear, &c.

Lastly, there is debility, the result of direct abstracting and exhausting influences—any habitual loss of blood, or drain, or discharge

of any kind, over-nursing, or sexual excesses. One especial cause of debility requires notice, it is that occasioned in young children or people who sleep with the aged; for the fact is an undoubted one, that the practice has an extremely debilitating effect upon the former. It is one which should never be followed or permitted. The withdrawal of accustomed excitements often occasions debility of an alarming and even fatal character. The debilitated drunkard or the opium eater cannot without danger be deprived of his usual stimulant, and even the man who has lived in the most perfect moderation, cannot always, without danger of inducing great debility, leave off an accustomed stimulus. It is not said that in many instances this may not be done with impunity, or even benefit, but there are cases in which it is hazardous. The effect is not manifested, perhaps, for a considerable time, it may be weeks or months, but it *is* manifested some time; and the author has met with some cases of extreme depression and general weakness, traceable to no other cause than an unadvised and rigid adherence to the strict rule of teetotalism. It matters not what the long-accustomed stimulant may have been, that of alcohol, of fresh air, of mental exertion, it cannot be withdrawn without danger of inducing weakness.

In the treatment of debility, whether simple, or complicated with disease, it must be obvious to all that it must be adopted with due reference to the cause. This must, if persistent, be removed or rectified as quickly as possible; if the mischief, as occurs in original debility, or in that produced by causes which have ceased to operate, cannot be prevented, of course nothing remains but to build up or restore strength by nourishment, tonic medicines, change of air and scene, especially to the sea side when that is practicable. In every case, however, of marked debility, the medical man should be consulted; he only is likely to detect with certainty the cause or causes, and to direct the adoption of appropriate remedies.

It may seem that too much space has been devoted to this subject, but it is one which is so erroneously regarded by the public in general, particularly by the lower classes, that it is a matter of importance for juster views to be imparted, that there should be a more enlightened understanding of the subject, of the principles by which debility is to be judged and treated. The case of apparent debility was disposed of in the first portion of this article. In the weakness which accompanies fever and acute inflammatory attacks, nothing is at times more difficult than to convince people, not only of the utter uselessness, but of the injuriousness, of administering any food but that of the mildest and most unstimulating character, such as the appetite alone desires, if it desires it at all; and notwithstanding that nature herself points instinctively to the proper course, they will persist in the idea, that if the person "would eat he would be better." Undoubtedly if he would and could eat, and *digest* the food taken, he would be better, for he must be better beforehand to do so; but the popular idea is, that if food be but got into the stomach, it must give strength, and foolish friends foster the same impression in the mind of the invalid, till he forces himself to take food; and many a promising case is thrown back in this way, although the medical attendant is never informed of and can only guess at the cause. Fortunately, nature often resents the error, and vomiting relieves the stomach of its injurious load; if not, fever, headache, &c., and relapse are too frequent consequences.

It is repeated, in the treatment of debility, whatever may be the cause, if still in operation, *that must* be rectified, but the weakness itself is only to be repaired by a sufficiently ample supply and circulation of healthy blood. The latter must be procured by every means which tend to enrich and purify the vital fluid: good food well digested, air, exercise, and the use of all accessories to health, and assisted when suitable by such regular and regulated exercise of the debilitated parts themselves, as will increase the circulation of blood through them, without exhausting either their constituent tissues or nervous power; but it is useless, and worse than useless, to load a stomach which cannot digest it, with food and drink, in the vain hope of giving strength, as people too often do, or wish to do, in cases of febrile or other disease. To resume the simile of the steamer, although the seasoned wood-work within may be broken up to feed the engine, and to carry the vessel safely into port, it would be no slight hindrance, and no small aggravation of her danger, were she to be loaded with water-logged or green wood, which would not burn when it was wanted; so it is with the body in fever: the already prepared and digested components stored up in its tissues, though not perhaps accumulated for the special purpose, will yet answer well to keep *its* works in movement; but crude food is like the green wet wood, useless for good, and fitted only to overload and retard. When increase of nourishment is called for in cases of debility, care must always be taken to adapt it to the condition of the digestive organs; these are generally weakened, and while the food given contains much nutriment, it should be as easily soluble in the stomach as possible. For information on this head, however, the reader is referred to the articles on *Digestion*, *Food*, *&c.*

Refer to—*Animal Heat—Bilious Cholera—Blood—Fever—Nerves—Cookery*, *&c.*

DECAY, or the gradual giving way of the physical powers in old age, may almost be considered as a part of the preceding article. After the sixtieth year in men, and somewhat later in women, as a general rule, the period of old age or of decay commences; the descent has

begun, imperceptibly perhaps at first, but it is progressive. There may be no positive disease, but the circulatory powers fail, the arteries lose their elasticity and tone, and in this, perhaps, lies one great cause of the decay of the body generally, the deficient circulation of the blood; the brain, the muscles, the whole body becomes smaller, shrinks, and if there is no disease, the powers of material life are gradually extinguished; a fall of a few degrees in the thermometer may be all that is required to put out the flickering flame. For the management of this stage of life the reader is referred to the article on *Old Age*.

DECIDUA, or DECIDUOUS MEMBRANES, are those which line the uterus during pregnancy, and which are cast off shortly after the birth of the child.

DECLINE.—See CONSUMPTION.

DECOCTION literally means a preparation which has been boiled; but in medicine, by the term is understood that which has been boiled for a certain length of time for the purpose of extracting matters from crude materials, which cannot otherwise be obtained. Moreover, when improperly employed as a process, it drives off volatile matters, which ought to be retained. The most useful decoctions used in medicines are—

Compound decoction of aloes.
Decoction of cinchona bark.
Decoction of oak bark.
Decoction of sarsaparilla.
Decoction of log wood.
Decoction of senega or snake root.
Decoction of elm bark.
Decoction of poppy.

And the preparations, gruel, barley-water, &c., are also classed with the decoctions.

There are many other medicinal decoctions, but they either do not require mention in this work, or the preparation, as in the case of dandelion, broom, &c., is better made as infusion. For information respecting those mentioned, the reader is referred to the respective articles.

DECOMPOSITION is the separation of the component principles or elements of compound bodies from each other, the process being either naturally or artificially excited.—See *Antiseptics—Fermentation—Putrefaction*.

DEFORMITY means "any and every deviation from the recognised symmetrical proportions of the human frame;" but the word is more definitively applied to those irregularities of form which consist in partial deviation from the natural position of the body, unaccompanied by malformation of the general original structure. Deformities are either congenital—that is, dating from birth—or acquired. With respect to the causes of congenital deformities, "some are at present inclined to attribute them to a mental impression, generally a sudden one, received by the mother during pregnancy, but it oftentimes happens that the mother can assign no cause; in other cases the deformity appears hereditary." "In non-congenital cases, teething, worms, irritation of the spinal cord, and infantile paralysis, are frequent causes. Certain occupations, such as much standing, or carrying heavy loads; position also may be regarded as a cause, especially in lateral curvature of the spine; but occasionally we are at a loss to discover any cause, the deformity coming on insensibly, while the patient is apparently in perfect health." These cases, if attended to at their commencement, might certainly be relieved and prevented, but it often unfortunately happens that there is little interference with the general health; the deformity, as in the foot for instance, coming on insidiously, no attention is paid to the circumstance; a weakness, as it is termed, of the ankle is felt, and the foot deviates occasionally from its natural position, and thus, if the case be neglected, the foundation is laid for a permanent deformity, or at all events a permanent weakness of one or both limbs, which may involve their being disabled for life.—See *Ankle*.

The most simple form of distortion is the horse foot, which consists of complete elevation of the heel, so that the patient in walking rests entirely on the toes (fig. 66). This deformity

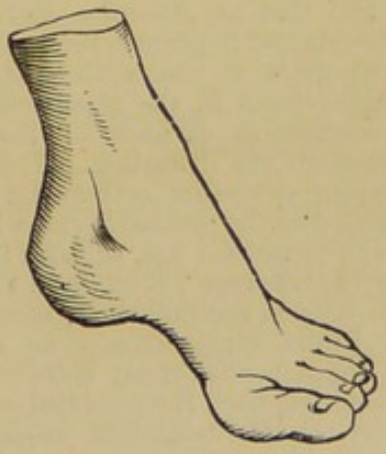


Fig. 66.

is rarely met with as a congenital affection, but as explained by Mr. Tamplin, it arises as a consequence of disorder of the system, and more especially of nervous irritation, such as that caused by teething, worms, &c. It may also be occasioned by wounds or local irritations, such as ulcers, affecting the calf of the leg, or "it may arise spontaneously, the patient experiencing no pain or inconvenience beyond the inability to bend the foot or ankle joint in the act of walking, and retaining at the same time power over all the muscles. When weakness of the ligaments of the ankle joint is conjoined with the above deformity, in the course of time the foot is liable to become so much distorted, that the person at length comes to rest on its outer edge in walking.

Another deformity of the foot, that in which

it is simply bent inwards, may date from birth and frequently does, but it may also be induced by various causes of irritation affecting the nervous system. The flat or splay foot, although it may be a congenital formation, is also liable to be caused, where previous debility exists, by the carrying of heavy loads, and other things which necessitate much pressure upon the arch of the foot. "The first thing which attracts the attention of patients to this deformity in its incipient state, is a sense of weakness, more especially on the outer side of the ankle joint;" they then observe the flat appearance of the sole of the foot, and the tendency of the inner ankle to approach the ground in walking; as the deformity increases, the pain in the joint, and the sense of weakness increase to such an extent, that the patient becomes totally unable to follow his ordinary occupation.

It would be superfluous waste of time and space here to enter further into a consideration of the various deviations from the natural formation to which the limbs are liable. Suffice it, that whether the infant is born with these deformities, or whether it becomes the subject of them as life advances, they *cannot too soon* be submitted to medical management; modern surgery has demonstrated that they are remediable so far, that all striking deformity is removed, and that an otherwise almost useless member is adapted to perform its natural offices, if not with grace, at least with comfort. The great improvement in the treatment of these defects consists in division of the tendons which occasion the distortion. This practice Mr. Tamplin and other orthopædic surgeons recommended as the preferable one, whether for infants at the earliest age, or later in life, for the following reasons: "First, from the facility with which it is accomplished; secondly, because it incurs comparatively no risk, and scarcely any inconvenience; thirdly, because you at once overcome the principal resistance, and render the after-treatment painless to the patient, and comparatively easy to the attendant, independently of which, the child is not subjected to such constant confinement of the limb as is absolutely necessary when you do not have recourse to an operation; you can allow exercise to be taken for a certain time during the day, and that, even in infants, must have a most beneficial effect." Much benefit, however, is derived from wearing supporting apparatus suitable for each particular deformity. Boots with leg irons and bands made to grasp the limb, either above or below the knee, are now universally made use of for weak knees or ankles, and for other deformities arising from softening of the bones.

The above remarks have been brought forward in the hope that parents, and others having the care of children, may not, knowing the general causes of non-congenital deformity, neglect the first warning symptoms of its insidious approach, and in the case of children born with distortions, may place them at the earliest possible period under efficient surgical management, and not be deterred by the fear of an operation, which, in proper hands, is perfectly safe, comparatively painless, and unattended with loss of blood.

Deformity occurs from the softened condition of the bones in the disease of childhood named rickets, and also from softening of the bones in adults, but these cases are the effect of distinct and well-marked diseases.—See *Rickets—Softening of Bones, &c.*

Deformities and contractions of the shoulder and elbow joint are very generally the result of injury or disease. The wrist joint and the joints of the fingers are also liable to distortion from the same cause; in some cases the contraction is seated in the skin, as in cicatrices from burns, in others the joints are deformed and perhaps displaced by rheumatic disease. Deformity of the fingers may also be congenital. Such cases should be put at once under the management of the surgeon.

Refer to—*Neck—Rickets—Spine, &c.*

DELIRIUM is a temporary disordered condition of the mental faculties, occurring during illness, either of a febrile or of an exhausting character. It is generally a symptom of serious import, but not always; many children, and some adults, become partially delirious, or "wandering," from very slight causes, even a simple feverish cold being sufficient to produce the effect; in such cases, of course, judgment must be formed with some reservation. In fever, and febrile diseases generally, delirium may be no more than slight confusion of ideas on waking from sleep, or it may amount to furious and dangerous excitement, or merge in low muttering, or terminate in confirmed coma or stupor.

Delirium may be the effect of disordered or inflammatory action affecting the brain itself, or it may be sympathetic with active disease in other parts of the body, such as the heart or kidneys, or it may be caused by long-continued and exhausting pain, and by a state of inanition of the nervous system. In the treatment and alleviation of the symptom, it is of the highest importance that it should be ascertained to which of the above conditions it is owing, and from this circumstance, any attempts to remedy it by the unprofessional—who must be liable to error on this head—cannot but be attended with great risk. It may, however, at times, be requisite even to run this risk, for the chance of doing good, and then the following directions may serve as some guide:—

When delirium occurs in a person of full habit of body, accompanied with inflammatory fever, with quick strong pulse, bloodshot eye, and flushed countenance, abstraction of blood in the first instance, either from the arm, by leeches, or by cupping, cannot fail to be of service; along with bleeding, free purging with

calomel, combined with compound colocynth pill, with jalap or scammony, or followed by senna and Epsom salts, should be resorted to; the head should be shaved and kept cool, with the coldest applications to be procured, the feet should be kept warm, the room darkened, and every source of excitement removed. If there is violent effort, and unruly conduct, the limbs must be restrained firmly, but gently, whenever attempts to exercise them in an improper manner are made. In this case a broad belt passed loosely over the bed, and fastened at each side, so as to confine only when any attempt at rising is made, is of considerable assistance. In this form of delirium, it is of the most essential import that watch should be kept without one moment's interval, night and day; there must be no risk run of sleepy attendants, and there must be sufficient physical power to restrain the almost superhuman, though transient, efforts made by delirious patients. Some of the most painfully distressing accidents of illness have occured in consequence of neglect of these precautions; one unguarded moment, one five minutes' sleep, have neutralised days and nights of anxious care and watching; in the brief interval of remitted surveillance, the patient has escaped from bed, from room, even from house, by the usual modes of egress, or has dashed madly through the first window in his way, or laid hold of the first means of self-destruction. The force of the excitement, it is true, is generally soon over, but it lasts long enough for serious or fatal mischief; no apparent quiet for some time is to be trusted; unceasing care must be exercised till intelligence returns.

In the low forms of delirium, the mental disturbance is equally complete as in the acute forms, but the violence of the inflammatory fever is absent; generally, the person lies in a dreamy state of incoherent thought; but even in this form, occasional fits of excitement, and attempts to get out of bed, and the like, occur, and must be guarded against. It is this form of delirium which generally becomes developed in the progress of typhus and typhoid fever. The temperature is scarcely so high as in the inflammatory attack, the vessels do not throb in the same manner, and the eyes are not blood-shot, the pulse is feebler and more easily extinguished, the tongue and the hands are tremulous, the former when protruded, and the hands are perhaps affected with convulsive startings. When these symptoms are at all marked, there can be but little doubt as to the nature of the case. To take away blood is to kill; the head is to be kept cool, the bowels moderately but sufficiently opened, and the warmth of the feet attended to, perfect quiet being observed around the patient. In such a condition, particularly *if there is tendency to nervous or convulsive twitching of the fingers or of the tendons at the wrist*, opium may certainly be given with benefit—the best form is Battley's sedative solution; the dose for an adult fifteen drops in the evening, five drops additional being given every two hours till sleep is procured, or till thirty drops have been administered in all; or the muriate of morphia may be given, in half or quarter grain doses, in the same manner; or in the absence of these, any other preparation of opium in corresponding quantity. The hydrate of chloral in doses of ten or fifteen grains may be given often with advantage to procure sleep, when it is not advisable to use opium. Sleep is the only remedy for the irritation and irritable exhaustion of the nervous system which is attended with this form of delirium, and opium is mainly to be trusted to for procuring its benefits. Strong meat soups, and wine, may also be requisite, but the consideration of these matters rather belongs to the subject of fever.

A form of delirium, accompanied with much nervous irritation, is apt to be developed in the course of scarlet fever, towards the third day of the eruption, or when it is beginning to fade. In the progress of rheumatic fever, this same delirium of exhaustion may occur, and, like the others already mentioned, requires the treatment by opium.

Traumatic delirium takes either of the above forms, according to circumstances, but it is more generally the low type, especially when consecutive to severe accident or operation, or during protracted child-birth; generally, therefore, opiates and supporting measures, meat, broth, wine, and bark, &c., are required, rather than the reverse.

It is of consequence that delirium should not be mistaken for insanity, as it might be and has been, but scarcely ought to be by a medical man. The concomitant circumstances of disease, &c., will generally guide. In true delirium the presence of fever more or less, the acute disorder of the functions generally, such as digestion, &c., and the disorder of the *whole* mind, generally sufficiently indicate its distinctness from insanity, in which the faculties of the mind are only perhaps partly affected or perverted, and disconnected. The insane, moreover, do not exhibit the appearance of illness which accompanies true delirium, and the functions are not usually impaired in the same way. Still the two affections may nearly approach one another, and in the form of delirium which follows child-birth or the delirium tremens of the drunkard, it may often be difficult to make the definition as to which the case belongs. Still more difficult of discrimination are some cases of hysterical delirium, which, when long continued, might well be mistaken for insanity, unless submitted to medical judgment; indeed, in every case of delirium, medical assistance should be procured as early as possible. No unprofessional person in his senses would think of treating a case of delirium, when professional assistance is at

hand. In its absence, the foregoing article should be useful.—See *Insanity*.

DELIRIUM TREMENS consists of a peculiar exhausted condition of the nervous system, which is accompanied with more or less mental disorder of a peculiar kind. This disease is generally the result of excessive continued intoxication with alcoholic liquors, or of their withdrawal when they have been habitually consumed in considerable quantity; it may also, however, be produced by the continued use of opium, and has been known to arise from other causes of cerebral exhaustion. The first symptom of delirium tremens is a state of restless nervous irritation, if the exciting cause be continued, sleeplessness follows, there is no rest, and if there is any approach to sleep, it is haunted by dreams and figures, which seem to excite the greatest terror; the mind is more collected than in most other forms of delirium, but seems always to be more or less haunted with suspicions of those around. The entire frame is in a state of tremor, the closed eyelids and the protruded tongue are tremulous; the hand which attempts to perform any action requiring exactness, cannot execute it for shaking; the patient is exhausted, and still sleep does not come. Succeeding the above condition, the nervous excitement becomes so great that the person cannot be kept in bed, the mind becomes more disordered, a state of temporary insanity ensues, and convulsions, epilepsy, or apoplectic stupor close the scene; a scene of the most painful nature, perhaps, which the physician is called to witness—the death-bed of the drunkard—of the man slain by his own suicidal act, by the poison of alcohol.

Delirium tremens often supervenes in cases of injury, and tends greatly to complicate the cure, especially if the injury happens to be of a serious nature. It may continue for three or four days or even longer, though it usually succumbs to the remedies prescribed by the doctor.

It can rarely happen that an unprofessional person could have to undertake, unassisted, the management of a case of delirium tremens, and never should do so, except under extreme necessity. The nature of the disease is, unhappily, in almost all cases too palpable, from its exciting cause. It is an exhausted condition of the brain and nervous system, and the great effort must be to alleviate this exhaustion, too great even for sleep. Opium is *the* remedy among others, and must be given in full doses. A medical man will of course give it more freely at once than another person; but in a confirmed case of delirium tremens, twenty-five drops of Battley's solution, or thirty of laudanum should be given at once, and repeated until sleep has been procured. Should the opium fail to give relief, twenty grains of chloral, either alone or combined with some aromatic stimulant, may be given and repeated at intervals. It often happens that the stomach is in so irritable a condition that it will retain neither food nor medicine; in such a case, the opium is better given by hypodermic injection, and repeated should the occasion require it, but the person should be carefully watched, lest the narcotic should produce a too powerful effect. In some cases of delirium tremens, the liver is more or less affected, it is loaded with dark unhealthy bile, and so much is this the case, that some have been inclined to attribute many of the symptoms of delirium tremens to the liver disorder, and to recommend a purgative treatment, in preference to that by opium. The author has generally found the medium course the best, that is the combination of opium with calomel, and the compound colocynth pill. Five grains of powdered opium, ten grains of calomel, and twenty of compound colocynth pill, are to be compounded together and divided into twelve pills; of these, two or three should be given for the first dose, and one at intervals of an hour between each, till six have been given. Under this treatment, after sleep has continued for some time, the bowels are generally acted upon, with immense discharge of dark black-looking bile, much to the relief of the patient. After this, the remaining pills may be given, two every night, and castor oil in the morning, if required; five, ten, or fifteen drop doses of laudanum, or two teaspoonful doses of paregoric being given if the nervous irritation is unsubdued, or threatens to return. After the nervous irritation is tolerably well subsided, the next object must be to restore the tone of the stomach. Eight-grain doses of the carbonates of soda, or potash, combined with a tonic bitter, calumba, gentian or chamomile, may be given for this purpose, every eight hours, or quinine or bark, in some form, will be found useful. Bitter beer, with ten drops of potash solution, may be very serviceable. During the whole treatment, it may be necessary to allow the unfortunate subject of the disease a *certain regulated* portion of alcoholic stimulant, such as brandy and water, in some degree proportioned to the previous habits, and as soon as the stomach will bear it, the nourishment of strong meat broths, yolk of raw egg, beat up with a little brandy, or gruel or arrow-root, with brandy, should be given. If the tongue is very red at the tip, and if the pit of the stomach is very tender, milk, with or without the addition of a little brandy, should be substituted for the above; fifteen drops of solution of potash, or one or two tablespoonfuls of fluid magnesia or of lime-water, may be added to the milk with advantage. In cases of persistent sickness, effervescing draughts, and ice given in small, frequently repeated fragments, are often useful. The reception of nourishment by the system is of the highest importance in this disease; so much indeed, is this the case, that as long as a man continues to take food freely, he is not likely

to become the subject of delirium tremens. The necessity for the continuance, in reduced quantity, during the treatment, of the stimulant which has produced the disease, is evidenced by the fact, that many cases of delirium tremens are precipitated at least, by the sudden withdrawal of the accustomed excitement, and relieved by its renewal; and for the same reason the radical removal of this fearful disease, or indeed of intemperance generally, though it can only be effected by the abandonment of the pernicious habit, must in many cases be conducted with extreme caution, otherwise dangerous or fatal consequences may result. Undoubtedly, men of naturally good nervous power, whose stomachs still retain some of their pristine tone, and can receive and digest food in tolerable quantity, and where the constitution has not been thoroughly sapped by intemperance, may, and do with impunity and benefit abandon at once their habits of drinking, and when this can be done, it is the safest and most certain plan; but many cannot do this without risk, and must go more cautiously to work. Where spirits have been consumed, let them be exchanged for wine or malt liquor, in reduced and reducing quantities. At the same time, with all who are endeavouring to break through the evil habits of intemperance, some innocent and rational excitement ought to be substituted for the pernicious one; excitement of mind or body of some kind must take the place of that which has been abandoned, if the full benefit of the change is to be derived.

Many methods have been devised for gradually weaning the intemperate from the craved excitement: perhaps one of the most feasible is that of commencing with a certain quantity of the accustomed stimulant, taking from it a measured proportion only every day, and for every measure withdrawn, substituting an equal quantity of water. The plan is a good one, but no plan will succeed without the firmest determination of the drinker to conquer the vice which is dragging him to ruin in this world and the next. If he will make this resolve, and pray to Him who alone can strengthen and uphold man's feeble will, then may he hope to overcome. Again it is repeated, the intemperate man, whose constitutional powers will enable him at once and without compromise to cast aside the vice, has the easiest task; but no man should do so except by medical sanction, and the further advanced in life, and the more confirmed the habits of the patient, the more necessary does the precaution become. But in any case in which a person, who has been in the habit of taking alcoholic stimuli, abandons the custom, he should be under medical surveillance for a considerable time after; otherwise, formidable depression of some or all of the vital functions may be the result.

The question of restraint in cases of delirium tremens is one of much importance; at times it becomes absolutely necessary to exercise it, for the preservation both of the patient and of those around. When the necessity does arise, it must be put in force with as much gentleness as may be compatible with firm command. The individual suffering should be kept in a bed where there is room for persons to be on each side, and all efforts at violence should be restrained by *perfectly adequate physical* power in the attendants. It is not necessary to keep the hands constantly upon the patient; if he knows—and he is generally conscious enough for this—and feels that he is mastered, he will remain quiet; but if by the temporary absence of an attendant, he thinks he can overpower the others, he again becomes unruly. This consciousness of hopeless effort on the part of the patient is in many cases the most powerful means of restraint. A strong webbing band made to cross over the bed about the middle, and to buckle at one side, is often extremely useful in checking sudden violence, whilst it ought to be sufficiently loose to prevent any feeling of restraint, such as the straight waistcoat gives rise to, thereby irritating the patient to a great degree, and inciting him to ceaseless and exhausting efforts to get free; the latter should never be used except under great necessity. The question of permanent restraint, where repeated attacks of delirium tremens occur, and where the patient is continually in a condition verging upon insanity, is a very puzzling one, in consequence of there being no asylum adapted for such cases. The person when at liberty *will* drink, and when he drinks he is mad; but when sober, or nearly so, his mind is not sufficiently affected to class him with the insane.

The difficulty of dealing with such cases is often extreme, both to the family of the patient and to the medical attendant. There may, it is true, be procured a keeper or guardian, but comparatively few can incur this expense, and it is but an insufficient safeguard after all; the consequence is, that numbers of such patients are kept at home; they cannot be prevented from indulging their irresistible propensity to intoxication, and so, for a longer or shorter time, they are a source of danger and of terror to their family, and to every one around, and run hourly risk of terminating their own miserable existence by a more speedy description of suicide than the one they are following. It is much to be regretted that no proper provision is made in this country for the reception of such cases, which cannot properly be transferred to a lunatic asylum; for no sooner is the stimulant withheld, or regulated, than they become restored to sufficient intelligence, at least, to make them unfit inmates of the place.

Refer to—*Alcohol*—*Intemperance*—*Dipsomania*.

DELIVERY.—See CHILD-BED.

DEMULCENTS.—The name, as used in

medicine, is applied to remedies which exercise a soothing influence, more especially upon the mucous membranes and upon the skin, when these are from any cause in a state of irritation. The demulcent may either be applied directly to the irritated and irritable surface, as in the case of the stomach and bowels, or indirectly, as in the case of irritation of the urinary passages, and of the bronchi or air tubes.

The principal demulcents are:—

Almond (sweet).
Arrow-root.
Carrageen moss.
Eggs, in the form of emulsion.
Gelatine and isinglass.
Grains, in their preparations: barley-water gruel, &c.
Gum arabic.
Lard.
Linseed.
Liquorice.
Marsh mallow
Oils.
Sago.
Spermaceti.
Tapioca
Tragacanth gum.
Wax.

It cannot be said that any of the above substances act as medicines in the proper sense of the word; nevertheless, they constitute a class of remedies peculiarly valuable for domestic use. They are perfectly safe, and certainly most beneficial; at the same time, it is a necessary caution that the prolonged use of demulcent remedies is liable in some persons to occasion a relaxed and debilitated condition of the system. For further information respecting individuals of the class, the reader is referred to the separate articles.

DENGUE, or DANDY FEVER, is the name of a fever which has occurred in an epidemic form in the East and West Indies, and also in North America. The disease presents many of the characters of an eruptive fever, like measles or scarlatina, combined with pain and swelling of the joints, and the symptoms of acute rheumatism. It is liable to frequent remissions or relapses, and must be treated in a similar way to other fevers. The disease is scarcely known in this country.

DENTIFRICE.—See TEETH.

DENTITION.—See TEETH.

DEOBSTRUENTS are medicines which have, or are supposed to have, the power of removing unnatural thickenings or formations from any portions of the body. Such medicines were formerly much more used and depended upon, particularly as external applications, than they are now. That is, there were many substances employed for a sort of mysterious deobstruent action, which probably possessed no such action at all. Mercury, iodine, cod-liver oil, and friction are, however, deobstruents to be trusted, and are much employed as such in the present day.

DEODORANTS are chemical or vegetable substances, which disguise or destroy fœtid and offensive odours. In its largest sense the word would include most antiseptics and disinfectants, but in a domestic way it is usually applied to various agents of a volatile character, which are employed to impregnate the atmosphere of a sick room or other inhabited apartment, and to remove from them any faint or disagreeable odour. Chlorine and sulphurous acid being irrespirable gases, and the best deodorisers we possess, cannot be safely employed for this purpose, and recourse is had to scents of various kinds, balsamic and resinous substances burned in the form of pastilles, lavender twigs, cascarilla bark, and other aromatic vegetable matters, which are usually thrown on some hot cinders on a shovel, and volatilised. Coffee berries placed upon a very hot shovel, are both agreeable and effective as a deodorant, and according to some are disinfectant. The oil of the *Eucalyptus* is a valuable addition to our fragrant deodorants. Indeed, almost all essential oils, that of the common wild thyme especially, are recognised as beneficial air purifiers, although for a time they were supplanted by mineral products. Our forefathers were wise when they cultivated aromatic plants near their dwellings. Aromatic vinegar, Condy's fluid, solutions of chlorinated lime, chlorinated soda, and carbolic acid, may be all volatilised by means of the spray producer, and are most effective deodorants, as well as antiseptics. To remove fœtor from uninhabited places, the more powerful oxidising agents, chlorine, sulphur, nitrous acid, and ammonia, can of course be used with advantage, and their action may be kept up till the cause of the smell is removed; but it is well to bear in mind (especially in connection with the sick room) that the best deodorant is *fresh air*, and that the best means of obtaining it is by the occasional opening of the windows. Another important use to which deodorants are applied, is that of absorbing and destroying effluvia from sewage. Charcoal is much employed to destroy the smell of sewage gas, by filtering the gas through a charcoal layer on its passage through drains or sewers, which communicate with the external air, but the mixture of charcoal, clay, blood, and alumina, known by the name of the A.B.C. process, has become the most general plan of dealing with sewage on a large scale in tanks and cesspools. For privies, outhouses, and dung-heaps, no agent possesses greater powers of deodorisation than carbolic acid. When mingled with lime in the form of carbolate of lime, it can be sprinkled about or thrown down foul places, without blocking up the drains like chloride of lime.

Though we have thought it necessary to recommend the removal of all bad smells, it does not follow from experience that they are

all positively injurious, nor on the other hand, that gases which are not offensive or even perceptible to the sense of smell are wholesome; all that we wish to call attention to is the importance of discovering the cause of any odour, however slight, for until that is done it must always be regarded with suspicion.

DEPILATORY is an application which removes the hair from the skin. Pitch applied to the surface to be denuded, and then forcibly pulled off, so as to bring the hairs with it, was formerly used for this purpose, but has, deservedly, with other barbarous customs of another age, fallen into disuse. Preparations of quicklime and of arsenic have also been used for the same purpose. In the few cases, such as some kinds of skin disease, in which it may be thought necessary to detach the hairs by the roots, they often come out easily, and the process is better effected by means of tweezers, than by the wholesale, painful, and it may be dangerous, though perhaps quicker methods above mentioned.

DERBYSHIRE NECK.—See BRONCHOCELE.

DERIVATIVE—a term not so much used as it formerly was in medicine, signifies whatever tends to withdraw diseased action from any part of the body, by establishing a counter action in some other part. Thus, bleeding from the lungs may be stopped by the derivative action exerted by the flow of blood from a vein opened in the arm, or inflammation affecting the eyes may be relieved by a blister, or seton, at the back of the neck.

Derivatives may be either natural or artificial. The principal natural derivatives are, either the discharge of blood, or the increase of natural secretions; thus, bleeding from the nose may act derivatively, as regards the brain; or the bleeding from piles, as regards the liver or parts within the abdomen; or an attack of diarrhœa may also relieve in the same way. Boils, cutaneous eruptions, ulcers, &c., also act as derivatives, but in many cases approach the class of counter-irritants. The great principle involved in the existence of natural derivatives is, that they must be the effect of some cause, and in many cases, of some internal disorder which has thus formed for itself a safety-valve, through less important channels, for the protection of more important organs. Much caution is requisite in stopping, or permitting to be stopped, incautiously and blindly, what is to be regarded as a natural derivative. The symptom itself should be regarded only as the outward sign of something which requires rectification within, and the efforts should be directed to the discovery of this inward acting cause, and to its removal when discovered; this being done, the external symptom will possibly disappear; but even should it not do so quickly, in consequence of having established a habitual local tendency, it may be much more safely attended to as a local disease, after the constitution has been relieved. Not only, however, must the constitution be relieved at the time, but if the natural derivative is done away with, it must be kept, if possible, free from the primary disorder; otherwise, should this recur, and should the constitution fail to re-establish the natural derivation in time, serious or fatal consequences may be the result. It not unfrequently happens that, some months after an old ulcer has been healed, or cutaneous eruption removed, the individual is seized with some dangerous internal malady, perhaps apoplexy, which might have been prevented, if, after the natural drain had been closed, strict attention had been paid to the regulation of the general health. This is a cogent reason why persons in whom some natural derivative action, such as any of those named above, has stopped, or been stopped, should pay the greatest attention to diet generally, to the regulation of the bowels, to the functions of the skin by cleanliness, of the lungs by fresh pure air, and of the system generally by exercise, and why on the slightest symptoms of indisposition they should subject themselves to medical treatment. A still more cogent reason is it why such persons should beware of tampering with themselves with quack ointments, lotions, and outward appliances, which if they do cure sores, as they profess, without constitutional treatment, must do mischief, for they would merely obliterate the outward symptom of disease, and send the latter to attack perhaps some vital organ.

Artificial derivatives, such as blood-letting, blisters, &c., may be referred to under their proper heads.

DESQUAMATION is the separation, in scales or flakes, of the outward or scarf skin. Strictly speaking, desquamation is constantly going on upon the surface of the body, and scales or scurf are constantly being separated in small and almost insensible quantity; but after some inflammatory diseases, particularly those of an eruptive character, such as scarlet fever, measles, &c., a much more copious desquamation takes place, and the scarf skin separates in large pieces. The same thing occurs after irritants, such as mustard plasters, blisters, &c., have been applied to the skin. Desquamation, whether natural or the consequence of disease, is always facilitated by the use of the tepid or warm bath.

Refer to—*Skin—Scarlet Fever.*

DIABETES is a disease in which the urine is discharged in unusually large, often in enormous quantity, and for the most part contains a large amount of saccharine matter. The serious nature of the affection renders it one of those which should be trusted for treatment only to medical hands; the same reason renders it important that its first symptoms should be known, that they may not be neglected. It may creep on a person insidiously, or be suddenly developed. The first and most prominent symptom which usually awakens atten-

tion, is the frequent call to pass urine abundantly; at the same time, the thirst is extreme, and the appetite voracious. As Sir T. Watson remarks, some persons, especially among the lower orders, are apt to think, that as they eat and drink so well, there cannot be much the matter, and are thus lulled into security, whilst a fatal disease is undermining their constitution. In addition to the symptoms already mentioned, the mouth is dry, and the tongue clammy and sticky, often very red; there is flatulence and indigestion, and the bowels are generally constipated. Emaciation and general debility also occur; pain and weakness in the loins, and feebleness of the limbs. The leading symptom, however, is the discharge of urine, which has been authentically known to exceed forty pints in the twenty-four hours, the average in health amounting to two or three pints. At the commencement of the disease, the urine may still retain the urinous properties of the diluted secretion; but this passes into the saccharine condition, and sugar, which may be obtained in a crystalline state, is largely discharged. The specific gravity of healthy urine averages 1020°, but in diabetes it rises as high as 1040° and 1050°. Among other means of detecting the existence of sugar in urine, take a test tube filled with the suspected fluid and add to it a few drops of a strong solution of sulphate of copper, and rather more than the same amount of liquor potassæ. The mixture will display a dirty bluish look, and when afterwards boiled over a spirit lamp, it will let fall an orange precipitate.

A disease of the nature of diabetes can never with propriety be treated domestically, and an individual who may detect in himself the occurrence of the symptoms detailed above, should at once seek competent medical assistance. The dietetic treatment of diabetes is of more importance than the medicinal; the chief precaution being the avoidance of whatever (either sugar of any kind, or vegetable starchy matter) is capable of being converted into grape or fermentable sugar. This of course involves the prohibition of potatoes, and bread made from ordinary flour, which contains all the starchy matter of the grain. This privation is always much felt and complained of, and various substitutes have been proposed. Bread made from bran, thoroughly ground and freed from as much starchy material as possible, is now in general use; so also is a species of bread sold in slices and prepared mainly from the gluten of flour. Biscuits and rusks made of ground almond powder, to which eggs are added, are also much in request. If only ordinary bread is to be used it ought to be much toasted, and green vegetables should always be used instead of potatoes. Skimmed and butter milk have been advocated to the exclusion of other aliment as a diet, and it is said with good results.

The tepid bath, to induce perspiration, is often of service. As regards medicine, its prescription *must* be left to the medical man. Persons who suffer from any suspected tendency to diabetes cannot attend too strictly to the state of the digestive organs. Wet feet must be particularly avoided, and flannel should be worn next the skin. The constant drain on the system causes excessive emaciation, and diabetic people suffer from the slightest exposure to cold; it is calculated that one half of them die in the end from consumption. The complaint may be very acute and run its course in a few months, but it is more likely to continue for years: two years is about its average extent, but it may go on for eight or ten years. Codeia, one of the constituents of opium, has of late years been used successfully in the treatment of diabetes, but it requires careful medical supervision.

Refer to — *Fermentation — Sugar — Urine, &c.*

DIACHYLON PLASTER is the commonly used adhesive plaster spread on calico or leather. It was formerly prepared by hand, but as now made by machinery, is a beautifully uniform preparation, and notwithstanding many substitutes, is still the most firmly adhering, and most to be depended upon of the plasters for retaining the edges of wounds in apposition. People in general have a very false idea of the nature and uses of this and of other plasters. They attribute to them some healing power over the wound, whereas their only use is, by keeping the edges of the wound in perfect apposition, to permit them to heal by the natural power with which the living tissues are endowed. This idea of the healing properties of diachylon, however, often leads to mischief, from inducing persons to apply the plaster to abrasions and sores, which it seriously irritates, causing in some cases, much increase of inflammation, and troublesome ulceration. The practice is most hurtful, and should never be followed. This idea of the healing powers of diachylon has, too, been probably magnified by its known use by surgeons in the treatment of, and for the healing of ulcers. In such cases, used as a strapping round the leg, and over the sore, the latter quickly gets well, and apparently under the influence of the diachylon plaster, which, however, is used only as a convenient mechanical agent, to closely envelop the limb, and give support to the weakened vessels and infiltrated tissues, which have encouraged, and which surround the sore. The diachylon, it is true, passes over the ulcer, but it is prevented exerting any effect upon its surface by the intervening discharge. Sometimes, even when applied to the sound skin, diachylon is found too irritating, in which case soap or lead plaster must be substituted. If diachylon plaster is kept folded up in too warm a situation, it adheres together and becomes useless.

Refer to—*Plasters.*

DIAGNOSIS is a frequently used medical term, which may be applied either to the "art

of discovering the nature of diseases, and of distinguishing them from each other," or to the conclusion arrived at by the exercise of the art. In other words, when a medical man, after investigating a disease, expresses his opinion respecting its nature, it is called his "diagnosis" of the disease. It must be evident to all how much, indeed how everything depends upon a correct diagnosis of the existing disorder; for unless correctness on this point be attained, treatment can scarcely be of much service, and if active, may be worse than no treatment at all. It is true that there are certain general symptoms of disease which may be treated, perhaps with benefit, in a general sort of way, without the medical attendant having any definite idea of the existing derangement. Such is the case with most febrile diseases, and many others, and as the natural powers do much towards the removal of the malady, and to promote restoration to health, a practitioner *may* practise in this loose sort of way with apparent success; he treats prominent symptoms, attends to diet, &c., and his patients get well. But this is not the true practice of medicine, it is very different from the active, well directed, and energetic measures of the man who, having both the knowledge and the will to truly investigate his case, and having done so, strikes home at once. The man who does not or cannot make a correct diagnosis is working in the dark; and if he uses edged tools, so much the worse for his patients, whose safety must in some measure depend upon the treatment of their cases being conducted upon the same inert plan as their investigation. At the same time, if there be any efficiency in medical treatment at all,—and no man who knows his profession and practises it conscientiously can doubt it,—how much passive evil must result from insufficient and slovenly investigation of disease; how much must be and is every day overlooked, which ought not to be so; how often are germs of fatal disease undetected, which ought to be detected, until they have ripened into active growth that is not to be repressed! One or two cases will more forcibly illustrate the difference between a loose and ill-defined treatment of disease, and that which is the result of accurate diagnosis. A child is taken ill, becomes feverish, the breathing quickened, and there is frequent cough, along with other symptoms, indicating in a general way inflammatory affection of the lungs, and so far, perhaps, the diagnosis is too plain to be overlooked, even by a very cursory examination. Tartar emetic, mercurials, &c., are remedies so generally useful in the treatment of such cases, that they will be prescribed with probable success, and it may be that the little patient will get well under their use; but it may not so happen —the disease evidently does not yield, the feverish condition, the quick breathing, and the cough, all show that it is still active. It is evident that abstraction of blood is called for, but the child will not bear it from the arm, and it must be effected by leeches—where?—of course on the chest. But on what part of the chest? Here comes the point of diagnosis; the careless or slovenly practitioner will be content with the general indication of the fore part of the chest, unless indeed there is complaint of pain—which may mislead as well as lead—to direct his aim elsewhere, and the chances are, that blood is taken away, comparatively little good is affected, and the child, not the disease, is weakened. The error may be a fatal one, which a correct diagnosis would have prevented. It may be that the anterior portions of the lungs are free from disease, which is confined to the posterior and lower portion of one or both. If a correct diagnosis has been made, this should be known; the practitioner, by the percussion of his fingers and the application of his ear to the chest, will probably be able to lay his hand upon the skin over the seat of disease, and to mark out with confidence the limits within which blood may be abstracted with the greatest certainty of benefit.

Again, a patient suffers from indigestion, from weakness, pain in the back, and general symptoms of bad health—the spirits are depressed—a general diagnosis is perhaps made, and the round gone of various tonic medicines, alterative remedies, &c.; but the urine, if thought of at all, is passed over with a cursory glance: to the unassisted eye it looks all right, and perhaps is proclaimed so, but a simple chemical test may show the presence of albumen in solution, and indicate the commencement of Bright's disease of the kidneys. The correct method of diagnosis affords at once the key to the main points of the disorder, and probably to its successful treatment, which might have been groped after in vain; or if stumbled upon by accident, and found successful, the success would give but little clue in the next case of the kind which might occur; or it may be that false ideas of the nature of the disease, a false diagnosis having been formed, the success itself will constitute an abundant source of evil and error, not only to the individual practitioner, but to others. The fact being a false one, leads to false conclusions. The above cases—which might be multiplied to any extent—have been brought forward to show how much success in treatment must depend upon the correctness of the diagnosis which the attendant practitioner forms of the disease of his patient. They have also been brought forward to show that this correct diagnosis can only be attained by time and patient attention and investigation, even by the greatest in science. In many cases, no extent of knowledge will enable a physician to say what portion of a lung is affected, unless his sense of hearing conveys the exact information to his mind in a physical examination. A physician may suspect from symptoms that his patient is suffering from disease which tends to the formation

of oxalic gravel, but he cannot positively assure either himself or others that such is the case, unless he actually see with his eye—through the microscope—the peculiar crystal which marks the disease. From what has now been said, it must be evident that the highest attainments in medical knowledge will not compensate for a hurried examination of cases; there must be time; people forget this: attracted by some great name, and in all probability a really and truly great one, they crowd the reception rooms, and are passed in quick succession through the consulting room of the fashionable practitioner, who *cannot* give time to the full investigation of the cases which come before him. Few, perhaps, attain the meed of popularity without having well deserved it, or retain it without deserving to retain it by their progressive attainments; but, withal, they are not gifted with intuition, and if the public will compel them to see ten cases in the time they ought to take to two or three, the public must suffer, and they do suffer, for many a case overlooked is unravelled by the patient investigation of some less occupied practitioner. It must not, however, be supposed that it is here insinuated, that time and patience alone are sufficient for the proper investigation of disease in the living body; the man of experience, and who to his experience has added accurate observation, will undoubtedly seize more quickly than one less informed, the most distinctive features of the case before him; even at a single glance, in some cases, he may form a conclusion—and it may, probably, be a correct one—in his own mind respecting the nature of a case, and this conclusion will lead him at once to use the means of diagnosis best adapted quickly and surely to satisfy his mind; but even with all this, with abundant knowledge and ready tact, some time is required in all cases, often much more than is given by some in the full tide of practice. Nothing will compensate for a hasty and imperfect diagnosis, and evils innumerable spring from it. On this head Sir Thomas Watson, one of the ablest writers on medicine, remarks:—"It is mainly to the uncertainty in the diagnostic part of medicine, that we must attribute the uncertainty and variation both of doctrine and practice, which have brought so much suspicion, and reproach, and ridicule, upon the science we profess." The case of the fashionable physician has been alluded to; but there are other members of the profession equally overwhelmed with work, but of a far less remunerative character. These are the union and club surgeons, who have not the time, in the midst of their numerous avocations, to devote an adequate amount of it to a careful investigation of the special features of every case brought under their notice. There is yet, however, another essential—in many cases at least—either to facilitate or enable the formation of an accurate opinion of a case of disease, and this is, *perfect candour on the part of the patient towards the medical man consulted;* and not only candour, but thoughtful consideration and communication of every circumstance which is, or may appear to be, connected with the illness. Whether it be hereditary predisposition, or personal transgression, nothing should be concealed. Females often permit prudery or mistaken feeling to interfere with their communications with a medical adviser; but one thing can be said upon this matter, if they cannot confide in him on these points, he is unworthy of their confidence at all, but the same resolution which induces the consultation, ought at the same time to give this resolve, to leave nothing untold connected with the state of health.

So much has been said with regard to the necessity for a well-defined diagnosis, that it may lead some to suppose that this can be made out in all cases, which is not possible; many diseases are, it is true, so distinctively marked, that there is no difficulty in assigning them their true name and character, but there are many diseased conditions of the human frame which will not fall under any classification, and which baffle the best directed efforts of our *present* knowledge for their elucidation. In this case, the diagnosis must be what has been called "empirical;" it is imperfect, because the science of medicine is yet an imperfect one, and in the absence of knowledge of the cause of the disease, experience of the use of medicines in similar cases must be used as a guide to treatment. These observations are made, that too much may not be expected from medical men by the public, and to show, that because a medical man will not, or cannot, give a defined diagnosis of a disease, he is not necessarily ignorant of its proper, or, at all events, best ascertained mode of treatment. Further, when it is reflected how strict an investigation is required at the hands of those whose lives are and have been devoted to the subject, it ought to make unprofessional persons doubly cautious in dealing with disease. To quote from the "prefatory address" to this work:—"When it is remembered, how the nicest judgment that observation and experience can form, the most patient attention, aided by practised ear and eye, by microscope and test tube, are frequently necessary, to enable the conscientious physician to judge of his case before he can apply the remedy, it is evident how great must be the responsibility of those who, in rashness or ignorance, venture upon the treatment of serious disease, either in their own persons or in those of others;" this is not meant as a discouragement, but as a caution, for the real object of a work like the present can only be fulfilled when the good it offers is safely and judiciously employed.

Lastly, either our physicians, most of them men of Christian character and of high honour, make a parade of their diagnosis of disease, and

devote their lives of labour to deceive the public, or are themselves deceived; or quackery and quack medicine must be impudent lies and wicked deceits. The individual who purchases a quack nostrum can either have no idea of the disease—if he has one—under which he is suffering, or only the crude idea—diagnosis——of his own judgment; and upon the faith of this, he *prescribes for himself* the unknown compound of an unknown—to him at least—individual, on the faith of some lying advertisement. Is the diagnosis of the physician a delusion and a snare, or does the patroniser of the quack remedy exercise the same judgment in the treatment of his body that he would in his worldly business? To our readers we leave the answer.

Refer to—*Advice, Medical—Disease, &c.*

DIAPHORETICS, or SUDORIFICS, are agents used in the practice of medicine which "determine to the skin," or produce perspiration or sweating. When it is considered how extensive the surface of the skin is, how largely it is supplied with blood, and how abundantly with means for exhaling moisture (see *Skin*), it must be evident how powerful an influence its excitation or depression must exert upon the condition and functions of the body. This influence is so undoubted, and so marked, that in all ages, and in almost all nations, even the most uncivilised, the cure, by promoting the flow of the sweat, has been a common and favourite mode of treatment. Among the tribes of North American Indians, it is employed, both as a curative and as a sanitary agent. The most general mode of exciting perspiration, particularly among the more uncivilised portions of mankind, is by means of hot vapour or the vapour bath, but they also employ abundantly decoctions of various herbs, to assist the process.

The effect which the constant insensible perspiration from the body exerts in regulating its temperature must, of course, be augmented as the excretion and evaporation of fluid from the surface is increased, thus furnishing an active medium for lowering the temperature of the body in states of fever. Every one knows how much and distressingly the dry heat of the skin is felt, and how grateful the sensation of moisture upon the surface. In addition to the reduction of temperature, however, the action of diaphoretics must tend powerfully to relieve congestion or collection of blood, or inflammatory action in internal organs; and, indeed, the fact is every day manifest in the treatment of disease, not as regards general perspiration only, but also as a consequence of the effect of local agents—such as the poultice, fomentation, or hot vapour to the skin, which produce sweating of the part to which they are applied. The most useful diaphoretics for domestic purposes are:—

Ammonia.—In the form of carbonate, when stimulation is required at the same time, and in the form of acetate or *Spirit of Mindererus*, which is one of our most certain and safest diaphoretics.

Antimony.—In the form of the tartarised antimony, in small doses, when fever is excessive, and the true James's powder, which is the safest form for children.

Baths.—Tepid, warm, or vapour, or used as in hydropathic establishments by means of the wet sheet and blankets.

Ipecacuanha.—In any of its combinations.

Opium.—Particularly in its combination with ipecacuanha, named Dover's powder. There are others, such as aconite and pylocarpin, but these are too dangerous for any but medical hands.

To the above may be added, ethers, camphor, spirits of various kinds, and diluent drinks of a stimulating character, sometimes cold, but generally warm, and exercise. There are many other agents employed in medicine as diaphoretics, but they are not likely to be used domestically, unless, indeed, we except the dulcamara, or bitter-sweet, also called woody night-shade, which, being a common native plant, might be used in the absence of other remedies of the class (see *Dulcamara*). For information respecting the other diaphoretics mentioned, the reader is referred to their respective articles.

When perspiration is thought to be required, the most suitable agent to produce it should be selected; thus, if there is very hot dry skin, and quick hard pulse, antimony will generally be most useful; if there is depression, spirit of Mindererus, sweet spirit of nitre, or carbonate of ammonia will be most suitable, and with any of these ipecacuanha or opium may be combined. *To form one of the most useful and certain sweating draughts*, take of spirit of mindererus half an ounce, of antimonial or ipecacuanha wine fifteen to thirty drops, and water four table-spoonfuls, adding or not, as circumstances dictate, ten drops of laudanum, or a tea-spoonful of paregoric.

As there is always a degree of uncertainty, especially in some constitutions, in the action of diaphoretic medicines, when they are taken, every means should be used to assist and promote the desired effect. Confinement to bed is absolutely necessary, and before retiring there, it is *always* well to put the feet in hot water for twenty minutes; the diaphoretic medicine should be used on getting into bed, and nothing more for three quarters of an hour, when the warm diluent drinks are to be commenced with, and may after that be taken *very freely*, and continued as long as the sweating process is kept up. If the warm diluent drinks are taken too soon after the medicine, sickness will probably ensue, and so the object in view be defeated: purgative medicine, which is likely to act during the operation of a diaphoretic, should be avoided, for the disturbance occasioned thereby will not only effectu-

ally counteract the desired process, but may, by checking it, aggravate the disease it was intended to benefit. Some persons promote the action of sweating by cold instead of warm drinks; in cases of much febrile heat and excitement they may be useful, but as a general rule, it is the safer plan to keep to the warm fluid. When sweating is produced, the person should *always* have flannel next the skin, never linen, and of course there must be sufficient covering to maintain the requisite temperature; if the person is labouring under infectious disease, additional care is, of course, requisite in the after disposal and purification of the woollen clothing. When it is thought desirable to check the sweating process, every source of chill must be avoided, the skin is to be dried with *warm* towels, and fresh clothing previously slightly warmed, put on, the coverings lightened, and the hands and arms gradually exposed. There is sometimes great difficulty in producing perspiration in certain constitutions; when such is the case, the medicines should be given, and other means resorted to, towards four o'clock in the morning, that is, just previous to the time in the four-and-twenty hours, when the body, either in health or disease, appears most liable to perspiration.

Refer to—*Skin*.

DIAPHRAGM, or MIDRIFF, is the partly muscular and partly tendonous and membranous partition, which separates the cavities of the chest and the abdomen, the heart and lungs being on one side, while the liver, stomach, and intestines are on the other. The diaphragm assists materially in the process of respiration, descending and pressing downwards upon the contents of the abdominal cavity each time a breath is drawn; this is more particularly seen in some cases of chest disease,

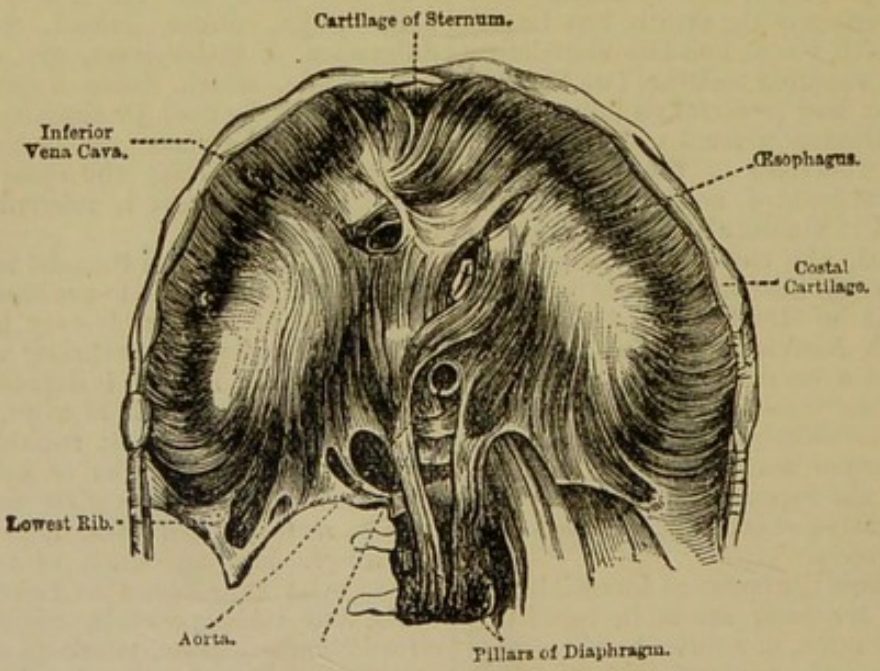


Fig. 67.

when the respiration becomes almost entirely dependent upon this action of the diaphragm. From this it must be evident to all, how important it is that this muscle should have free play, and how much its essential movements must be impeded by anything, such as tight lacing, which presses the contents of the abdomen upwards.

Refer to—*Lungs—Respiration, &c.*

DIARRHŒA consists in frequent and urgent calls to relieve the bowels, the evacuations being for the most part more liquid than usual. The causes of diarrhœa are very numerous, but may, perhaps, be classed under three heads, nervous causes, causes which act upon the surface of the body, and irritating causes which act directly upon the bowels themselves. Perhaps the simplest form of diarrhœa is that arising from nervous causes, such as some experience on the approach of thunder, or from electrical disturbance generally, or such as arises from emotions of the mind, as for example—fear. In these cases the bowels would appear to be simply "relaxed," the evacuations being healthy with the exception of being thinner, from their more rapid passage through the bowels. The simple salutary diarrhœa, in teething children, is an example of the same kind.

Influences affecting the body, particularly cold, and especially cold feet, often produce diarrhœa; cold nights succeeding hot days are often said to occasion the disease, but it is also remarkable that diarrhœa is apt to occur at

the breaking up of a long frost, indeed, to be epidemic, that is, of general prevalence.

By far the most frequent cause of diarrhœa, however, is irritation in the bowels themselves, caused either by undigested or indigestible food, by biliary and gastro-intestinal derangement; it may also be caused by an accumulation of hardened feculent masses, or, as they are called in medical language, "scybalae;" or by the lodgment of such matters as the skins of old peas or beans or of raisins, in the folds of the large bowel; the above are frequent causes of teasing diarrhœa in children. Lastly, diarrhœa may be dependent upon disease of the bowels themselves, such as inflammation of the mucous membrane of the intestines, ulceration or disease of the large intestine, when it constitutes dysentery, or ulceration of the glands and of the lining membrane such as occurs in typhoid fever and consumption.

It must be remembered, however, that to some persons a habitually relaxed condition of the bowels is natural, and at the same time essential for health, and that to check it is dangerous. It is evident, that in a disease depending upon so many and various causes, a due discrimination of these is requisite for proper treatment. It must not, either, be lost sight of, that diarrhœa is in many cases salutary, an effort of nature to free the constitution from some morbid matter which, if retained, would produce disorder or disease. On this account, the simple forms of diarrhœa are better left to right themselves so long as they keep within moderate bounds; *this caution is particularly to be observed with regard to that which occurs in the teething of children*, which, when moderate, is a safeguard. But when the diarrhœa becomes so frequent that the child is evidently weakened by it, and especially if the evacuations appear to be losing their feculent character and become like shreds of skin, or streaked with blood, then a warm bath for six or eight minutes, temperature 92°, should be used for two or three evenings in succession; isinglass or gelatine given in the milk food, and the castor oil emulsion with yolk of egg (see *Castor oil*) given three or four times a day, each dose containing from a quarter to half a drop of laudanum. Of course medical assistance should be procured if the complaint is not quickly *moderated*, for checked entirely it should not be.

In diarrhœa resulting from exposure to cold, the best plan of treatment is to moderately re-excite the skin according to the system recommended in the article *Diaphoretics*, and also, if requisite, to administer the remedies prescribed for continued diarrhœa generally.

When diarrhœa is caused by irritating matters in the bowels, one thing is evident—it cannot be properly relieved unless the bowels are freed from the irritant matters; it may, it is true, be stopped under these circumstances, but it will recur, unless indeed the irritating substance has been removed by the action, previous to the use of the astringent medicine, and the continuance of the diarrhœa is merely the consequence of the previous irritation. In many cases in which the diarrhœa is owing to irritant matters in the bowels, all that is requisite is to relieve the bowels by a dose of castor oil or by some saline aperient followed up by demulcent drinks, to which, if there is acid in the stomach, a little carbonate of soda is to be added. In other cases, when the action of the bowels is constant, painful, and exhausting, it is absolutely necessary to check these symptoms in the first place, and to soothe the bowels, before means are resorted to for freeing them from the irritant cause. For the former purpose, the common chalk mixture in three table-spoonful doses, with the addition of five drops of laudanum to each, may be given at short intervals till the disease is checked; or the compound chalk powder—dose thirty to sixty grains—and the same powder, with opium—dose, five to twenty grains—are both useful. Or aromatic confection may be given in half drachm doses in water, with or without laudanum. If the active diarrhœa does not, from its comparative mildness, require these remedies at first, or when it is sufficiently moderated, the bowels should be thoroughly cleared out with a table-spoonful dose of castor oil, to which ten drops of laudanum have been added; this will probably clear away the irritating matters, if they consist of indigestible substances, hard feculent matter, or the like. When castor oil cannot be, or is not taken, the best substitute is ten grains of rhubarb and six of calcined magnesia, with some aromatic, such as half a tea-spoonful of sal volatile, or a tea-spoonful of tincture of rhubarb, and if there is much pain, five to ten drops of laudanum, the dose being repeated, if requisite. After the action of the opening medicine one or two doses of astringent may again be required, as the bowels are apt to keep up acting, simply from irritability. Medical men sometimes give more active purgatives to clear away irritant matter; but the practice is not safe in the hands of the non-professional.

When diarrhœa has been permitted to pass into the stage of irritation, when there is tendency to fever, the belly tender, the tongue red, and the motions resemble shreds of skin, or pieces of jelly, and are mixed with blood, the case is of that serious nature that medical assistance should at once be obtained, if it has not been so before. In the meantime, the emulsion of castor oil with yolk of egg will be found the safest and most effectual medicine; two table-spoonfuls, with five drops of laudanum, being given every four hours, and starch and laudanum injections; the diet being as unirritating as possible, and containing abundance of gelatine. A most excellent drink in these cases is rice water, in each pint of which from a quarter to a whole ounce of gelatine or

isinglass is dissolved, with a piece of toasted bread introduced to flavour it, or a little cinnamon.

In the more severe forms of diarrhœa, such as that connected with consumption or fever, or when fever is present, medical attendance should alone be trusted to, but when unattainable, the disorder must be treated according to such of the methods above detailed as may appear most suitable. In all probability the soothing and astringent plan, such as chalk with opium, will answer best. The author has found bismuth of much service in some of these cases. In case of much tenderness of the bowels, a few leeches might be used, but pain generally should be treated with warm fomentations, or the hot bran poultice. The use of diluted sulphuric acid in frequently repeated doses of ten to twenty drops, of the diluted nitro-muriatic acid, in similar doses, in pure water, or combined with a tea-spoonful of the compound tincture of gentian, are remedies which have been found serviceable in obstinate diarrhœa.

During the late summer or early autumn persons are liable to suffer from a form of aggravated diarrhœa occurring epidemically, often attended with nausea and vomiting, and always with profuse watery evacuations. There is great thirst, accompanied with pains in the stomach and bowels, often amounting to cramp, the pulse is rapid and feeble, the voice becomes weak, and the countenance sunken and anxious. The skin at the same time is cold and damp, and the urine scanty and suppressed. The marked resemblance of these symptoms to those of Asiatic cholera has given the disease the name of British or summer cholera, and the treatment to be pursued partakes much of the same character as that employed in Asiatic cholera. Between the severe form and the mildest, the disease occurs in every degree of severity; if severe, the attack is always painful and alarming, and may be dangerous; and in the country, or at a distance from medical aid, requires to be quickly dealt with. The first thing to be kept in mind is, that the manifestations are not the disease; that the actual outbreak is only an effort of nature to free the system of morbid matter; that we may guide, control, and stop, if matters go too fast, but must not thwart. A mild attack of British cholera is better left alone as far as medicine is concerned, diluent drinks, such as barley or rice water, &c., being given. In a severer attack, when pain, purging, and other symptoms become urgent, it is time to interfere. The patient, if not in bed—which, however, frequently happens, from the attacks coming on in the night—should go there at once, and hot applications, and such like, used to the bowels to relieve the pain; or more extensively to the limbs, back, &c., if there is much coldness or cramp. Twenty to five-and-twenty drops of laudanum should be given to allay pain and moderate purging, and repeated if necessary. If the stomach will not retain liquid of any kind, chloric ether in the dose of fifteen or twenty drops should be given, either in combination with laudanum, or in the form of chlorodyne. Sometimes the vomiting is so obstinate that no ordinary means will stop it. Dilute hydrocyanic acid in the dose of five drops at a time may be employed; or four to eight drops of chloroform in a little sugar and water, or brandy and water, might have the desired effect. Two table-spoonful doses of the ordinary chalk mixture, either with or without the laudanum, or half drachm doses of aromatic confection, will be useful when purging continues. In addition to these means, ice, cold water, diluent demulcent drinks, barley and rice water, with isinglass or gelatine dissolved in them, are to be taken. In case of extreme depression, stimulants, hot brandy and water, &c., are to be administered. The attack of British cholera is so sudden and its course so rapid, that if there is any great distance to send for medical assistance, there will be full time for the employment of the above means, not only to the relief, but also to the safety of the patient.

Diarrhœa may occur as a chronic, or long-continued affection, lasting months or years; but these cases depend on such a variety of causes and influences, and require so much care in treatment, that they can only be advantageously managed by a medical adviser, and ought as soon as possible to be put under the care of one. In these and in all cases of bowel complaint, diet exerts great influence; generally speaking, the preparations of milk and of the grains are most suitable, such as arrow-root, sago, tapioca, rice, &c. When broth is given, it should be in small quantity and of tolerable strength; it is improved by the addition of gelatine, and of *well-boiled* rice. Alum whey is sometimes found useful in these cases.

Refer to—*Alimentary Canal*—*Bile and Biliary Disorder*—*Digestion*, *&c.*

DIASTASE, according to Liebig, is a portion of vegetable gluten in a state of decomposition, which possesses the power of converting starch into grape sugar; in fact, of acting as a sort of yeast or ferment.

DIASTOLE is the dilating action of the heart, or that by which its cavities are opened to attract and receive a portion of the current of blood, after a previous portion has been expelled by the systole or contracting action of the organ.

Refer to—*Circulation*—*Heart.*

DIATHESIS is a term used in medicine to indicate states of constitution peculiarly predisposed to certain diseases, such as scrofula, cancer, gout, &c. Peculiar diathesis is for the most part hereditary.

DIET.—See Food.

DIETARIES.—During recent years, the united labours of physiologists, chemists, and medical men generally, have added much to

our knowledge as to the relative value of different kinds of food, and have even furnished us with pretty accurate data from which we are enabled to draw up tables of diet suitable for people in various conditions of life, in health and in disease, during repose and during severe exertion, for the hospital patient, for the soldier, for the prisoner, for the valetudinarian, and for the athlete.

It will be seen from a reference to the article *Food*, and to the following tables, what are the general principles upon which dietaries ought to be drawn up; that is to say, what are the different classes of constituents into which our food may be sub-divided; and every one knows that unless certain proportions of these constituents enter into a diet, it is to all intents and purposes imperfect, whereas the proportions can, by a proper knowledge of the subject, be so adjusted as to afford the greatest amount of nutriment and sustenance to the frame, with the least possible amount of waste.

The late Dr. Parkes, has published in his work on *Practical Hygiene*, a table by which the amount of different aliments in any given diet may be accurately estimated,—a table calculated to be very useful, not only to the army medical officer, but to the officers of institutions of different kinds throughout the country, and to the public generally. The same authority states that a full-grown man of average weight (140 to 150 lbs.) and height (5 feet 7 in.) requires one twentieth part of his weight in food during the twenty-four hours. This would amount to about 7 lbs. of food, one to one and a half pound being solids, and the rest water.

In all calculations upon diet it must be borne in mind that the daily amount of nutriment must be increased with exercise and exposure, else the body quickly loses weight or becomes diseased; and that while a person at rest (such as a prisoner) may require 17 oz. of a properly proportioned diet, another, such as a hard working navvy, would require as much as 36 oz., or more than double the quantity.

It is a curious reflection, that our instincts and habits, as illustrated in our daily practice, have exactly adapted themselves to the demands of science and theory on the question of proper variation of diet. Thus we eat pork with pease pudding, bacon with veal and chicken, butter with fish, rice, sago, &c., cheese with maccaroni and bread; and it is well known that health cannot be maintained without proper variety in diet, and indeed that life itself cannot be preserved without a certain amount of it.

Salted meat is not equal to fresh in nutritive value, as some of the albumen and aromatic principles are lost in the process of curing, neither is it so digestible. It is desirable to add to a diet which must consist of salted meat, such substances as peas, dried fruits, butter, or oil, in order to make up for the deficient nutritive elements.

Tea and coffee, and such like articles of food, though not directly nourishing in themselves, are yet, according to all authors on dietetics, of great value, owing to their power of preventing the wear and tear of the tissues of the body; hence, in classifications, the name of "paratriptics" has been given to them. In all other parts of the world the same practice exists, and it has been proved that men do not feel the effects of hard work so much when tea, coffee, cocoa, chocolate, and the like are added to their diet.

Dietaries, or diet tables, must be used in many public institutions for the sake of order and convenience; also in hospitals for the sick, although it is well known that the innumerable wants of the sick in this respect can never be tabulated, and that a certain amount of extras will always be provided in any well-regulated hospital. It is matter of congratulation that our knowledge as to what does or what does not constitute a sufficient diet for people, under different conditions, is now so much more accurate than formerly, that we may hope to hear no more of outbreaks of scurvy in our jails and reformatories, or still worse, among our soldiers and sailors.

It will be seen at a glance how easily the following table may be employed to calculate the different proportions of the essential elements of food contained in any quantity of any of the articles mentioned. Every public institution, school, college, prison, workhouse, or hospital, has a diet of its own, and it would be an endless task to give even a selection of the best.

The dietaries now in use in all state establishments, are calculated on what may be termed a liberal scale, since they are proportioned to meet the requirements of the persons concerned, whether they are employed in idle or laborious work. The following figures, from the Science Hand-book of the food collection at the Museum, Bethnal Green, give a summary of the essential dietetic elements of food, supplied to the following classes, in the shape of nitrogenous or flesh-forming, and in the amount of carbon, or heat and force-producing constituents. The British soldier and sailor receive each 5 oz. of flesh-formers and 10 oz. of carbon, a distinction being made in the case of the sailor, when he is placed on a salt meat diet, when he receives 6 oz. of flesh-formers and 12 oz. of carbon, on account of the less digestible nature of the latter diet. The French soldier, though his diet is made up with many articles different from the English soldier, is kept in good fighting condition on a diet composed of 4¾ oz. of flesh-formers, with 12 oz. of carbon. When not employed in active work, a smaller amount of nitrogen and carbon will suffice for the wants of the system; accordingly, we find that the Chelsea pensioner must content himself with 3½ oz. of flesh-formers and 10 oz. of carbon, and the workhouse pauper with 3¼ oz. of flesh-formers and 8¼ oz. of carbon.

In estimating, however, the nutritive quality of all diets, it is well to bear in mind that the nitrogenous elements of food, besides making flesh, are to a limited extent employed in producing force; while, on the other hand, what for convenience we term heat-givers or force-producers, though stored up in the body for reserve purposes, cannot be applied to the formation of flesh.

The following table, referred to above, for calculating the nutritive value of different articles of food, is extracted from Professor Parkes' work on *Hygiene* (the edition by Dr. de Chaumont):—

Articles of Food.	In 100 Parts.				
	Water.	Albuminates.	Fats.	Starch and Sugar.	Salts.
Meat of best quality, like beefsteaks,	74·4	20·5	3·5	...	1·6
Uncooked meat, ordinary character,	75	15	8·4	...	1·6
Uncooked meat of fat cattle,	63	14	19	...	3·7
Cooked meat, roast and boiled,	54	27·6	15·45	...	2·95
Salt beef,	49·1	29·6	0·2	...	21·1
Salt pork,	44·1	26·1	7·0	...	22·8
Fat pork,	39·0	9·8	48·9	...	2·3
Dried bacon,	15·0	8·8	73·3	...	2·9
White fish,	78·0	18·1	2·9	...	1·0
Poultry,	74·0	21·0	3·8	...	1·2
Bread, wheaten, of average quality,	40	8	1·5	49·2	1·3
Wheat flour, average quality,	15	11	2	70·3	1·7
Biscuit,	8	15·6	1·3	73·4	1·7
Rice,	10	5	·8	83·2	0·5
Oatmeal,	15	12·6	5·6	63·0	3
Maize,	13·5	10	6·7	64·5	1·4
Peas, dry,	15	22	2	53	2·4
Potatoes,	74	1·5	·1	23·4	1
Carrots (cellulose excluded),	85	·6	·25	8·4	·7
Cabbage,	91	·2	·5	5·8	·7
Butter,	6	·3	91	...	2·7
Egg,	73·5	13·5	11·6	...	1
Cheese,	36·8	33·5	24·3	...	5·4
Milk (sp. gr. 1030 and over),	86·7	4	3·7	5	·6
Milk (sp. gr. 1026),	90	3	2·5	3 9	·5
Cream,	66	2·7	26·7	2·8	1·8
Skimmed Milk,	88	4·0	1·8	5·4	0·8
Sugar,	3	...	...	96·5	·5
Pemmican,	7·2	35·4	55·2	...	1·8

In estimating the requirements of the sick, there are numerous difficulties to contend with, which are not met with in other spheres, and which must always complicate, to a greater or less extent, any attempt to provide a diet table on a purely scientific basis. Granted that the waste of tissue involved by disease must be replaced, there are numerous conditions that are to be considered with reference to each individual. The disease or injury from which the person is suffering, the age, sex, and previous habits of life of the person, all point to the necessity of a thorough understanding of the normal requirements of the body in its healthy state, so as better to appreciate its needs in disease. A person in fair health, and doing a moderate amount of exercise, is generally understood to require daily about 27 oz. of water-free food, one sixth part of which should be made up of nitrogenous, and the remaining five-sixths of carbonaceous materials; while a man or woman at rest, with no physical exertion whatever, will require little more than half that amount. The condition of a person in sickness is essentially one of rest and quiescence; the wants of the body are diminished, so far as assimilation is concerned, and the amount of aliment required must depend on the nature of the disease, and the best means of remedying it. As a rule, persons suffering from chronic illness are for the most part confined to bed, and, being usually in a depressed condition, their diet, though select, must necessarily be of low nutritive value, somewhere between that of mere subsistence and the diet of rest. In acute diseases fluid food in a concentrated form, such as milk or beef tea, with the addition perhaps of some farinaceous material, is probably all that is required until the digestive organs return to their normal condition, and it would be wholly impossible for medical authorities to

institute any series of dietaries which would meet the requirements of such cases. Still all properly conducted hospitals, lunatic asylums, workhouses, infirmaries, and similar institutions, have found it necessary to have various scales of diet to suit the majority of their inmates, and it is instructive to see how, in numerous instances, these vary in some important details. The following figures give in a tabular form a summary of the constitutents of the dietaries in the leading hospitals of the country, and apply in all instances to the most generous diets in use at the respective establishments. When reduced to their chemical equivalents, the nitrogenous, or flesh-forming elements, will be found to average between 3 and 4 oz., and the carbonaceous, or heat and force-giving compounds, from 14 to 18 oz. daily :—

FULL DIET TABLES OF VARIOUS HOSPITALS.

	Bread.	Dressed Meat.	Potatoes.	Pudding.	Mutton Broth.	Butter.	Tea and Sugar.	Milk.	Eggs.	Porter.
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.		oz.
Guy's Hospital, . . .	14	5	8	4	10	1	20	...	...	20
St. Bartholomew's Hospital, .	14	8	8	...	...	1	40	...	...	20
St. Thomas' ,, .	12	4	4	8	...	¾	30	10	...	...
The London ,, .	12	6	8	8	20	...	...	...	1	20
St. George's ,, .	12	6	8	...	...	1	20	10	...	20
The Middlesex ,, .	12	8	8	...	20	...	...	10	...	...
King's College ,, .	12	4	8	8	...	...	...	15	...	20
University College ,, .	12	6	8	4	15	...	...	20	...	20
St. Mary's ,, .	15	6	8	...	...	¾	40	10	...	...
Westminster ,, .	14	6	8	...	...	...	20	10	...	...
Seaman's ,, .	16	8	12	...	10	...	20	...	...	...
Edinburgh ,, .	17	6	...	...	20	...	...	30	...	...
Glasgow ,, .	14	4	8	...	40	1	32	...	...	...
Manchester ,, .	16	6	8	...	...	¾	20	...	...	...
Newcastle ,, .	14	6	8	...	10	...	20	10	...	...
Leeds ,, .	16	5	8	...	5	1	40	20	...	...
Birmingham ,, .	12	6	8	...	20	...	20	...	...	...
Dublin ,, .	16	8	7	...	15	...	30	...	...	...

There are usually three or four distinctive diets in hospitals, comprising the full diet above stated, the ordinary diet, the low diet; and occasionally milk food is introduced as a separate scale of diet by itself, though more usually it is given as a portion of the low, sometimes called the fever, diet. These separate scales give a maximun allowance of 22 oz. of water-free food and a minimum portion not amounting to more than 3 oz. The nutritive value of the full diet given at Guy's Hospital may be judged of from the following table. It may be premised, however, that it is to some extent optional with the patient to take either porter or the same quantity of milk (1 pint) daily; and if he prefers the latter, the nutritive value of the daily rations would be considerably increased above the amount specified in the table :—

Rations.		Water.	Flesh-Formers.	Heat-Producers.		Salts.
				Starch and Sugar.	Fat.	
	oz.	grains.	grains.	grains.	grains.	grains.
Bread, . . .	14	2266	495	3123	98	141
Cooked Meat, . .	5	1181	603	...	337	65
Potatoes, . . .	8	2625	72	769	6	24
Rice Pudding, . .	4	1320	94	428	73	16
Butter, . . .	1	65	...	...	363	8
Sugar, . . .	1	21	...	415	...	...
Milk, . . .	3	1241	59	74	56	11
Porter, . . .	20	7964	8	760	...	18
Total, . .	56 oz.	38 oz.	3 oz. 20 gr.	17 oz. 6 gr.		183 gr.

The foregoing will be found to be about the average of the full diet daily allowance at most hospitals for the sick, and though it may not present much variety of fare, it is to be remembered that the cooked meat may be replaced or alternated with fish or chicken, chop or occasionally beef steak. In all hospitals, also, provision is made for those who have no appetite for solid food, and whose cases are met with oysters, beef tea, and other articles, which are comprised under the exceptional class of extras for the sick. In most books on nursing the sick, and in nearly all books on diet and cookery, numerous receipts are given, which may advantageously be prepared for the sick room; but it is better for the female attendant on the sick to be perfect in the preparation of a few articles of recognised merit, than to attempt too much.—See *Cookery for the Sick—Food.*

In connection with this subject, one word of advice to those who are under medical treatment, or their friends, as to dietetics. It is much more comfortable both for them and for the medical attendant to have the prescribed diet in "black and white," in all cases where it is necessary to adhere to a particular system, and where it is desirable to include certain articles, and as necessary peremptorily to exclude others. It saves a great deal of trouble and talk upon the subject, and nothing can be more simple than under the heads of the different meals to write down a list of various articles from which the patient or his friends may make a choice.

DIGESTER is a strong iron pot, the lid of which is fastened or screwed down, so as to be steam-tight, and is provided with a valve. By these arrangements, when the digester is placed near to or over the fire in cooking, the steam is confined, and by its pressure prevents the contents from boiling at the ordinary boiling temperature of 212°, consequently it is possible to raise the temperature above this point, or that at which the amount of heat carried off by the evaporated steam, balances that received by the fluid. This power of elevating temperature confers, of course, upon the water which must be used in the vessel increased power of acting upon bones, or any other substances immersed in it. The use of the digester, either in an economical or dietetic point of view is to be strongly recommended. The valve, of course, prevents all danger from bursting. The price is moderate. Bones which have been well acted upon in a digester, have their animal matter so thoroughly exhausted that, when taken out, they fall in pieces, little being left except the earthy constituents. The amount of animal nourishment in the form of gelatine thus extracted from bones is very considerable, quite sufficiently so to make it an object to the poor in their own homes, and in the houses of the rich, as the foundation of soup for distribution.

Refer to—*Heat—Gelatine, &c.*

DIGESTION is the process by which food is fitted for the nourishment of the animal body. The whole process may be divided into:—

The mastication or chewing of the food, and its mingling with the saliva or spittle.

The swallowing of the food.

The digestion of the food in the stomach, by means of the gastric juice.

The mixture of the food with the bile and juice from the pancreas, and its conveyance through the small intestines.

The passage of the remains of the food into and through the large intestine, or colon, during which it becomes acid, and mixed with the feculent excretions from glands of that bowel.

The discharge of the remnants of the food from the body along with other excrementitious matters.

To the above must be added the absorption of the digested and nutritious part of the food into the blood.

The first process of digestion, the mastication or breaking down of the food by the teeth, and its mixture with the saliva, is one of extreme importance. The teeth of man are evidently adapted for the two processes of cutting and bruising; the front or incisor teeth being constructed for the former purpose, the back or molar, for the latter. These adaptations are well seconded by the action of the powerful muscles of the lower jaw, which give it a direct cutting, and a side to side or grinding motion; the morsel of food submitted to this mechanical action being at the same time kept admirably under it by means of the extraordinary mobility and sensibility of the tongue, whilst it is at the same time thoroughly moistened by the saliva or spittle, which is poured out abundantly from the salivary glands, which lie imbedded around the mouth and jaws; the same mechanical action which grinds the food, serving at the same time to press out the secreted saliva. This fluid, however, does not act simply as a moistener of the food; it exerts a distinct chemical or digestive power upon its starchy components, acting in the same manner as the *Diastase* mentioned a few articles back, and converting them into sugar, in which state they become fitted for absorption into the blood, a capability which starch does not possess. When the food morsel has been masticated, and moistened sufficiently—at least such ought to be the case—it is collected by the action of the tongue into a ball, and conveyed to the back of the throat or fauces, where it is consigned to the care of involuntary muscles, and passes for the most part from under man's direct control. Passing from the throat into the gullet, it is carried by the wave-like action of that tube into the stomach. This action is not, as some might imagine, a simply mechanical one; that is, the food does not drop into the stomach as it would into a bag, by means of its own weight, but it is carried thither by the muscular movements of the œsophagus, or gullet, by the same power

that water is conveyed upwards through the gullet of the drinking horse or cow, or indeed in ourselves, as any one can testify who has drunk from a spring by stooping down to the water. The entire process of swallowing, particularly that part of it by which the top of the windpipe is protected during the passage of the food over it, is a series of beautifully connected actions.

When the food has been passed down the gullet, and has reached the stomach, it lodges in its left or larger extremity. As soon as the lining membrane of the organ feels the contact of nutriment, it becomes reddened, there is evidently increased flow of blood to it, and quickly its peculiar secretion, the "gastric juice," or solvent fluid of the stomach, begins to be poured out. This fluid is "clear, transparent, and viscid, without smell, slightly saltish, and very perceptibly acid," its characteristic power being that of dissolving the chief components of the food, and reducing the varied ingredients of a common meal to one homogeneous, grey-looking, pulpy, acid fluid, which is called the "chyme." This uniform mass, when formed, varies but slightly in perceptible character; when the food has been farinaceous and albuminous, it is like gruel, but when much oily or fat nutriment is mixed with it, it has more of a creamy appearance, on account of the oily matter being as yet undigested.

The solution of the food, and its formation into chyme by the powers of the gastric juice, is much assisted by the muscular movements—alternate contractions and relaxations—of the stomach, which turn the mass over and over, and thoroughly incorporate it with the solvent fluid. When the chyme is fully formed, it is probable that the albuminous, some part of the starchy, and all the saccharine components of the food have been dissolved, and fitted for absorption into the system. The action of the acid gastric juice, however, puts a stop to the conversion of the starchy ingredients of the food into sugar by the saliva; but this is resumed in the small intestines, when the acidity of the chyme has been neutralised by the alkalinity of the bile and juice of the pancreas or sweetbread, with which it becomes mingled, immediately after it passes or is passed through the opening at the right or smaller extremity of the stomach, into the duodenum, or first portion of the small intestines. This passage of the chyme from the stomach into the intestines, is effected as each successive portion is perfectly formed, that is, has become of semi-fluid, perfectly smooth consistence; for in a healthy condition of the digestive organs, should a portion of solid food attempt to pass the muscular valve at the "pylorus," or place of exit, it is immediately closed against it, and the morsel passed back into the stomach. As already mentioned, the chyme has no sooner passed from the stomach into the small intestines, than it becomes mingled with the bile, which is continually distilling into them from the liver, and with the juice from the pancreas or sweetbread. The effect of this admixture is to neutralise the acidity of the chyme. The action of the saliva in converting the starchy matters into sugar is now resumed, and is probably assisted by the fluid from the pancreas, and the oily principles of the food are converted into a milky-looking emulsion, in which state they are fit for absorption into the system. The digested and altered food mass is now passed slowly through the small intestines by their muscular, "vermicular," or wave-like movements; during this passage, the nutrient portions are absorbed, partly by the blood vessels, and partly—more particularly the oily emulsion portion—by the lacteal absorbent vessels, until the now almost exhausted food, reaching the valve-like opening into the large bowel, or colon, is discharged into it. Here the food mass again becomes acid, and this change is supposed by some, and not improbably so, to be of the nature of a second digestion, to ensure the perfect solution of any matters which may have escaped the first acid digestion in the stomach. A more striking change, however, is effected, for here the contents of the bowels assume their natural fæcal or excrementitious character, and acquire their characteristic odour from being mingled with used-up matters thrown out or excreted from the system at large, and from the small glands with which the lining membrane of the large bowel is studded. The absorption of the nutrient matters from the chyme requires a little explanation.

The process is now considered to be largely shared in by the blood vessels, but much of it is doubtless effected by the lacteal vessels, which, indeed, were at one time considered to be the sole agents for the purpose. These little vessels (fig. 68—1) are abundantly distri-

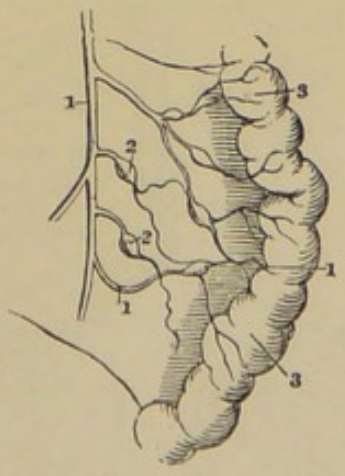


Fig. 68.

buted over the small intestines (3). The lining membrane of this portion of the alimentary canal is thrown into folds for the purpose of increasing the surface for absorption, and this lining membrane has a velvety appearance,

from innumerable small elevated points, or "villi," which cover it—each of these villi contains a small lacteal vessel. These vessels were formerly thought to absorb the nutrient portion of the food or "chyle" by means of open mouths, but it is now ascertained that the absorption is effected in the first place by minute cells, which burst, when full, and deliver up their contents to the lacteal twigs in contact with them. By the lacteals, the "chyle" or milky-looking fluid absorbed from the intestines, is conveyed through a set of small glands—the mesenteric (fig. 68—2), after passing through which, the chyle, this extract from the digested food, seems—if we may so speak—to become in some degree vitalised; it acquires the power of coagulating, and assumes a red tinge when exposed to the air. The chyle from the various smaller lacteal vessels is now collected in the larger trunks, which coalesce at one point, and form one main vessel, the "thoracic duct" (fig. 69), which runs up and lies close upon

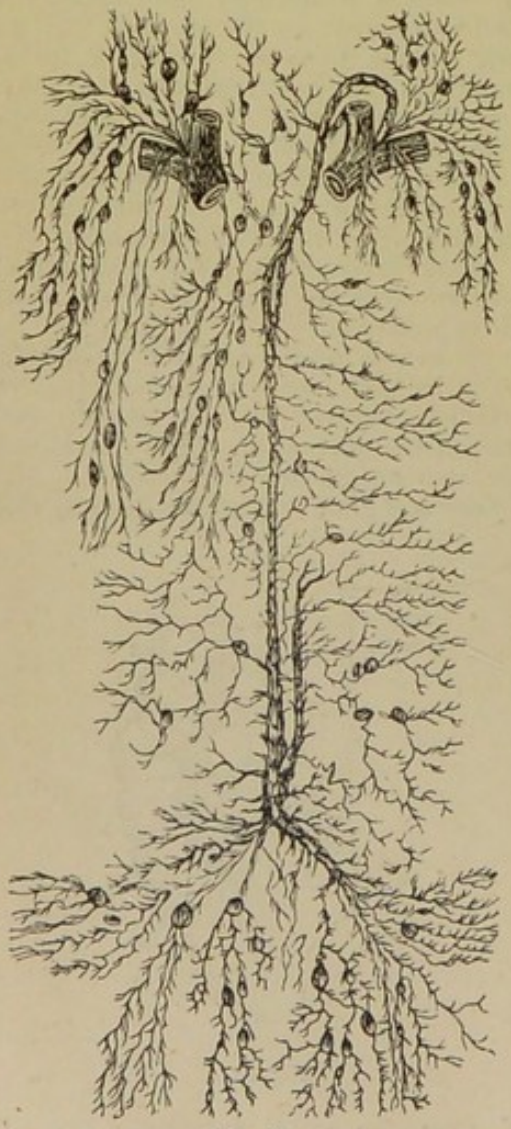


Fig. 69.

the spine, till, arriving at the neck, it turns down and opens to discharge its contents into the general current of the circulation at the junction of the large veins of the head and neck with that from the arm. The illustration gives a representation of the thoracic duct and its tributaries as seen when injected with mercury.

Such is the marvellous process by which man's material body is daily nourished, and its strength preserved and renewed; such, at least, is the healthy process, as it ought to be: the most generally prevalent causes of its disorder, and they are very general and very prevalent, it remains now to point out. Of course the nature of the food must exert great influence, for good or evil, over digestion; but as that will be fully discussed under the article *Food*, it need not be entered into here.

One of the most frequent causes of disorder of the digestive function is insufficient mastication, either from want of teeth, from a habit of hurried eating, or from carelessness; many persons but half, or indeed scarcely at all, chew their food, which is swallowed in lumps, and of course, not being broken down, is unmixed with the due proportion of saliva. Fortunately, the solvent powers of the gastric juice are sufficiently active to compensate in the course of time for the imperfect performance of the first of the digestive operations; but it must be evident to all, how much longer and more laborious the process must be of dissolving a solid lump of meat or potato, than of one well broken down and opened up to the operations of the gastric juice; it must also be evident, that in the case of farinaceous and vegetable food, insufficient admixture of saliva must occasion insufficient digestion, or conversion of the starchy matter into sugar, and that, therefore, a portion of the food consumed may become useless. When a difficulty of mastication is experienced, it is always advisable to have the solid food, especially meat, well cut up or minced before partaking of it. Mincing instruments are now sold for the purpose, made on the principle of the sausage-making machine.

Another evil resulting from imperfect mastication, is the rapidity with which food is introduced into the stomach, so that, probably, the organ is over-loaded before the natural sensation of appeased hunger can make itself felt.

Many persons, again, hurry over their meals, with minds intently engaged on something else; the food is swallowed as quickly as possible, and the scarcely interrupted mental effort or business anxiety is resumed, or it may be active exertion at once engaged in. Now, it is a law of the animal economy, that all the functions of the living body, and those which are only periodically called into exercise more than others, require for their perfect performance, some additional access of nervous power, and some increase in their usual supply of blood, whilst the peculiar function is in active operation. With the stomach this is peculiarly the case; the disinclination for exertion, and the slight sensation of cold which generally

follow a full meal, are the results of the call made upon the nervous energies, and upon the circulating blood, by the stomach, during the first stages of digestion. These sensations are more felt if the individual remains quiet after a meal, less so or not at all, if active exertion, either of mind or body, is at once engaged in, and the reason for this is evident; in the first instance, the person who remains quiet, permits the nervous power and the blood to be, as they ought, directed to the performance of the digestive function, and consequently, their supply to the other portions of the body being diminished, incapacity for exertion, both of mind and body, is experienced; if, however, before the nervous and circulating energies have become fully directed towards the stomach (or, indeed, if after they have, exertion is made by a strong effort of the will), they are attracted by a still stronger power, either of muscular movement or mental exercise, the inclination for rest is not experienced; but as this is attained at the expense of the stomach and of its digestive powers, the food is more slowly and perhaps imperfectly digested. It is true that many persons go on for a great length of time without apparent bad results, violating the laws of their own constitution, snatching hurried meals, and running off to business, or study, or exertion, immediately after; but the practice tells in the course of time, and the extreme prevalence of disorder of the digestive organs, amid the commercial and professional classes in this country, is evidence sufficient of the hurtful tendency of such practices. There is, of course, much variation in the injury which the digestive powers sustain, for some have these naturally much more active than others, and can with much more impunity impose upon them; but, as a general rule, moderate rest, both of body and mind, is requisite for a short period after a full meal has been taken, to ensure the perfection and the *continued healthy operation of the digestive powers*. If exertion is *requisite*, the meal should be made a light one, and the full supply of food delayed till rest can be taken. Somewhat similar consequences and enfeeblement of the function of digestion are apt to occur, if an individual makes a hearty meal when in a state of fatigue or exhaustion from exertion previous to the taking food, even though quiet is observed after it; the nervous power being exhausted, cannot be sufficiently supplied to the stomach to support its efficient action.

Another frequent cause of disordered digestion is excess of food, either at once, or by its too frequent repetition. It would seem that the healthy digestive power, and secretion of the gastric juice, is dependent in some degree upon the requirements of the system, and as the gastric juice can only dissolve a certain proportionate quantity of aliment, if more is taken than there is gastric juice to act upon it, it must be imperfectly or not all digested, and if it is not, it becomes subject to the same chemical laws as if exposed to heat and moisture out of the living body; fermentation takes place, gas—"wind"—is generated, acids are formed both in the aliment itself, and thrown out, probably by the efforts of the irritated stomach, and heartburn, pain, and the many other uneasy sensations connected with indigestion are developed. Many of the causes of indigestion are undoubtedly traceable to other sources, but the consideration of those will be taken up in the article devoted to the subject. The digestive power of the stomach is remarkably interfered with, or even negatived, in many diseases, especially those of an acute or febrile character; it seems to lose almost its power of secreting the gastric juice, and with it, of course, all power of digesting; if food is put into it, it is unacted upon, and is probably vomited after many hours, almost unchanged. There can be no question that this instinctive sympathy, as we may call it, of the stomach with the constitution at large, is wisely intended to prevent nutriment being introduced into the system, and into the blood, when it would either only tend to embarrass the curative powers of nature, or to aggravate the disease.

From the review now taken of the nature of the process of digestion, and of the more general causes of its disorder, the reader must have been made *rationally* aware of the necessity and reasons for attending to these requirements, which have been pointed out as imperative, for the immediate proper performance, or for the continued health of the function. The food *must* be prepared for the stomach in the mouth, and the stomach must not have the nervous energy and blood supply, requisite for the important office it performs for the system at large, abstracted from it by unseasonable exertion. The food must, too, be proportioned to the wants of the system. If a man will be sedentary, if he will not use up his blood, his muscle and nerve, in active exertion, he must not expect to enjoy food like one who does: he may eat the food, and, if he possess naturally strong digestive powers, his stomach may dispose of it without giving him much inconvenience; but when the excess of nutriment reaches the blood, it must either be deposited as fat—itself, when in excess, a disease—or it must be developed in the poison of gout, gravel, or biliary or other disorders.

Hitherto, the processes of the first or primary digestion have been considered, being the changes of the food from its introduction into the mouth, to the discharge of its refuse on the one hand, and the passage of its nutrient materials into the blood on the other. Physiologists, however, recognise a secondary digestion, embracing the changes undergone by the blood and tissues in the performance of the various functions of the living body, and the final discharge of their components after they

have fulfilled their offices. As the consideration of these changes is entered into in various articles, such as *Animal Heat*, *Nutrition*, *Respiration*, *Motor Change*, &c., it is unnecessary to pursue it further in this place.

It may, perhaps, have puzzled the unprofessional reader, that at times the digestive operations have been alluded to as if they had actually been witnessed by the eye, and such is the fact; for it happened that, between forty and fifty years ago, an American physician, Dr. Beaumont, enjoyed the rare opportunity of experimenting upon, and witnessing with his eyes, the results of his experiments upon the healthy stomach of a living healthy man.

The subject of Dr. Beaumont's experiments was Alexis St. Martin, a young Canadian of good constitution and robust health, who was accidentally wounded by the discharge of a musket, which carried away a portion of the skin and muscles covering the stomach, and perforated the organ: by good treatment, St. Martin recovered from the injury, but the opening into the stomach never closed. The case coming under the notice of Dr. Beaumont, he, fortunately for science, availed himself most fully and intelligently of the unique opportunity it afforded, and, by numerous well-conducted and accurately-recorded experiments, he cast light upon many unascertained points connected with the process of digestion, to some of which allusion will be made in future articles, particularly in that upon *Food*. Those who wish further information respecting the case will find all its details in Dr. Beaumont's work, re-edited in this country by the late Dr. Andrew Combe.

Refer to—*Absorbents—Alimentary Canal—Chyle—Food—Indigestion*, &c.

DIGITALIS, or Fox-Glove, is well known, and one of the handsomest of our native plants. It is biennial, that is, the first year a tuft of leaves only is formed, and the flowers do not appear till the second summer. About the middle of June, the wand-like stem, rising from two to four feet high from the centre of the root leaves, begins to expand its purple blossoms, resembling in some degree, in shape, the finger of a glove, from which resemblance the plant is named.

Digitalis is a very powerful medicine, and, except in skilled and careful hands, a dangerous one, and can never be employed with propriety as a domestic remedy; although in Ireland it is used by the peasantry for the cure of epilepsy. The infusion and tincture as well as the active principle of the leaf, named digitaline, are used in medicine; the dose of the tincture is from five to thirty minims, that of the infusion from two tea-spoonfuls to half an ounce.

Fox-glove acts powerfully upon the kidneys in many cases, but its most marked, and, at the same time, most dangerous property, is that which it possesses of depressing the action of the heart, the hazard being increased from the tendency of the medicine to accumulate in the system, and suddenly to develop its depressing or poisonous effects. Properly administered, nevertheless, digitalis is a heart tonic, toning down tumultuous and irregular action. There are but few cases of direct poisoning by fox-glove recorded, but accidents sometimes happen from the incautious administration of it as a medicine; in these cases, great languor and depression of the action of the heart, yawning, giddiness, nausea, and a sense of anxiety, are the usual symptoms. The best antidotes would be wine or brandy, small doses of opium, ammonia, and strong infusion of green tea.

DILL, or Dill-Seed, is the fruit of an umbelliferous plant, the *Anethum graveolens*. It is a native of South Europe, but is cultivated in Britain. The distilled water, or "dill water," is one of our best carminatives for infants when suffering from flatulence, in one or two tea-spoonful doses, either alone or combined with magnesia.

DILUENTS are agents used medicinally for diluting the fluids of the body, and in many diseases their employment is a subject of much practical importance. In most cases, either in health or disease, the necessity for the use of diluents is made known by the occurrence of thirst. This sensation, which is perceived in the mouth and throat principally, is evidently only felt from sympathy with the body generally, for it is not relieved by the mere moistening of these parts, but only by a supply of fluid afforded to the system at large, either, as in most cases, by the stomach, or through the medium of the skin. Diluents may, however, be very serviceable in the treatment of some diseases when thirst is not felt, as in gravel; they are much more largely used, and perhaps abused, as medicinal agents, on the Continent, than they are in this country. Many reputed mineral waters act most beneficially by their diluting effects; under the hydropathic system, the treatment is carried to a most unlimited, and often injurious extent.

In health, a large amount of fluid, or of diluent, is required periodically by the body to supply the waste continually going on by the discharge of moisture from the lungs and skin, and by the excretions from the kidneys and bowels. The amount must, of course, vary somewhat according to the conditions of the surrounding atmosphere as to temperature and dryness, and also according to the amount of exercise taken; a man making much active exertion, and perspiring profusely, requiring a much larger supply of diluent than one who is not. Stokers, ironfounders, and others who work hard under great heat, consume an almost incredible amount of fluid. The unnecessary use of diluents by persons in health is undoubtedly hurtful, particularly when the amount is taken along with food; the gastric

juice is thereby diluted too greatly, and its digestive powers impaired; moreover, persons who drink largely with their food, are apt to wash it down in a half masticated condition, and to take more than is necessary. A certain amount of dilution is, nevertheless, requisite for digestion, and error on this side, also, is undoubtedly committed; but these are points connected with individual constitution, which every man's sense and experience ought, as far as he himself is concerned, to determine better than another can do for him.

All dilution must, of course, be due to water, and the various forms of diluents used in illness are but varied modes of administering the pure element disguised. In many cases this is too largely practised, and patients, very commonly, after having gone the round of the various artificial drinks, are found to prefer, and to adhere to the simple water, as their most grateful and only drink. How often does the child with fever ask for "water from the pump" in preference to everything else!

Water may be used as a diluent in its purest condition, that of distilled water, or rain water, or as procured from the various sources of spring, well, river, or lake, in which cases it is more or less impregnated with foreign matters. Its temperature may be modified, for it may be used either ice cold, or tepid, or warm; or it may be administered in the form of some of the artificial drinks, such as toast-water, barley-water, thin gruel, or, as on the Continent, as tisane of various kinds. Weak tea is a common and favourite diluent with many. But diluents are not necessarily unstimulating, though most generally so; as a dietetic diluent, oat-meal and water may be more serviceable than any other form, and the same may be the case on occasion where there is intense thirst, along with nervous exhaustion. Persons who have become exhausted by severe labour, having at the same time been exposed to heat, may often with greater benefit and safety take a small quantity of slightly stimulating diluent, than a larger, or even the same amount of plain water. This must not be understood as a recommendation of stimulants under circumstances of ordinary labour, but as applying to cases of *exhaustion*, and even in these the stimulant must be in very moderate proportion.

The instinctive desire for fluid in cholera, and in diseases generally which are attended with fever, ought not to be neglected. There appears to be almost a superstitious fear with many, particularly of the poorer classes, of allowing the sick to "drink cold water," and many a sufferer regards most gratefully the permission of the medical attendant to take it freely, after it had perhaps been begged for, but withheld by mistaken friends. There are few safer prescriptions, none perhaps which may be more freely carried out by unprofessional persons, than the moderate allowance of simple, unstimulating drink, in all acute diseases in which thirst exists, and especially if fever be present.

As mentioned in the first part of this article, diluents may be administered through the medium of the skin, and thirst and distress allayed in this way, when the power of swallowing is impaired or lost, either temporarily or permanently, or when the only diluent at command, such as sea water, is unfit for drinking. Diluents may also be administered by injection into the bowels.

Refer to—*Cold*—*Cookery*—*Heat*—*Thirst*—*Water*, &c.

DINNER is *the* meal of the twenty-four hours, the principal occasion on which the daily waste of the body is restored by food. At dinner, for the most part, the articles either of food or drink taken are stronger and more stimulating that at any other meal, consequently its disposal makes the greatest demand upon the digestive powers. It matters not that what some persons call dinner, others would call supper, for by the designation is here meant the principal meal of the day. The regulation of the meal as to time and circumstances often requires more attention and care, in relation to health, than is bestowed upon it, either by medical men or the public. In more primitive times, and where primitive habits prevail at the present day, the timing of this principal meal, must obviously be very different from what it should be when taken in connexion with the habits and modes of life of many in this country, particularly in our large cities. When persons, such as those engaged in country and agricultural work, rise very early, breakfast early, and are engaged in active muscular exertion in the open air, there can be no question, that by the time of noon, the system is ready for, and requires a full supply of good nourishment; and the powers of digestion are fully equal to the task, even though the interval of rest be not very great. Further, half-a-dozen hours' work afterwards, pave the way for another substantial meal; and such being the case with our agriculturists, the healthiest and strongest, probably, of our population, people seeing this, have jumped somewhat hastily to the conclusion, that the early dinner is the secret of health, forgetting the other accessories of fresh air and exercise, and, in the case of the labourer, not over-active minds. The case of mechanics and artizans generally, who begin the day early, is nearly, but not quite similar to that of the labourer; they require a good meal tolerably early in the day, but not having the advantage in many cases of the fresh air of the agriculturist, many of them might with advantage divide the meals a little more equally; diminish the dinner, and add to the meal made after work is concluded, more particularly when the dinner hour is short, or shortened by the necessity of walking home from the place of employment to the meal.

When the case of the higher classes is con-

sidered, it must be evident how completely the time for their principal meal must be altered by circumstances; beginning the day, for the most part, some hours later than the operatives, making, generally, much less physical exertion, and working the head more, there is not the necessity for the principal meal being early in the day. Moreover, the employments generally of the class in question, being more of the mind than of the body, and often of an anxious and thought-engrossing nature, they cannot in the midst of them cast loose the mind, or place it in the same careless ease as the physical labourer can do, consequently the digestive powers are interfered with. If these observations are taken in connection with those upon *Digestion*, in the article devoted to that subject, their force will be seen. From them the following deductions may be drawn:—That although those engaged in physical exertion, either of business or pleasure, particularly if early hours are observed generally, require and ought to have the principal meal of the day early; those engaged in occupations of mental rather than of bodily exertion ought to delay it till the necessity for the mental stretch is passed over. This subject has been more dwelt upon from its so frequently being the case, that early dining is prescribed in cases of stomach disorder as a sort of panacea, which it does not prove. It is not counselled that the dinner hour should be thrown too late in the evening,—probably six o'clock should be the limit, but it is far better that it should be late, than interpolated in the midst of the turmoil and anxieties of business, or mental strain of study. It is objected that a late dinner involves either too long an interval between breakfast and dinner, or a luncheon. This is matter of constitution simply; some persons of good constitutional powers, who can make a substantial breakfast between eight and nine in the morning, do not require food between that meal and a five or six o'clock dinner; those who cannot take so much at a time, are much more likely to do well with a light luncheon, *not necessarily a meat one*, in the midst of their work, than with a heavy meal, as even the lightest dinner must be. It is no real objection against a late dinner, that its being made after work, induces people to indulge in the pleasures of the table more than if they dined early; abuse will neutralise the good of anything, however beneficial, but it is not an argument against its use. Further, there are undoubtedly invalids, and certain impaired states of health, in which an early hour for dinner is found beneficial, but these must be cases in which either the state of health, or circumstances, require or permit *all* arrangements to be made conformable to the one object—health. An early dinner almost certainly involves supper of some kind, and this may or may not be an objection according to circumstances.

Undoubtedly, modern habits and luxury tend frequently to make even this principal meal a much too abundant one, chiefly by tempting the appetite with a variety of food, and it is impossible to lay down any set rules on this head beyond that which every rational man must be well aware of, that none can perseveringly transgress the bounds of temperance, either in eating or drinking, without, sooner or later, disease being the result.

Sleeping after dinner may suit a few persons, but it is not advisable for those of full habit of body. For the reasons already mentioned, the time immediately succeeding dinner should be one of easy relaxation, to the man of mental toil in particular. The use of wine, beer, or any stimulant falls of course to be considered under the other articles more directly bearing on these subjects. A cup of coffee is sometimes taken shortly after dinner; opinions differ as to the propriety or not of the practice; it will probably be found to be best regulated by individual experience; the practice, however, of taking tea or coffee, either immediately or two or three hours after the meal, is unquestionably a serviceable one amid the usages of civilised life, and assists the perfection of the latter stages of digestion. These diluents, however, ought not to be taken too strong, or too late in the evening, otherwise their effect upon the nervous system will interfere with sleep.

Some individuals of weak digestive powers are in the habit of taking a "dinner pill," for the purpose either of exciting the appetite, of stimulating the digestion, or of both. As a habit, the practice is bad, because it must be a substitute for more efficient and permanent means of improving appetite and digestion; occasionally, however, in some cases the dinner pill is useful as a temporary remedy. Eighteen grains of compound rhubarb pill, six grains of cayenne pepper, and twelve grains of extract of gentian, made up into twelve pills, of which one or two may be taken a quarter of an hour before dinner, will be found useful. The practice of taking spirits, or stimulant cordials, or bitters, before dinner, is highly injurious to the stomach, exhausting and irritating in a way that must interfere with digestion. A draught of cold water is a much better preparative; with persons of very weak powers, however, cold water, either before or during the meal, depresses too much. Many persons find that a glass of warm water agrees better with them than cold, and it is certainly quite as efficacious in quenching thirst.

Refer to—*Digestion—Food—Stimulants.*

DIPHTHERIA.—There prevails throughout this country a very general, though an entirely erroneous impression, that diphtheria is a new disease. It cannot be doubted, however, that it had been observed at different times in France, in Scotland, and in England during the last two or three hundred years.

Diphtheria may be defined as an acute specific infectious disease characterised by

the presence of a whitish leather-like membrane (Greek, *diphthera*, a membrane) on the throat (tonsils, pharynx, and upper air-passages), attended by great prostration of vital power, and not unfrequently followed by a remarkable form of paralysis of certain muscles, of which more will be said hereafter. It is caused by a rod-shaped bacterium, known as the *Bacillus diphtheriæ*, or, from its discoverers, the Klebs-Loeffler bacillus.

It mainly attacks children and young people, and it may occur more than once in the same individual.

Symptoms. — The disease generally commences with a feeling of languor and debility, sickness, headache, and not unfrequently shiverings or chilly sensations. It is very remarkable that, in a short time after the commencement of the symptoms, the strongest man may feel as weak as a child, and require to be supported in walking to his bedroom. The throat affection comes on in different ways. Some patients awake in the middle of the night, and find the throat sore for the first time. In others it is preceded by a slight feeling of stiffness in the neck, and general uneasiness in the region of the throat. The tonsils and glands of the neck become tender and inflamed, there is difficulty of breathing, and sooner or later there appears the leathery membrane spoken of above. This does not, of course, present itself fully formed all at once, but in the form of little patches, which coalesce to form one continuous skin or membrane, which certainly resembles damp white leather. It is this skin or membrane which is so eminently characteristic of diphtheria, whether it occurs in the throat, or, as it sometimes does, in other parts of the body. In bad cases of the disease, the membrane increases in extent, and spreads to the surrounding parts —to the palate, uvula, gullet, and nostrils, the cheek and gums, or even—in which case it is of course extremely perilous, to the larynx and wind-pipe. In cases where there is much of this membrane about the throat or mouth, there is always a great amount of sloughing, accompanied with fœtor of the breath while the membrane is being detached and separated, leaving a raw, ulcerated surface underneath, which is often very painful during swallowing, especially if any irritating substance is used with the food which the patient takes. The pulse is generally quick and very feeble, and the skin dry and hot. The tongue is generally furred; and there is great disinclination to take food, both on account of the difficulty of swallowing, and the want of appetite. In very bad cases, occurring for the most part in those who live in dark and damp, ill-ventilated and ill-drained dwellings, the patient very soon sinks into what is called a typhoid state, mortification sets in in the affected parts, and there is not unfrequently hæmorrhage occasioned by the separation of the sloughs, which may cause death to those already weakened by the disease. Most commonly death takes place from exhaustion. It may, however, take place suddenly, owing to the formation of clots of the diseased blood in the heart or large blood-vessels. It not unfrequently happens, too, that the patient is choked by the membrane extending down into and blocking up the air passages; death being either gradual or sudden from this cause.

The Bacillus of Diphtheria.—The bacillus is found only locally, as a rule, although, according to some authorities, it may invade the general system. But it produces an extremely powerful poison, or toxine, which is rapidly absorbed, and it is this toxine which gives rise to most of the symptoms characteristic of the disease. One of the most remarkable discoveries in medicine is that of Behring and Kitasato that, if animals (horses) are subjected to inoculations of this diphtheria toxine in repeated and increasing doses, their blood, after a shorter or longer period, contains a substance which can neutralise the toxine, and so destroy it. This "antitoxine," or "antitoxic serum," has become a specific in the treatment of the disease, and better results have probably been obtained with it than by any other method. However, as in the case of other "specifics," it does not always effect a cure. The serum is injected into the subcutaneous tissue of the abdominal wall, and the earlier in the disease the injection is made, the better are the results.

Local Treatment.—Mild antiseptic solutions of boracic acid are most in favour, or chlorinated soda in the proportion of one part to eight of water. Warm sprays to the throat of carbonate of soda (20 grs. to 1 oz. of water) afford great relief. Strong beef tea and wine should be given at regular intervals, according to the patient's state; and, in cases of great depression, brandy must be given instead of wine. Where there is inability to swallow, enemata of brandy, beef tea, and quinine should be administered.

After Effects.—It now remains to speak of the very remarkable consequences which often attend upon an attack of diphtheria. During convalescence from this disease, the patient is sometimes affected by paralysis of certain muscles, especially those concerned in the act of swallowing; the food, both solid and liquid, passing down the nostrils, to the great inconvenience and pain of the sufferer.

Paralysis of the legs and arms may supervene quite suddenly. Paralysis of the muscles of the trunk is much less frequent, but paralysis of the heart may come on, and cause death. The eyesight may be affected, or the tone of the voice altered for a time. But it is fortunate that, as a rule, none of the above-mentioned conditions continue permanent. On the contrary, after a few weeks, they generally begin, under proper treatment, to improve

steadily, and progress gradually towards a perfect cure. The nervous sequelæ are best treated by the internal administration of nux vomica or strychnine. The citrate of quinine and iron, in doses of from three to five grains, three times a day, may be prescribed with advantage; while bathing, rubbing, and shampooing the limbs may be practised with the employment of electricity. A liberal diet, with a moderate allowance of sherry or pale ale, should be given; while, at the same time, if the patient is unable to take walking exercise, it will be well to substitute daily drives in an open carriage, if the weather be fine enough to admit of it.

Isolation. — *Precautionary Measures.* — As the disease is contagious, it is absolutely necessary that the patient should be isolated, and the attendant should protect herself by *avoiding the breath and cough of the patient*, and by disinfecting the vessels into which he expectorates. Unless perfect isolation is insisted on, the disease usually spreads to other members of the household, and especially to the children.

To arrest the spread of diphtheria, the disease should be recognised as early as possible. A precise diagnosis can be made from the examination of the false membranes, by the microscope, or by the cultivation of the germ. It must be remembered that the bacillus can remain active in the mouth for weeks after the disease is cured. Consequently, diphtheritic patients should be kept isolated for some time after the disease subsides. Linen and all articles which have been in contact with diphtheritic patients should be disinfected by boiling for at least five minutes.

Of course, it is not expected that any unprofessional person would attempt to carry out the treatment of so formidable and fatal a disease as diphtheria, when the aid of a medical man can be procured; but, as diphtheria now prevails in almost every quarter of the globe, and under every variety of circumstances, it is well that all should know the symptoms of the malady, and the measures most likely to be successful in subduing it.

DIPLOE is the name given by anatomists

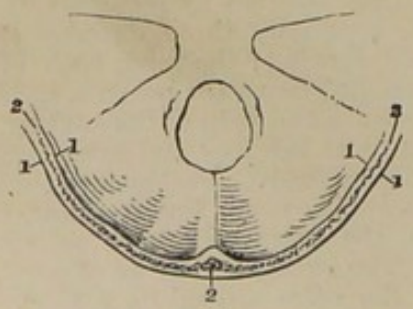


Fig. 70.

to the more cellular or porous portion of bone (fig. 70—2) which intervenes between the more condensed and solid, but thinner, outer and inner "tables," or plates (1,1,) of the skull.

Refer to—*Skull.*

DIPSOMANIA is a state when habits of intemperance have reached such a height, that the unfortunate victim becomes partly insane, or at least so much so, as to lose all self-control on the one point, and to become affected with the species of monomania to which the term *Dipsomania*, has been applied. Sir Alexander Morrison describes it as a "morbid craving for drink which generally occurs at intervals, in which persons are seized with an irresistible propensity to drink to excess, although conscious at the time of their misconduct, but are unable to control themselves."

The employment of the term dipsomania has been rendered necessary by the now well-known fact, that there are numbers of individuals whose desire for intoxicating liquors is so strong, and their ability to resist it so feeble, that they are in a manner obliged to give way to it, or, at all events, are so little under the control of reason, that they are for the time being maniacs, in one sense of the word. It is a remarkable and at the same time a most melancholy reflection, that those persons who have for a length of time indulged a craving for intoxicating drinks, sooner or later, are apt to lose all power of control over themselves, and, in fact, so conscious are they of this, that many of them would willingly submit to any kind of restraint which would deprive them of all opportunities of indulging in a vice, the pernicious consequences of which they are too well aware of. Continuance in such a degrading vice as drunkenness cannot fail to be followed by punishment, and those who are ignorant on the subject should not be left uninformed that the disease, if we may so call it, dipsomania, is a consequence of vicious habits unchecked, that it is one of the most dreadful punishments with which a poor human creature can be visited,—so dreadful, that the sufferer is often only too anxious to put himself under voluntary restraint, making the humiliating confession that his reason—that proudest faculty of man—has lost its ascendency over his evil passions, and that he has indeed sunk into a lower condition than the brutes that perish! It must, however, be distinctly understood that there is no such disease as dipsomania, which has not been self-acquired or *hereditarily transmitted*, of which more hereafter; that is, there is no disease of the brain known to physicians which causes this morbid craving for drink that has not itself followed as a consequence of indulgence in the evil habit. In connection with this, it may be well to remark that there is in the present day too great a readiness on the part of the public mind to attribute the commission of the most revolting crimes to insanity, and to regard a drunkard as an irresponsible being, a tendency which is

as much against common sense as it is detrimental to public safety. The welfare of society demands that there should be institutions throughout the country for the voluntary or compulsory restraint of habitual drunkards, where they might be subjected to proper treatment, under the care of duly qualified medical attendants. Proper treatment consists in the entire removal of stimulants and the substitution of good nourishing food, exercise in the open air, and healthful occupation both of body and mind. Medicine is only of use in so far as to correct that derangement of the digestive organs which almost invariably is present in the debauchee. Bitter tonics, the mineral acids, quinine, iron, &c., may be given to restore the tone of the system. To relieve the craving and to procure sleep, bromide of potassium in twenty-grain doses is frequently administered, and is often combined with twenty or thirty drops of tincture of capsicum. Ærated waters of various kinds, either alone, or with the addition of some agreeable fruit syrup, lemonade, soda water, potash water, &c., may be taken as drinks at meals.

It is matter of congratulation that at the present time the absurd custom of pressing people to drink, under the idea of being hospitable, no longer exists in the homes of the more educated and refined, and that any one, even the most wanting in moral courage, may abstain entirely, without any explanation being asked or given; or, if any is asked, it is quite sufficient to say that it is in accordance with medical advice.

It is much to be regretted that there is no legislative provision made in this country for the treatment of dipsomaniacs, and that medical men and others have to find a private retreat for them in their own houses when they belong to the well-to-do classes. It is different in America, where facilities for treatment are afforded them in establishments under the eye of the law. The great want of such institutions is shown by the fact, that no class of persons are so convinced of the necessity for them as the patients proposed to be admitted to them for treatment. At present there are many persons abroad in the world who have acquired this disease, and who are unable to resist the sudden craving for drink when temptation offers, in spite of all the numerous good resolutions which they may previously have formed in perfectly good faith. Now, it is to such persons that asylums of this kind would afford a retreat, and a means of cure under proper and skilful medical treatment, both of body and mind, till the morbid propensity is overcome. It will be readily understood, upon a little reflection, how much misery might be spared to families, and to individuals, by the adoption of such a system, and how many an onward career to ruin might be opportunely checked, and, perhaps, when the time came, turned to better account. The experience of medical men goes to prove that even the worst cases are capable of cure, if only time can be gained, and most are of opinion also that the time of probation should be as extended as possible, owing to the extreme proclivity which such cases manifest towards a relapse into former habits when restraint is withdrawn, and temptation suddenly presents itself in the shape of old familiar scenes, associates, and customs. No doubt the great difficulty will be to say when, in any given case, it will be safe to remove the patient from restraint. But the very experience upon this point, afforded from the treatment of such cases in public institutions, will be of the greatest value both to the medical profession and to the public at large. Meanwhile, it may be stated as a general rule, that those cases in which the habit has not been of long standing, will require much less and much shorter duration of treatment than those in which the vice has been acquired through a system of continued indulgence for many years, and in which *partial* reform has been only too surely followed by a speedy relapse.

Dr. Aitken, in his work upon the *Science and Practice of Medicine*, very forcibly describes the effects of a long-continued and immoderate use of alcohol in giving rise to degeneration both of body and mind. He says,—"By far the most active sources of degeneracy are those direct and repeated influences upon the blood, the brain, and the nervous system, which give rise to morbid conditions, and which often place those who periodically expose themselves to the influence of toxic agents in a condition merging on, or equivalent to, insanity. The effects of *chronic alcoholism*, for instance, in giving rise surely and progressively to the degeneration of the individual, are mainly demonstrable by the production of the following states, namely:—Persistent loss of appetite, indigestion, nausea, occasional diarrhœa, progressive emaciation and cachexia, the appearance of pustular eruptions, the occurrence of eructations, associated with offensive breath, serious disturbance of the functions of the stomach, liver, kidneys, and heart, and the production of organic lesions in these organs, and in the structures of the blood-vessels, followed by fatal *serous effusions*, *dropsy*, *hæmorrhages*, *extravasations*, or *apoplexies*. Intercurrent with these morbid conditions, at variable periods, and otherwise contingently, 'fits of drunkenness,' with sexual incompetency, different forms of psychical aberration, *delirium tremens*, suicidal melancholy, and such like morbid phenomena, ensue. Finally, epileptiform seizures, general paralysis, drivelling or slavering idiocy, may close the scene." The tendency of such unfortunate individuals, as described by Morel, is either to pass at length through a succession of stages marked by intellectual and physical deterioration of all kinds, into a condition known as general paralysis: or on the other hand, to drag out a

miserable existence, with a completely shattered nervous system, a burden to themselves and their friends, depraved in body and mind, and not unfrequently exhibiting the most degrading propensities. Dr. Aitken states that the degenerative effects of alcoholism above detailed do not stop here, but affect the procreative functions to such a degree, that not only is the standard of the offspring lowered materially, but the extinction of race follows as an almost invariable consequence. In speaking farther on this subject, he says:—"When such results are coupled with the moral and the social aberration which ensue from bad example, misery and want in families and masses of men, they become ample sources of the degeneracy of the population, not only throughout the existing, but succeeding generation; and not only is the vice of alcoholic abuse transmissible, but it also frequently leads to insanity in the offspring of the drunkard, and in cases where the tendency to alcoholic excesses has a hereditary origin, the cure of the dipsomaniac is generally impossible." Morel gives the following example, in which a well-marked succession of morbid phenomena became developed in different descendants of a family throughout four generations:—"The great grandfather of the family was a dipsomaniac; and so complete was the transmission of the disease, that the race became totally extinct, under the well-marked form of alcoholic poisoning and degeneracy. The effects entailed were—in the first generation, alcoholic excesses, immorality, depravity, brutish disposition; in the second generation, hereditary drunkenness, attacks of mania, general paralysis; in the third generation sobriety prevailed, but hypochondriasis, lypomania, persistent ideas of persecution, homicidal tendencies were expressed; in the fourth generation intelligence was but feeble, mania became developed at sixteen years of age, stupidity running on to idiocy, and to a condition involving extinction of the race."

Dr. Gairdner, in his *Clinical Medicine*, gives the result of his very extended experience in the observation and treatment of cases of this nature. He mentions the case of one man, a clerk, who had been admitted upwards of twenty times to the hospital, and who was not likely to be long in seeking re-admission. After giving a very full and interesting description of what may be regarded as a typical case of dipsomania, the professor says:—"There is in all this evidence of long-continued and probably irreclaimable bad habits founded on a weakening of the moral sense, amounting to a kind of paralysis of it;" and, again, "It is a case not only of degradation, but of positive *degeneration* of the moral instinct; the degradation is probably both physical and moral by this time; the machinery of mind has suffered as well as the mind itself. This man, I believe, literally cannot do good at present; you can no more expect good conduct and high principle from such an organisation than you can from that of a gorilla. A long course of reformatory discipline might possibly, indeed, even now, do something to reverse the habits of forty years; but at the present moment of time this man is in a state of *moral paralysis*—powerless for good, and a prey to evil, in virtue of his physical and moral organisation — his craving appetites and deeply imprinted bad habits." Seeing that there are many such, and many worse cases, it remains an important question, What is to be done with them, how they are to be classified, and whether or not the medical man should be allowed more support from the public, and from the law, in dealing with them? And this manifestly becomes a question likely to excite much greater interest in the eyes of the public, when it is considered that all the cases are not met with in hospital patients only, but that unfortunately there are not a few, it may be, holding offices of trust and responsibility, heirs to large fortunes, or possessed of large estates.

Refer to—*Alcohol—Delirium Tremens—Intoxication—Stimulants.*

DISCHARGE, used as a medical term generally, means anything cast out from the body; it is often applied, however, in a more restricted sense to the excretion of purulent matter solely.

DISEASE is any departure from the naturally healthy actions of the system at large, or of any structure or organ in particular. The divisions and sub-divisions of diseases generally, according to their nature, causes, &c., are very numerous. A distinction is made into organic and functional diseases, the former being such as are accompanied with perceptible and appreciable change from the natural structure or composition of any component of the body; the latter those in which the actions are not healthy, but in which, as far as present means of investigation go, no appreciable departure from the ordinary structure can be detected. As, however, it may be doubted whether disordered action can take place without change of structure, temporary or permanent, its non-detection is probably owing to the deficiency of our present means of investigation; and, indeed, chemical analysis, and the use of the microscope, have demonstrated, and are daily demonstrating, the nature and tendencies of many alterations in the composition and structure of the bodily constituents which had previously escaped notice.

Perfect health consists in the uninterrupted action, and perfect balance of all the functions of the body; this involving, of course, perfection of structure, the slighest pain or ache must be indicative of a hitch somewhere in the machinery. In this view, perhaps, none are free from disease for a day, for few can boast of such perfect undeviating health as to pass four-and-twenty hours without some slight twinge of pain, without some ache or weariness

to remind them that their bodies are mortal, and from this slightest passing uneasiness, to the confirmed and fatal malady, disease passes through every gradation. Many of the most painful and deadly disorders are not more felt at their commencement than as a slight sense of discomfort, and perhaps numberless of the lesser pains felt during what is considered health, might pass on to real disease, were it not for the natural tendency to cure with which our bodies are endowed; that which is called the *vis medicatrix naturæ*—the same tendency which restores the fractured bone to soundness, and heals the wound. There can be no question that, but for this tendency towards health, this power of resisting and casting off disease, our bodies would quickly succumb to the innumerable causes of disorder to which they are hourly exposed. This power of resisting disease is without doubt much greater in some persons than others, and even in the same person at different times, often without any perceptible reason why it should be so. The power of the system in casting off disease, when forming or formed, is for the most part more plainly exercised, but of this more will be said hereafter.

Again, it must be remembered, that constitution and other causes occasion so much variation in the actions of the body, that what would be disease in one man is health in another. For instance, one man's pulse may average sixty in a minute, another's eighty; and it is certain that the former could not rise to the level of the latter, or the latter sink to that of the former, without disease or disorder being present. Such considerations are important in judging of the real state of a person labouring under disease; to judge accurately of disorder, we *must* know the whereabouts of the level of health, and in this consists the great advantage of the regular medical attendant over one who is casually consulted, and who first sees the patient when suffering under illness. In popular language, the regular attendant "knows the constitution" of his patient; the other has it in many respects to learn. But if there is a tendency towards health, there is also a tendency, more or less, towards certain forms of disease existing with every one, this tendency being either hereditary or acquired. The power of hereditary tendency towards certain forms of disease, such as scrofula and consumption, gout, gravel, and rheumatism, paralysis, &c., is so generally recognised as to be a matter of popular information; that is to say, when these diseases have affected parents, or relatives of parents, they are regarded as hereditary in descendants; there is, however, a hereditary predisposition not so apparent, which requires more notice than it receives; it is that which devolves upon children in consequence of the habits, &c., of the parents. The latter may be of healthy families, but if there has existed much inequality of age—especially if the father has been advanced in years, or if marriage has been contracted too early in life, or if either parents have lowered the standard of health by dissipation or by any other means, their sins, in obedience to those laws which the Almighty has connected with our being, are visited upon the children, in tendencies to certain diseases. The offspring of drunkards are very frequently the subjects of affection of the brain and nervous system; the child of the woman who gives way to indolence, or indulges in undue excitements, will in all probability fall below the standard of health. Tendency to disease may also be given, in persons previously healthy, by whatever lowers their own standard of health. Dissipation of any kind, deficient food or supply of pure air, exhaustion from whatever cause, depressing passions of the mind, &c., all give that tendency to disease which renders the constitution more susceptible of its attacks. Even the time of day exerts some influence, for it is well known that a person is much more liable to become affected with any malady, either of a contagious or malarious character, such as ague, if exposed to its influences in the early morning, before the powers of the constitution have been invigorated with food, especially with that, such as warm tea or coffee, which affords the gentle stimulation of heat. Further, individuals are never so liable to succumb to disease as they are during the stage of depression succeeding a debauch. Every day adds to our experience of the way in which the ill-ventilated and badly-drained dwelling gives the tendency to fever and to cholera, whilst at the same time it fosters their deadly germs into activity.* Lastly, nothing predisposes more to disease, or increases the tendency to it, than the depressing passions, such as fear, despondency, &c. Those who give way to dread of taking any malady, open the readiest door for its incursion; and even without the fear of the disease itself being the cause of the depression, the fact of the mind being depressed, increases greatly the susceptibility to any causes of disorder in active operation at the time. This is often strikingly exemplified in the case of troops; it is always observed that sickness is more prevalent among the men of a retreating and desponding army than under the reverse circumstances. Perhaps, under no circumstances is the *worldly* advantage of a firm reliance upon Providence more palpable than when that reliance sustains the mind in cheerfulness, hope, and resignation, resistants to disease, which come to the aid of those who hold them, when other help seems to have vanished.

There is a kind of mixed tendency to disease, partly hereditary and partly excited by external circumstances: it is this from which the children born in India, and the other hot climates, of English parents, suffer, particularly if the parents have been long resident. They

* See Article *Germs of Disease.*

cannot be retained in the clime of their birth, without the greatest risk to life before the age of puberty is attained.

Most of those causes which give a tendency to disease, also, in themselves, when acting with increased intensity, tend to produce it, or to aggravate it when existing. The influences of climate, of air, whether pure or impure; of food, whether deficient in quantity or quality; of occupation, of habits, or mental influences, are all-powerful excitants of disease. The remittent fevers of the tropics, and the typhus of Britain, the scrofula, the rickets and cutaneous eruptions, the consumption of the metal grinders, the delirium of the drunkard, are all instances, which might be multiplied, of diseases produced by external influences. The *diarrhœa* of fear, the nostalgia or home sickness—which is actually accompanied with disease in the lungs—of the Highlander or of the Swiss, the diseases of the heart which result from the agitation of political or commercial excitement, are all examples of the production of disease by the internal agency of the mind.

When disease has established itself in the constitution, were it not for the "tendency to health," it must run on to a fatal termination; the wound would remain unhealed, the inflammation would extend, or its effects remain unrepaired, were it not for these curative powers existing in the constitution itself. If, then, whatever tends to lower the standard of health, favours the inroads of disease, so the preservation of that standard, as far as may be consistent with the safety of the patient, and the reduction of his malady, ensures a more certain and speedy throwing off of the effects of the disorder, or in one word—convalescence. Patients who have suffered from hæmorrhage are often very long in recovering, and during the period of recovery are liable to relapse, and to be attacked by other forms of disease.

Moreover, during the progress of disease, nothing assists more the powers of the constitution which tend towards health, and to throw off the enemy, than a cheerful and hopeful mind; as the people call it, a "good spirit;" it may make all the difference between recovery or the reverse; indeed every medical man must have met with cases of illness, in which the patient seemed, as it were, resolved not to give in—seemed, even under unfavourable circumstances, determined not to die, if he could help it—and did not die; even when physical powers tended to death, the mind tended to life, and the mind succeeded. Were it not for the tendency to health, or to cure, existing in the body, our medicines would be in vain, and he is the best physician who can detect those tendencies to recovery, permit them to act when they seem strong enough, and assist them when they do not. The patient in the lowest stage of fever still has the tendency to health existing, and acting within, and battling with the disease; the powers of a good constitution *may* of themselves be sufficient to conduct him over the crisis, but they may not, and unassisted, the patient must sink ere the tendency to throw off the disease gets the mastery; but the physician steps in—he gives his help to the constitution, his wine, and bark, and nourishment, and regulation of the functions, supports the frame till the struggle is over, and the disease is vanquished. This power of throwing off disease, this tendency to health with which the living body is endowed, requires to be impressed upon the mind of people generally, for they are too apt to attribute that to the action of medicine, which medicine only gives its assistance to, and to despise the simpler modes of treatment, which place the natural powers in the most favourable position for curing. The vulgar attribute the healing of the wound to the plaster which merely holds it together, and cold water is too simple to do good.

The aggravation of existing disease, both by physical influences and mental emotions, is one of the most serious enemies the physician has to contend with. The subject is sufficiently entered into in the various articles of this work.

Lastly, disease is often established as a secondary affection, it occurs in consequence of some previously existing morbid condition of, or in some part of the body. Dropsy is a disease peculiarly of this class; affection of the heart, liver, kidneys, or other disorders, all tending to produce it; apoplexy may result from disease of the heart: in these cases, the secondary disease appears simply a result, without beneficial influence; but in many cases, it exerts a tendency to remove the primary one, and this fact is one of great importance in the treatment of all disorders of the body, for rash interference with the natural effort may throw the diseased action back upon the previously affected, or upon some more vital part. The healed-up ulcer, or seemingly cured eruption, may occasion head disease, or the checked diarrhœa may throw back upon the constitution, with serious or fatal effect, the blood poison of which the vital fluid was endeavouring to relieve itself. Even that alarming incident, spitting of blood, though in itself a grave symptom, may tend to relieve from worse evil. These efforts of the constitution, therefore, to cast off or cure disease, are to be cautiously interfered with.

In the treatment of disease, two very different methods have to be pursued; the one is that which exerts itself directly to cure by the direct action of certain medicines. Of this, the cure of ague, of neuralgia, and other periodical diseases, by quinine or iron, is an example; experience has unfolded to us, that in these and similar cases, the medicine has the power of curing by some relation established between it and the disease, by the Author of all things, and in nothing is His mercy more strikingly exemplified. But why quinine should cure neuralgia,

why opium should allay pain, we cannot tell, at least in the present state of our knowledge; the only approach to any explanation being one given by Liebig. The other method in the treatment of disease is not so much of the active as of the expectant or passive character. There are many—perhaps the majority belong to this class—forms of disease, for which we know of no *cure* such as quinine is to ague; the throwing off of the malady must be by the natural powers, and our only resource consists in putting and keeping those natural powers in as favourable a state for this purpose as possible. Of this, many forms of fever are examples; we cannot hope to cure, we can only hope to pilot the body through the rocks and untoward currents which arise in the course of the disorder, to allay secondary diseases which show themselves, to alleviate painful symptoms, and to support the constitution. These facts should be made plain to the minds of unprofessional persons generally, for the most erroneous notions prevail upon the points just alluded to, and often lead to dissatisfaction with medical men. One who is content with guiding the course of a fever, either with the gentlest treatment, or with what people may consider no treatment at all, is looked upon as inefficient; whilst the busy meddler, who interferes without aim or object, and probably thwarts, with uncalled-for medicine, the natural tendency to cure, is regarded as the "active"(?) practitioner.

The reference from this article must be to the work at large, for it bears upon the whole.

DISINFECTION, in the largest sense of the word, is a process which destroys the power or means of propagation of diseases which spread by infection or contagion. Purification of every kind, therefore, either by fresh air, cleanliness, or by chemical substances, is disinfection, these agents acting either by destroying, dispersing, or diluting the morbific germs emanating from the sick. In its less comprehensive, though more correct, sense, the term "disinfectant" is confined to substances we have at our command, which we know have the power, by their gaseous and chemical relation, of acting on clothing, &c., or the atmosphere of an enclosed space, such as a room or a house, and thoroughly destroying every vestige of contagious matter which may be present.

The recent advance in knowledge concerning the nature of contagion has led to greater precision in the measures adopted to destroy the infective agents which are the cause of zymotic or infectious diseases. The study of the life-history of the germs, or *bacteria*, to which these diseases owe their origin, and which are responsible for their propagation, has proved that many of the preventive measures hitherto relied upon have no claim to be classed as true disinfectants. Hence, the term "disinfection" should be applied only to a process which effects the complete destruction of the poison; but, owing to the indiscriminate use of the terms *disinfectant*, *antiseptic*, and *deodorant*, much confusion exists, and, as a result, the public, by adopting inefficient precautions, are relying upon a false security, and thereby, owing to laxity in the use of other precautionary measures, the risk is increased rather than diminished. The following definitions may help towards a clearer understanding of the subject:—

(1) The terms *disinfection* and *disinfectant* should only be applied to processes or substances which are absolutely destructive of the virus or poison of disease;

(2) The term *antiseptic*, to substances or processes which have the power of arresting the growth of the virus; and

(3) The term *deodorant*, to substances or processes which correct offensive smells.

To appreciate the difference between "disinfectants" and "antiseptics," it is necessary to know something of the behaviour of disease germs. It has been proved that these germs, during certain stages of their existence, are more tenacious of life than at others, and that what may be destructive of mature germs is powerless as regards their *spores* or seeds. These have the power of lying dormant for indefinite periods, and as soon as the adverse conditions are removed, the process of development is continued, and the active virus is produced. It follows from this, that a substance which is a real disinfectant, if used in sufficient strength, may, by dilution, be reduced to the level of an antiseptic or even a deodorant, and, as a fact, this has been experimentally proved. The essential conditions then, in a *true disinfectant* are the following:—

(1) That it shall be capable of killing germs and their spores;

(2) That it shall be applied to every part;

(3) In sufficient strength;

(4) For a sufficient time.

It will be useful to consider here, shortly, the relative value of the means of disinfection now in use, and their method of application, so as to insure that they shall comply with the essential conditions named.

Moist Heat.—The best disinfectant we possess is moist heat. By boiling any infected liquid or article of clothing for ten minutes, all disease germs and their spores are destroyed. All infected articles, therefore, which can be boiled will be rendered absolutely safe by this means.

Dry Heat is also a disinfectant; but, for several reasons, it is not so reliable as moist heat. In the first place, a higher temperature is essential, and the articles require much longer exposure to it. Drs. Parsons and Klein have proved that it requires an exposure of four hours to a dry heat a little over the temperature of boiling water to de-

stroy the spores of the germ of anthrax disease, but that one hour's exposure to a temperature of 245° F. suffices. The latter temperature, however, very closely approaches the scorching point. Until steam disinfecting apparatus were introduced, Sanitary Authorities had to depend upon dry heat disinfecting chambers, and the process, if carried out at all thoroughly, was a very tedious one, and frequently led to the destruction of articles of clothing or bedding. Steam, on the other hand, when used at a high pressure, and corresponding temperature, is a most reliable agent for disinfecting by heat, having great penetrating power, and being available for articles which do not admit of boiling. The steam disinfectors now in the market comply in every respect with the conditions laid down as essential to thorough disinfection, and although they cost more than the hot air apparatus, their efficiency more than justifies the extra outlay incurred in their purchase.

Carbolic Acid has long been in popular favour as a disinfectant, but it is doubtful whether it is often used in a solution of sufficient strength to act otherwise than as a mere deodorant, or at best an antiseptic. Five per cent. is the weakest solution which can be credited with disinfecting properties, and even in this strength the solution must remain in contact with the disease poison for a length of time. It is obvious from this that the common practice of discharging carbolic acid into sewers is of little or no real value from the point of view of disinfection, as, owing to the great dilution which takes place in the sewer, the acid is rendered useless. It follows, therefore, in the case of diseases, such as enteric fever and cholera, that to properly disinfect the stools with carbolic acid, they should be kept for twenty-four hours in closed vessels containing the disinfectant in sufficient quantity to form, with the excreta, a mixture of 5 per cent.

Corrosive Sublimate (bichloride of mercury), which has lately come into great favour, is a very potent disinfecting agent, even when diluted to the strength recommended—viz., 1 in 1,000. Unfortunately, its extremely poisonous character greatly interferes with its usefulness in the hands of the public, but the risk may be much lessened by artificially colouring the solution, (which is naturally colourless), and keeping it in specially-shaped bottles, with a prominent poison-label attached.—See *Mercury*.

Condy's Fluid (potassic permanganate solution), which is in daily use, has, theoretically speaking, disinfecting properties when the strength of the solution used contains, at least, 5 per cent. of potassic permanganate. As, however, the disinfecting power is very much diminished, owing to the material being used up in oxidising the organic matter present in the infected fluid, to be of real value it must be added in so concentrated a form as to forbid its use altogether on account of cost.

Remembering the distinction between disinfectants and antiseptics, the three substances just mentioned will act in the latter capacity in the following relative proportions:—

Corrosive sublimate	= 3	parts per 1,000,000.
Potassic permanganate	= 700	,, ,,
Carbolic acid	= 1200	,, ,,

Concerning the other so-called disinfectants, namely—chloride of lime, chloride of zinc, sulphate of copper, sulphate of iron, boracic acid, &c., experiment has proved that in practice they come short of what is required.

From what has been said, it will be understood that the popular custom of suspending about rooms sheets, &c., saturated with solution of carbolic acid and other substances, is useless, so far as disinfection is concerned. It is equally useless to place dishes about the house containing Condy's fluid, &c.; and, as already hinted, such practices are likely to do more harm than good, by encouraging a false security which may lead to valuable precautions being neglected.

How to Disinfect a Room.—Rooms are usually disinfected by burning sulphur in the proportion of 1½ lb. per 1,000 cubic feet of room space. The process is conducted as follows:—Carefully seal all openings, such as the fireplace, defective window-sashes, and any ventilating apertures, by pasting brown paper over them; furniture and all articles which cannot be boiled or otherwise disinfected, should be arranged so as to be as freely exposed as possible to the fumes. The sulphur should then be placed in one or more vessels (a sauce-pan answers very well) according to the size of the room, and, as a precaution against fire, each should be placed on two bricks standing in a tray containing water. Having added a little methylated spirit to facilitate lighting, the sulphur (which should be in small pieces) is then set fire to, and the operator must at once leave the room, close the door, and place paper all round it. The room must be left undisturbed for six hours, after which the windows should be left freely open for at least twenty-four hours. As it is doubtful to what extent, in practice, sulphur fumigation is effective, it should invariably be supplemented by further precautions. The rooms should undergo a thorough cleaning, the floors, and such articles of furniture as will permit of it, being well washed with soap and water. If the walls are papered, they should be re-papered after the old paper has been stripped off; painted walls, on the other hand, should be washed, and coloured walls should be scraped and re-limewashed. Any furniture which cannot be washed should be exposed in the open air for several days.

The process of sulphur fumigation, like other methods of disinfection, is credited with greater powers than it possesses, hence the necessity for observing the precautions just mentioned. The penetrating power of sulphurous acid into textile fabric is practically *nil*, one fold of blanket being sufficient to protect bacteria from its influence.

Sulphurous acid gas under pressure, in cylinders, is now often used as a convenient means of applying this method of disinfection.

What is known as *formic aldehyde* gas is now coming into favour as a substitute for sulphurous acid gas. It is liberated from a substance called "paraform" by heat, in a special apparatus, and as the gas has the same density as air its power of diffusion is greater than that of the sulphur gas. When used in solution this is undoubtedly a valuable disinfectant, but opinions differ as regards its practical value in the form of a gas.—See *Germs of Disease—Enteric Fever.*

DISLOCATION, in medical, or rather surgical language, means the displacement from their natural positions, of bones or portions of bones at the points where they are connected together by means of joints or "articulations." There is not, perhaps, a bone in the body which may not be displaced by violence, but some are much more liable to the accident than others. It would answer no good purpose, in a work of this kind, to enter into details respecting the varied dislocations which may and do occur: a few, therefore, only of the commonest, most easily recognisable, and most readily remediable will be noticed. There is some difficulty in treating the subject of dislocation in a popular work; for, although, from the nature of the accident, and of the circumstances in which it is apt to occur, it is highly desirable that some knowledge should be possessed by the unprofessional, both as regards the signs and symptoms of dislocation, and its more immediate treatment, the difficulty that occasionally presents itself, even to the skilled surgeon, in determining whether dislocation actually exists or not, or whether it is complicated with some other injury, such as fracture, renders the matter a delicate one for lay interference. With this caution, therefore, that unless tolerably clear upon the point, it will be better to wait even days for the arrival of skilled advice, than to make attempts to remedy an uncertainly-ascertained injury, the following hints may be useful, particularly in those cases in which the accident does not happen for the first time; and this will often be the case, for, having once occurred, it is very apt to do so again, even from slight causes. In such cases, the doubt as to the nature of the mishap will be most materially diminished; indeed, the patient himself is generally perfectly well aware of what has occurred, and can often give directions accordingly. The symptoms of dislocation having occurred, after violence or accident, are, pain with loss of power over the limb or member, and its becoming fixed in one position, so that it cannot be moved, either by the patient or by others, at least not without occasioning severe suffering; numbness is felt in the limb, the person becomes faint and sick, and if the joint be examined, it will be found deformed.

Whenever doubt exists as to whether dislocation has or has not happened, the case should be examined by a competent surgeon as early as possible, and no time wasted in fomentations and rubbings, which are perfectly useless. If a bone is "out of place," it cannot be too soon restored to its proper position, and nothing will give relief, at least for a long period, if this is not effected. A bone certainly may remain permanently dislocated, and the member attain, in the course of time, a very considerable amount of motion, by the formation of a new joint; but it is long before it does so, the power of movement is never equal to what it was before, or would have been, had the injury to the joint been properly rectified, and much unnecessary pain is suffered. The necessity for the speedy reduction of a dislocation is great, from the fact that every day increases the difficulty of its performance, and when a certain time has elapsed, no force which can be exerted—consistent with safety to life and limb—will be adequate to return the displaced bone, partly owing to the resistance of the muscles, but also to obliteration or doing away with the cavity which formed the one portion of the joint. When dislocation occurs, two different actions take place; one, that by which the bone is driven from its usual position; the other, the action of the muscles, which tend still further to draw it from its proper site as soon as the balance of resistance of bone against bone is removed. It is, too, in most cases, the action of the muscles which tends to keep the bone displaced, and to resist the efforts made to replace it. This is evident from the fact, that if a person be seen immediately after a dislocation, and whilst suffering from the faintness which almost invariably accompanies the accident, and whilst the muscles are necessarily in a state of weakness and relaxation, the dislocation may often be reduced with the greatest possible ease, even by the unskilled. The inhalation of chloroform is now universally used by surgeons prior to attempts being made to reduce the dislocation. It relaxes the muscles round the joint better than any thing else, and while under its influence, there is seldom any difficulty in ascertaining the extent of the injury and its true character, or of reducing the dislocation, if it is of recent date. When a dislocation occurs, the bone is not simply pushed out of its place, but is drawn for the most part upwards, or towards the body; the dislocated bone of the finger is drawn upwards over its fellow; the arm bone, in dislocation of the shoulder, may be drawn

upwards, or into the arm pit, in this case downwards, it is true, as regards the joint, but still towards the body; and the same will be found to be the case in most forms of dislocation. The first object, therefore, in treating a dislocation, must be to draw it down *from* or out of the situation to and in which it has been drawn, and is retained by the muscles of the limb, and to get it as near the corresponding part of the joint, or in other words, as near the part from which it has been dislocated as possible. If the dislocated bone is thus drawn down to, or near to the level of the other portion of the joint from which it has been removed, the muscles will of themselves tend to draw it into its old position. A good deal is often said about the adjustment, &c., of the bone in reducing dislocations, and though, perhaps, useful in some cases, in many nothing of the kind is required, at least, unprofessional persons should not attempt it; all that is to be done is, give the muscles the chance of drawing the bone into its old place by bringing it to a position in which this can be effected. This is often exemplified in cases in which much force is used in the reduction of a dislocation; if the force be kept up strongly, the bone cannot be drawn into its socket, because the force is stronger than the muscles of the patient; but relax the external force for a moment, and without any fitting or adjustment, the bone is instantly drawn, or "sucked" into its proper position by the power of its own muscles. The above principles will be better understood by a reference to the annexed cut, for which the author is indebted to Professor Fergusson's *Manual of Surgery*. In this (fig. 72—1) is the shallow cup attached to the

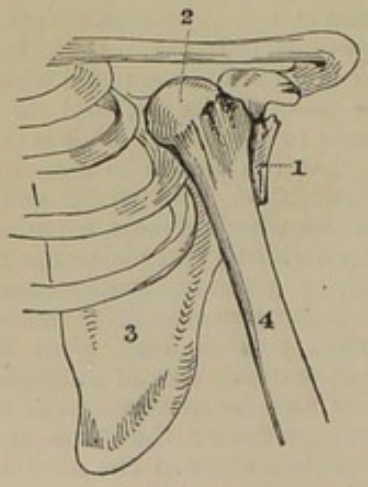


Fig. 72.

shoulder blade (3) in which the round extremity or head (2) of the arm bone (4) ought to rest, but from which it is represented as displaced or dislocated. The muscles are not here represented. It is evident, that before the round head (2) is replaced in the cavity (1) it must be forcibly drawn down to its level; this drawing down the muscles strongly resist, but also tend by the same power to draw the head of the bone into its place, as soon as *it* is drawn down sufficiently for them to do so.

These *principles* respecting the nature and management of dislocations have been dwelt upon, from the author thinking that a knowledge of them would be more likely to lead an *intelligent* non-professional person to judge correctly and act efficiently on such emergencies, than the bare enumeration of certain sets of symptoms, often sufficiently obscure, which characterise the different forms of dislocation, and which he could not carry in his mind. There is, however, yet another important principle involved in the reduction of dislocations. It has been pointed out, how the bone farthest from the body—which is usually drawn up—is to be drawn down; but that this may be done properly, the bone above it must be *fixed*, otherwise it will be drawn down too. This is easily effected in such cases as the ankle or the wrist, by any one grasping and holding firmly either the leg or the fore arm; but in the case of the hip or the shoulder, more management is requisite. In the latter, which is the most likely to fall under non-professional treatment, the shoulder blade must be fixed or prevented from giving way with the "extending" force applied to the arm bone; how this is to be done will be pointed out when the particular dislocation is treated of. Again, in "making the extension," that is, using the forcible effort to return the dislocated bone to its place, the extending force will best be made in the direction in which the limb is fixed, and in the manner most likely to bring the joint portion, or "articulation," of the displaced bone as near to the old position as possible, and it must be applied directly to the bone which is displaced. Thus, in dislocation of the shoulder, the reducing force is applied to the arm bone; in dislocation of the hip to that of the thigh. This extending power may simply be by the hand, but a cloth, or band of some kind, put round the member to be replaced, is often more advantageous. In order to put this band on most efficiently, it is

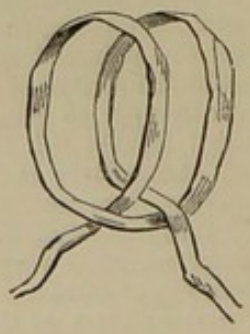


Fig. 73.

applied in the form of what is called the clove hitch (fig. 73) which will be better understood from an examination of the cut, than from any

description. This double noose, which may be formed of any suitable material, such as a large soft handkerchief, being fitted to the part to which force is to be used, with a piece of cloth interposed between it and the skin, is not liable to tighten when its loose ends are used to pull by. The particular dislocations most likely to be recognised and to be remedied by unprofessional persons, are those of the small joints, such as fingers and toes, of the wrist and ankle, of the elbow, shoulder, and lower jaw.

Dislocations of fingers or toes may generally be made out by most, and should, if possible be reduced at once; the dislocated bone being grasped as represented (fig. 74, also taken



Fig. 74.

from Fergusson's *Surgery*), and forcibly pulled into place; or the clove hitch noose, made with a piece of tape, may be used. Dislocation of the thumb, it should be known, is extremely difficult of reduction, and should this not be effected *at once*, the attempt ought to be given up till the surgeon's arrival; it is, moreover, one of the dislocations which may be left unreduced with less subsequent inconvenience than many others. Dislocation of the ankle is very generally accompanied with fracture, but the distortion is often so great and evident, and the suffering so severe, that when the accident does occur far from proper aid, some attempt ought to be made to put the displaced parts in better position; for this purpose, whilst one individual grasps the leg firmly, another, putting one hand on the heel and the other on the instep, should endeavour, whilst steadily pulling downward, to bring the joint into its natural position.

Dislocation of the wrist is reduced by the fore arm being tightly grasped by one individual, the surgeon laying hold of the patient's hand in his, and endeavouring by steady traction downwards, and *slight* up and down movement, to bring the joint into its proper condition.

Dislocation of the elbow, if attended to quickly after the accident, may often be easily reduced by seating the person in a chair, carrying the arm well behind the back, and pulling, not very forcibly, from the forearm; or by placing the knee in the hollow of the elbow and forcibly bending the forearm across it. This dislocation, like that of the wrist is extremely apt to be confounded with fracture of the bones close to the joint, and great caution is necessary in ascertaining the nature of the injury.

Both these dislocations — of the wrist and elbow—may be suspected, when, after violence — particularly such as is *calculated* to push either the hand or lower arm upwards—inability to use the limb below the seat of the injury, and distortion and impaired motion of the joint, are unaccompanied with any grating sensation, such as occurs when bone is fractured.

Dislocation of the shoulder is most generally occasioned by violence applied to the elbow, or by falls whilst the arm is not close down to the side of the body. Sometimes the exact discrimination of an injury to the shoulder-joint is a matter of much difficulty, for fracture alone, or fractures with dislocation, may occur. At other times, particularly in thin persons, it is tolerably easily made out, more so if the examination is made before swelling comes on. In addition to the general symptoms of dislocation already enumerated, the injured shoulder will be perceptibly altered in shape; it will appear more depressed and flatter than the sound one, and if the hand is placed upon the spot which ought to be occupied with the round head of the arm bone—and this may be discovered by examination of the uninjured shoulder—it will be found hollow, and further, if the arm be now gently moved about, and its bone traced up towards the shoulder, it will be found moving in some unusual position, most probably in the arm-pit. Supposing, therefore, that the case is sufficiently clear, and that the sufferer from the accident, in the *absence of proper surgical assistance*, is content to risk the matter to non-professional judgment, or that, from having been the subject of the accident on some previous occasion, he is tolerably certain of its present nature, the means for the reduction ought to set about as speedily as possible, if it can be, whilst faintness from the injuries continues. These means vary considerably; hanging over doors or gates, the arm-pit being placed on the edge, have been employed and recommended, and in persons who have been the subjects of frequent dislocations in the same shoulder, may be efficient, but in a first dislocation should never be resorted to. One frequently-used method of reducing dislocation of the arm bone into the arm-pit, is for both patient and surgeon to lie down upon the ground side by side, but with their heads different ways, and so that the surgeon, having previously taken off his boot, can place his heel in the arm pit of the patient, whilst he grasps the hand, or a towel fixed to the arm of the affected side; in this way, whilst the heel is used to push against the displaced bone in the arm-pit, it, combined with the traction exerted by the surgeon upon the limb of the patient, tends to give a leverage by which the bone is so placed, that it can be drawn into the socket by the muscles. This method may be a convenient one, when only one person is in company with the individual to whom the accident has happened. The following is the most generally

useful and most resorted to mode of reducing dislocation of the shoulder:—The patient being seated on a chair, a large towel or a table cloth, folded broad, is to be passed round the chest, close under the arm pit of the affected side, crossed over the opposite shoulder, and held either by a strong assistant or fastened to some fixed point. By this application, the shoulder blade is fixed, the arm itself is then to be pulled, chiefly in the direction in which it has been fixed, *firmly, steadily, and slowly;* this being done, either directly by the hands of assistants, or by a towel fastened round the arm by the hitch-noose (fig. 73). If, when this steady pull has been persevered in for some time, the displaced bone does not get into place, the effect of suddenly taking off the attention of the patient may be tried, either by some sudden exclamation, or by dashing a little cold water in the face. By such a proceeding, the muscles which resist the reducing or pulling force applied to the arm, are for a moment, so to speak, thrown off their guard, and that moment may suffice to permit the bone to pass into its socket.

Dislocation of the lower jaw is not a very unfrequent occurrence, and happens from persons opening the mouth very wide, either in laughing or gaping; the jaw slips, and its joint portions or articulations on both sides are drawn forward; the person cannot close the jaws, but remains with the mouth wide open, a most inconvenient position should skilled assistance be far distant; the accident, however, can scarcely be mistaken, and may be rectified without much difficulty by a bystander. It should be remembered, however, that the unfortunate sufferer is quite unable in most cases to speak a word distinctly so as to explain the nature of the accident. To reduce it, the thumb or thumbs, according to whether the joint is entirely dislocated or only on one side, are to be placed by the acting party upon the upper portions of the back teeth, and strong pressure exerted downwards, whilst the chin is drawn upwards by the fingers at the same time. As the jaw returns to its place, its powerful muscles draw it upwards with a sudden snap, and if the fingers of the operator are not covered with a handkerchief or some other material, they may get smartly bitten.

After dislocation of any part has occurred and been reduced, a bandage or some application which will confine the injured members should be worn for two or three weeks, not simply from fear of the accident recurring at the time, but to keep the parts, which must have been more or less lacerated, quiet, and to permit the internal traces of the injury to be as much as possible obliterated. In conclusion, although the subject of dislocation has been dwelt upon at some length, it is chiefly for the reason that these accidents, painful at the time, and, if unremedied, productive of deformity and impaired usefulness for the future, are often overlooked, or are apt to occur at great distances from skilled assistance. In such cases, the information given in the foregoing article, may, either by directing attention to the importance of the injury and of its speedy rectification, or if acted upon with care and prudence, by pointing out the most effective treatment, prove a useful guide.

Refer to—*Joints—Muscles, &c.*

DISORDERED FUNCTION—a term very frequently used in medical language, means departure from the usual healthy action of any portion of the body, either unaccompanied with perceptible change of structure, or as a consequence of altered structure of the part.

Refer to—*Disease.*

DISTILLED WATER.—See WATER.

DIURETICS are medicines which increase the flow of urine. The class embraces very many substances, but it will be sufficient to notice only those which may be most safely and generally used; they are—

Broom.
Dandelion.
Fir Top, Gin, Juniper, } which contain turpentine.
Parsley.
Potash—Solution, or Liquor Potassæ.
,, Acetate.
,, Bitartrate, or Cream of Tartar.
,, Carbonate.
,, Nitrate, or Saltpetre.
Soda—Carbonate.
Spirit of Sweet Nitre.
Spirituous Liquors.
Squill.
Turpentine.

There is always some degree of uncertainty in the action of diuretic medicines, but with some more than others. The author has found the two first on the list—broom and dandelion—as certain as, or more so, than any others, and, as domestic remedies, they have the advantage of being easily procurable in this country, and of being perfectly safe. Fluids should be given freely during the action of diuretic remedies. It sometimes happens, that diuretics, which would not act before, act after the administration of an active purgative. Similar effects are found in the hands of medical men, before and after bleeding. As mentioned under the article *Coffee*, the infusion of the raw berry is diuretic. Mental emotion such as fear, and nervous disorders such as hysteria, it is well known, give rise to great increase in the flow of urine.

Refer to the various separate articles for the uses, &c., of the diuretics mentioned.

DOUCHE is a stream of water directed upon a part of the body, and "is most frequently performed while the patient is in the bath. Douches are of various kinds, as the descending, the lateral, and the ascending—the water in the first kind falling from a reser-

voir, at a greater or lesser height, upon the patient in a single or divided stream, the size of which may be varied according to circumstances. The lateral douche is produced by a man's pressing the water through a tube, as with a fire engine, the stream being directed against any part of the body that is indicated. The strength of this can be regulated by the attendants pumping with a greater or less degree of force, and also by a finger placed over the aperture by which the stream is divided. In the ascending douche, the column of water is directed upwards, and is usually taken in a sitting posture; this douche being almost exclusively employed in complaints of the organs contained within the pelvis.

"Douches are directly exciting remedies, and are mostly used to produce a greater degree of vitality and activity in parts, as in cases of local debility, scrofulous swelling, muscular rigidity, paralysis, contracted joints, neuralgic pains, &c. They are mostly administered while the patient is in the bath, and are often advantageously combined with friction. The employment of the douche requires to be carefully superintended."—Extracted from Lee's *Baths of England.*

Refer to—*Bath.*

DOVER'S POWDER is a compound of one grain of opium, one of ipecacuanha, and eight grains of sulphate of potass, powdered *well* together; ten grains consequently contain one of opium. It is much used as a remedy to produce perspiration, and frequently cuts short an attack of cold. A pill containing five grains of Dover's powder, that is to say, half a grain of opium, will be found generally sufficient for a dose.

Refer to—*Opium.*

DRAINAGE is the important process by which superfluous moisture is removed from the soil, through the soil itself, or by means of channels made in or through the earth. It may be either natural or artificial, to carry off the simple excess of fluid resulting from atmospheric moisture, such as rain, or to remove the impure and deteriorated fluids, which more or less result where man and the domestic animals are congregated.

The salubrity of a district is always closely connected with its natural drainage; whenever moisture accumulates, either from position, that is, want of inclination or slope to run it off, or from the nature of the soil, disease is apt to prevail. Professor Ansted remarks:—"There can be no doubt that the district where sand and gravel allow the water to drain off at once beneath the surface, and that where hard and impermeable rock permits the rain to escape readily into the nearest running stream, will be on the whole the most healthy; while, on the other hand, that in which the tough clays retain the water in ponds on the surface will be exposed to marsh fevers and various disorders affecting the throat and lungs. These remarks apply chiefly to temperate climates, but when the conditions of vegetation are taken into account, they are no less true than important for warm countries, where the rankness of the vegetation must no doubt be connected with the nature of the sub-soil over which it grows."

These considerations are important for all, and especially for the emigrant and settler in new districts, who ought always to fix, if possible, upon a site for his dwelling, where the water has, or may be made to have, an efficient drainage in every direction and way, and to exercise caution also, that the dwelling of himself and family is not so placed that any generally prevailing wind can blow upon it from a marshy or badly-drained tract of country. The effect of draining the soil, in rendering a country more salubrious, and in removing disease, is well exemplified in the disappearance of ague from many parts of Great Britain in which it formerly prevailed, a circumstance which can only be accounted for, by the increased attention to the drainage of those districts.

The drainage of houses or collections of houses, where day by day there must be removed the excretions, both solid and fluid of man and animals, is one of the most important points connected with the preservation of health—it might almost be added, and one of the most neglected ones. Both in town and country, the necessity for sufficient drainage, whether of the natural moisture of the soil, of the results of animal life or of domestic use, has been, if not entirely overlooked, most insufficiently provided for.

It is generally thought, that in the country less necessity exists for perfect drainage than there does in large towns, and to some extent the idea may be correct, in so far, as the less number of individuals collected in a given spot, and the freer circulation of air, must tend to preserve greater purity of atmosphere; but the idea, by lulling suspicion has proved a dangerous one, and the single homestead, or small isolated hamlet, has been desolated by the scourge of fever, which a little precaution might have prevented. One most striking instance has been recorded by the late Sir Robert Christison, long before the true causes of fever were distinctly understood, which occurred in and close round a farm house occupied by an extensive farmer, in "a thinly-peopled rural district in Peeblesshire." With respect to situation, Dr. Christison, after describing it, concludes with, "A healthier locality could not well be chosen;" and yet, in and close to this healthily situated house, and in no other in the district, fifteen cases of a severe and peculiar form of fever (no doubt enteric) occurred within the space of a few weeks, and three proved fatal. Such a well-marked visitation could not well escape searching investigation, which brought to light the fact, that the house was completely surrounded by drains, which had, in the course

of time, become filled up with the drainage of the farm-yard, of the necessaries, &c. Such cases are by no means uncommon, even in country situations, which would be at a first glance esteemed most salubrious, and indeed would be, but for the shameful neglect of the inhabitants.

It is not simply typhoid fever, cholera, and diphtheria which are associated with deficient drainage, but bad health generally; and whatever case of disease or accident may remain within the tainted locality, acquires a certain unfavourable tendency and type; *even recovery from child-bed is affected by it: and perhaps more cases of child-bed fever and death than would be imagined, might be traced to the unhealthy influences originated by habitations situated in a badly-drained locality.*

The contamination of wells which supply water used for drinking and cooking, by badly-arranged or imperfect drainage, is a very fertile source of disease; many invasions of typhoid fever, diarrhœa, and cholera have been traced to this disgusting source.

Whatever has been said respecting drainage in country places, applies with increased force to the provision in towns, with their dense populations. All large towns are bound to have systems of sewers and drains in connection with the houses, having an ultimate outlet into the sea or river, and it is the duty of all constituted authorities to see some efficient system carried out.

Essentials of Proper Drainage.—The first essentials for proper drainage are—(1) well constructed sewers—that is, such as will not promote the deposition of solid matter in their interior. That the majority of the old sewers and drains do this has been proved by numerous parliamentary enquiries. It has been shown, that their unnecessary size and defective form (most of the old sewers being flat at the bottom) cause a retardation in the flow of their muddy contents, and thus, of necessity, produce a lodgment of putrefying animal and vegetable matter. Another source of deposit is the improper direction of these conduits, the sharp angles and curves of which, especially where the smaller sewers enter the main trunks, lead to obstruction; and to these must be added the various irregularities of surface connected with the masonry.

(2) In addition, however, to construction, a full supply of water is requisite, one that can thoroughly and periodically, at not too distant intervals, be sent in full volume—"flushed"—through the passages so as to sweep everything before it.

It often happens, where a sufficient fall cannot be obtained between the house and the sewer, and there are no frequent facilities for flushing, that the drain pipes become choked with semi-fluid filth. To remedy this serious nuisance, no mechanical contrivance supersedes the self-acting flushing chamber, fitted with Mr Rogers Field's annular syphon (fig. 76), which acts automatically, and affords a simple and effective means of flushing house drains and sewers at stated intervals during the day, thereby preventing dangerous deposits from accumulating.

In the case of private drains the usual capacity of such a tank is from 80 to 100 gallons, the diameter of the discharge pipe being 4 inches. A tap is connected with the tank, and the flow of water is regulated in accordance with the interval it is intended should elapse between each discharge. The action of the syphon is so perfect that even a drop supply is sufficient to insure the discharge of the tank.

Construction and Laying of Drains.—There are certain principles with which all house drains must comply in order to come up to the modern standard. In the first place, they should be constructed with a view to the immediate and perfect removal of house sewage. Fresh sewage in itself is not offensive; but when putrefaction starts, nuisance arises from the foul gases which are given off. To facilitate the flow of sewage, therefore, and prevent any deposit or obstruction are all-important considerations, and with these objects drains should have *a perfectly smooth internal surface*, and be absolutely free from any projections such as are often found, owing to cement being allowed to penetrate into the interior by a careless joint-maker.

The *size of the pipes* used in house drainage has also an important bearing upon the self-cleansing property of the drains. It is a mistake to suppose that the larger a drain is, the less likelihood is there of its becoming obstructed; the cause of obstruction, as a rule, is not large articles, but the gradual accumulation of deposit arising from the slow rate of flow of the sewage. Given an equal fall in two drains which carry an equal volume of sewage, and the respective diameters of which are 4 and 6 inches, the rate of travel, and, therefore, the flushing power, in the former, will be greater than in the latter, because the depth of fluid in the smaller pipe is greater than in the larger.

The tendency among sanitary engineers in recent years has been to diminish the size of drains. In the case of private houses, of ordinary dimensions, *no drain should exceed 4 inches in diameter, and the fall should not be less than one in* 30 *or* 40.

In laying drain pipes, certain points are essential to success. In the first place, in order that the pipes may rest on a firm bed, it is important not to dig the trench, in the first instance, deeper than is necessary, otherwise soil will have to be replaced, and this cannot well be done without the risk of impairing the solidity of the beds on which the pipes are laid. Again, a common practice among careless drain-layers is to rest the

pipes on their sockets, in place of removing a portion of the soil from the bed of the trench corresponding with the socket of each pipe, to allow the pipes to rest on their bodies. Unless this precaution is observed, the weight of soil which is replaced, instead of being uniformly distributed along the entire length of pipe, will be concentrated upon each joint, and will, in all probability, cause the recently introduced cement to be expelled from the sockets.

In making drain-joints the best Portland cement alone should be used. It is still a common practice to use clay, but such joints are never water-tight, and even if they can stand the test which should be applied to all new drains before the trench is filled in, their durability is only temporary. An excellent method of making ordinary drain-joints is shown in the accompanying sketch (fig. 75). Having laid the pipes in accordance with the above instructions, spun yarn, which has

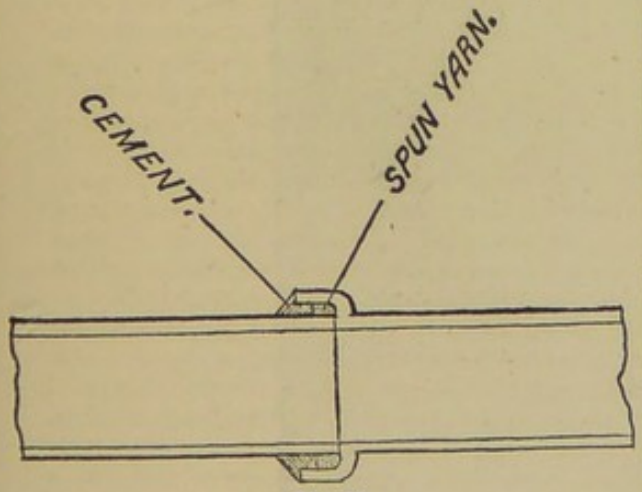


Fig. 75.

previously been soaked in fluid cement, is rammed into the socket to a depth of about an inch, and the joint is then completed in the ordinary way with stiff cement. By this process, the risk of any cement penetrating into the interior is avoided; the whole sets firmly, and forms, if carefully made, a perfectly water-tight joint. In replacing the soil, the first portion should be packed well under and on either side of the pipes, so as to guard against after-displacement. Various patent joints have been invented from time to time. Perhaps the best of these is Hassall's, which has two rims of smooth and durable material cast on the spigot end of the pipe, thus leaving a groove between, while in the socket two corresponding rims are cast, so as to come in tight contact with the rims on the spigot end when it is introduced, thus forming, by means of the opposing grooves, a channel round the middle of the interior of the socket. Communicating with this channel, at the top of the socket, are two openings placed side by side; into one of these fluid cement is poured until it fills the whole of the interior of the channel, the displaced air escaping at the other opening. When the cement sets, a strong water-tight joint is formed. These pipes are expensive, but they are now frequently used, and are specially useful when drains have to be laid in a water-logged soil.

In laying drains in loose soils, they should rest on a bed of cement concrete; also all drains in close proximity to wells, and drains which must be carried under houses, should be completely embedded in the same material. In the last case, however, it is better to use iron pipes with caulked lead joints. No drain should be covered over until it has been thoroughly tested. This is best done by what is known as the *hydraulic* test. Having sealed up the terminal end, a short length of pipe with an easy bend is then temporarily fixed, with its curve directed upwards towards the surface, to the house end of the section of drain which is to be tested, and water is poured in until it completely fills the drain; by this means all imperfections will be detected by the water oozing through. The same test may be applied to existing drains by stopping them up at the manhole, or disconnecting chamber, and pouring the water in at one of the surface gullies until it reaches the surface; if after a time it is found that the water does not sink away, but remains at the same level, the integrity of the drain is proved.

Caution!—The house connections with the drains should in every case be so arranged as not to communicate directly with the drains, the sink, bath, and other wastes being made to discharge on to outside traps; in addition to this a trap should invariably be placed at the top end of the waste pipe itself. In the case of many houses, which appear to a casual observer to be properly disconnected from the drains, all the precautions taken are found to be defeated owing to the existence of cellar connections with the drain, which under no circumstances should be allowed. They are introduced for one of two purposes — either to drain cellars which are liable to flooding from ground water, or as a convenience for swilling purposes. In the first case it is wrong that a cellar should exist at all unless measures are taken to render its floor and walls impervious, and in the latter, there is no reason why the cellar washings should not be mopped up, as is done daily in the case of back passages, &c. It may be asked: What is the objection to a cellar drain if it is properly trapped? The answer is, that a trap is not an absolute security, and in the case in point it is exceedingly likely to become dry from disuse, when sewer gas will have a free entry to the house. The above remarks apply only to cellars proper. In those cases where the kitchen premises are underground, the sink water is carried through the wall in

the usual manner on to a disconnecting trap in the area.

Effluvia are very apt to escape from drains by the improper position of the gully gratings. By improper position is meant the top of an eminence, where no surface water can properly accumulate. Gratings and gullies are therefore injurious in such situations; and, indeed, should only be placed where absolutely necessary to carry off surface water, which will clear them out and maintain their water seal.

If the water-supply of a house should be stored in a cistern (as may be necessary in the country, and in towns where the supply is not on the "constant" system), it is essential that the supply to the water-closet should be cut off from direct communication with the house cistern by means of a special small flush-cistern which is termed a "water-waste preventer" (see *Water-Closets*). Unless this precaution is observed the water-supply will never be safe from pollution, as foul matter may be absorbed from the closet—a risk which is entirely prevented by the introduction of the special supply cistern.

The report of the Commission appointed to inquire into the best method of distributing the sewage of towns, shows that nothing is more to be deprecated than the opening of mains and sewers into a river, the water of which is used for drinking, and it is to be hoped that this will no longer be permitted by the law. The natural question is, Where is the sewage to be disposed of? It ought, if possible, to be conveyed by the drain into the sea, *beyond low water mark*. But what is to be done with the sewage of inland towns? In answer to this, it may be at once stated that

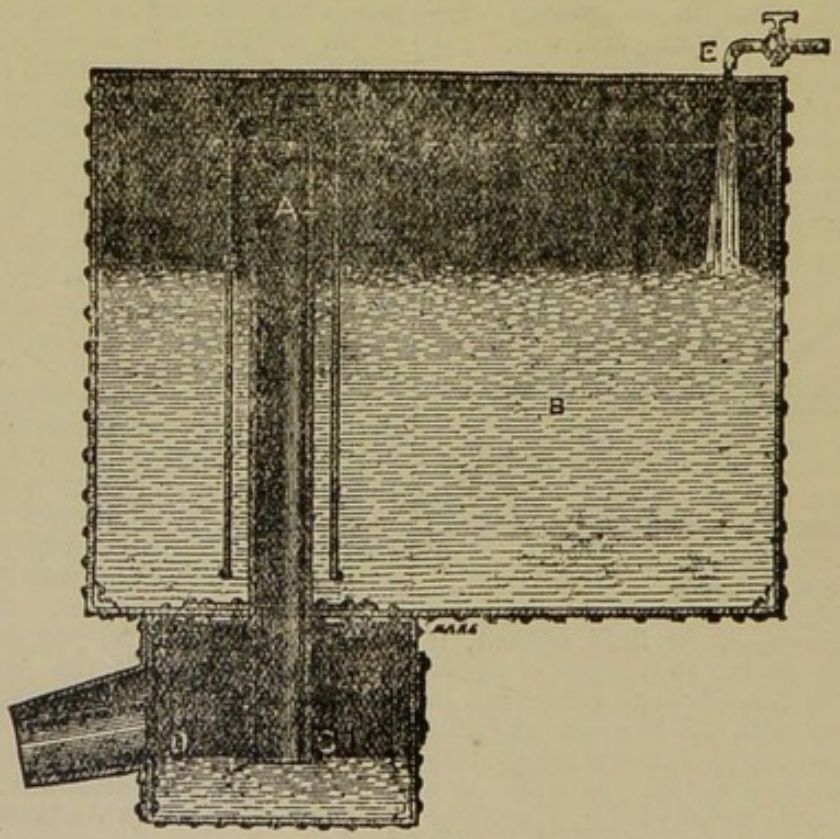


Fig. 76.

scientific men have not yet decided what is the best and most economical method of disposing of it, the great difficulty being that it is so diluted with water, as to render its collection and application to the soil very troublesome and unremunerative. The day, however, will assuredly come when all sewage will be utilised, and this is the more probable since there does not seem to be much fear of bad consequences, such as the production of disease, owing to the deodorant and disinfectant properties of most soils. The subject is one of great difficulty, because all attempts to improve the quality of the sewage, by diminishing the quantity of water to the drains, is immediately followed by undesirable results, seeing that the drains are dependent upon a large supply of water for their adequate purification. Some idea of the amount of dilution of the sewage may be obtained, when it is known that upwards of 400,000,000 gallons of water are calculated to pass through the sewers of London on a daily average.

The reader is referred to the article *Enteric or Typhoid fever*, for an account of the disastrous effects likely to accrue from bad drainage.

It would be a wise precaution if, in every large establishment, and even in every house, especially in the country, an accurate plan of all the drains, &c., were kept, so that when it is necessary to have repairs executed, they may be done with as little trouble and ex-

pense as possible. Many days' unnecessary work in digging would thus be saved. In surgical language, drainage is the continuous drawing off of fluid tending to collect in a cavity, such as an abscess, or a place from which a tumour has been removed. It is usually effected by fixing in the lowest point of the cavity an aseptic tube of india-rubber or glass, through which such fluid can pass into an absorbent dressing covering the outside of the wound through which the cavity has been emptied.

Refer to—*Public Health*—*Ventilation*—*Sewage Disposal*—*Water-closets*—*Traps*, &c.

DRASTIC—a medical term applied to purgative medicines which act strongly and produce watery evacuation.

Refer to—*Purgatives*.

DREAMING is the wakeful and sentient condition of some of the faculties of the mind whilst the others are asleep. Few are so fortunate as to have escaped an attack of incubus, or nightmare, arising from disordered digestion; and all who have been much with children, know well how liable they are to suffer from disturbing dreams, whenever the stomach and bowels are disordered. It may be safely asserted that a large proportion of uncomfortable dreams are connected with disorder of the digestive functions—generally over-loading, but sometimes the reverse. Some people always dream if they do not take some slight refreshment just before retiring to rest. Mental excitement during the previous day is of course a frequent cause of dreaming. Organic diseases, which give rise to oppression within the chest, such as diseases of the heart, are peculiarly liable to occasion uncomfortable dreams and nightmare. Uneasy and powerful sensations excited upon any portion of the body occasion what are called suggestive dreams; that is, the sensation seems to start some thought in relation to itself from which a train of incongruities, such as occur in dreams, appears to arise: a blister is the foundation for some dream of torture, or a loud sound for one of tumult.

Although made the subject of much credulity, dreaming, not only in its general character, but as regards the nature of the dreams, is not to be altogether disregarded with respect to the indications it affords of the bodily condition. When natural sleep is thus disturbed, particularly by dreams which cause alarm and uncomfortable sensations, or which occasion children to start and scream, the cause should be investigated; some error, simply as regards diet, either as to time, quantity, or quality, may be the reason; or disease may be forming. One or two smart purges will frequently remove the symptom. Whether in child or adult, should much mental exertion be going on, and sleep become unusually disturbed by dreaming, mental relaxation, and a greater amount of physical exercise, should be combined with attention to all the functions. The shower bath, either generally, or as a local application to the head alone, will be useful in such cases.

Refer to—*Sleep*.

DRESS.—See CLOTHING.

DRESSING is the application of various substances or agents to diseased or wounded parts to protect them from the action of the air, and from external injury, and, either by mechanical action or otherwise, to promote their healing or cure. It is of course also requisite both for cleanliness, and for the comfort of the patient and of those around.

In former times, the process of dressing was a much more formidable and complicated affair than it is now under the modern, simpler, and more efficient practice of surgery—too simple to please patients sometimes. As the treatment of and mode of dressing burns, wounds, &c., is entered into in the articles on these and similar subjects, it is unnecessary to reiterate them here; and for what is requisite respecting the application of bandages, the reader is referred to the article itself. Here it is proposed to give the principle on which dressing generally should be conducted rather than its details.

The first essential in dressing is gentleness and lightness of hand. Parts which require the process are generally in a state of greater or less inflammation, and consequently of increased sensitiveness; and the patient too, owing to the weakness which accompanies or follows disease or accident is most probably in an irritable and nervous condition. For these considerations, if for no other, the dressing, which is so often dreaded, should be conducted with the utmost gentle care. The next essential is to have at hand whatever is likely to be wanted; warm soft water, with sponge—or in its place some soft material—scissors, and lint, or linen. A piece of waterproof material to draw under the part is often useful. If plasters, bandages, &c., are required, they should not have to be sought for or cut when the wound is exposed, and the patient waiting. If the old dressings have become in the least hard or adherent, or if plasters form part of the applications, they should all be well softened by the warm water before the attempt is made to remove them; they should not require pulling away. When plasters are to be taken off a wound, the lips of which they hold together, they should be lifted at both ends, so that the detaching process meets just at the wound. The object of this proceeding is to prevent the newly healed and adhering surfaces being torn asunder, which they are more likely to be if the plaster is pulled off from end to end. For taking dressings off wounds, a pair of "dressing forceps" will be found useful. When the old dressings have been removed, the parts around the wound should be gently but thoroughly cleansed. If there are any loose, mortified, or "sloughing" substances upon the wound, they may be lifted off, but its surface must not—as is too frequently done, even by medical men—be washed and swilled

over with water. The matter which covers the surface of a wound is the protective covering provided for it by nature, and if this be removed, it is much more likely to become irritable and painful, and to be longer in healing. When the *proper* cleansing has been effected, the requisite dressings should be put on without delay, leaving room, if there is likely to be much formation of matter, for its due discharge, and so *placing the part* when the dressing is finished, *that the discharge can easily escape.*

The various dressings requisite for injuries will be mentioned in their proper places and articles; see specially *Carbolic acid* and *Wounds.* But one often recommended in this work requires notice here: it is the simple water dressing; which is at once the most convenient, agreeable, and universally applicable application to wounds of every kind. The popular fallacy that the applications have in all cases something to do with the healing of wounds, is very apt to make people, especially the poor, look suspiciously on so simple an agent as pure water. It is true, the interference of art is frequently requisite, either to stimulate or to repress action whilst wounds or diseases are in process of cure; but in the majority of instances, the cure is the work of the natural powers alone; all that has to be done is to place these in as favourable a position for exerting their agency as possible, and nothing answers this purpose so well as pure soft water. The application is made either by linen or lint soaked in the water—warm, tepid, or cold, as most agreeable to the sensations of the patient—and is in most cases covered over with some material which will prevent evaporation. Oiled silk has generally been used for the purpose, and oiled calico where economy is an object, but latterly thin sheet gutta percha has been employed, and answers extremely well. If linen is used, it will require folding at least double, to enable it to retain moisture sufficient. As a dressing, lint is a material better adapted than anything else. Water dressing is not necessarily covered with waterproof material; if the part requires keeping very cool, it is better not so; but then it will require much more frequent wetting, either by a nurse or by the system of irrigation recommended under article *Cold.* When waterproof material is put over the wet linen or lint, it of course prevents evaporation, and keeps in heat; *it should always be larger than the lint.* A mistake is very commonly made in this matter; a great piece of linen or lint is put on with its edges sticking out beyond the oiled silk, or whatever is used; and these edges, or even a very slight protrusion, are sufficient to drain off the entire moisture, leaving what ought to be a most soothing dressing, a dry and irritating one. Among the poor the most complete ignorance respecting the use of water dressing prevails; it is too simple to get much of their confidence; and very often, unless the most particular and repeated directions are given, the waterproof material—mistaken for a plaster—is put next the sore, and the wet lint on the top of it! Of course, when requisite, any description of lotion can be used as a dressing in this way, in place of the simple water. So universally applicable is the water dressing, and lotion applied in the same way, that they may almost entirely supersede ointment, to which there are many objections. A greasy application is seldom as pleasant, and never so cleanly as the fluid one; moreover, ointments are very often indeed used rancid, and thus become sources of irritation, rather than of benefit. When a simple greasy dressing is required, a little perfectly fresh lard, or olive-oil, is as good as any.

Refer to—*Adhesion—Bandages—Blisters—Burns—Wounds—Carbolic acid—Forceps.*

DRINKS.—Fluids taken by the mouth may be simple, medicated, nutrient, or stimulant. The only simple drink is water. When agents which act medicinally upon the body are dissolved in that fluid, as in the case of mineral waters, either natural or artificial,—when it is rendered alkaline, or is acidulated, or is impregnated with carbonic acid gas, as in the case of soda water,—it becomes a medicated drink. Barley water, toast-water, milk, &c., are examples of nutrient, and alcoholic liquors, tea, coffee, &c., of stimulant drinks. It is difficult, however, to draw the line between these classes. Many drinks which might be called medicated are in daily use; those which are stimulant are in many cases nutrient, and *vice versâ.* As drinks come under the head of *Diluents,* the reader is referred to the article under that head.

DRIPPING.—As this article is often used for household purposes, or given away, it should be known that symptoms of lead-poisoning, or colic, have been induced by dripping from meat which had been baked in a newly-glazed earthen vessel; the lead-glaze being soluble in the fatty matter. Neither should it be forgotten, in connection with this subject, what was said of the power of fatty matters to act upon copper, when kept in vessels composed of that material, and especially if mixed with salt. Otherwise good roast-meat dripping is an excellent substitute for lard or butter in cooking, and many families, especially among the poor, use it instead of butter for their bread. It is sold in the shops at a third of the price of butter.

DROPPED WRIST, or wrist drop, as it is often called, is an affection frequently accompanying lead poisoning, and depending upon paralysis of the muscles which extend the hand, so that it falls, or drops. Galvanism of the muscles twice a day, besides kneading, shampooing, and rubbing them with flower of sulphur, are useful as local remedies. Hot baths, with sulphur, or with the addition of a

handful of sulphuret of potassium may be given every other day. These means, it is scarcely necessary to add, will be of little avail without the administration of medicines to aid in the elimination of lead from the system, and this should only be followed out under medical advice. The affection is common among painters, and all tradesmen who use lead (see article *Lead*), such as plumbers and workers in glass and putty powder, and among those engaged in the manufacture of preparations of lead. It is also occasionally the result of prolonged indulgence in alcohol.

DROPSY is the effusion or accumulation of the serous or watery portion of the blood—such as we see thrown out in a blister—in any of the tissues or cavities of the body. Thus the watery effusion may take place in the cellular tissue (see *Cellular tissue*) which connects the various portions of the body, and fills up their interstices, in which case it will show itself in the eye-lids and other portions of the face, or swell the feet and legs, hands and arms, or the body generally. This form of dropsy is called by medical men *Anasarca*. The effusion, on the other hand, may be into some of the larger cavities, as into the abdomen, when it is named *Ascites;* or into the cavity of the chest, between the lungs and ribs, when it is known as "*Hydrothorax*, or water in the chest." Again, effusion may take place into some of the smaller cavities, or rather "sacs," as into the bag which surrounds the heart. Whenever it occurs, dropsy is always to be regarded seriously. It is not, as the unprofessional generally regard it, a disease in itself, but it is almost invariably a symptom of disease, either constitutional or local, existing in the system. It is not here meant that dropsy is not a disease, but that it is generally a secondary one, not the original affection, which may, however, be so obscure, that nothing is left for the practitioner to treat but the dropsy, and that he must get rid of, if possible; for though in itself an effect only, it tends to produce other diseased actions, by impeding or stopping the functions of important or vital organs.

Anasarca, or effusion into the cellular tissue under the skin, may be simply the result of general constitutional debility, of which the blood vessels, both large and small, and the heart partake. This form of dropsical swelling usually shows itself in the feet or ankles towards night, especially after long standing; many delicate persons are subject to it as a temporary ailment, when from any cause the general health has become impaired. When it shows itself and continues in the weakly, as in delicate girls, along with weakness generally, pallor, &c., it is only to be got rid of by measures which restore the tone and vigour of the system; such as good diet, with port wine and porter, tonic medicines, exercise, and change of air. Should the error be made of confounding it with an inflammatory condition of body—and the quick irritable pulse might mislead—and lowering measures be resorted to, the disease will be greatly aggravated. Local anasarca, or dropsical swelling, may arise from any cause which impedes the return of the blood through the veins, and is a very common accompaniment of disease of the liver or heart, or of tumours which press upon the great veins; of this, pregnancy, which often occasions swelling of the legs during its continuance, is an example, the effect passing off as soon as the cause is removed. The lower limbs are the most frequent seat of anasarcous, or as it is often called, "œdematous" swelling; but the hands, face, &c., are also occupied by it; indeed, swelling of the eye-lids in the morning, with stiffness on first trying to open them, is often one of the first symptoms of the tendency to dropsical effusion, whatever the cause. Again, anasarcous dropsical swelling may be occasioned by affection of the kidneys, which cannot carry off the fluid from the body with sufficient rapidity. The above are all instances of what are called "passive" dropsies; the cause generally acting slowly, and unaccompanied with a marked feverish state of the system. There are, however, forms of dropsy which are attended with this feverish state, and in which the watery effusion takes place rapidly, sometimes surprisingly so. The best instance of this is the acute form of dropsy, which is apt to happen to convalescents from scarlet fever, and which is traceable to cold. Whatever occasions "anasarca," or effusion of watery fluid into the cellular substance of the body generally, may also cause its occurrence in the cavities, as of the abdomen or chest; but it may also take place both in the large and small cavities, as a consequence of local inflammation. Their lining "serous" membrane becomes inflamed, and pours out a watery secretion in greater or less abundance. It is matter of popular information, that dropsy in the belly, or ascites, is apt to follow inflammation, and disease of the liver, and that water in the chest results from pleurisy.

From what has now been said in explanation of the nature and causes of dropsy, it must be evident that its serious treatment is not for the unprofessional; the causes are often too obscure, and the proper and *efficient* remedies too active, to be entrusted to non-medical hands, particularly as it can rarely be an emergency. A case of inflammatory dropsy, such as occurs after scarlet fever, might of course happen at a distance from medical aid, and for the measures to be adopted the reader is referred to article *Scarlet Fever*.

Whatever form dropsy assumes, however, the case should at once be put under medical superintendence. As temporary palliative measures, the bowels should be kept either simply open or actively purged, according as the patient is of weak or strong habit of body; and the effusion of water may be kept in check

by the use of diuretic remedies (see *Diuretics*). Of these, infusion of broom or dandelion, cream of tartar, sweet spirit of nitre, or saltpetre, will be found the most suitable.

Refer to—*Blood—Diuretics—Urine, &c.*

DROWNING is death by suffocation from immersion in fluid. Few subjects treated of in this work are more important; accidental drowning is so frequent an occurrence, and it so often happens that no medical assistance is at hand during *those first few precious moments* after the body of a drowned person is recovered from the water, that some bystander, who is possessed of the knowledge, not only of what ought to be done, but of what ought to be avoided, may have the satisfaction of saving a life which must otherwise have been lost. When an individual falls into the water, especially from a height, there may or may not be considerable shock, from the body striking the surface; or the head or other parts may have struck against a stone or some hard body, or there may have been fainting caused by the fright; all these circumstances must, of course, modify the effects. The last has been said to account for those cases which have been *reported* as recovered, after very long immersion, that is, half an hour or longer.

The longest well-authenticated time of complete immersion, after which recovery has been effected, is fourteen minutes, and this case stands by itself. Other cases of ten minutes and even half an hour are recorded, but there is always doubt whether immersion has been complete during the whole time. This doubt, however, which must occur in most cases, is the very reason why hope should not be abandoned, even after persons may be *thought* to have been in the water a considerably longer period; and though it might be established, that none could be entirely under water for five minutes, and recover, this is not to be acted upon; half an hour's supposed immersion, or even longer, should be no barrier to efforts at restoration. When an individual falls into water, the body generally rises again to the surface, when an effort to breathe is made; air may be drawn in to some extent, and with it water, more or less, which passes into the stomach; this may be repeated two or three times, or efforts to breathe may be made beneath the surface; however it may be, the contact of the water in the breathing effort causes closure of the "glottis" or chink at the upper part of the windpipe; a small portion of fluid may pass in, but the principal effect is the exclusion of the air, and thus the drowned person is effectually suffocated, and the lungs in a considerable degree emptied of their air, which is pressed out in the vain respiratory efforts, and rises in bubbles to the surface—death in such cases occurring from apnœa, accompanied with a state of unconsciousness. The amount of water which may have been swallowed is comparatively of little moment, and can have but little, if anything, to do with the fatal consequence. A person, therefore, who is rescued from the water after immersion, if not dead beyond recall,—and here is the doubt of which he should be given the advantage,—is partially suffocated; the vital powers are also depressed by the action of cold, and probably also by the struggles and shock, both mental and bodily; but still the machinery is perfect,—the pendulum may be stopped, but the spring may yet be capable of action. In other words, vitality, though apparently suspended, may yet linger in a frame of which the structures are as capable as ever they were of acting as its agents; the mysterious link which binds them in action may be almost severed, but our efforts may restore it. If on the other hand life is extinct, the appearances on the body must vary according to the length of time the body has been in the water. If a long time has elapsed, a week or longer, signs of putrefaction will have commenced to show themselves in the skin, and the face will be swollen and livid; but if the person found drowned has been only a few hours in the water, the skin will be found pale and cold, and the mouth and nostrils will be covered with frothy mucus. The stomach and lungs will contain much water, and the latter organs will be found congested with venous blood.

Drowned, Treatment of the Apparently.—It may first of all be laid down as a general rule, never to be forgotten, that however discouraging apparent want of success may be, the attempt to restore a drowned person to animation should be continuously persevered with, as many cases are on record where a happy result was obtained long after many of the bystanders had given up the case as hopeless. When a body has been recovered from the water, it is well that those standing around should each provide a garment, so that the unfortunate person may at once be as much protected from cold as is possible under the circumstances. In addition to the measures which will be presently recommended, artificial respiration should at once be commenced, according to what is now generally known as "Marshall Hall's ready method;" that is to say, the patient should be laid upon a table upon his face, the forehead resting upon a book or some such thing, and every three or four seconds the body should be turned quite on one side, and then returned to the former position. Of course, all the while that this is being done, preparations should also be made for the other means necessary, such as constant chafing of the hands and feet, the application of warm blankets, hot bricks, or bags of salt, &c., when these can be obtained.

The Royal National Life-boat Institution has issued the following directions for restoring the apparently drowned. The leading principles of the system, and the practical

instructions, are founded on those of the late Dr. Marshall Hall, combined with those of Dr. H. R. Silvester, and are the result of extensive inquiries which were made by the Institution in 1863-4 amongst medical men, medical bodies, and coroners, throughout the United Kingdom:—

I.

Send immediately for medical assistance, blankets, and dry clothing, but proceed to treat the patient instantly on the spot, in the open air, with the face downwards, whether on shore or afloat; exposing the face, neck, and chest to the wind, except in severe weather, and removing all tight clothing from the neck and chest, especially the braces.

The points to be aimed at are—first and immediately, the restoration of breathing; and secondly, after breathing is restored, the promotion of warmth and circulation.

The efforts to restore breathing must be commenced immediately and energetically, and persevered in for one or two hours, or until a medical man has pronounced that life is extinct. Efforts to promote warmth and circulation, beyond removing the wet clothes and drying the skin, must not be made until the first appearance of natural breathing. For if circulation of the blood be induced before breathing has recommenced, the restoration to life will be endangered.

II.—TO RESTORE BREATHING.

To Clear the Throat.—Place the patient on the floor or ground with the face downwards, and one of the arms under the forehead, in which position all fluids will more readily escape by the mouth, and the tongue itself will fall forward, leaving the entrance into the windpipe free. Assist this operation by wiping and cleansing the mouth.

If satisfactory breathing commences, use the treatment described below to promote warmth. If there be only slight breathing, or no breathing, or if the breathing fail, then—

To Excite Breathing.—Turn the patient well and instantly on the side, supporting the head, and—

Excite the nostrils with snuff, hartshorn, and smelling salts, or tickle the throat with a feather, &c., if they are at hand. Rub the chest and face warm, and dash cold water, or cold and hot water alternately, on them.

If there be no success, lose not a moment, but instantly—

To Imitate Breathing.—Replace the patient on his face, raising and supporting the chest well on a folded coat or other article of dress.

Turn the body very gently on the side and a little beyond, and then briskly on the face, back again; repeating these measures cautiously, efficiently, and perseveringly, about fifteen times in the minute, or once every four or five seconds, occasionally varying the side.

[*By placing the patient on the chest, the weight of the body forces the air out; when turned on the side, this pressure is removed, and air enters the chest.*]

On each occasion that the body is replaced on the face, make uniform but efficient pressure, with brisk movement, on the back, between and below the shoulder blades or bones on each side, removing the pressure immediately before turning the body on the side. During the whole of the operations, let one person attend solely to the movements of the head, and of the arm placed under it.

[*The first measure increases the expiration, the second commences inspiration.*]

III.

Should these efforts not prove successful in the course of from two to five minutes, proceed to imitate breathing by Dr. Silvester's method, as follows:—

Place the patient on his back on a flat surface, inclined a little upwards from the feet, raise and support the head and shoulders on a small firm cushion or folded article of dress placed under the shoulder blades, in the manner represented in the engravings.

Draw forward the patient's tongue, and keep it projecting beyond the lips; an elastic band over the tongue and under the chin will answer this purpose, or a piece of string or tape may be tied round them, or by raising the lower jaw the teeth may be made to retain the tongue in that position. Remove all tight clothing from about the neck and chest, especially the braces.

To Imitate the Movements of Breathing.—Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upwards above the head, and keep them stretched upwards for two seconds [*by this means air is drawn into the lungs*]. Then turn down the patient's arms, and press them gently and firmly for two seconds against the sides of the chest [*by this means air is pressed out of the lungs*].

Repeat these measures alternately, deliberately, and perseveringly, about fifteen times in a minute, until a spontaneous effort to respire is perceived, immediately upon which cease to imitate the movements of breathing, and proceed to induce circulation and warmth.

IV.—TREATMENT AFTER NATURAL BREATHING HAS BEEN RESTORED.

To Promote Warmth and Circulation.—Commence rubbing the limbs upwards, with firm grasping pressure and energy, using handkerchiefs, flannels, &c. [*by this measure the blood is assisted along the veins towards the heart*].

The friction must be continued under the blanket or over the dry clothing.

Promote the warmth of the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, &c., to the pit of the stomach, the arm-pits, between the thighs, and to the soles of the feet

INSPIRATION.

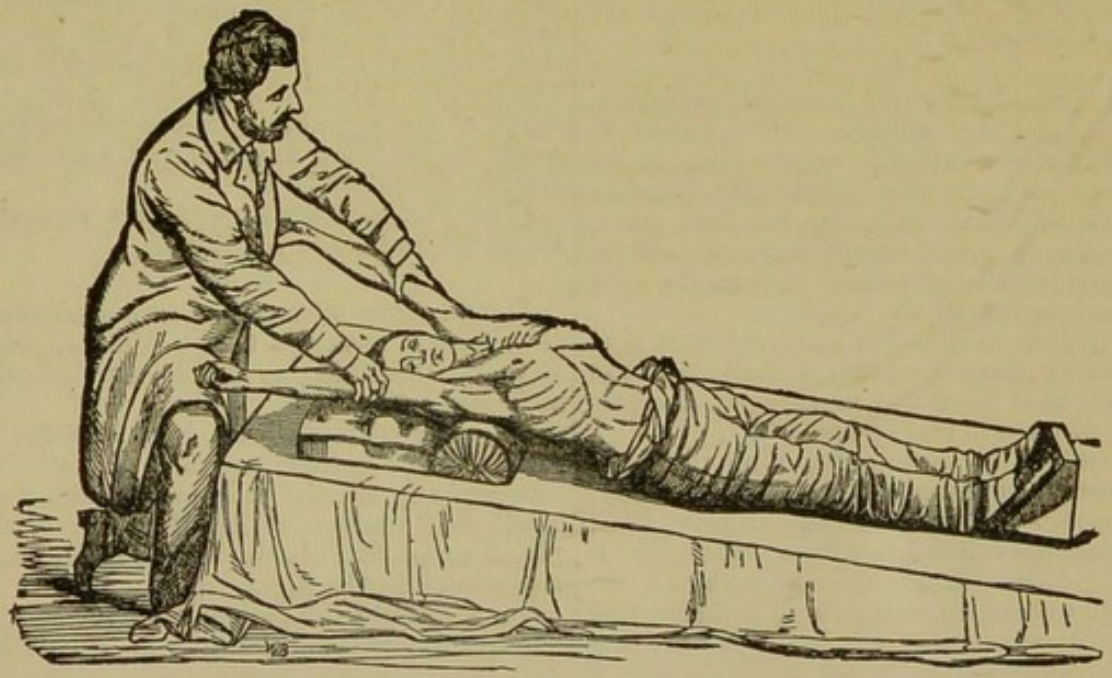


Fig. 77.

EXPIRATION.

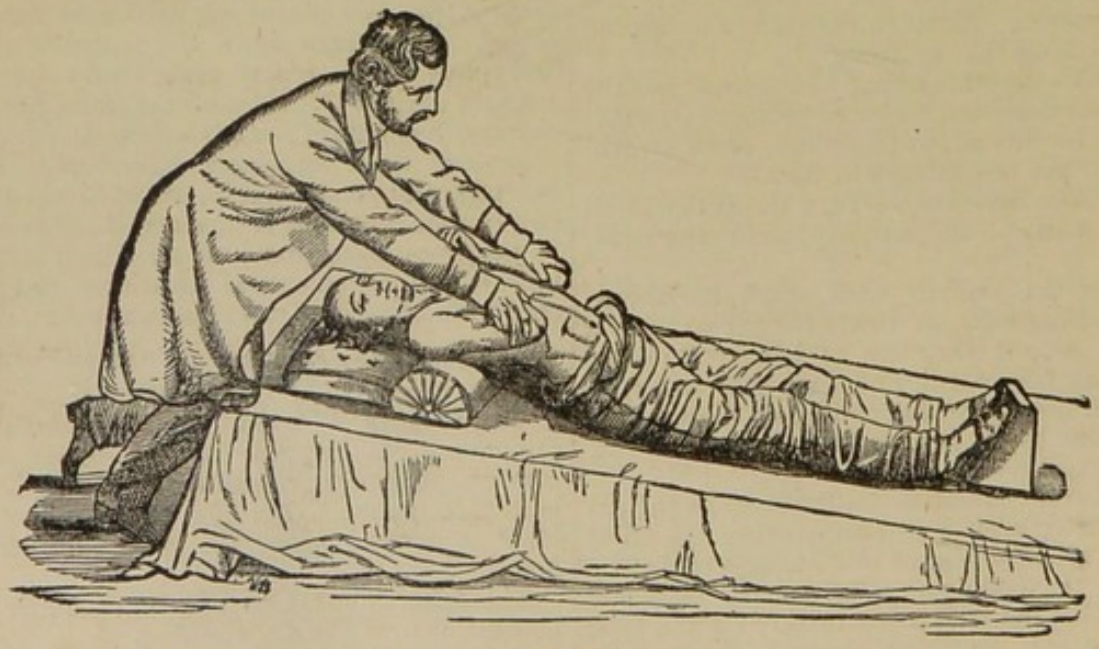


Fig. 78.

Treatment of the apparently drowned, as recommended by Dr. Silvester. Inserted by kind permission of the Royal Humane Society, Trafalgar Square.

If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room.

On the restoration of life, a tea-spoonful of warm water should be given; and then, if the power of swallowing have returned, small quantities of wine, warm brandy and water, or coffee, should be administered. The patient should be kept in bed, and a disposition to sleep encouraged.

General Observations.—The above treatment should be persevered in for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance, persons having been restored after persevering for many hours.

Appearances which generally accompany Death.—Breathing and the heart's action cease entirely; the eye-lids are generally half closed; the pupils dilated; the jaws clenched; the fingers semi-contracted; the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increase.

Cautions.—Prevent unnecessary crowding of persons round the body, especially if in an apartment.

Avoid rough usage, and do not allow the body to remain on the back unless the tongue is secured.

Under no circumstances hold the body up by the feet.

On no account place the body in a warm bath, unless under medical direction, and even then it should only be employed as a momentary excitant.

The directions issued by the Royal Humane Society for restoring respiration are confined to the method recommended by Dr. Silvester, which may be resorted to at once, and of the two methods this will, on the whole, be found the most convenient in practice. It is the plan most in favour in Hospitals, where accidents from chloroform inhalation and other causes give rise to suspended animation.

Having now mentioned what ought to be done in cases of drowning, it is necessary to notice *what ought not to be done;* for many old and most injurious modes of treatment are still apt to be resorted to by the ignorant and prejudiced. Most of these have originated in the idea, that water swallowed was, or had something to do with, the cause of death; hence patients have been hung up by the heels, rolled on barrels, choked with emetics, under the idea of making them disgorge the water.

Undoubtedly, if there is much water swallowed—as sometimes happens—it would be better away; but any means which unprofessional persons can use for its removal would only be a worse evil. If a medical man is present, and thinks well to use the stomach pump, quickly remove the water and replace it with a small quantity of hot brandy and water, it may be of service; but no attempts should be made to administer anything by the mouth so long as unconsciousness continues.

In cases of drowning, the motto should be—never despair: when all hope seems to have vanished, and no sign of life has been given for one, two, four, six, or even eight hours, the perseverance of those around has been at last rewarded, and existence preserved.

After a person has been restored to consciousness, there may be considerable congestion of blood about the head, which may require leeches. In all cases of recovery, the greatest care must be taken to preserve the re-excited actions; if stimulants are thought requisite, they must be given most cautiously, and all sources of excitement, such as visits from friends or relatives, guarded against; hot fluids, tea, coffee, and the like, should be given moderately, and the strength supported by nourishing meat soups.

Refer to—*Lungs—Suffocation, &c.*

DRUG is the general term applied to medicinal agents used in the treatment of disease; it is, however, more generally employed with reference to the crude or commercial substances; after these have undergone preparation, they are usually called medicines. Although, undoubtedly, many medicines are largely adulterated in this country, many are impure in consequence of the adulteration of the drug in its collection or preparation by the natives of the country of which it is a product. Thus, senna is largely mixed with the leaves of other plants, opium with seeds and leaves, and sometimes with small stones, &c., to increase its weight; scammony is mixed with chalk. As, however, the adulterations to be guarded against are mentioned under the respective articles, to them the reader is referred.

Refer to—*Medicines.*

DRUM OF THE EAR, or TYMPANUM, is an interior portion of the organ of hearing, which contains the small bones, and air.—See *Ear.*

DRUNKENNESS.—See INTOXICATION.

DRY CUPPING.—See CUPPING.

DUCT is a medical term applied to a tube or "canal," adapted to convey fluid from one part of the body to another. Thus, the "hepatic duct" conveys the bile from the liver into the intestines; the "salivary ducts" carry the saliva into the mouth from the glands, by which it is secreted from the blood; the "thoracic duct" (see *Digestion*) conveys the chyle into the blood, &c.

DUGONG OIL.—For a very interesting account of this oil, the reader is referred to a pamphlet on the subject by Dr. M'Gregor Croft, of London, to whom we are indebted for its introduction to this country.

Dr. Croft claims for it a superiority over cod-liver oil, on account of its being not disagreeable to the taste. It is true that the oil has this advantage, being almost like mutton fat to the taste; but it is not proved as yet that it

possesses all the advantages, both as a nutrient and as a medicinal agent, of cod-liver oil. The high price of the oil has prevented medical men from making the extensive trial that would be necessary to determine this question, although, owing to the praiseworthy efforts of Dr. Croft, the oil has been presented at as low a rate as possible. To medical men holding appointments in hospitals, who are in the best circumstances to try its effects, Dr. Croft has on many occasions provided a small quantity at his own expense. The results, so far, have been most satisfactory, and one thing is certain, at all events, that the patients do not complain of the taste of the oil. The writer has made a trial of it, and was pleased to note a decided improvement in the patient during its use. The case was one of consumption, and the patient gained in weight, and did not suffer to the same degree as formerly from perspirations at night. It seemed to agree well with the stomach, and was said not to be at all disagreeable to the taste, even in the first trial.

DULCAMARA, or SOLANUM DULCAMARA, or BITTER-SWEET, or WOODY NIGHTSHADE,—are all names for the same native plant, which is, however, widely distributed over the temperate portion of the globe. It is a shrubby climbing plant, bearing clusters of flowers, closely resembling, but smaller than those of the potato, which belongs to the same family. Under its name of "bitter-sweet" it is well known in the country. It flowers in June, and in the autumn bears clusters of red, somewhat transparent, berries. The twigs are used in medicine, and are directed to be gathered when of the thickness of a goose quill. The medicinal use of dulcamara is as a soothing diaphoretic, producing perspiration, and it might be used in the absence of other remedies for this purpose. To make the infusion, one ounce of the twigs, chopped, is to be infused in half a pint of boiling distilled water. Of this, the dose is two to six table-spoonfuls twice or thrice a day.

Refer to—*Diaphoretics.*

DUMBNESS, or inability to utter articulate sounds, may arise from absence of the tongue, or from defect in the formation of the organs of voice; probably also from causes affecting the nerves which supply the organs of speech; but most generally, from complete deafness, either congenital, that is dating from birth, or as the result of disease before the power of speech had been acquired and fixed in the memory.

Refer to—*Deafness.*

DUODENUM.—The first portion of the small intestines, and that immediately connected with the stomach. It derives its name from the idea that it did not exceed twelve finger-breadths in length.

Refer to—*Alimentary Canal.*

DURA MATER is the term applied to a firm white fibrous membrane which lines the skull on the one hand, and invests the brain. Between it, however, and that organ, two other membranes lie: the "arachnoid membrane," so named from its extremely fine texture, which lines the dura mater, and also covers the brain, forming a double layer, or "shut sac," in the interior of which a watery fluid is secreted; and the "pia mater," or vascular membrane of the brain, which lies directly upon and covers the organ itself, dipping between its convolutions.

The "dura mater" is prolonged into various "processes," or projections, which pass between and give support to the different portions of the cerebrum, or brain, and cerebellum, or little brain, which are in fact partially separated from each other by a fold of the dura mater. This membrane, and the others above mentioned, are continued from the interior of the skull down the spinal column.

Refer to—*Brain—Spine, &c.*

DWELLINGS.—See HOUSES.

DYSENTERY, or as it has been popularly called "bloody flux," is a disease characterised by severe diarrhœa, fever, &c., the accompaniment of a peculiar inflammation of the mucous membrane lining the large intestines. It is much more frequent in tropical climates and marshy districts than it is in this country at the present day although formerly it was very prevalent, forming a large item in the bills of mortality of a hundred or a hundred and fifty years back; and at times showing itself in a fatal epidemic form. It is probable that the diminished occurrence of dysentery in Britain at the present day is owing to the increased comfort of the population, the drainage of the land, and some attention to sanitary influences; for, deficient as the regulations attached to these still are, they are certainly better than they were a century ago. A kind of dysenteric affection—that is, severe diarrhœa, with fever, tenderness of the bowels, indicative of inflammation, and bloody stools—is frequently met with in autumn during the prevalence of the common British cholera. In some low-lying districts in our eastern counties, we have still a good deal of dysentery allied with ague. An ordinary attack commences with diarrhœa, and griping pains, which continue till the patient is scarcely able to pass anything but a little bloody mucus. The term "tenesmus" is given to the violent straining, and this constitutes one of the main features of the disease. After a time, the evacuations become more copious and are tinged with bile. Occasionally, and these are the most dangerous cases, we have high fever, furred tongue, with rapid and feeble pulse, and the urine becomes scanty and highly coloured. These symptoms often denote the approach of death, the patient retaining consciousness to the last. Dysentery appears to be engendered by exposure to cold, wet, and to privations connected with food; hence it has been one of the greatest scourges of our armies in all parts of the world, especially in hot

climates. On the coasts of our East and West Indian possessions, and on the coast of Africa, we have still a good deal of dysentery along with ague. The same causes, and its connection with variations in climate, particularly with a hot one, must render dysentery a disease respecting which the emigrant ought to possess information; for it may happen, and it often does, that the disorder attacks those far removed from medical aid, and it is not one which brooks much delay in treatment. Medical men in this country have comparatively so little experience of the disease, that the author gladly avails himself of the valuable work of Dr. Parkes in the compilation of this article. By this author the symptoms of dysentery are thus succinctly described:—"Dysentery commences either gradually or suddenly; the general commencement is, however, by diarrhœa.

"First, as to the kind of stools.

"These are, first, simply numerous, perhaps feculent, in a few very rare instances scybalous. [That is, containing hard black-looking lumps about the size of beans or nuts, called by medical men scybalæ].

"After this the stools become numerous, slimy, gelatinous, bloody; blood in streaks, or mixed with a dark watery fluid; in another form pure, perhaps clotted. Afterwards, stools watery, muddy, like the washings of meat, or gelatinous-looking, shreddy, offensive in odour. Sometimes after this the stools present an appearance something like pus (matter), or this is mixed with mucous slime and blood, in such a way as to form a variously coloured stool, which causes great griping and tenesmus when passed."

With respect to the causes of dysentery Dr. Parkes says: "We may admit as both predisposing and exciting causes, according to circumstances, the following agents:—

"1st.—All acrid agents, whether produced by irritating ingesta, or secretions: as bad or too rich food, bad water, fruits, or retained excretions, or derangement of the biliary secretions, &c.

"2nd.—Suppression of secretions rapidly accomplished: as that of the skin by cold, wet, sudden changes of temperature from hot to cold, &c.

"3rd.—Epidemic states of the atmosphere, and probable alteration of the blood, either from food or its digestion."

The power of these causes to produce dysentery should be well fixed in the minds of all those whose lot it may be to be exposed to their influences; for by their avoidance the disease may probably be escaped; and there can be few misfortunes greater than for a new settler, whose welfare and that, perhaps, of a family depend upon his health and strength, to be attacked with dysentery.

The treatment of dysentery which may most safely be practised by an unprofessional person, in the absence of a medical man, would be, in the first instance, if they were procurable, the application of leeches to the belly, a dozen or more at once, and repeated according to the strength of the patient, if the symptoms remained unrelieved. Should leeches not be obtainable, and even if they are, a warm bath once or twice—if it did not exhaust too much—in the twenty-four hours, would be found useful; and probably warm fomentations to the bowels. To allay pain and relieve the disease generally, opium is the most valuable remedy; but as there may be irritating matters in the bowels, they must not be confined, which the opium alone might do, and thus, though relieving apparently for a time, aggravate the disease ultimately. To avoid this, the opium should be combined with castor oil, or olive oil, either simply or in emulsion with yolk of egg. If castor oil is procurable, it should be trusted to; if not, Epsom salts, in tea-spoonful doses, each dissolved in from half a pint to a pint of gruel or barley-water, or some other demulcent, with four or five drops of laudanum added, may be given every four or five hours. Ten grains of Dover's powder, given once or twice in the twenty-four hours, may probably be of service, or a pill composed of half a grain of opium, a grain and a half of blue pill, and half a grain of ipecacuanha, may be given every six or eight hours. The safest course, however, will be the treatment by the oily aperients and laudanum. In addition, injections containing from ten to twenty drops of laudanum will give much relief. Sometimes the lower bowel is too irritable to bear the enema, or even the tube; in which case, a suppository, or pill, made with a grain of opium, mixed with a little flour and water, may be passed into the bowel. The food requires much attention, and should be of the mildest character: milk, and preparations of the grains, and sago, arrow-root, &c., combined with gelatine or isinglass, will be most suitable. If the strength is much reduced, strong concentrated animal soup will perhaps be required.

Of course so serious, and it may be fatal, a disease as dysentery should be put under medical care as shortly as possible; in the meantime the above directions may be of much service.

"The first appearance of recovery is evidenced by the stools becoming less slimy, perhaps copious and feculent, or bran-like, or dark and slightly beaten up; or while one part of the stool is slimy, the remainder consists of natural feculence." A person convalescent from dysentery will of course require the greatest possible care in diet; and also with respect to all exposure to the causes which originated it.

Refer to—*Castor oil—Enema—Diarrhœa—Suppository—Tenesmus, &c.*

DYSMENORRHŒA.—Difficult or painful menstruation.—See *Menstruation.*

DYSPEPSIA—INDIGESTION.—See INDIGESTION.

DYSPHAGIA.—Difficulty in swallowing.—See *Swallowing.*

DYSPNŒA.—Difficulty in breathing.—See *Respiration.*

DYSURIA.—Difficulty in passing water.—See *Urine—Bladder, &c.*

EAR.—This is the organ of hearing, by means of which man and animals are made sensible of what we call sound, that is, of certain vibrations communicated to the atmosphere, or surrounding medium, which give rise to the sensation of sound, by acting upon the organ fitted by structure to receive them, which organ is connected with the brain, or agent of the sentient mind, by nerves special to the purpose. The entire organ of hearing is called the ear; its anatomy and functions constitute a wide and interesting branch of study; but here it will be sufficient to explain just so much as is requisite to give the unprofessional reader some idea of the nature of the organ—some rational view of the disorders to which it is subject, sufficient, it is trusted, to guard them against submitting so valuable an agent, of which the varied structures must give rise to varied forms of disease, to be tampered with by ignorant quackery. Any one who will for a moment consider in how many ways deafness may be produced, *must* see that there can be no specific to effect its cure, but that the means of cure *must* vary with the cause of the disease.

The human ear consists of an external, middle, and internal portion,—the external being composed of the flat folded organ attached to the head, usually called the ear (fig. 79—1), and of the ear passage, or "meatus"(2).

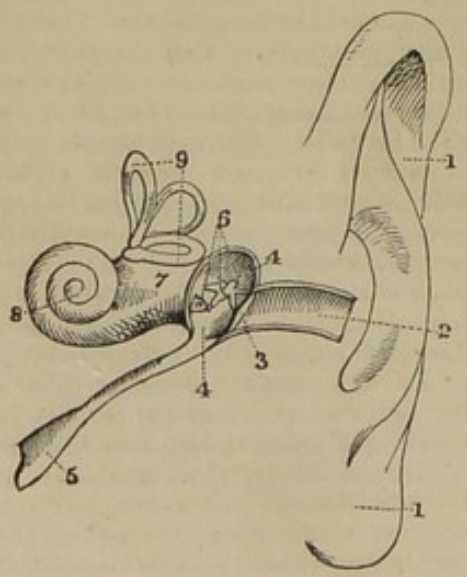


Fig. 79.

The external flap of the ear is divided by anatomists into various parts, which it would answer no good purpose to go over here; its evident function is to collect as much as possible the body of sound. Its adaptation for this purpose is more plainly evidenced in the movable ears of the lower animals than it is in man. The air passage, or meatus, is oval in form, curved upon itself, and rather narrowest in the middle; it contains a few small hairs, and glands which secrete the peculiar bitter wax, or "cerumen," which is probably a provision to prevent insects entering the air passage.

The inner extremity of the ear passage is closed by a membrane (3), that of the tympanum, or drum of the ear; it is placed obliquely. The cavity of which it forms the external boundary is the portion of the middle ear named the drum, or tympanum (4); it contains air, and communicates with the atmosphere by means of the eustachian tube (5), which opens into the throat. The tympanum contains three very minute bones, articulated or jointed together so as to admit of slight motion; these which are represented magnified (fig. 80) extend across the cavity; the small

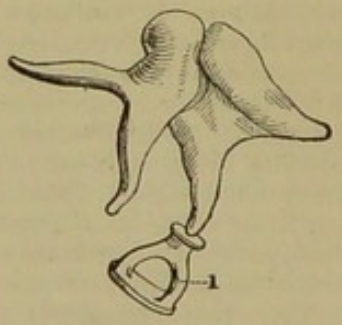


Fig. 80.

bone (1)—which resembles a stirrup in shape, and, indeed, derives its name, "stapes," from that resemblance—being attached at a small opening to a portion of the membrane which lines the inner ear, or "labyrinth," as it is called from its complex construction. The labyrinth, or inner ear, is composed of three parts, the vestibule (fig. 79—7), the "cochlea" or shell-like portion (8), and the semicircular canals (9). Both the middle and inner ears, and indeed part of the external ear passage, are accommodated in a portion of the temporal or temple bone, excavated for the purpose. To the small bones of the tympanum are attached four minute muscles, which by their agency act upon the membrane of the drum; the office of these bones being evidently at the same time to conduct the vibrations of sound from the membrane of the tympanum, which is exposed to the external air, to the membrane of the vestibule, which, with the other parts of the labyrinth, constitutes the essential organ of hearing. Within the labyrinth, a watery-like fluid is the medium for conducting the vibrations of sound to the nervous expansions which are also contained within the cavity.

The disorders to which the organ of hearing is most liable, are loss of function, or deafness, noises in the ear, neuralgia, or affection of its nerves, abscess within the meatus, or in the

EAR

cavity of the tympanum, chronic discharges, polypus; and further, the meatus in children is very apt to be chosen as the receptacle for peas, small buttons, or indeed anything they can poke in easily, but which are often extremely difficult to get out again.

The subject of deafness has been already treated of, but the attention of the reader is again called to the many causes which may produce the one effect. The malformation at birth of the inner ear, as a cause of complete deafness, is also connected with dumbness; or accident may at any time of life injure the delicate structures contained within their cover of bone. The passage of the air through the external ear passage may be obstructed or prevented by an accumulation of wax or other matters; the membrane of the drum may be perforated; the bones may have been discharged by disease; or the eustachian tube blocked up by swelling temporarily, or permanently by thickened mucus. There are no diseases, perhaps, which require—as must be evident to all—more tact in their discovery and in their treatment, than those of the ear.

Noises in the ears, such as singings, ringing of bells, roaring as of the sea, &c., are often extremely troublesome, and may arise from many and different causes. Mere temporary derangement of the digestive organs will in some persons produce them; they are often indicative of determination of blood to the head, and when accompanied with symptoms of this tendency ought not to be neglected. Partial obstruction of the eustachian tube by cold, or accumulation of wax in the external ear passage, is apt to occasion these noises, and they are accompanied with some degree of deafness. Of course the remedy must vary with the cause; if the digestive organs are deranged, they must be regulated; if cold be the cause, the symptoms may be left to pass away with the temporary ailment. In some cases of chronic, or continued, noise in the ears, regularly bathing the head with cold water every morning will, after a time, remove it.

Earache, or neuralgia of the ear, is treated of under the head of *Neuralgia* generally. It is often relieved by the insertion of a piece of cotton wadding dipped in laudanum, or equal parts of chloroform and laudanum.

Abscess in the meatus is often also called earache. It is one of the most painful disorders, and is generally the result of cold. It is characterised by intense throbbing pain in the ear, with, frequently, perceptible swelling externally, and more or less fever. There is no relief from pain till the abscess bursts, and this result is to be encouraged by the assiduous use of fomentations, poultices, &c. After the matter has discharged, the ear ought to be gently syringed out three or four times a day with warm water, till the discharge ceases. To assist the operation of syringing the ear, a very simple and ingenious apparatus may be had for a few pence from the instrument makers. This channel fastens with a spring round the head (fig. 81), and being thus maintained in place and projecting from the ear prevents the water from flowing over the patient's clothes as it is returned from the ear. As it

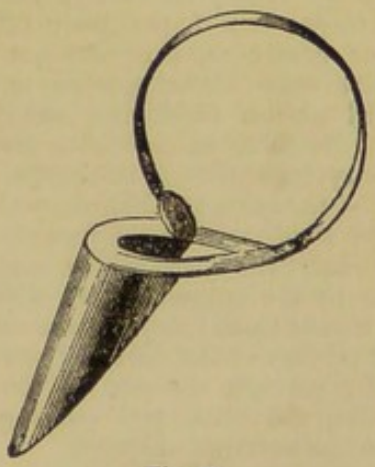


Fig. 81.

is not always convenient to get a second person to syringe the ears, a very neat and efficient instrument may be procured, by means of which any person can syringe for himself. The instrument is made of india rubber, and is somewhat like a small enema instrument. It will be advisable to give a few doses of aperient medicine during the progress of the case.

The abscess may form within the tympanum, and the membrane be perforated in giving exit to the matter. Inflammation of the ear ending in abscess, differs from true earache, or neuralgia, in the pain being comparatively slight at first, and gradually increasing in intensity as the disease progresses; whereas in neuralgia it commences with full severity.

When the discharge after an abscess does not disappear, or when running from the ears shows itself after acute diseases, such as measles, scarlet fever, &c., the symptom must not be neglected, and should be examined into by a medical man. It is most general in children of weak or scrofulous constitution, and may be with or without disease of the bone; in the former case the discharge is extremely fœtid, and often stains the linen black. These discharges cannot be allowed to go on without risk; as the brain or its membranes may become affected by the gradual extension of the disease to them through the bones. Counter-irritation, by blisters, or tartar-emetic, behind the ears; strict attention to the bowels; the general tonic treatment recommended under the article *Scrofula;* the introduction of glycerine tannin into the internal ear, or syringing with slightly astringent washes, such as one grain of lunar caustic, or two of white vitriol, to the ounce of water, will constitute the most appropriate treatment. The safest plan, however, is to submit the case

to medical inspection. Bodies of various kinds are apt to be thrust into the external ear passage by children, or to find their way there by accident; and farm labourers sometimes get grain, peas, &c., projected in during threshing. If the introduced body is much smaller than the passage, its removal may be attempted by syringing freely, and with a strong syringe; but if the body fills up the meatus, or nearly so, this will not succeed; and in the event of its being a pea, or anything which will absorb fluid, and swell, will do mischief. Neither, in case of a large body, which the syringe will not disengage, is it well for friends to attempt the removal, in any other way; they never do any good, and only push the obstruction further in, rendering its extraction by the surgeon more difficult, particularly if it is passed beyond the middle and narrowest portion of the canal. Insects, which occasionally get into the ear, may be removed by inclining the head and pouring a little water into the external opening.

To protect a diseased ear from cold or injury, there is a cover or shield manufactured of india rubber, and moulded exactly to fit the external ear. The sense of hearing is not at all interfered with by this covering.

Refer to — *Cerumen* — *Head* — *Indigestion*, *&c.*

EARLY RISING. — There can be no question, as *a general rule*, that the habit of early rising is conducive to health; but, like many other similar matters, the general application would, by many, be converted into a universal law, and much fallacy and no little mischief has been done by the propagation of the dogma. The poets have given their strains, the philosophers their aphorisms, and the hearty centenarian his experience, to eulogise early rising as a sort of elixir of life, and preventive of illness and disease. It is a great good, but not a universal one.

It is generally said that all those who have attained great and green old age have been early risers; therefore, say others, early rising is a promoter of health; therefore, it might be whispered, those whose constitutions have carried them through a long life have been able to be early risers. As in many other things, the truth probably lies between the two: there have been good vital powers on the one hand, and good habits, of which early rising is often an indication, on the other. The wrong deduction, however, that early rising is an unmixed good, has occasioned much erroneous practice; and many a delicate person, either in consequence of the false idea, or badly advised by others, has injured his health, materially, by perseverance in the practice; this, however, is more common among the young, than among the aged who require less sleep.

There is no question but that the bodily powers and constitution undergo marked and regular changes during the twenty-four hours, changes which are probably influenced by atmospheric and other causes not at present understood. At all events, in disease, evening brings fever if it is present at all, and towards morning, excitement abates if it does so at all; further, in health, the body, it is well known, is more obnoxious to the causes of disease in early morning than it is at other times; and lastly, persons of weak nervous power, generally feel better towards evening than they do in the morning, even when the refreshment of a night's rest might be expected to have given strength. The reason of these differences it is perhaps not possible fully to explain, but we may reasonably conclude that the same influence which causes or aggravates the evening fever, and abstracts excitement towards morning, may also act as the elevator or depressor of the constitution generally, although only felt when it is not in full vigour; it may, or it may not, be owing to the presence or absence of solar influence, but still it is so, and the fact is one of general experience. The fact, too, explains why early rising is not only not good for all persons, but why to some it is positively hurtful, and why those who are able to practise it are generally of strong and good constitution. Moreover, the fact tells that the person who cannot rise early with impunity is not in full vigour, but requires means for attaining a better state of health: when the powers of life are raised to the proper level, then, by all means, let them be kept to it, and early rising used as one of the preservative means.

What is meant by early rising, is getting up from rest before the sun has exerted some power upon the earth; the exact period to suit the invalid it is impossible to specify; it ought to be matter of experience. As a general rule for a healthy adult, eight hours sleep, or a third part of the twenty-four hours, should be devoted to rest. That is to say, retiring to rest at a reasonable, early hour, such as ten o'clock, the person should rise as early as can be done without feelings of sleepiness, languor, &c., supervening during the day. There are certainly evils consequent upon continuance in bed in the morning, such as perspiration, &c., but they may be greatly obviated by the non-use of feather beds, or too much clothing; they are less, however, than those which result from a nervous system exhausted at a period of the day before it had come into full activity. The same arguments which apply to early rising, also do so to exertions, or continuance without food, by weak individuals in the first part of the morning; they can practise neither with impunity. There is no time of the day so pleasant, and the hale and strong can enjoy it to perfection, and gather health in its fresh breezes, and their description will often tempt the unwary invalid to leave his couch and follow the example, and he really does enjoy, for a short time, the novelty; but shortly,

languor creeps over him; the breakfast which disappears before the appetite of the strong morning walker, has no charms for his exhausted weaker companion, who pays with a day of listless languor for this ill-advised attempt. These hints will, it is trusted, not be taken as an encouragement to laziness, but as pointing out a very common error in popular belief and popular practice. The person of weak vital power, who cannot be an early riser, must guard well that he does not mistake sloth for inability, nor encourage the inability by indulging in late hours, which are often to him the most vigorous. Persons who suffer much from debility in the morning, and who are constrained to be up early, ought, as soon as possible, to have some warm refreshment, a cup of warm milk if it agrees, or tea, coffee, or cocoa. In some cases the popular addition of a tea-spoonful of rum or brandy to milk is undoubtedly useful, particularly where there is tendency to faintness; but the cordial must be taken as a medicine, and abandoned as soon as possible.

Refer to—*Bed.*

EARTH CLOSETS.—These are ingenious contrivances introduced by Mr. Moule, a Hampshire clergyman, to obviate some of the defects of the ordinary water closet, and especially to utilise the excreta for the purposes of manure. Their action is based on the well-

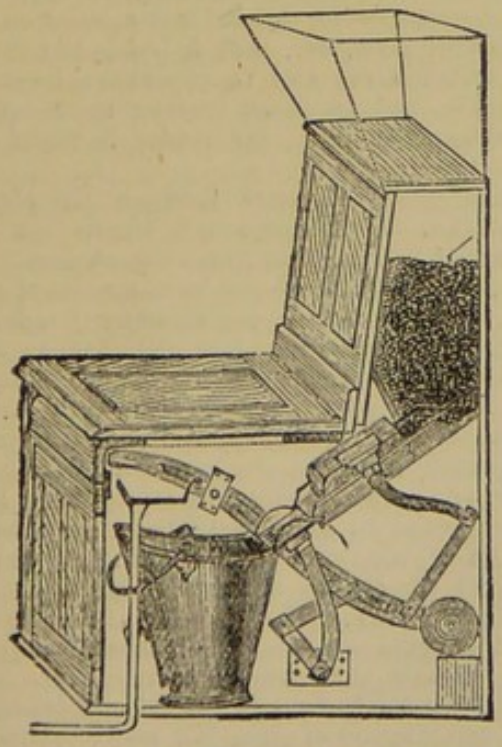


Fig. 82.

known disinfecting and deodorant property of dry earth, and they consist of an apparatus worked by a handle, which measures and delivers the requisite quantity each time the closet is used. Neither sand nor chalk can be employed for the purpose, and care is necessary that the earth used should be dried beforehand, so that it may more readily be converted into mould. The invention has not met with much favour in private houses in towns, on account of the care and attention it requires to prevent its being a nuisance. We must, however, exempt from this condemnatory opinion Parker's portable earth closet (fig. 82), made for sick-room purposes and intended for persons unable to leave their rooms, but sufficiently well not to require a bed-pan; in such cases the earth closet is both a convenient and a sanitary arrangement.

In outside privies in country houses to which gardens are attached, in public schools in the country, in lunatic asylums, and in other establishments, the earth closet has been largely adopted, and appears to answer its purpose well. It has been much employed in warm countries, especially in India, where it has been introduced into numerous barracks and prisons; and Dr. Mouat, the late Inspector-General of Prisons, reports that "it has removed the greatest sanitary defect of the prisons, and has led to a remarkable change in the health of the prisoners, which, prior to its adoption, was in a very bad state."

EATING.—See Food—Digestion—Indigestion.

ECCHYMOSIS is a medical term applied to discoloured swelling, caused by effusion of blood beneath the skin, or in the tissues of the body. A common bruise is the most familiar example.

ECTHYMA.—A disease of the skin in which pimple-like pustules containing matter are developed.—See *Skin.*

ECZEMA is of more common occurrence than any other affection of the skin. It is not a contagious disease. Though considered vesicular (that is to say, attended by an eruption and exudation of watery fluid from the skin, which dries up into a scab or crust), it presents various appearances, being sometimes marked by pustules, sometimes by papules, while at other times, and not unfrequently, the inflamed skin has a smooth glazed look, without a trace of eruption. All parts of the body are liable to eczema, but its more frequent sites are the scalp and hairy parts of the face, where it is most liable to take on the pustular form; the hands, feet, and legs, as well as those parts of the skin liable to contact and friction with other parts, as the flexions of the joints, the nates, and the inside of the thighs, are also prone to be attacked. The disease is usually attended with much irritation and intolerable itching; and if scratching is indulged in by the patient, the symptoms are aggravated, and bleeding from the surface of the inflamed skin is most likely to ensue. Eczema is very common in infants and young children, and may be traced to want of cleanliness, or to vermin in the hair, or to not drying the tender parts about the anus and groins after washing. In unhealthy children, it is an accompaniment of

various constitutional affections, and it is extremely apt to supervene on measles. Among the aged, the circulation becoming languid, eczema is prone to be very troublesome; it usually attacks the legs in these cases, particularly the calves and shins, and resists most remedies except palliatives. The skin of those parts which have suffered from repeated attacks of the disease, undergoes sensible changes; it becomes permanently red and thickened, and when pinched up by the fingers, it changes its colour at the point of pressure to a dirty yellow hue. Eczema, as a rule, is not difficult to cure, but in adults it is liable to recur, and in the aged it is very intractable.

The remedies employed for the removal of eczema are very numerous, and include those of a constitutional character, as well as local applications. In the case of infants and young children, carefully drying the parts after washing, and dusting them with the powder of zinc oxide and starch, morning and evening, combined with attention to the state of the bowels, will generally effect a cure. If the disease is the result of itch or vermin in the hair, it will be necessary to employ sulphur ointment, or ointment composed of ammoniated mercury (white precipitate), which should be smeared over the parts night and morning. If, on the other hand, the disease is the offspring of scrofula or other constitutional taint, it will be necessary to have recourse to steel wine, Parish's food, cod-liver oil, and to the class of remedies best suited for each individual case. When there is reason to suppose that the complaint is associated, as it very often is in adults, with derangement of the digestive organs, alterative and aperient medicines are indicated, such as rhubarb and carbonate of soda, combined with three grains of grey powder three times a day. Should the person be florid and robust, an occasional smart purge with calomel and scammony, or the mixture of magnesia and Epsom salts, will be found effective. The diet ought to be carefully attended to, and abstinence from alcoholic beverages of all kinds strictly enjoined. In obstinate cases of eczema, no remedy has been found so serviceable as arsenic, but it is a powerful poison, and can only be administered under medical supervision. The arsenical solution (Fowler's) is given in five minim doses in water twice a day, and must be persevered with till the symptoms abate, or the constitution is affected by the drug.

With regard to external applications, those which soothe inflammation and itching are most in request. A bran or bread poultice applied over the affected part will often do this, or the lime water liniment, so serviceable in burns and scalds, will be found equally useful in allaying the irritation in eczema. The iodide of mercury ointment, glycerine tannin, a weak solution of nitrate of silver, are each employed with the view of producing a normal condition of the skin; another good local application is the liquid pitch ointment, composed of five parts of tar to two parts of wax, which has long had a deserved reputation in the treatment of this affection. Persons liable to attacks of eczema will find the continuous employment of the coal-tar soap for the ordinary purposes of ablution an excellent preventive; but while cleanliness is essential, it is a mistake to overdo it by incessant washing of the parts most liable to the disease with soap and water. In the obstinate eczema of the legs in old people, the solid rubber bandage, as made by Messrs. Hooper, of Pall Mall, has, in Dr. Thomson's hands, proved especially useful. In general eczema, an ointment, composed of ten grains of boracic acid to the ounce of vaseline, is the most generally efficacious application he has met with. For washing, Perkin's American wood-tar soap is excellent.

EDUCATION, as applied to man, means literally the bringing forward, or encouraging and regulating the qualities or properties of which his whole being is capable. The natural division of the process is into mental and physical; the education of the mind and of the body. Strictly, in a work like the present, it is with the latter only we have to do; but the two are so intimately connected, that it is impossible to separate them.

So much that is applicable to the subject of physical education is said in the article *Childhood*, and also in the various articles on *Air*, *Clothing*, *Food*, *&c.*, that it leaves but little to be added here; and to the above mentioned articles, and to those bearing upon sanitary measures generally, the reader is referred for information.

The great difference between the physical education of the male and female sex commences when children leave the nursery. The boy, much less hampered by the mode of clothing, and permitted much more freedom in physical exertion than the girl, has, as far as these are concerned, a better chance of attaining his full measure of health, provided the mind be not overworked, and constitution and surrounding circumstances not absolutely deficient or adverse. The girl, on the other hand, is subjected to many artificial restraints and modes of education which militate strongly against the chance of her making a perfectly healthy woman. The diffusion of a knowledge of the principles on which health depends, has, of late years, tended to ameliorate many of the most injurious practices connected with the bringing up of girls, but many yet require to be corrected.

The bad results which are often brought about by the use of stays, have been so often exposed and condemned, that the subject has become almost hackneyed, and yet by a majority of the female sex the practice is still followed to an injurious extent. It seems as if people imagined that the Creator had made the body of the adult female so weak, that it can-

not support its own weight; for either on this account, or without reason, they case it up in artificial supports. Even among the poorest the abuse extends; and girls of ten or twelve are kept from bending naturally by a stiff piece of steel stuck down the front of what, at least, stands instead of stays. True, these articles of dress do at last become indispensable, but it is only after the muscles of the frame have been weakened, in consequence of not being permitted to exert their appointed and regular action. Any muscle or set of muscles of the body, if not regularly exercised, become diminished both in substance and power; and the human framework or skeleton is so constructed, that the muscles with which it is furnished, and particularly those connected with the spine, preserve its equilibrium. Supersede these muscles by artificial support, and they become weakened; but as their artificial substitutes cannot act with the perfection of the natural supporters, the defect sooner or later shows itself; the unsupported spine gives way somewhere, and curvature, more or less, ensues. It would astonish most were they made aware how many curved spines there are; in how many, who even do not themselves suspect it, the deviation exists, and how often it is the occasion of impaired health, palpitation of the heart, hysterical and other affections. To the above assertion, it is only necessary to add the high testimony of Sir John Forbes, who says in a note to the article on "Physical Education," in the *Cyclopædia of Practical Medicine:* "We lately visited, in a large town, a boarding school containing forty girls; and we learnt on close and accurate inquiry, that there was *not one* of the girls who had been at the school two years—and the majority had been as long—that was not, more or less, *crooked!*" True, the whole of this enormous evil is not entirely due to the use of stays, but much of it is so, coupled with long-standing lessons, seats without backs, and too many hours devoted to the education of the mind, by which the constitutional powers, generally, are enfeebled. Moreover, the above spinal weakness is not the only evil consequence, for it is too often mixed up with disorders of the digestive and circulatory organs, originating in their compression by the clothing. The too prolonged hours of study inflicted upon girls have been alluded to, and are unquestionably a great evil, but they would be less so, were the hours of relaxation and exercise more rationally conducted. No exercise can be beneficial unless the mind be actively interested, or at least pleasantly occupied, during the time of exertion; but little good can result from demure walks, taken without interest, and almost without enjoyment.

Nothing perhaps is more certain than that, for the full development and healthy exercise of *all* the powers of the mind, a healthy body is required. The Almighty has connected our mental manifestations in this world with a material organ, the brain, and this organ, like every other in the body, is dependent for its healthy action upon that of the other organs. It is evident then, that to preserve this wonderful instrument in the harmonious and vigorous exercise of its powers, the whole body must be in health; but modern fashion and fallacy, and many modern educationists, say no; let the body and instrument take care of themselves, our part is to elicit as many tones from the latter as possible, and elicit them they do, but they often sadly jar. Moral perceptions and acts, influenced by bodily disorder, often war with moral and religious precepts; the precept "slow to anger" cannot always control the irritabilities of a morbid nervous system, and the "not slothful in business" cannot at all times rouse the body oppressed by morbid and narcotising blood, to the active and vigorous discharge of its duties. As long as our abode is in this world, our bodies and minds must be in intimate relation, in action and re-action with one another; God has joined them, and man cannot dissolve the union, without paying the penalty of his transgression. A perfectly healthy mind is only compatible with a perfectly healthy body; and in civilised life, with its many causes of disorder, the latter can only be insured by attention to the laws of physical health and education. The mind, on the other hand, has its influences upon the physical health; but these will be considered in the article devoted to the subject.

EEL.—The eel, according to Letheby, contains fourteen per cent. of fat and nine of nitrogenous matter. It is much prized by epicures, but is hardly suitable for the sick.

EFFERVESCENCE is the rapid evolution of gas or vapour from a liquid; hence, boiling is effervescence; medically, however, the term is generally applied to the evolution of carbonic acid gas solely. Many mineral waters, such as Seltzer water, are effervescing, from containing the gas naturally; soda water and other effervescing drinks are impregnated with it by mechanical means, whilst in fermented liquors it is generated in the process of fermentation. In the practice of medicine, effervescing draughts are most frequently, perhaps, formed by the direct separation of the gas from one of the alkaline carbonates, such as the carbonate or bicarbonate—which latter contains the gas in greatest abundance—of potash, soda, or ammonia; the solution of bicarbonate of magnesia, or "fluid magnesia," is also used for the purpose. In many forms of illness, particularly those attended with thirst, no kind of medicine is so grateful to the patient, or so readily taken, as that which is given in a state of effervescence. If the stomach is irritable, and a tendency to sickness present, medicines given in this way are more likely to be retained, the carbonic acid apparently exerting a quieting and soothing effect upon the

organ; at the same time, the taste of medicine is considerably obscured by its administration by this method. When the tongue is much furred, and particularly in cases of sore throat, when medicine in any effervescing form can be swallowed, none appears to exert a more cleansing effect, in removing thick mucus and incrustations; and if it does this for the mucous membrane of the mouth, it will probably have the same effect on that of the stomach.

Some persons who are liable to suffer from difficulty of breathing, whether from asthmatic or other causes, and those who do not easily get rid of flatulence, cannot take effervescing drinks without inconvenience; this, too, occurs if patients to whom they are administered are confined to bed, and lie down too soon after taking the dose. A minute or two ought always to be allowed for the eructation of the gas, before a patient who has taken an effervescing draught resumes a recumbent position.

One of the alkaline carbonates above mentioned being made of the effervescing agent, many medicines may of course be given in combination. The acids most generally and beneficially used to combine with the alkali, and set free the gas, are lemon juice, citric acid, and tartaric acid; they ought to be used in the following proportions: To thirty grains of bicarbonate of potash, a small table-spoonful of lemon juice, or twenty grains of either tartaric or citric acids. To thirty grains of bicarbonate of soda, about one fifth more of the above acids. To six grains of carbonate of ammonia, two tea-spoonfuls of lemon juice, or about eight grains of either citric or tartaric acids.

So common has the use of effervescing draughts become, that the materials, soda and tartaric acid, and a measure for the purpose, are kept in many houses. The practice is not free from danger or injury, the continued use of soda being apt to impoverish the blood. To the weakly it is of course more likely to prove hurtful than to the strong.

The mode of mixing effervescing draughts which is commonly recommended is a bad one. The two powders are generally ordered to be quite dissolved in separate portions of water before mixing; the consequence is, the gas is evolved all at once; the violence of the effervescence—unless the glass is a very large one—is very liable to carry up and spill over a portion of the liquid, and the action subsides before the person can drink. All this may be avoided if the acid and alkali, in *fine* powder, are put dry into the glass, and the water poured slowly upon them from some little height. In this way the gas is more slowly extricated; there is no spilling, and, if properly done, full solution of the powders ought to be effected. If lemon juice is used, it should be mixed with the water, and poured upon the alkali in the same way. Of course, when the draught is a very small medicinal one, the same precautions are not required. Soda and potash waters are now prepared domestically by means of the gazogene, a very convenient and useful appliance of the sick-room, by which the objections urged above can be easily avoided. A tea-spoonful of any of the fruit syrups added to the effervescent draught will prove in most cases agreeable. The use of effervescing forms of medicine has of late years become much more prevalent than formerly, and, as a consequence, we find many improvements introduced, by which various drugs are rendered not only more palatable if taken in the above state, but also more likely to sit easily upon the stomach. Thus, we have effervescing magnesia, iron, quinine, lithia, bismuth, &c.; also, the familiar lemon kali. Until these preparations were introduced, it was a necessity of effervescing preparations that the acid, whatever it might be, should be kept separate from the carbonated alkali until the moment the effervescing action was required, the water of crystallisation contained in salts, such as carbonate of soda, potash, &c., and also in tartaric or citric acid, being sufficient, though perhaps not apparent, moisture to cause slow decomposition and destruction of the effervescing quality. As in the well known lemon kali, this was overcome by depriving both alkali and acid, before mixing, of their water of crystallisation by heat; but even then moisture sufficient was attracted from the atmosphere to decompose the salts in time, owing to their being in fine powder. The process of "granulating," not long introduced, and now applied to many medicines, quite overcomes the defect, and, consequently, we have such medicines as the granulated effervescing *citrate of magnesia*, and others, which are found so convenient and so comparatively agreeable.—See *Magnesia—Citrate of Ammonia—Carbonic acid—Potash—Soda, &c.*

EFFLUVIUM is a gaseous emanation or exhalation from any body, generally of an offensive or noxious character. Effluvia is the plural.

Refer to—*Contagion—Disinfectant, &c.*

EFFUSION is a medical term applied to the throwing out of an unnatural amount of fluid into cavities, or tissues, which ordinarily contain a small quantity only. Thus, the watery fluid which is thrown out into the chest in consequence of inflammation of the pleura or covering membrane of the lungs, is named an effusion. There are also effusions into the abdomen and in the head, also into joints and cellular tissue.

EGG of the domestic fowl, or of birds generally, as an article of diet, is one of the most nutritious; this is evident, indeed, from the fact, that from the contents of the egg the entire young bird is formed. As a means of nourishment for the sick, especially when it is beaten up, and given mixed either with hot or cold fluid, the yolk of the egg is often most valuable. It may be combined with any

stimulant, such as brandy or wine, and sweetened with sugar, or it may be used with beef tea as a concentrated means of nourishment. The alimentary composition of the egg is not unlike that of butcher's meat. The white contains in 100 parts:

85 of Water.
12 of Albumen.
2 of Fat.
1 of Salts.

While the yolk is constituted of—

51½ of Water.
15 of Albumen.
30 of Oil and fat.
2 of Extractive matter.
1½ of Salts.

The saline matter is rich in the various phosphates of lime, magnesia and iron.

The digestibility and nutritive conditions of the egg are considerably improved by its maceration in cold water for twelve or fourteen hours. The egg is broken into a basin as for poaching, cold water poured gently over it to some depth, and the whole allowed to stand for the above time. The egg may then be poached, fried, or beaten up. This form is very useful in diarrhœa.

In the preparation of medicines of an oily character, the yolk of egg is often advantageously employed, forming with them an emulsion which is miscible with water. Castor oil and turpentine are both advantageously given by this method.

ELASTICITY is the power possessed by various bodies of returning quickly to the form from which they have been forcibly altered. India rubber, both in its natural and in its vulcanised condition, presents one of the most familiar and best examples.—See *India rubber*.

ELATERIUM is a medicine possessing most powerful drastic cathartic properties. It is obtained from the juice of the *Momordica elaterium*, or "squirting cucumber." The plant is native to the south of Europe. It is a most valuable remedy in proper hands, but one much too powerful to be used with safety by unprofessional persons. The compound powder of elaterium is composed of one part of elaterium and nine parts of sugar of milk intimately mixed in a mortar. The dose is from three to five grains.

ELBOW-JOINT.—See DISLOCATIONS—JOINTS, &c.

ELECTRICITY and GALVANISM.—The employment of these agents in the investigation and treatment of disease has been greatly developed during the last twenty years. It had long been known that electricity possessed properties allied in some degree with the manifestation of nervous force, but it was not till much new light was thrown on the subject by patient investigators, and by the construction of numerous new and ingenious instruments, for its administration, that its importance and value as a curative agent has been generally accepted.

The three forms in which electricity and galvanism are employed are—

1. *Static*, sometimes called *Franklinic*, after the name of its discoverer. This form of electricity is generated by means of a glass cylinder or plate, with a multiplying wheel, which with a handle is made to turn rapidly against a rubber of silk, and the electricity induced by the friction is conveyed to an insulated brass cylinder, called the prime conductor, and from thence to the person (who is seated on a chair with glass legs) by means of a chain or covered wire, the operator using a glass director fitted with a brass knob at its extremity to administer the agent.

2. *Faradisation*, also named after its discoverer, but variously known as the *induced*, *intermittent*, *interrupted* and *electro-magnetic* current. The apparatus provided for its administration are various, and are furnished with means for breaking the continuous current from a galvanic battery, and producing a constant succession of shocks. A similar, though much slighter effect is produced with a horse shoe magnet, against which two coils of soft metal are made to revolve in a box worked from a handle outside, and which is known by the name of the magneto-electric machine. A better arrangement was afterwards introduced in what is known as the galvano-magnetic machine, which for many years was, and is still employed for administering the induced or interrupted current. The battery, however, most in use by electricians for medical purposes, is that known as Stohrer's, as it is not liable to get out of order, and will retain its activity for a month or more without change. But perhaps the most convenient and certainly the most portable battery for private use, is one manufactured by Coxeter, of Grafton Street, which will remain good for a couple of years, with careful handling. The illustration (fig. 83) gives an idea of the construction of this battery, the leading feature of which is, that it is worked without acids, and is always ready for use.

3. The *Galvanic*, *continuous*, or *silent* current, is simply developed by the chemical decomposition of an acid upon two different metals. There are also many varieties of this battery; those best adapted for medical purposes are Daniell's, Muirhead's, Smee's and Leclanché's. The improved portable Leclanché battery is the best apparatus of its kind yet introduced. By the substitution of agglomerated cells in the battery in place of porous cells, the apparatus gains three or four times in activity, and is reduced proportionally in bulk, since the smallest size of the agglomerated cell is fully equal in strength to the largest size of the old porous cell. For the conduction either of the intermittent or the continuous current, copper wires of convenient length are attached to the batteries, insulated from the operator by

wooden handles, to the extremities of which sponges in direct communication with the wires are attached for topical application. When required, the sponges are moistened with warm salt water, to aid the penetration of the electric current through the skin to the tissues beneath.

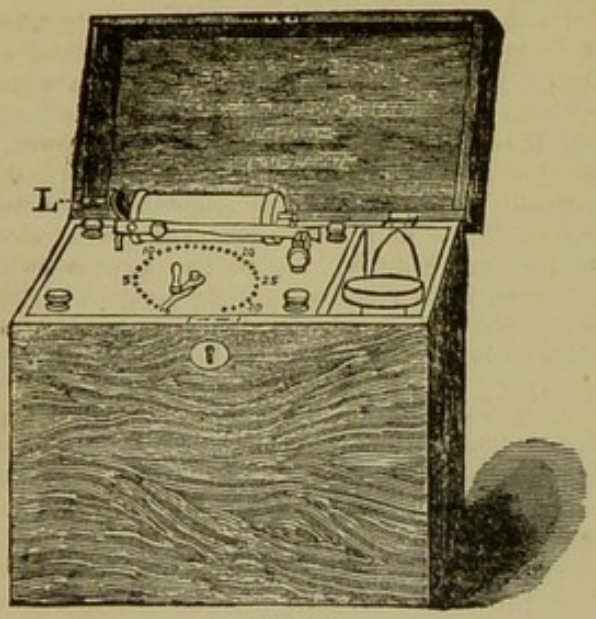


Fig. 83.

The medical uses to which electricity is applied, may be classified under those intended for the diagnosis or discovery of the true nature of nervous disease, and such as refer to its curative properties. In the former case, both currents are employed to discover the amount of loss of power in a muscle or group of muscles of any part, either from paralysis or injury, the constant current frequently responding by the manifestation of muscular action, when the induced current fails to elicit it. In cases of feigned disease or malingering, electricity is often of great service, especially where attempts are made to excite sympathy by simulating paralysis. In persons suffering from ideal influences, such as loss of voice, or aphonia, the application of electricity has often been known to restore speech in a miraculous manner. The diseases in which electricity has been found most useful, can only be enumerated here. They comprise infantile and local paralysis, the paralysis induced by lead, loss of sensation in the nerves of special sense, unless such is accompanied with organic lesion, neuralgia, especially that affecting the face and known by the name of tic-douloureux, sciatica, lumbago, and some forms of chronic rheumatism. In the majority of cases, the continuous galvanic current will be found more effective than that induced by faradisation, but it should always be remembered that electricity is one of the most powerful agents we possess, and that it must not be rashly tampered with. Its application requires considerable skill, as well as knowledge of the anatomy of the parts subjected to its influence, and it should only be employed under the direction of a medical man or experienced electrician.

In cases of suspended animation from drowning, from hæmorrhage, from the effects of alcohol, or from any other cause, electricity is a most powerful agent in restoring the vital powers through the nervous system. It has also been known in more than one instance to restore persons to life who had been looked upon as dead, hours before its application.

ELECTUARY—a medicinal preparation made of sugar.—See *Confection*.

ELEPHANTIASIS is a name applied to two very distinct forms of disease. One in which a limb (usually of the lower extremities) obtains gigantic proportions in consequence of the thickening of the skin and subjacent tissues; and the other the true leprosy of the ancients, of the Middle Ages, and of our own time. The first is often called Barbadoes leg, as it was frequently seen among the natives of Barbadoes; the other seems now to be limited to hot climates, where it is shown to be hereditary among the population. True leprosy, or elephantiasis of the Greeks, is characterised by a shining tubercular condition of the skin with a tendency to ulceration and sloughing. The disease is very chronic, and the victims of it are reduced to the most pitiable mental and physical condition.

ELM-BARK, from the well-known tree, has been used as a remedy in skin diseases, especially in lepra and psoriasis; it is also slightly tonic and astringent. The decoction is made with two and a half ounces of the bark and a pint of distilled water, and the dose is from three to four fluid ounces.

EMACIATION is wasting of the tissues so that the body becomes thin. The process of emaciation, however, is very different from simple diminution of bulk; the latter may take place whilst the appearance of health is still retained; but with true emaciation, the skin and aspect generally present an unhealthy appearance. There are few diseases which are not accompanied with loss of flesh or emaciation, and it is not unfrequently the first observable symptom. Sir Thomas Watson remarks:—"It occurs in complaints that are not commonly dangerous—as in dyspepsia, and in hypochondriasis, which is often connected with dyspepsia; and when it does occur, it marks the reality of the disease." It is a good plan, now often pursued by medical men, to weigh at stated intervals a patient, who complains chiefly of wasting, in order to test the effect of remedies and of the progress of the disease. This wasting happens in many fatal maladies — in pulmonary consumption, for example, and in dropsy, although the dropsical enlargement sometimes masks it. It accompanies many acute diseases, and is reckoned an unfavourable symptom: for it shows that the body is not properly nourished. Sometimes the emaciation is so extreme that the integu-

ments give way—the bones of the patient are said to come through his skin.

Refer to—*Atrophy.*

EMBROCATION.—A fluid applied with friction to any portion of the body.—See *Liniment.*

EMERGENCIES.—We intend this term to denote such occasions as are liable to happen in the experience of every one, when it is necessary, in the absence of medical assistance, to use one's own judgment promptly and judiciously in rendering what aid one can in the circumstances. Such events arise in cases of injury from accidental causes, in persons subject to fits, in cases of sudden hæmorrhage, in drowning, poisoning, and in insensibility from a multiplicity of causes. It ought to be borne in mind, however, that more harm than good is often done by injudicious meddling in circumstances which might appear to warrant interference, and that he or she who has the courage to let well alone, and to persuade others to do the same, displays more medical skill and foresight than the industrious busybodies, armed with an infallible remedy for every ailment that afflicts humanity. As the occasions referred to are treated at length under separate articles, it is only necessary in this place to point out a few of the more prominent, and to indicate briefly the best course to adopt under the circumstances of each.

1. *Injuries.*—In the event of a person sustaining a serious injury, he should be laid flat on his back, with his head slightly raised; all constrictions in his clothing—such as necktie, shirt-collar, waistcoat, and trowser-band—should be undone. If possible, the seat of the injury should be sought for, and the clothing removed from it; and if there is loss of power in one or more limbs, it may be assumed that the patient has sustained a fracture or dislocation of one or more bones, and it is advisable to retain him in the horizontal position in the course of his removal to his home or the hospital.—See *Ambulance.*

2. *Hæmorrhage.*—Supposing that the patient has received a wound from which the hæmorrhage is great, and there is no surgeon at hand to control it, it becomes the duty of the bystander to have recourse to his own ingenuity to check it, and this he can best do by planting the front surface of his thumb on the spot from which the blood is issuing, and retaining it there until a more efficient substitute for a compress can be had. The best and readiest form of compress would consist of a coin, say a penny, enveloped tightly in several folds of linen rag, placed over the mouth of the bleeding artery or vein, and kept firmly in its place by means of a handkerchief tied round the limb. Such an arrangement answers well in the case of a punctured wound which bleeds much, or in a ruptured varicose vein, and is usually successful in checking the hæmorrhage. Should the wound be large or lacerated and the hæmorrhage great, it might even be advisable to extemporise a tourniquet by means of a handkerchief or bandage, in which case the compress above referred to must be placed over the main artery above the wound, and retained firmly there. This operation, however, could scarcely be had recourse to unless the operator was sufficiently conversant with the route of the vessel, and its anatomical relations. Hæmorrhage from an artery is always more to be dreaded than hæmorrhage from a vein. The blood in the former case is known by its bright red colour, and from its issuing from wounds in jerks corresponding to the beats of the pulse; while venous blood, on the other hand, is of a dark purple colour, and comes away in a full continuous stream. Should there be no fracture of the limb, it is advantageous in staying the hæmorrhage from a wound, to raise the part above the level of the body, to lessen the force of gravitation. This remedy is usually successful in bleeding from the nose, in which case both arms should be raised above the head, and retained there for several minutes, or until the hæmorrhage ceases.

3. *Burns.*—One of the most common accidents which an ordinary person has to encounter is a burn or scald, and no time should be lost in discussing which is the best application. The main object is to exclude the air from the wound and to relieve pain, and this is best done by soaking a piece of lint in carron oil, spreading it over the surface of the burn, and laying a layer of cotton wool over the dressing, the whole being kept in its place by a lightly applied bandage.

4. *Collapse.*—When there is much collapse or shock from the accident, or faintness from hæmorrhage, it is usually advisable to administer a table-spoonful of brandy and water from time to time; but in injuries to the head and insensibility from fits or other causes, stimulants should be avoided. The chief causes of sudden insensibility are due to injuries of the head, apoplexy, epilepsy, drunkenness, narcotic poison, and to heart disease; and unless the consequence of an accident, there is no single symptom in any of these occurrences which the bystander can rely on as indicative of the malady at fault. Nevertheless, something may be done before the doctor arrives, even if it be only to check injudicious meddling.

5. *Convulsions.*—In all cases of fits and convulsions, the patient should be allowed to remain on the spot where he has been smitten down, unless necessity renders his removal imperative, and all constrictions of clothing from the neck and chest should be at once undone, so as to give free play to the lungs. Means ought to be taken to prevent the person injuring himself, by the sudden contortions to which the body is subject in convulsions; and if there is much gnashing of the teeth and tendency to bite the tongue, a piece of wood, cork, leather,

or handle of a spoon, if nothing better can be had, should be placed between the teeth, while all attempts to make the patient swallow any thing should be summarily condemned, as in all probability it would choke him. The case is different with children who may be suffering from the convulsions caused by teething, in which little harm, or rather, much good, may accrue from the child's being at once immersed in a hot bath, at a temperature of 98° Fahr., and retained there for ten minutes or a quarter of an hour.

6. *Poisoning.*—When there is little doubt of the insensibility being caused by drunkenness or a narcotic poison, such as opium or belladonna, or where there is no doubt poison of some kind has been swallowed, attempts to cause vomiting should be made at once. This can be most readily done in domestic life by administering about half a table-spoonful of mustard in half a tumbler of water, followed by copious draughts of warm water.

7. *Symptoms generally.*—Violent fits are indicative of some injuries of the brain, of hysteria, of epilepsy, and sometimes of drunkenness; while convulsions of a less severe type are noticed in apoplexy, most head injuries, and in teething in children. The sudden cessation of the circulation in heart disease is so rapidly followed by death, that the condition may be looked on rather as one of fatal syncope than insensibility, and no action can be taken under the circumstances. Simple giddiness often precedes more violent symptoms, but it more frequently occurs alone, and indicates something amiss with the stomach and bowels which requires rectification. There are certain symptoms which, allied with others, help materially in aiding diagnosis in cases of insensibility—to wit, the condition of the pupil of the eye, and the pulse at the wrist. In apoplexy, the pupils are usually dilated and fixed; in disease or injury of one side of the brain, they are unequal in size; and in simple congestion, they are as a rule contracted. The pulse again is always weak and sometimes imperceptible in shock from injury, collapse, and in hæmorrhage, irregular in heart disease, and slow in cases of apoplexy, and in other diseases producing insensibility by pressure on the brain. In nearly all cases of insensibility, whether arising from disease or injury, the recumbent position, with the head slightly raised, is the best for the patient; cold applications to the head and warmth to the body, especially to the feet, are also indicated in the vast majority of cases. Drowning and other causes of insensibility and sudden death are noticed in separate articles.—See *Ambulance—Wounds—Fractures—Burns and Scalds—Hæmorrhage—Emetics, &c.*

EMETICS are substances which excite vomiting; that is, which cause the stomach to be forcibly emptied of its contents by the mouth, and which do this by a peculiar action, exerted either directly upon the organ itself, or in consequence of their having been taken into the circulation; thus, vomiting may be excited by the injection of some emetic substances into the veins.

Many agents are capable of exciting vomiting, which are not classed as emetics, such as nauseous tastes or smells, swinging motions, such as that which causes sea sickness, mechanical irritation of the throat, &c., but these causes are very different from the specific action of a true emetic, which acts independently of taste or smell. Emetics constitute a class of our most valuable remedies, although not so indiscriminately and extensively used as they were formerly. In ancient times, particularly among the luxurious Romans, emetics were commonly employed for the disgusting purpose of enabling them to disgorge one luxurious meal as soon as swallowed, that they might immediately begin with another. "Cicero, in describing a visit paid to Cæsar at a villa near Rome, states that Cæsar paid him the high compliment of taking an emetic before dinner, when he understood that Cicero intended to spend the day with him."

The most generally used and most useful emetics are—

Antimony.	Sulphate of alum.
Ipecacuanha.	Sulphate of zinc,
Mustard.	or white vitriol.

Salt is sometimes used as an emetic; and the mechanical irritation of the throat with a feather or piece of rolled up paper is often resorted to with benefit, for the purpose of exciting vomiting. The reader will find further information respecting the above emetics under their individual articles.

Of sulphate of zinc thirty grains in a little water should be given to an adult; of sulphate of alum, a teaspoonful; of mustard, half a tablespoonful mixed with half a tumbler of water. For children one or two teaspoonfuls of ipecacuanha wine every ten minutes usually act. A little time, five to fifteen minutes, according as the state of the stomach is empty or full, often elapses before vomiting occurs. The first sensation is one of nausea, accompanied with flow of the saliva, slight faintness, and cold perspiration; at last, the effort of vomiting supervenes, and the contents of the stomach are ejected. As soon as actual vomiting commences, as a general rule, but not before, some tepid fluid—water, gruel, chamomile tea, or such like—should be given in moderate quantity, not exceeding half a pint at a time. A slight caution is requisite upon this head, for occasionally individuals, under the action of an emetic, are encouraged to drink very freely of fluid and to distend the stomach. This is not well, for it not only embarrasses the action of the organ, but might cause its being lacerated or burst. It is also requisite to caution against giving the diluent fluid too soon, that is before the specific power of the emetic substance has come into action; if this

is done, the dilution will either delay, or altogether prevent the desired effect. When there is much debility of stomach, it is better to choose for the diluting fluid a bitter, such as chamomile tea, which has the additional advantage of being itself emetic. As a general rule, the mineral act more quickly and violently than the vegetable emetics; for this reason the former are generally selected in cases of poisoning, such as that by opium, in which there is some difficulty in rousing the stomach to action at all, and in which it is important that it should be relieved of its contents as speedily as possible. In such cases medical men may give the sulphate of copper; but for the unprofessional, the sulphate of zinc, or white vitrol, is the safest, and is a nearly equally efficacious remedy.

When there is much fever, and in some forms of inflammation, the salts of antimony, particularly tartar emetic, are most generally used if emetic action is desirable. As a simple emetic to relieve the stomach, and also in cases of chest affections, ipecacuanha will be found the best. In diseases of depression, mustard is most useful; and carbonate of ammonia may also be employed alone, or combined with ipecacuanha. In cases where the power of swallowing is lost, medical men can excite vomiting by the injection of emetic substances into the veins. This practice, of course, cannot be followed by the unprofessional, yet they may safely, and with much certainty of success, have recourse to mechanical irritation of the back of the throat, either by the finger or by a feather. A few individuals possess the power of spontaneous vomiting, or at least of exciting regurgitation of the food from the stomach into the mouth; a process somewhat analogous to the rumination of animals. Such persons usually suffer from dyspepsia, and have recourse to the operation to free the stomach from food it cannot digest.

The evening is generally the most suitable time for administering an ordinary emetic, as the stomach has time to recover itself during the night, and the uncomfortable nausea which often follows is less felt.

Emetics are used to fulfil various indications, the most direct and obvious being the emptying of the stomach of any noxious substances, either formed within the body, such as bile; or taken in by the mouth, as indigestible food or poison. Fortunately, these matters often of themselves excite vomiting, but in many instances they do not sufficiently empty the stomach, in which case the action must be kept up, or re-excited, either by a diluent or by some emetic medicine. It must be remembered, however, that in the case of some poisons it is not desirable to dilute largely. In addition to their power of emptying the stomach, emetics are valuable from the mechanical effects, both general and local, which they exert upon the body. Formerly, the general mechanical effect, or "shock," of an emetic, was believed to have the power of checking fever and other diseases at their outset; it is not now, however, much trusted to by medical men, and if it does not do good, is apt to prove injurious, by causing an irritable condition of the organ, which may continue throughout the disease. In many cases of incipient disease, however, characterised by depression, coldness of the skin, &c., the mechanical action of a smart emetic of ipecacuanha, either alone, or with five to eight grains of carbonate of ammonia, is most beneficial, by rousing the system, and removing the tendency to internal congestion, or accumulation of blood. Another, and most beneficial, mechanical emetic effect, is in the case of children suffering from affections of the chest, with accumulation of mucus, or phlegm. Children cannot expectorate, and are liable to be suffocated if the phlegm is in large quantity, and cannot be removed; nothing ensures its removal so effectually as an emetic, or rather emetics, repeated from time to time—every few hours—according to circumstances. In cases of jaundice and overloaded liver, the mechanical action of emetics is often beneficially had recourse to. In chronic bronchitis and some forms of consumption, the periodical exhibition of emetics has been used with advantage. In spasmodic diseases, either general, as hysteria, or local, as in spasm of the stomach, emetics are beneficial; in the latter case, often, of course, by freeing the stomach from the offending cause of the disorder. In asthma, they often relieve when nothing else will.

Emetics are not always safe remedies; in pregnancy, in persons of very full habit, particularly if there is determination to the head, in rupture, in falling down either of the bowel or of the womb, vomiting should, if possible, be avoided. The ancients held the opinion that emetics strengthened the stomach, and they were even used in the training of the athletæ; modern experience certainly does not uphold the fact, for the habitual use of these agents assuredly injures the tone of the organ, and weakens its power.

An error is frequently committed in using antimonial, or, as it is called, "antimony wine," as an emetic; it is far too depressing for general purposes. For these, ipecacuanha is the safest agent of the class; an adult requires ten to twenty grains of the powdered root; a child one to four grains, mixed with a little water.

EMIGRATION.—For those who leave their native country and go to seek a home and fortune in other lands, one thing is essential to success. Invaluable to all, *health* is to the emigrant a necessity; it is to him a capital of more than money value; and yet this foundation of future fortune, nay even of existence, is often carelessly and ignorantly undermined at the very outset of the enterprise. Many are undoubtedly too poor and too ignor-

ant to profit by counsel even when it is given, but thousands annually leave the shores of Britain as emigrants, who are capable of acquiring and acting upon useful information concerning matters of health; and how few, comparatively, have even a slight acquaintance with the laws which regulate their being, on the observance of which their health and usefulness depend; how few are capable of acting intelligently and promptly under the occurrence of those accidents and contingencies which it must often fall to the lot of the emigrant to encounter! Into the hands of some who meditate emigration these pages may fall; to them the author more particularly addresses himself.

The first thing to be considered must be, not whether gold is to be extracted from the river sands in one place, or corn is to be grown without exertion in another, but the question should be, What is my constitution? What are its tendencies, hereditary or acquired? To what climate is it most adapted? Will it endure the hot summers and severe winters of America, or will these probably develop the consumptive tendency I inherit? Is it not more suited for Australia or New Zealand?—are not my children more likely to be reared in the one climate than the other? These and numerous other considerations connected with *the adaptation of constitution to climate and probable occupation*, ought to hold the chief place in the decision as to emigration. That being decided, the next is the preservation of health during the voyage. As far as circumstances will permit, a vessel should be selected which guarantees sufficient room, ventilation, supply of water, and fresh food. The various Emigration Acts have done much to succour the friendless emigrant from numerous hardships and discomforts which at one time were notoriously associated with the passage out, whether to the old world or the new. The Emigration Commissioners are enabled to grant free passages to those colonies in want of labour, and which are willing to provide necessary funds for the purpose, and Boards of Guardians at home are at liberty to raise money for the same purpose under the authority of the Local Government. Space will not permit, in a work like the present, the detail of all those means and measures which the intending emigrant should adopt as regards health: much information on these points he may gather from the various *Emigrant's Guides*, particularly those of the Messrs. Chambers; and further, he is referred to the various articles in this *Dictionary*, which treat of matters connected with the preservation and regulation of health, more particularly *Ague*, *Bed*, *Climate*, *Clothing*, *Consumption*, *Food*, *Medicines*, *Ventilation*, *Water*, *&c.* These and others contain many hints which will be found valuable, both in the selection of the future home, and of the mode and means of transit. One thing is generally agreed upon, that, however good an emigrant ship's dietary may be, it is always advisable for the passengers to add a private one, of such concentrated foods as means will allow—common cabbage will do, preserved in vinegar—which may afford a supply of the vegetable acids, the best counter-agents to the effects of the salted provisions which necessarily form a large proportion of the food on board ship: a few bottles of lemon juice are always a valuable addition to the sea store.

As regards clothing, it is unnecessary to repeat here what is said in the article on that subject, but it may be mentioned, that emigrants who probably have to encounter exposure on first landing in their adopted country, would do well to provide some cheap waterproof material to place beneath them at night. An attack of rheumatism is an unfortunate, and often, when once acquired, too constant companion of the emigrant, and may cripple him permanently. Those who have to undergo the confinement which a long voyage must entail, most especially require to attend to all the laws of health, and particularly exercise, which, from the small walking space on board ship, is often neglected; it should be a carefully observed rule to walk for a certain time daily.

The amusement of the mind is a matter of much importance, even in a health point of view, for those exposed to the monotony of a long sea voyage; happy are those to whom books afford their never-failing resource, and the time might be worse employed than in the perusal, or rather study, of works like the present. When the new scene of labour is reached, the opportunity will be past, but the man who has acquired for himself information which may enable him either personally to avoid, or, in the case of others, to counsel the avoidance of sources of disease, or to act intelligently and promptly in cases of sudden illness or accident, may have reason to bless the, perhaps otherwise wasted, time spent in the acquisition of the principles of *Domestic Medicine*, or of *Household Surgery*.

After landing in his new country, the emigrant ought to inform himself as far as possible respecting the occurrence and causes of illness, either in the one district of his residence, or in those he may have to pass through.

As said at the commencement of this article, health is, next to trust in God, the essential, and it cannot be too jealously guarded by the emigrant, to whom its loss is ruin and misery. For information respecting medicines, the emigrant reader is referred to the article.

"Although emigration is now universally looked upon as the best means of disposing of a surplus population, it is clear from the returns published by the Board of Trade, that its ebb and flow depend on other causes than the numerical increase of the people. The deficiency of employment, coupled with bad harvests, at home, and the facilities and demand for

labour abroad, at given intervals of time, influence more than any other cause the stream of emigrants from the mother country. This is especially the case with respect to emigration to the United States, which swallows up the larger proportion of the emigrants from the United Kingdom, and nearly all the Irish who leave their country. No incident connected with our history lent a greater impetus to emigration than the potato blight and consequent famine in Ireland, which occurred in the memorable years 1846–47. The same influence, though less severe, was felt in other parts of the United Kingdom, and raised the total annual emigration to a height which it had never reached before, averaging till about the close of the Crimean war 200,000 a year. After this time (1857) the exodus began to decrease steadily till it reached in the year 1861, a minimum of 65,197, the smallest return since the famine year. The year 1861 coincided with the beginning of the Civil War in North America, which no doubt deterred many from carrying out their intentions of emigrating there, but after a few years the flow kept pretty steadily increasing until 1873, when the numbers who left these shores for various quarters of the globe amounted to 228,345. After this time it diminished again, in consequence, it was thought, of the great American railway panic, until the year 1877, when the total emigrants from the mother country numbered 95,195. During the two years 1879–80 there has been again a very considerable increase in the number of emigrants from the ports of the United Kingdom, the number for 1879 having amounted to 164,274, and in 1880 to 227,542. The great labour market of the United States absorbed no less than 73 per cent. of the emigrants in 1880, induced there by a succession of good harvests and ample employment, and discouraged by a couple of years marked with bad harvests in Britain. The colonies of Australia and New Zealand come next in order of preference, after which our possessions in North America, which, doubtless, when they become further developed, will offer attractions to the emigrant equal to those of the United States."

EMMENAGOGUES are medicines which exert, or are supposed to exert, their action upon the womb, and to promote the menstrual discharge. The only well-known medicinal agent which exerts an undoubted specific action of the kind, is the *Secale cornutum*, or ergot of rye (see *Ergot*). The *Actæa racemosa* is akin somewhat in its action to ergot (see *Actæa*). Some medicines seem to exert their influence upon the womb by stimulating neighbouring organs, to this class aloes, colocynth, and other strong purgatives belong; others, such as valerian and assafœtida, by their action on the nervous system; and another set, such as iron, by their tonic influence upon the system at large. In the majority of cases in which emmenagogues are required, a combination of iron with aloes, will prove the most effectual means of stimulating the womb.

Refer to—*Menstruation.*

EMOLLIENTS are remedies which possess the power of relaxing and softening parts to which they are applied. Heat and moisture, and oil or fatty matters, are the chief and best emollient remedies.

EMPHYSEMA means the presence of air in the cellular or connective tissue of any part of the body, and when the part is in fault it is said to be emphysematous, though the term is now almost entirely applied to a dilated or ruptured condition of the air cells of the lungs, which condition materially interferes with the natural process of respiration. The disease is brought on by repeated attacks of bronchitis, of which it forms afterwards a troublesome complication. It is also induced by violent respiratory efforts, and is a common consequence of asthma. The symptoms are shortness of breath on exertion, and much less chest movement in respiration, the lungs being unable to perform their proper complement of work, in consequence of the dilated condition of the air cells, the person affected becomes short-winded, and the blood is deprived of its free oxygenation. The lips and face in consequence become livid, and the person is apt to have a tendency to lean forwards, and after a while to become round shouldered. Emphysema of the lungs is extremely common among cabmen and others addicted to drink, although it is not at all an unusual disease both among men and women who lead most abstemious lives.

The treatment to be pursued must be both general and medicinal. A person liable to emphysema will usually take care not to expose himself to the raw night air, and should have a fire in his bed-room in cold weather. He ought also to provide himself with a respirator, if he is forced to face cold foggy weather, and adopt the same means as those recommended generally for bronchitis, with which disease this complaint is closely allied. When it comes on in paroxysms, it is useful to employ one or other of the numerous antispasmodics recommended for asthma, as, spirits of chloroform in doses from twenty to thirty minims, ether spirit to the extent of thirty to forty minims, or the etherial tinctures of lobelia, belladonna, or conium.

Dr. Coghill's new inhaling respirator is now one of the most efficient aids in the treatment of bronchitis and bronchitic asthma, with emphysema. By its means a patient can, without fatigue or trouble, inhale for hours whatever medicament is considered best. Eucalyptus oil; compound tincture of benzoin, with or without henbane; or spirit of chloroform or creasote, and others, may all be inhaled in this way with much advantage.—See *Inhalers.*

The form of emphysema connected with the subcutaneous tissues, sometimes follows upon

the accident of fractured rib, when a point of the bone penetrates the lung. In this case, with every breath expired, air passes from the lung into the cavity of the chest, from whence it finds its way through the wound made in the walls of the cavity, and by this means becomes diffused through the cellular tissue; the features and the whole body become greatly swollen, and when the surface is indented by the finger, a crackling sensation is experienced. The mere distension of the cellular tissue is not a circumstance of so much importance as the accident which gives rise to it, but in those perfectly unaware of the possibility of such an occurrence, the appearance presented by the affection would cause much alarm: of course the broken rib itself should be attended to; the emphysema may be relieved by punctures made in the skin by a lancet, and by the application of bandages.

Refer to—*Bronchitis—Fractured ribs, &c.*

EMPYEMA is one of the results of inflammation of the pleura, in which suppuration occurs, and the matter has a tendency to gravitate towards the lower part of the chest walls. When there is reason to suppose from the bulging of a part of the chest wall, generally at the back, or side, and from other symptoms indicative of chronic pleurisy, that matter is confined in the space between the lung and the skin, the surgeon has recourse to the operation of tapping, or as it is called paracentesis thoracis, by which the imprisoned fluid may be allowed to escape; and after its discharge, he introduces a drainage tube into the wound to permit the escape of more matter. In severe empyema the surgeon (with aseptic precautions) usually makes a free opening into the pleural cavity, cutting out, if necessary, part of a rib; after the matter is removed a drainage tube is inserted, and kept in the opening covered with antiseptic dressings until the cavity heals by granulations or adhesions.—See *Aspirator.*

Refer to—*Inflammation of the Lungs.*

EMPYREUMA is the peculiar and often offensive smell which many substances acquire after exposure to considerable heat in *close* ovens or vessels. The fact of an article of diet having an empyreumatic odour, renders it unwholesome and irritating to the stomach; on this account, baked meats, pastry, &c., are more apt to disagree than the same articles roasted or boiled.

Refer to—*Baking.*

EMULSION is a mixture of oil with water by the intervention of a third substance. This may be effected by means of gum mucilage, syrup, &c., but perhaps the best agent for forming emulsions, is the yolk of egg. The oil must first be rubbed up with the yolk, and then, distilled, rain, or perfectly soft water added gradually. Milk, which is itself a natural emulsion, is also a very good agent for uniting some oily, or such like matters resembling the oils in composition, with water, particularly camphor.—See *Camphor—Castor oil, —Turpentine.*

ENAMEL.—The outer hard casing of the teeth.—See *Teeth.*

ENCEPHALON—a medical term employed to designate the parts generally contained within the skull.

Refer to—*Brain.*

ENDEMIC is a term applied to diseases which are peculiar to, and persistent in, certain districts or countries. Thus, ague is endemic in marshy districts; bronchocele or goitre where the water is impregnated with magnesian limestone; and cretinism in the low dark valleys of Switzerland. These and other endemic affections are undoubtedly due to natural peculiarities of soil and climate; but their power is unquestionably much augmented by the privations attendant on poverty, and by the depressing influence of dirt and vice; or, as in the case of bronchocele, by laborious lives.

Besides naturally caused endemic diseases, there are others which may equally be called endemic, though arising from the artificial circumstances which have hitherto been attendant on man when living in community; such are the fevers of our large towns, which are so constant in their operation in particular localities, as truly to merit the name of endemic.

In many situations, the constitutions of the natives of districts in which endemic influences prevail, appear to become habituated to, or proof against, the morbific causes, which are quickly productive of disease in strangers. Such is strikingly the case in the rivers of the African coast; and the Niger expedition afforded melancholy proof of how fatal to Europeans a climate may be, in which the natives live with comparative impunity. In many cases something is due to the adaptation of habits and modes of life by the inhabitants, which are either unknown to or neglected by strangers.

Refer to—*Climate—Epidemic, &c.*

ENDERMIC.—See Hypodermic.

ENEMA, Injection, or Clyster, are all names for the same useful adjunct to medical treatment, the mechanical injection of fluid into the bowels by the rectum. Injections are most commonly employed as aperients, but they are also used as anodynes, or antispasmodics, for the purpose of dispelling wind, or as internal fomentations, or as styptics. One of their chief uses is the administration of nutriment when the passage to the stomach is obstructed. In illness they are generally administered to the patient by others, but instruments are constructed to facilitate their self-administration, which is of course preferable when, as frequently occurs, they are often required in ordinary health.

The mechanical means used for the administration of injections are very numerous, one of the simplest is the vulcanised india rubber bag (fig. 84). The pipe and bladder, which was formerly the only method used, is still em-

ployed in country districts, and though clumsy, may be had recourse to on an emergency. Of late years the syringe most in favour has been Higginson's enema syphon, in

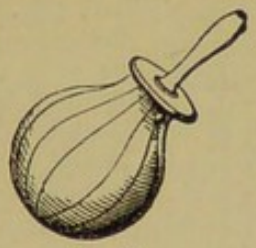


Fig. 84.

which a vulcanised india rubber ball takes the place of the metal syringe, and the fluid is forced by hand pressure through the tube into the rectum. Another useful form is that manufactured by Messrs. Ingram, figured in the accompanying illustration (fig. 85), which is made in one piece.

The injection syringe is most useful when the injection to be administered much exceeds half a pint in quantity, when it is used as an aperient, and requires to be forcibly injected. When the enema does not exceed half a pint, as in the case of children, or when used as an anodyne or styptic, the vulcanised india rubber bag (fig. 84) is quite the most convenient mechanical agent, from its simplicity and the ease with which any one may use it. Suitable instruments may be procured good from any respectable maker of surgical instruments, and directions are, or ought to be, given with them. When an enema is administered to the sick, the patient may either be laid on the face or on the left side, near the edge of the bed, with the knees drawn up. The bone or vulcanite pipe which is introduced into the bowels should be well oiled or greased, and its introduction should be effected with perfect gentleness, not straight up, but in a direction slightly inclined towards the back bone, care being taken that no abrasion or scratching of the parts be occasioned; this is a most necessary caution

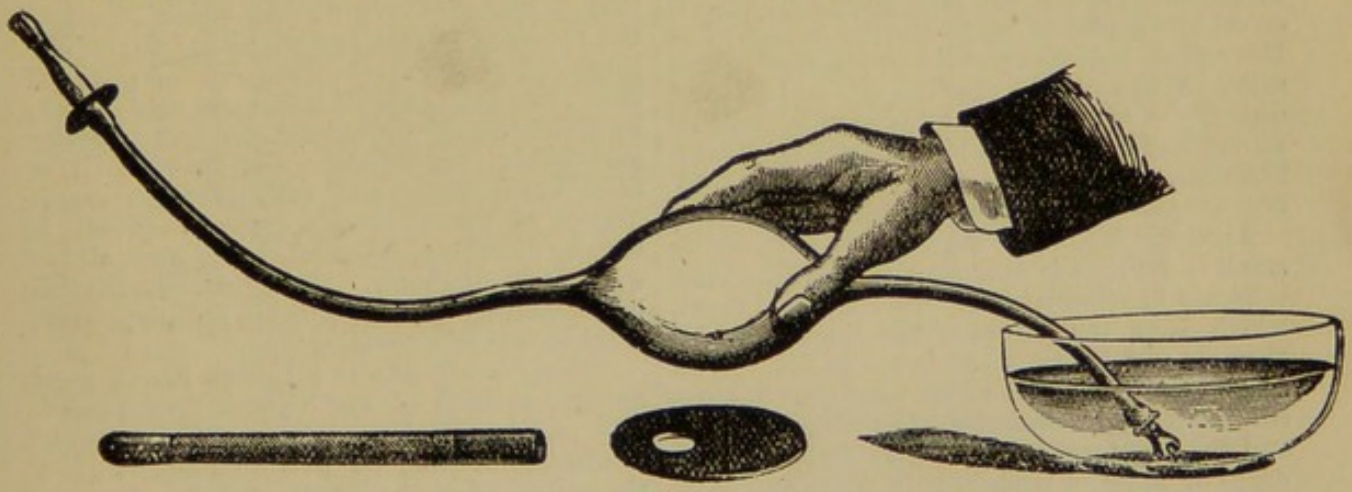


Fig. 85

in all cases, but more especially in those in which repeated use of the remedy will probably be required. Even with the greatest care, the parts are liable to become sore, causing the patient both to dread and suffer each time the instrument is used, and even to be unable to bear a continuance of the practice. In all cases an enema should be given slowly and gently, and care taken that air is not thrown up into the bowel as well as fluid; with the syringe, this is to be avoided by pumping it full of fluid, before it is applied to the patient, and by not continuing the operation when the fluid used gets so low in the basin as to allow air to be drawn in; with the bag, care should be taken that it is quite full, and that the pipe end is held upwards until placed in the bowel. When self-administered, the sitting posture is the most convenient. When the syringe is used, if the flexible tubes have been kept bent in one position, they should be slightly warmed before any attempt is made to straighten them for use, otherwise, especially in cold weather, they are apt to crack. If an instrument has been used for anything but simple water, it ought always to be well washed out with warm water before putting by. When taken to pieces it must always be unscrewed by the hand holding the metal mountings.

Enemas, self-administered, can be done most conveniently by means of the syringe.

Aperient injections may be simply mechanical, of water, gruel, and the like, either cold, tepid, or warm, or they may be medicated. There is an objection to enemas of simple water, that in some cases they are apt to wash off the natural protecting mucus of the bowel, and therefore it is perhaps better as a general rule, and where the remedy is often or habitually used, to employ a demulcent, such as gruel or barley-water. Cold enemas, sometimes useful, ought never to be resorted to except by medical direction; the fluid about the temperature of 90° will generally be found most appropriate, and when used simply, about a quart thrown up slowly, but with sufficient force,

will be found a suitable amount for the generality of adults. Some use a much larger quantity, as much as two or three quarts; this, in certain cases of illness, may be a useful measure, but as a habitual thing is bad; the frequent over-distension with so large a quantity of warm fluid, produces want of tone, which aggravates the torpid tendency of the bowels, and favours fæcal accumulation. For a child of six years of age, half a pint of simple gruel injection is ample. These simple enemas act by stimulating the bowel by their mechanical bulk; when a medicinal injection is used, or when food such as beef tea is given by the rectum, the object is in some degree to avoid this, so that the agent may not be expelled before it has time to exert its peculiar agency. The medicinal or nutritive injection ought, therefore, as a general rule, to be small in quantity, not exceeding two or three ounces.

The most convenient medicated aperient enema is made, either with a table-spoonful of common salt in a pint of gruel, or with a piece of brown soap, the size of a hazel nut, rubbed down into a pint of warm water; or instead of these, from half an ounce to an ounce of Epsom salts, or two ounces of olive oil, or half that quantity of castor oil; or infusion of senna, half an ounce of leaves to the pint, may be employed. Stronger enemas, with turpentine, croton oil, &c., are also used by medical men.

Anodyne injections ought always to be so small in bulk—not exceeding three fluid ounces—as not to stimulate the bowel to expel them, which, from the nature of the cases in which they are usually given, it is apt to do. In all cases, anodyne injections are most conveniently administered by means of the vulcanised bag, and the best form is from fifteen to twenty-five drops or more of laudanum in three ounces of moderately thin starch. This enema is of course to be retained in the bowel if possible. One of the most useful injections for dispersing flatulence, is made with two drachms of tincture of assafœtida to half a pint of gruel, to which, if there is much pain, ten or fifteen drops of laudanum may be added; or the same quantity of assafœtida tincture may, if required, be added to an aperient injection. Injections used for the purposes of internal fomentation may be given to the amount of a quart, and of a temperature of 98° or 100°.

Nourishing injections are usually composed of strong beef tea with yolk of egg beat up in it, and to which port wine or brandy may be added. As it is an object to retain the fluid in the bowel as long as possible, not more than three or four ounces should be thrown up at one time, the operation being repeated every few hours.

In hæmorrhage from the lower bowel, *when it is proper to interfere with it*, a two or three-ounce cold styptic injection may be used, made with sulphate of zinc four grains, or sulphate of iron one grain, to the ounce of fluid.

ENTERIC, TYPHOID, or GASTRIC FEVER.—These three names apply to one and the same disease, than which there is none more dangerous and subtle. It may run its course mildly, without the development of any bad symptoms whatsoever, beyond the ordinary manifestations of a slight feverish attack; it may be attended by the gravest symptoms, so as to threaten life, at any time during its course; or, lastly, it may appear to be running on to a favourable termination, when, suddenly, a relapse declares itself, and the patient is speedily again in the greatest danger. Severe cases of this disease were formerly confounded with typhus fever; while mild cases were generally called gastric fever. Still later, its striking analogy to typhus, led some medical men to give it the name of *typhoid* fever, but it was reserved for Sir William Jenner, to prove thoroughly the non-identity of the two diseases, and to give the latter the name of Enteric Fever. It is a circumstance of singular and melancholy interest, that it was this very disease which attacked the Prince of Wales, and which carried off our great and good Prince Albert, in the prime of life. The disease is attended, in many cases, by ulceration of the bowels, and sometimes by perforation (see article under that head); or fatal hæmorrhage may take place in consequence of the ulcerative process. There is usually diarrhœa, the stools being generally of a pea-soup character. Any treatment beyond that generally recommended in ordinary fever, must be left to a medical man.

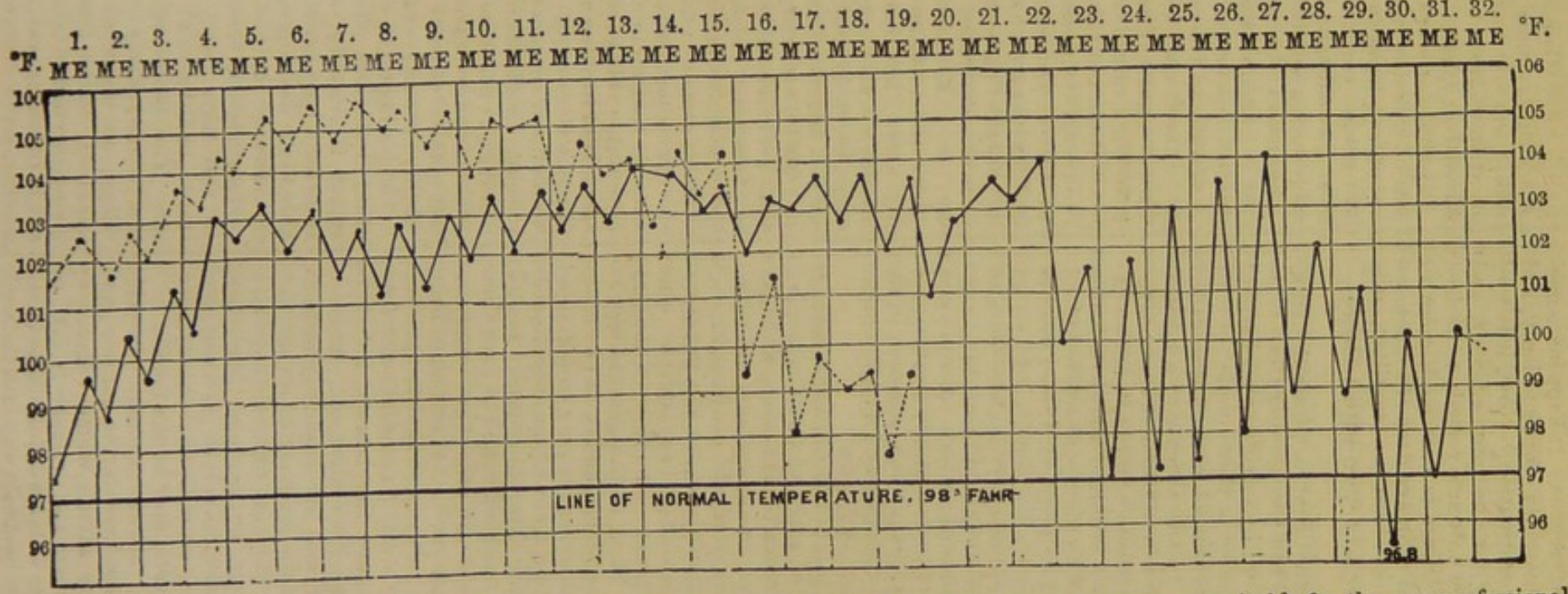
Management.—As in all other fevers, good nursing is here of the highest consequence. The patient is often delirious, and requires constant watching on this account. Again, the irritation of the bowels and diarrhœa are very troublesome, inasmuch as many patients who have never been accustomed to it cannot (in their half-delirious state, perhaps) be prevailed upon to make use of the bed-pan, and yet nothing is more dangerous when there is great prostration than to allow them to get up to the water-closet or to the night-chair; indeed, in some cases with hæmorrhage from the bowels, death has taken place suddenly, from this precaution having been overlooked; besides, it is dangerous to the public to allow non-disinfected stools to enter the drains.

As medical science advances, it may be that we shall discover a method of treatment for this disease which will be successful in destroying or eliminating the poison. At present, however, the chief indication is to pay great attention to the state of the bowels, as it is the glands upon the surface of them which are chiefly affected. These glands are exceedingly liable to ulceration, during the fever, and this constitutes the prime danger of the disease.

From what has been already said, it will be believed that more than ordinary care is required in the nursing and general treatment

RANGE OF TEMPERATURE DURING TYPHOID FEVER.

TYPICAL RANGES OF TEMPERATURE IN CASES OF TYPHUS AND TYPHOID FEVER CONTRASTED WITH EACH OTHER THROUGHOUT THEIR COURSE, FROM THE BEGINNING TO THE END OF THE DISEASE. The Records indicate Morning (M.) and Evening (E.) observations. The *dotted lines* indicate the *Typhus* range; the *continuous dark lines* indicate the range in *Typhoid* (WUNDERLICH and TRAUBE).



N.B.—The above table, taken from Dr. Aitken's work on the *Science and Practice of Medicine*, may appear unsuitable for the non-professional reader; still the subject of the range of the temperature of the body in different diseases engages so much of the attention of medical men, that we need offer no apology for its introduction.

of cases of this disease, and at no time more than during convalescence. It happens, sometimes, that the diarrhœa stops suddenly, and is succeeded by constipation. Now, it is well to know that by far the most efficient, and indeed, almost the only safe remedy to be used for this state of things is castor oil, *given in a small dose*. An ordinary dose of some more irritating and less bland purgative, often causes the purging to return with violence.—See *Castor oil*.

If there is much thirst, a pleasant drink, and one likely to suit the peculiarities of the fever, may be given, by mixing equal parts of milk and lime water, either simple, or still better as the effervescing lime, or as it is called *Carrara* water. In the absence of a medical man, when there is severe hæmorrhage from the bowels, (this sometimes occurs to such an extent—several pints—as immediately to threaten life), gallic acid with opium, or acetate of lead with opium, may be given, or if these remedies are not at hand, at all events, cold or iced water should be applied over the abdomen, and above all, the patient should be made to continue in the recumbent posture. Should great faintness ensue, of course brandy must be given freely, and indeed, it is often necessary in this disease to adopt treatment of a highly stimulating and supporting nature.

An important point in the domestic management or nursing of cases of this disease, is to avoid the occurrence of bed-sores, which are often so distressing and dangerous, and which, in all cases, greatly retard convalescence, if they do not ultimately cause the patient to sink from exhaustion. They can be quite well avoided by proper attention to the state of the patient's back, in the general way recommended for bed-sores, and it will be necessary, when the diarrhœa is very troublesome, and the patient in a state of unconsciousness, perhaps, is passing everything under him, to sponge the body frequently, and to have abundance of drawsheets, in order that impurities may be at once removed. At the risk of being thought tiresome, we repeat that the greatest care is necessary during convalescence from this disease, because the bowels, let it be remembered, have been ulcerated, probably at several points, and are gradually healing, so that the least undue exertion on the part of the patient, or the least distention or irritation of the bowels, by improper food, may cause the cicatrising ulcers to give way, and fatal hæmorrhage, or still more likely, perforation of the bowel, may be the result.

Enteric fever, always endemic in this country, is most common during autumn, and at this time may attack whole villages or parts of towns where the drainage is bad, or where the drinking water is contaminated with sewage, which has made its way into the well.

This disease and typhus fever were at one time supposed to be identical, but now their distinctiveness is well recognised and admitted by all. Sir William Jenner first proved their non-identity, mainly from the fact that, after death, there is found ulceration of the bowels in enteric fever while these organs are not affected in typhus.

It would not serve any useful purpose, in a book of this description, to detail the symptoms of each disease with the view of qualifying the reader to distinguish the one from the other, as medical knowledge is essential to enable such a distinction to be made.

Causation.—As regards causation, enteric fever is undoubtedly a germ disease, and the introduction into the body of the specific germ is essential to its production. Formerly it was believed that sewer gas in itself, or the offensive gases given off by a collection of putrefying organic matter might give rise to the affection, but this theory is now exploded. It is true, the disease is generally associated with such conditions; but this arises from the fact that its germs are contained in the bowel discharges of patients, and thus gain entrance to sewers, cesspools, or privies, as the case may be. The most frequent channel by which the contagion is introduced is drinking water; but here, again, however much impurity a water may contain, and unwholesome though it may be in consequence, the specific ailment "Enteric Fever" will not result from its consumption unless the germs of that particular disease are present in it. At the same time, it must be remembered that the contaminating source of a water-supply is likely, sooner or later, to be the means of this particular virus being imparted to it. Bearing this in mind, it will be understood how unsafe it is to rely entirely upon chemical analysis in forming an opinion as to the safety of any water-supply. It is quite possible that a water may contain so little organic matter as to bring it well within the chemical standard of purity, and yet it may be fatally contaminated with enteric fever poison. The quantity of organic matter present is a small element if that which *is* present contains the specific poison.

The contagion of enteric fever, like that of other infectious diseases, can, apparently, retain its vitality, and exist in a dormant state for a long period until conditions favourable to its development arise, when it shows its presence by the disease making its appearance among those who are exposed to it. In this way, many cases which cannot be traced to antecedent cases may be accounted for. The following history illustrates this pretty conclusively:—In an isolated country village an imported case of enteric fever appeared, which terminated fatally without giving rise to any other cases. In the autumn of the following year, after an interval of ten months, seven cases of the disease occurred in four houses, among families whose water-supply was obtained from the well belonging to the

house in which the original case occurred, while other families in the village escaped. That the well water in question was responsible for all the cases was clearly proved, and there can be but little doubt that the imported case was responsible for the sowing of the seed which had germinated after so long an interval. Within a short distance of the well (a shallow one) was a privy with a sunk cesspit, into which the excreta from the original case had been thrown. The surroundings forbade the conclusion that the contents of the cesspit had taken ten months to find their way to the well; and the outbreak being so long delayed after the introduction of the contagion, indicated that circumstances had not been favourable to the development of the germs, which, therefore, remained in a spore condition in the soil until, possibly, the temperature necessary for their growth was reached. These cases are recorded mainly to illustrate a theory in support of which many similar outbreaks might be mentioned, and they also point to the necessity for the thorough disinfection of the excreta of enteric fever patients. To disinfect the excreta of enteric fever patients, the principles laid down in the section on *Disinfection* must be strictly adhered to; the disinfectant must be added in sufficient strength, not omitting to allow for the diluting effect of the excreta, and it must be allowed to remain in contact with the infected matter for, say, twenty-four hours. To allow of this it is desirable to make use of a special pail with a tight-fitting cover, in which the excreta may be retained until they are finally disposed of. The ultimate disposal of the excreta is best effected by burning, if circumstances will permit of this plan being carried out; failing this, and if land is available at a safe distance from any houses, the excreta may be disposed of by burying them well underground. If, on the other hand, the sewer is the only means of disposal, for reasons mentioned in the section on *Disinfection*, it is imperative that the disinfectant used (perchloride of mercury by preference) should be allowed ample time to do its work before the excreta are thrown away. If, as in many towns, and in most rural districts, the privy-midden system of excretal disposal is in operation, under no circumstances should the infected excreta be disposed of in that manner.

To insure success, all such cases should be isolated in hospital, and with proper observance of precautions as regards the disinfection of linen, excreta, &c., imported cases of the disease need give rise to no anxiety. Again, with thorough cleanliness, attention to house sanitation generally, and a water-supply which is beyond suspicion, the disease should become a thing of the past. The same remarks apply with equal force in the case of cholera and epidemic diarrhœa.—See *Cholera—Disinfection—Germs of Disease—Water, &c.*

ENTERITIS. — Inflammation of the bowels.

Refer to—*Alimentary Canal—Inflammation.*

ENTOZOA are parasitic animals which are found in a living state within the body. The most common entozoa in man are the various forms of worms.—See *Worms.*

ENURESIS. — Incontinency of urine.—See *Urine.*

EPHEMERA.—A fever which does not last more than twenty-four hours.

EPIDEMIC is a term applied to a disease which attacks a large number of individuals simultaneously, or at least in quick succession. Perhaps the best instance of an epidemic is the well-known influenza, which seems more independent of endemic, or local influences, than most others of the class. Cholera is an epidemic disease, but the liability to its visitation is evidently connected with local circumstances, which either assist in developing the activity of its mysterious germs, or at all events exert an attracting influence over them. Scarlet fever, measles, small pox, diphtheria, and other diseases of the class, most certainly prevail epidemically at times; for though they undoubtedly disseminate themselves by contagion, observation would show that the contagious influences are much more potent in different places at different times. The reason why this should be so is not always traceable; but as regards the greater and more pestilential epidemics, it has been observed that they have been preceded or accompanied by striking vicissitudes in the weather. It is well known that the first extensive diffusion of the Asiatic cholera dated from a swampy district at the mouth of the Ganges, after a very wet season, and it is matter of history, that the epidemics of plague were associated with unusual modifications of weather: the extremes of heat or cold, of drought or moisture. Neither are the epidemic influences always confined to man: the lower animals are also frequently and fatally subject to them. It is remarkable, as indicative of this influence, that birds have been observed to forsake districts in which an epidemic pestilence prevailed.

Epidemics were much more common and fatal in former times than they have been within the last hundred years. Such were the plague at Athens, 430 years before Christ, the black death or plague of the fourteenth century, the sweating sickness towards the end of the fifteenth, the great plague of London of the seventeenth; at the present day, the plague of eastern countries, of Egypt in particular, and the cholera, are the modern pestilences. All these, and many others, are undoubted epidemics; but equally certain is it, that they owed, and still owe, much of their potency for evil, to local and endemic causes, and to the entire want of attention to sanitary arrangements. However deficient these may be in this country, even at the present day, were it

not for such regulations as there are, we know of no reason why cholera, which still lingers around and sometimes decimates the neglected oriental city, should not again visit our shores. In view of a threatened outbreak, and during the prevalence of an epidemic, it is of paramount importance, that the general health of the individual, as well as of the community, should be strictly considered, and that every precaution should be taken that the drainage and water supply are in an efficient state. Poor and dirty neighbourhoods are almost certain to be the first affected, and there, if anywhere, thorough inspection should be made, and, if possible, overcrowding prevented. The ventilation of houses ought to be free and ample, and measures taken to have notoriously close and dirty rooms lime-washed and purified. In the majority of epidemics it is impossible to prevent personal susceptibility to an attack of the prevalent distemper, but in the case of small-pox we know re-vaccination to be an excellent safeguard, and in the advent of cholera much may be done in the way of prevention by checking the premonitory diarrhœa which is sure to prevail about the period. Measures of isolation for the affected, either in their own houses, or, when the disease occurs among the poor, in buildings arranged for their reception, should be strictly enforced; it is greatly to be regretted that so many obstacles to the establishment of these asylums should have been recently raised, for they unquestionably confer an enormous benefit on the public at large.

Refer to—*Contagion—Fomites, &c*

EPIDERMIS.—The outer or scarf skin, or cuticle.—See *Skin.*

EPIGASTRIUM. — The pit of the stomach.

EPIGLOTTIS is a cartilage of an oval or heart-shaped figure, situated at the root of the tongue, which falls upon and covers the glottis or opening into the larynx, so as to protect it, particularly during the passage of food, in the act of swallowing.

Refer to—*Larynx—Swallowing, &c.*

EPILEPSY, or Falling Sickness, is one of the very afflicting maladies to which man is subject, belonging to the class of convulsive diseases. It is also one of the most eminently characteristic, and at the same time terrible to witness, when it occurs in its severer forms.

The fits, or convulsive seizures of epilepsy, are most varied as to occurrence; occasionally an individual has suffered from one paroxysm, and one only, the disease never again returning; in other cases, years have intervened; frequently the interval is one of months, but again, daily fits, or even two or three times a day, are the rule in the worst cases. The attack of epilepsy is for the most part sudden: the individual in the midst of some accustomed occupation, or whilst holding active communion with persons around, suddenly utters a loud—a fearful—cry, and, if unsupported, falls to the ground; the eyes are staring or rolling, the head, or rather chin, is drawn towards one shoulder, the colour becomes dark or livid, the veins of the face and temples turgid with blood, and the features are thrown into convulsive movement; there is froth at the mouth, whilst a kind of choking noise is often made in the throat; the limbs are also more or less convulsed, and the excretions are often expelled involuntarily. The tongue very often suffers from being bitten, and the teeth have even been fractured during the fit. Gradually, these convulsive movements diminish, and the person awakes to consciousness, with a heavy stupid look, or falls into a deep lethargic sleep which continues for some hours; but even when this is roused from, there often remains slight temporary suspension of the activity of the mental functions. Such are the phenomena of a severe epileptic paroxysm; the disease, however, occurs in much milder forms, even in those who at other times suffer from it in greater intensity. A slight temporary unconsciousness may be the only symptom, with or without the slightest approach to convulsive movement, as evidenced by the twitching of a finger, the roll of an eye, or slight spasmodic action of the muscles of the face; the patient may fall gently as in a faint, or remain standing as it were asleep for a few moments. As there is every variety in the nature of the attacks, so is there likewise in their duration: from a few moments, to the average period of from two to three minutes, but sometimes much longer.

The attack in many cases appears to bystanders to come on suddenly, and without warning; but most epileptic patients are sensible for some time previously of the approach of the paroxysm, and even for twenty-four hours are always aware that a fit is at least probable, although its direct accession may not be certainly known until just previous to its occurrence. It may, however, happen that these symptoms will pass off without a fit, either independent of any effort of the patient to ward off the attack, or in consequence of some of those measures found to be efficacious, and adopted by epileptic patients for the purpose.

The premonitory symptoms vary greatly: low spirits, or unusual irritability, sometimes an increased energy, dizziness, noises in the ears, floating specks before the eyes, and many other signs connected with disorder of the nervous system, are the occasional precursors of the epileptic paroxsym; but the most generally marked, and remarked, precedent, is the epileptic "aura," a sort of creeping sensation, which exists but for a few seconds, and is described by the patient as arising at some particular part of the body, such as the extremity of a limb, and gradually ascending upwards to the trunk or head, till the

individual loses his consciousness in the convulsion.

Epileptic seizures are very frequent in the night time, just as the person is falling asleep; but they may occur at any period of the twenty-four hours, and may be induced by causes affecting the nervous system: the excitement of joy or passion, or the depression of grief, intoxication, and sexual excess are most frequent, not only actual exciters, but also predisposers, to the attack of epilepsy.

Epilepsy may be a congenital disease, that is, the child is born with the tendency, and becomes subject to the fits, either with or without apparent cause, early in life, indeed, many of the convulsions of children occasioned by teething, &c., are in fact epilepsy, but as they arise from causes irritating the brain, and not from affection of the organ itself, they are possibly not repeated when the cause of irritation has subsided. If, however, the tendency exists strongly in the constitution, and has not developed itself before puberty, it is very apt to do so at that period, and more especially if favoured by circumstances which lower the tone of the body generally, or of the nervous system in particular; but no period of life is exempt from becoming the period of epileptic development, even to old age. From Dr. Gower's exhaustive analysis of the causes of epilepsy, hereditary disposition comes first on the list, then follow in order, dentition, fright, mental anxiety, and excitement, blows and falls on the head; but in a very large proportion of persons subject to the disease, it is difficult to trace the phenomena to their true cause, which may be of a more or less complex character. The following observations of Dr. Bright upon this point are generally instructive, he says:—"There are leading periods in the evolution of the frame, and peculiar circumstances connected with certain periods, which may well be considered as influential in the production of the disease. In infancy, the nervous system is delicate, and easily acted upon by various causes of irritation. Then follows the trying period of teething. In a few years the second dentition occurs. In a few years later, all the great changes connected with the age of puberty. To this follow the excesses and exposures of manhood; and after the lapse of years the vigour of the system fails, and many causes act to derange the nice balance of the constitution: the bowels often become sluggish, &c."

A person may die in an epileptic fit, even in the first, but this is seldom the case; more generally the disorder does not immediately threaten life, but the individual goes on from year to year, suffering more or less, and still lives; even when the fits occur daily, or two or three times a day, this is the case. When death does occur early in the disease, it is more probably due to suffocation arising from the spasm of the muscles of the throat and neck, than to the brain affection. But if life is continued to the confirmed epileptic, too often intellect becomes affected. This may not be palpable after a first seizure, not even after many seizures for many years, not throughout a tolerably long life, but these are exceptions. The generality of epileptics become feebler in intellect, the memory fails, the power or continuous exertion of the mind is lost, and perhaps, at last, the condition ends in mental fatuity.

That epilepsy is due to disease or disorder of the brain and nervous system is unquestionable; the affection either directly originating from them, or through them, in consequence of irritation in some portion of the body. It is well ascertained that hereditary predisposition gives greater effect to causes which have plainly exerted influence in the production of this distressing malady. Dating, either directly or indirectly, from the nervous system, whatever weakens that system tends to cause epilepsy. From this it is evident how well founded the observation is, that there is no more fertile source of epilepsy than the abuse of the sexual organs, particularly in the young. The subject is a painful one, but the direful consequences of vice, with which the merest children become imbued at school, is frequently coming before medical men; unaware of the sin and evil consequences of their acts, they ruin constitutions at the most critical period of life, and lay the foundations of epilepsy and other nervous diseases, which are either quickly developed, or do not show themselves till late in life. The subject is one to which parents and tutors cannot be too strongly alive. Intoxication is a cause of epilepsy, and delirium tremens may be complicated with it. Strong and prolonged mental exertion may induce epilepsy. Fright is another and very frequent existing cause. Worms and irritations in the bowels, indeed, whatever can irritate the nervous system, may induce the disease in question. Imitation, or at least the witnessing an individual in the epileptic paroxysm has been known to give rise to the fits in others, but they were most likely predisposed, or at all events of nervous and susceptible temperament; for this reason, such persons, young females and children especially, should never, if possible, be permitted to witness an epileptic fit; the premonitory cry is so terrifying that it has been known to affect even the lower animals.

Of the predisposing causes there is no question that hereditary tendency is a powerful one, and especially if the constitution of the family be scrofulous. Epilepsy in the offspring has been traceable to no other cause than dissipated, and especially drunken, habits in the father. It is frequently observed to be concomitant with malformation, or at least mis-shape, of the head of the sufferer. From what has now been said, it must be evident that epilepsy is no disease for domestic manage-

ment in a curative point of view, but that it affords much room for preventive and other means.

In families in which a tendency to epilepsy is known to exist, the greatest care should be taken to guard the nervous system from all causes either of irritation or exhaustion. In infancy, the period of teething, and the condition of the bowels, will require special attention, and the tone of the system to be maintained as directed in article *Childhood*. The physical strength and health are to be cultivated in early life, even at some sacrifice of educational advancement; at puberty, the strictest eye must be kept upon the habits and tendencies, and whilst the constitution is developing, and growth going on, all exhausting exercises prevented; indeed, during life the suspicion of a tendency to so terrible an affliction as epilepsy should be a salutary check upon excess in every way—a check upon the man who consumes his energies in the exertions of business or of study, as well as upon those who waste them in the pursuits of vice or sensualism. In addition to passive preventive means, all those measures which are fully laid down throughout this work for the preservation of health should be well attended to, particularly the use of cold water to the head, spine, and surface generally, if there is sufficient re-action to bear the application.

Care must be taken in the curing or suppression of accustomed or long-continued discharges, such as habitual diarrhœa, bleeding from piles, &c.; at the same time it must be borne in mind, that the discharge, by weakening the system, may be itself the cause of the disease; but this is a point which the medical attendant must determine.

Certain precautions are always requisite with those who suffer from epilepsy, and as a general rule it may be laid down that they should never, if possible, place themselves or be placed in situations in which a sudden seizure will expose them to danger. Thus, employments which necessitate riding on horseback, ascending heights, &c., ought never to be engaged in, neither such as those in which even momentary unconsciousness may involve the lives of others in danger. Even the suspicion of epilepsy in a railway official ought to be a disqualifying circumstance. Many, it is true, have sufficient warning to enable them to prepare for the attack, and to withdraw from danger, but this is not always possible; the worst case of burning—or rather roasting—the author ever witnessed, was in consequence of a fall into the fire in an epileptic paroxysm: when means will allow of it, the epileptic ought to have an attendant constantly with him. When an individual is seized with a fit of epilepsy, but little can be done for its immediate relief; the chief thing is to prevent the patient inflicting injury upon himself, by striking against surrounding objects, and also to protect the tongue. Those who are much in attendance upon the epileptic, ought always to have at hand a piece of india rubber, or a thick india rubber ring—such as is used for children teething—to insert between the teeth. All fastening about the body, such as the neckcloth, &c., ought to be loosened, and air freely admitted; the head should be raised, and cold wet cloths *may* be applied to it if there is much heat. The person should be placed on the ground or floor, and the bystanders forbidden to give him any thing so long as the fit lasts. Much harm is done at times by good-natured attempts to make the patient swallow fluid, such as water or spirits during the fit, but all attempts of this kind should be postponed till after his recovery from the fit.

The treatment of an epileptic patient in the intervals of the fits, *must* be left to a medical man; it involves too many considerations to be advantageously managed by others: when well treated, there is a hope of cure, and this chance should be afforded to the patient, which can only be certainly done under efficient and educated management; for even with all that skill and attention can do, the disease often proves intractable. The various remedies which have been used in epilepsy, and they have been very numerous, it would serve no good purpose to enumerate here, further than to state, that in the severe headache which often accompanies the complaint, much benefit has frequently resulted from counter-irritation, such as the introduction of a seton in the neck. It sometimes happens that accidental counter-irritating effects relieve epilepsy, at all events for as long as they are in action. In one case attended by the author, a man who was suffering from daily attacks of epileptic convulsion fractured his leg, and from that time, had no attack for five or six weeks, during the period the accident was being recovered from. The inhalation of nitrite of amyl sometimes prevents an epileptic seizure, and ammonia, ether or chloroform, used in the same way are often serviceable. Of late years bromides of potassium, of sodium, and ammonium, taken in large doses regularly, have been found very efficacious. Tonics such as steel and cod-liver oil, with attention to the general health and surroundings of the patient are very necessary. Epilepsy is often a feigned disease, particularly among soldiers and sailors, and also by mendicant impostors. The latter usually choose public places for the exhibition, throw their legs and arms about, foam at the mouth with a little soap mixed with the saliva, and continue their exertions for a much longer time, and with more expenditure of force, but with less active power than the real epileptic. A real epileptic is not susceptible to pain or sensation; where suspicion exists, therefore, some test of this kind which will not injure may well be tried. Snuff may be put up the nostrils, and if it produces sneezing there is no epilepsy:

sometimes the proposal, within hearing of the person, to try some mode of treatment which involves considerable suffering is sufficient to dispel the fit. In the treatment of the disease the careful regulation of the bowels is of the highest importance. Patients often spontaneously remark that the fits are less frequent when attention is paid to this particular. The application of Chapman's india rubber ice bags to the spine has been attended with benefit in some cases. It should not be forgotten that it is consistent with the practical experience of most physicians, that epileptics improve for a time upon almost every new method of treatment.

Refer to—*Ablution—Convulsion—Cotyledon—Childhood, &c.*

EPIPHYSIS is the extremity of a long bone, such as of the arm or thigh, which is, in the young, connected with the shaft or main portion of the bone, by means of gristle. When such bones are boiled for some time, the epiphysis separates, as may be seen in the case of veal or chickens. In children the epiphysis is sometimes separated by accident attended with violence.

Refer to—*Bone.*

EPISPASTICS are substances used medicinally for producing inflammation of the skin, which may be followed either by blistering or by the formation of matter. Their action is in fact that treated of under the article *Counter-irritation*, which may be referred to.—See also *Blister, &c.*

EPISTAXIS.—Bleeding from the nose.—See *Hæmorrhage—Nose, &c.*

EPITHELIUM forms the external layer of the skin and the lining of the mucous membrane.—See *Mucous Membrane.*

EPSOM SALTS are a compound of magnesia and sulphuric acid—sulphate of magnesia—and derive their name from having been first obtained by the evaporation of the water of a spring, situated near Epsom, in Surrey, which contains the salt in large quantity. They are now prepared largely by manufacturing chemists from magnesian limestone, and also from sea water. They are sold in the form of small, pure white, needle-like crystals, and from their cheapness are extensively, indeed too much so, used among the poor as a general aperient, and not unfrequently by all classes. Epsom salts are tolerably certain in their action, do not gripe much, and produce free watery evacuation of the bowels; on these accounts the medicine is a most valuable one in many diseases, particularly in fevers and in cases of torpor of the liver, also in persons of a full habit, but, as generally employed, it is not suitable for a common or frequently repeated aperient. From its being in many instances taken in a state of too concentrated solution, it induces a discharge of the watery part of the blood into the bowels, and thus seriously debilitates: moreover, after the action of a dose of Epsom salts, the bowels, in those liable to habitual constipation, are very apt to be left with a greater tendency to inaction than before; nevertheless, in persons of full strong habit, an occasional dose of the medicine is, without question, beneficial, but it should be taken in smaller quantity and much more largely diluted than is usually done. The question of dilution is a very important one in the administration of this salt, and if attended to, renders it safe and efficient even for the comparatively delicate. From half a drachm, or even less, to a drachm, should be dissolved in at least six ounces or half a pint of cold or tepid water, and taken on first rising in the morning, when the dose should be followed by the fluid breakfast: many persons liable to constipation find this method a simple and effectual remedy, which may be used for weeks together. From five to ten drops of dilute sulphuric acid are often a good addition to the dose, and one which at the same time corrects in some degree the bitterness of the salt. If there is debility, either of the stomach, or generally, from a quarter to half a grain, either of quinine or of some salt of iron may be added. The quinine appears to increase the aperient power. The most convenient method of taking Epsom salts in this form is to dissolve one ounce in a pint—sixteen ounces—of water, adding the acid or other ingredients in proper proportion. Of the solution, from half to a whole wine-glassful may be taken the first thing in the morning, diluted with the proper quantity of water before taking, or if preferred, by the latter being drunk immediately after the medicine.

The following method for the administration of Epsom salts has been recommended in France:—take of water about sixteen ounces, powder of roasted coffee two and a half drachms, Epsom salts one ounce; boil well for two minutes—not in a tinned vessel—remove from the fire, and let the mixture infuse for some minutes, so as to allow time for the development of the aroma; then filter, or merely strain off: it must be sweetened to taste. This fluid does not impart the slightest taste of the bitterness of the salt. It should be observed that the *simple infusion* of coffee is not capable of removing the bitter taste.

Perhaps the most agreeable form in which the salts can be taken, is by using one or other of the numerous mineral waters which contain it in abundance, such as the Hunyadi Janos, Friedrichshall, or Pullna waters. A wine-glassful of Hunyadi water taken in the early morning, and afterwards supplemented with a breakfast-cupful of hot tea or coffee is almost certain to relieve the bowels.

The combination of Epsom salts with infusion of senna, constituting the common black draught, is one of the best forms of active *occasional* purgative in common use. It is well to bear in mind, that there is considerable resemblance between oxalic acid in its crystal-

line commercial form and Epsom salts, and that in consequence, fatal mistakes have occurred. The intensely acid taste of a single crystal of the former would at once clear up any doubt; perhaps it might be well always to use so simple a test.

Refer to—*Oxalic Acid—Purgatives—Senna.*

ERGOT OF RYE is a peculiar diseased or fungoid growth which is developed upon the seed of the common rye. The affected grain is sometimes called "spurred rye;" from the peculiar curvature of the growth, which varies from half an inch to an inch and a half in length, is about a quarter of an inch thick, slightly angular in shape, and black in colour. As a remedial adjunct in the hands of the accoucheur, ergot of rye is most valuable, but is scarce likely to form part of the domestic medicine chest. It is more commonly met with on the Continent, where much rye is grown, than in this country, and when the grain is largely infected with it, pestilential diseases have been ascribed to the use of the flour in which it has been mixed. It is certain that a peculiar kind of dry mortification of the extremities has followed the prolonged use of grain containing ergot.

Ergot of rye has been used in medicine in hæmorrhagic and other diseases, but chiefly on account of its undoubted action upon the womb. It is sometimes employed hypodermically to check hæmorrhage from any source, from its well-known power of producing vascular contraction, by its influence on the spinal cord and sympathetic nervous system. Of the beneficial effects of ergotine given hypodermically in hæmorrhages generally, it is impossible to speak too highly. It can only be safely used by medical men.

ERRHINES are medicinal substances used as snuff to excite discharge from the lining mucous membrane of the nostrils; they are, in fact, means of counter-irritation, but are not much employed by medical men. In some cases of headache they are useful, and common snuff may be used with as much effect as any of the class.

ERUCTATION is the rising, either of gas or fluid, into the mouth from the stomach. It is a common symptom in dyspepsia. Relief for this troublesome affection may generally be obtained by the following prescription:—nitro-hydrochloric acid half an ounce, distilled water seven and a half ounces, of which a tea-spoonful may be taken three times a day; or subnitrate of bismuth and compound powder of tragacanth, of each ten grains with an ounce of water two or three times a day. Half a tea-spoonful of powdered charcoal taken in water once or twice a day, will greatly check eructations, especially of a fœtid character.

Refer to—*Flatulence.*

ERUPTION—a diseased appearance on the skin.—See *Skin.*

ERYSIPELAS, or ST. ANTHONY'S FIRE, or THE ROSE, is an inflammatory affection of the skin, with or without vesication or blistering, sometimes extending to the cellular tissue beneath. It appears on various parts of the body, but most generally on the head and neck. Unless the attack is very slight indeed, the occurrence of erysipelas is generally ushered in by symptoms of fever, shivering, and headache, furred tongue, perhaps sickness, followed by thirst, hot skin, quick pulse, &c.; at the same time, the part first affected, such as the nose, cheek, or ear, becomes stiff, painful, red and swollen, the pain being of a burning character. If unchecked, this inflammation of the skin extends with more or less rapidity, and so rapid indeed is its progress at times, that in a very few hours the whole head and face become enormously swollen. As the disease progresses, blisters resembling these raised by a scald form over the surface, which is intensely hot and red, or purplish; the pain is severe, fever runs high; sore throat is a very frequent accompaniment, and delirium is common.

So serious a disease as erysipelas ought only to be treated by a medical man; but as it is important, if possible, to check it at its first onset, the following measures should be adopted if proper assistance cannot quickly be procured; a disease presenting the symptoms above detailed, must generally be recognisable even by unprofessional persons. In the general treatment of erysipelas, it is advisable to produce in the first instance free action of the bowels by means of the colocynth and hyoscyamus pill. Next, tincture of iron is to be given in doses of from fifteen to thirty drops to an adult, every four hours, and to a child, less in proportion. Fluid nourishment must be given in abundance, especially milk, and wine added if the fever be high and the patient delirious.

Flour is a very common and often a good and comfortable local remedy in erysipelas; hot fomentations, either of simple water or decoction of poppy heads, *applied continuously for many hours*, by means of flannel, give much relief in some cases; or a lotion composed of twenty grains of sugar of lead, a drachm of laudanum, and sixteen ounces of distilled or rain water may be used slightly warm, and applied by means of linen cloths, with much advantage; or the part may be covered with oil, and wrapped in cotton wool. Painting the erysipelatous surface with collodion, is another remedy in frequent use, and usually gives relief. It is thought by some medical men, that the application to the skin and around the inflamed part of a solution of lunar caustic, will arrest the disease. Either the solid stick of caustic may be used, or a lotion, containing two drachms of the nitrate of silver to an ounce of distilled water. When the scalp is affected with erysipelas, it is always advisable to cut off the hair. Probably the best mode of using lunar caustic

or nitrate of silver is that recommended by the late Mr. Startin. It is a solution in pure nitric ether, of the strength of forty grains to the ounce. It has this great advantage that it spreads easily and evenly on the skin, and dries quickly.

The remedial measures, both local and general, which have now been recommended, should and may, under intelligent unprofessional management, do much to keep this formidable disease in check until the medical man, whose presence *must be necessary*, can be got. Moreover, there ought not to be much doubt as to the nature of the disease, if the distinctions pointed out in the first part of this article are attended to, and further, many attacks of erysipelas are secondary ones, as persons who have once suffered are liable to do so again.

Much confusion of ideas exists on the part of the public with regard to erysipelas, and many affections of the skin are imagined to be this disease, which do not in the least resemble it. It should be remembered that it is an affection which appears suddenly, tends to spread, and is accompanied with fever; that the affected skin is red, hot, tender, and often blistered.

The causes of erysipelas are numerous: cold and atmospheric vicissitudes, and peculiar conditions of the atmosphere, are all apt to excite an attack, and everything which tends to produce debility, predisposes to it.

Wounds and sores often appear to be the first originators of the malady, and in such cases, contagion has much to do with its diffusion through a hospital or a town; even the most trifling scratch being sufficient to become the attraction. For this reason, erysipelas is the most formidable enemy which can gain a footing in a surgical hospital, and for the same reason when the disease occurs in private houses, caution should be observed that persons suffering from wounds do not come into close contact with the affected; and, indeed, in any case, the same precautions should be adopted in erysipelas as in contagious diseases generally. This is doubly requisite in a house in which a confinement is expected, or has recently taken place, for there is an undoubted close connection between erysipelas and fatal child-bed inflammation. The head and neck are the most frequent sites attacked by this disease, but any other portion of the body may be liable to it; the throat not uncommonly suffers, and is a dangerous complication, best treated by the free application of the caustic solution to the tonsils; it ought to be quickly attended to by a medical man, for death sometimes occurs most unexpectedly from suffocation, in consequence of swelling. Hot bran poultices and mustard plasters externally would perhaps relieve the throat in some degree.

When erysipelatous inflammation extends to the tissue beneath the skin, it constitutes what medical men call *phlegmon*; purulent matter forms, and the parts slough or mortify. In such cases it is usual for the surgeon to cut through the skin to give free exit to the matter, and by the proceeding much relief is afforded; this, of course, unprofessional persons cannot do, and poultices and fomentations must be their resource should it happen, which is not likely, since a case which has reached this stage has probably been visited by a medical attendant.

Refer to—*Silver, Nitrate of—Skin, &c.*

ERYTHEMA is a more superficial and evanescent inflammation of the skin than erysipelas. The most familiar instance of it is the inflammation produced by the chafing which occurs in stout children, or adults, between the folds of the skin, and which has a tendency to spread from its point of origin. The application of cloths dipped in tepid water, or in the sugar of lead and laudanum lotion, recommended in erysipelas, will allay the burning sensation. A few grains of grey power should be given at bedtime, followed by castor oil or senna in the morning, and then quinine administered in doses suited to the age of the patient. Rapidly spreading erythema, even in an infant, quickly yields to small doses of quinine. There is a form of erythema, called by medical men *Erythema nodosum*, to which some persons are liable, and which appears chiefly on the legs or arms, in the form of red, flattened, somewhat hard and painful swellings. Rest with the limbs raised, and the use of the warm lead and opium lotion, are the best local means; as the disease frequently occurs in those of florid habit, the diet generally requires to be reduced: a five grain dose of Plummer's pill may be given at bedtime, for three or four nights in succession, and two table-spoonfuls of the soda and magnesia mixture (see *Magnesia*) thrice daily. If the bowels are confined, the colocynth and blue pill will be better than Plummer's for persons of strong habit.

ESCHAR is the portion of "killed" animal tissue which separates from the living body after the application of a caustic or cauterant.

ESCHAROTICS are substances which possess the power of destroying, chemically, the living animal tissues to which they are applied.

Refer to—*Caustic, &c.*

ETHER.—See ÆTHER.

EUCALYPTUS.—The *Eucalyptus globulus*, or Australian blue gum tree, has obtained a great reputation as an antiseptic and oxidising agent, and has been freely planted in malarious districts in different parts of the world on account of its undoubted virtues in checking agueish and other fevers traceable to the soil. The antiseptic properties of eucalyptus are due to an essential oil emanating from the leaves, which is readily soluble in spirit and resin, and is now much employed both for medical and artistic purposes, as in

the preparation of sticking plaster, tooth-powder, toilet vinegar, and for inhalation, &c. Professor Lister sanctions its employment as a substitute for carbolic acid in the gauze dressing for wounds, and as it is entirely free from any poisonous or locally irritant action, and has moreover an agreeable perfume, it is very likely to come into general use.

The oil of eucalyptus is now becoming a most valuable agent in the treatment of various lung diseases, such as chronic bronchitis and consumption. By means of the "inhaler-respirator," the vapour of eucalyptus can be inhaled for hours in the day without fatigue or inconvenience, and with great benefit to the patient.—See *Inhaler.*

EUONYMIN—an oleo-resinous principle prepared from the bark of *Euonymus americanus;* it is proved to possess tonic, laxative, alterative, and expectorant properties, and is used with advantage in biliary disorders. Dose from one to three grains.

EUSTACHIAN TUBE. — The canal which connects the throat with the ear.—See *Ear.*

EXANTHEMATA.—The eruptive febrile diseases, such as scarlet fever, measles, and small pox.

EXCITEMENT—Excitants, or Stimulants.—To excite, to stimulate, is either to originate action where no action previously existed, or to give increased energy to powers already in active operation. Excitants or stimulants, therefore, are agents which are capable of producing such effects, and excitement is the effect produced. Excitants may be artificially divided into—

I. *Ordinary excitants*—the regular unceasing action of which is necessary for the preservation of sound health both of mind and body.

II. *Extraordinary or occasional excitants*, which produce a certain amount of temporary exalted action of mind, or of body, or of both.

III. *Superfluous excitants*, which are generally those comprised in the second division abused.

Under the head of ordinary excitants we have the following:—

A.—Physical Excitants.

1. Heat.
2. Light.
3. Electricity, Magnetism.
4. Atmospheric air.
5. Aliment.
6. Muscular action—Exercise.

B.—Mental Excitants.

1. Occupation of the mind with some definite object.

Under the head of extraordinary excitants we have—

A.—Physical Excitants.

1. Alcoholic excitants.
2. Excitant ingesta generally: tea, coffee, spices, drugs, &c.
3. Atmospheric changes.

B.—Mixed Excitants.

1. Sexual stimuli.
2. Extra exercises: dancing and athletic sports.
3. Travelling, and exciting or novel scenes.

C.—Mental Excitants.

1. Hope, Joy, &c.
2. Love, Anger, &c.
3. Social intercourse.
4. Argument, Politics, &c.
5. Music.
6. Eloquence, written or spoken, exciting literature.
7. Religion.

For the more particular consideration of the above-cited agencies, both as excitants and otherwise, the reader is referred to the various articles in which they are treated of in this work. From these it will be seen that certain *ordinary* physical stimuli, or excitants, are necessary for the sustenance of human health and life, and that equally important for the preservation of vigour, not only of mind, but of body, is the stimulus resulting from the ordinary but regular action and reaction of the mind of man, originating either in daily intercourse with his fellows, or in pursuits which continuously engage the mental powers. And further, that the mental and bodily functions are at intervals acted upon by occasional or extraordinary stimuli, which temporarily occasion their exalted and increased action; not only without actual injury, but with positive benefit. And, lastly, that these extraordinary stimuli are not liable to lose their power of beneficial stimulation, unless exerted in a disorderly and unrestrained manner.

EXCORIATION.—See Abrasion.

EXCRETION.—Anything either superfluous or noxious, separated and thrown out from the living body. Excretions may consist of noxious and superfluous matters which have been introduced into the circulation by the stomach—in the food—or through the lungs, or skin; but the bulk of the excretions consist of waste matters, that is of substances which, having fulfilled their part in the animal economy, cannot be retained in it without danger to health or life, and are therefore cast out by some of the outlets specially provided for the purpose. The urine is perhaps the best specimen of an excretion, and consists of water holding in solution mineral salts, and the used up elementary substances in various combinations. One of these compounds—the urea—is a narcotic poison, and if from disease of the kidneys, or other cause, it is retained in the blood, it acts as such, and kills. The chief constituents of excrement from the bowels are matters excreted by the large bowel, which cannot be retained in the body without danger. The kidneys, the bowels, including the liver, the skin, the lungs, are the excretory outlets of the body; and what has been said of the nature of excretions generally, must render

evident the paramount importance of keeping these outlets in free operation.

Refer to—*Alimentary Canal—Bile—Blood—Lungs—Skin—Urine, &c.*

EXERCISE — SPONTANEOUS MUSCULAR MOVEMENT.—The stimulus imparted to the system generally, and to every one of the vital processes particularly, by the excitant power of muscular movement which every healthy man is compelled or ought to undergo, is a fact generally recognised; it is one of those ordinary excitements the agency of which is linked with our happiness and health, and it may almost be said with our existence. A man engaged in active bodily exercise is undergoing a regular course of excitement; his will is stimulating the nervous system to rouse the muscles to action, and in this process both the rouser and the roused are using up their own substance; the acting muscles are sending the blood more quickly through the capillaries and large vessels, and the heart must move more actively to keep pace with them, and transmit the quickly returned blood loaded with effete matter to be purified in the lungs; to preserve the balance, the respirations are increased, and the stomach is stimulated to crave for nourishing food and unstimulating drink, fitted to keep in repair the ever-wearing structures of man's body, and to supply the fluid waste. Baron Liebig and his successors have done much to give us clear views respecting the changes which take place within the body under the influence of muscular movements; and from them we learn, that in the expenditure of this force, there is a certain metamorphosis in the tissues which require renewal in proportion to the amount of physical exertion and consequent waste.

Exercise, therefore, is in the first place requisite as an ordinary excitant, to be brought into daily operation, that the vigour of all the functions of the body, whether of digestion, or of secretion or excretion, may be preserved; it is the merciful provision by which the decree, that man should earn his bread by the 'sweat of his brow," has been converted into a blessing; it is the great compensating balance which gives the labourer sound sleep and healthy appetite and vigour, instead of the wealth which too often seduces to indolence, and palls every enjoyment of life.

Exercise, again, is requisite as an agent with reference to the food consumed. Food is taken to supply the waste of the body, which must go on more or less as long as man lives; more if actual exercise is taken, and *vice versâ*. Man ought not, therefore, to expect, if neglecting muscular exercise—that is, to use up the substance of his body in exertion—to have the same appetite for and enjoyment of food as if he did; but man does expect this in many instances; he indulges in indolence, and then excites the appetite and stomach by artificial means and tempting food, to take nourishment which is not required, and which *must* consequently produce disorder somewhere. If an individual's employments are of a kind which do not require muscular exertion, his food should be diminished either as regards quality or quantity in due proportion; but even under this regulation, none can be well or vigorous who do not take some amount of exercise in the open air daily.

With regard to extra exercises, such as dancing, and athletic sports generally, which are only engaged in at intervals, it is certain that their beneficial effect upon the functions and health depends quite as much upon the excitement of the mind as upon that of the body; and every one's experience must tell him how much his favourite exercise owes its renovating influence to the mental stimulation which accompanies it.

Refer to—*Blood—Excitement—Food, &c.*

EXFOLIATION is the separation of a scale of dead bone from the living. The term is applied either to the process itself, or to the separated portion of the bone.

EXHALATION applied to the body, means an excretion in a state of vapour, such as that from the lungs and skin. It is calculated that thirty-one ounces of water pass daily from the lungs in a state of vapour and that sixteen ounces of the same fluid is exhaled from the skin in the same time. It is obvious that these excretions cannot be checked without danger. The foolish practice of gilding the entire surface of the bodies of children, who took part in the Roman triumphal procession, was often attended with fatal results.

EXHAUSTION is the diminished or almost extinguished power, either of the body generally, or of one or more of its organs, to continue its natural active operations, until it has been recruited by a period of repose. Exhaustion may arise from two principal causes —failure of the nervous power, and deficiency of organised materials fitted to support the requirements of the living body.

If every thought, every exertion of the will upon the body, occasions the consumption of nervous matter, exhaustion of nervous power must in all probability be due to using up of nervous substance. Sooner or later, according to circumstances, every exertion must come to an end, and repose must be taken, that the exhausted brain and nerves may be recruited, and if man acts wisely, he will, if possible, stop exertion either of mind or body at the first point of exhaustion. It is true that powerful exercise of the will can and does compel exertion beyond the point at which nature says "stop;" but the effort is not made with impunity, and the after exhaustion is proportionally increased. No permanent injury probably arises from those *occasional* exhaustions, either mental or physical, which all have at times to undergo; but no man can habitually go on exhausting his nervous power, whether in the

direct service of the mind, in the labours of the body, or in the less excusable requirements of vicious excess, without suffering eventually. The early paralysis and softened brain of the mental, the premature old age of the physical labourer, the wretched decrepitude of the debauchee, are all the results of continued nervous exhaustion. It is not, however, simply the brain and nervous system which suffer, but the other organs of the body, particularly those of nutrition, suffer also, if the supply of nervous power which ought to sustain their healthy actions is withdrawn to support the exhausting efforts either of mind or muscle. Those, therefore, who can, will do wisely to avoid the cause of these evils, but all cannot do this: in many situations of life continued exertions, which carry the individual to the extreme of exhaustion, become absolutely necessary; it becomes a question, therefore, how the evil effects of the necessity may be most efficiently counteracted. This must be done by the proper management of the nourishment. The stomach in such cases is not receiving its full supply of nervous stimulation, and therefore its work must be made as light as possible, consistent with conveying good nourishment into the system; small quantities of food should be taken at once, and more frequently repeated, rather than anything like a meal made. In the majority of instances, the most efficient nourishment will be strong concentrated animal soup, either alone or mixed with some farinaceous material, and next in utility will be coffee or cocoa, along with bread or biscuit, or with the yolk of egg beaten with them. Of course, if these are unattainable, the next best substitute must be used; but the principle must be to keep the system supported by means of repeated small quantities of food, of as nourishing quality, and in as digestible a form as may be; the use of alcoholic stimulants being avoided as long as possible. At length, if the exhausting agencies are still in operation, a time comes when the stimulation of alcohol is eminently serviceable by virtue of its peculiar action upon the nervous system, when it does that to support the bodily powers which nothing else can; and then the draught of porter, or the dose of wine, or of diluted spirit, comes like an elixir of life to "him who is ready to perish."

Refer to—*Alcohol—Blood—Brain—Food, &c.*

EXPECTORANTS are a class of medicines which increase and alter the secretion from the mucous membrane of the air passages, and afterwards assist in its separation and expulsion. Very many substances are employed with this view; the most useful are—

Acids, which astringe and stimulate.
Ammonia, which stimulates.
Ammoniac, which stimulates.
Antimonials, which relax.
Ipecacuanha, which relaxes.
Squill, which stimulates.
Stramonium, or Thorn Apple.
Tobacco.
Tolu, which stimulates.
Vapour, either simple or medicated.

The use of expectorant medicines by means of vapour, spray, &c., is coming more and more into favour, and will probably greatly supersede the old "cough mixture" under the use of improved instruments.—See *Inhalation—Inhalers.*

In whatever way these medicinal substances exert their action upon the body, the most important practical point is the division into relaxing and stimulant. In the first stages of affection of the bronchi with cough, when there is fever, and probably inflammation present, the relaxing expectorants only should be used, either antimony or ipecacuanha; the former may be given with solution of acetate of ammonia, the latter with carbonate of potash; when there is much debility, ammonia combined with camphor is generally employed, and probably squill added. In chronic cough, with difficult expectoration, the same combination may be used, and when there is a relaxed state of the system, with copious expectoration and tendency to perspiration, the acids, either vegetable or mineral, alone or combined with squill, are most serviceable.

The combination of opium or some other anodyne with expectorants, is both a common and a useful practice; it allays the irritability of the bronchial membrane, and the frequency of the cough, and probably also relaxes spasm; opium, however, tends to check expectoration, and on this account ought in almost every case—in which it is given to allay cough—to be combined with some counteracting expectorant. More mischief is, perhaps, done with squill, than with any other of this class of remedies; its syrup is much given domestically, and generally too early, whereby both irritation and cough are increased. Tolu syrup is a good and pleasant addition to cough mixtures. Many expectorants act also as emetics, and in so doing, especially in children, frequently assist most efficaciously their expectorant action. Tobacco or thorn apple smoked, or watery vapour inhaled, act directly upon the air tubes.

Refer to articles on various expectorant medicines, to—*Catarrh—Cough, &c.*

EXPECTORATION is the term aaplied either to the act of coughing up matters from the lungs, or to the matters so coughed up. These vary greatly in consistence and appearance, and consequently are valuable guides in the investigation of disease affecting the chest; indeed, until the physical examination of the chest by the ear was introduced into practice, the expectorated matters were the most distinctive evidences attainable. Expectoration may be thin and frothy, as it is when the lining membrane of the air tubes is suffering from irritation or inflammation, or thick and almost solid as it becomes in the last stages of a cold;

it may be ropy, as it often is in old people, or viscid in inflammation of the true tissue of the lungs, when it generally becomes of a dull reddish brown or rust colour; it may consist more or less of purulent matter; or be tuberculous and semi-solid as in pulmonary consumption; it may be mixed more or less with blood, or pure blood may be expectorated, or it may be what is called the prune juice expectoration from its colour, as happens in certain cases of pneumonia. Generally, expectoration is inodorous, but sometimes it is abominably fœtid, the odour being mostly but not invariably indicative of mortification of the lung itself: other matters, such as bile, blood, &c., are occasionally coughed up from the stomach.

EXPIRATION is the act of expelling air from the chest after it has been inspired.

EXTRACTS are medicinal preparations made by separating the active portions of various drugs from the inert ones, this being effected by dissolving out the former, either by water, alcohol or ether, and evaporating the superfluous fluid, until a tolerably firm consistent mass of extract is left. Formerly, heat was used in the evaporation; but as this destroys in some measure the activity of the preparation, the best extracts are now all prepared without any heat whatever, and these should always be purchased in preference. The extracts of aloes, of colocynth, of hemlock, of henbane, of chamomile, of gentian, may be used by unprofessional persons. They are usually given in the form of pills, alone, or mixed with other drugs. There are many others, but they are either dangerous, or the medicine is better used in other forms.

EYE.—The organ of vision, not only in man but in the lower animals, is an instrument so wonderful, so replete with beautiful structure and admirable contrivance, that it is always alluded to as one of the most, if not the most splendid instance of the power and beneficence of God, as displayed in His physical creation. Its importance to man as an organ of sense, ought to render the study of its construction and adaptations one of intense interest, and must ever render its perfection and preservation an object of the greatest solicitude. The space which can be spared in a work like the present is too limited to do justice to the subject.

The whole apparatus of vision naturally divides itself into two sections—the globe of the eye and the appendages of the globe. The conical-shaped sockets, or orbits, in which the eye-globes are suspended, have projecting edges, especially superiorly, which protect the organ from injury; the pent-house of the eye-brow slightly shades from the light, and intercepts perspiration, which might trickle down and irritate; the fringed curtains of the lids are ever ready to close over and instinctively to protect their charge, and on their internal surface secrete a lubricating mucus; on their edges, a series of minute glands (fig. 86—2) open, which secrete an unctuous matter. In the upper and outer angle of the socket lies the lachrymal gland, which furnishes the tears, and is always pouring out a watery fluid which is continually passing over and cleansing the exposed surface of the eye, being taken up at its inner angle, at the points 86—5, and conveyed through

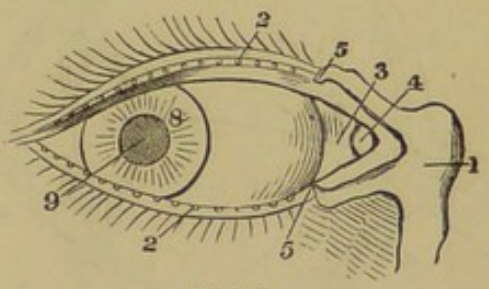


Fig. 86.

the lachrymal duct (1) into the nose, which it also supplies with moisture. Through this duct also, the membrane which lines the nose is continuous with that (the conjunctiva) which covers the fore part of the eye-globe and lines the lids.

In the socket, the eye-globe lies embedded in fat, but is also, as it were, slung in a kind of membrane; it is further both fixed and moved by means of its six muscles (fig. 87—1, 1)

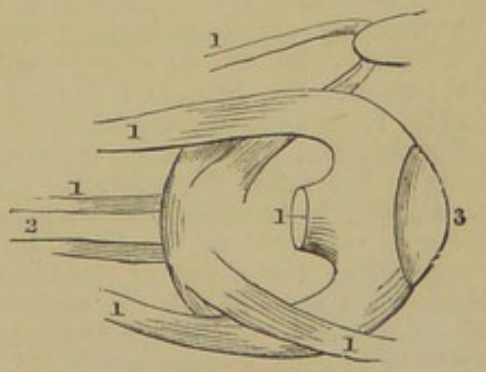


Fig. 87.

four of which pass forwards from the back or apex of the conical cavity to be attached to the globe. The optic nerve (2), and other nerves and blood-vessels, are also contained within the socket, the whole being arranged so as to afford the most facile, but at the same time steady, movement.

The globe of the eye itself is barely an inch in diameter, and measures longest from before backwards. Its outer coat, called the sclerotic, (fig. 88—1), is very firm and is composed of interlaced fibres; anteriorly a portion of it is, as it were, cut out to permit the insertion of the cornea (fig. 87—3; 88—3) or glass of the eye; posteriorly it gives passage to the optic nerve (fig. 87—2; 88—2). Within the outer coat is the choroid coat (fig. 88—4) of a dark chocolate colour, and within that, the retina or nervous coat (5), which forms the sensitive field of vision. The mass of the globe is filled with a remarkably transparent semi-fluid substance,

the vitreous humour, in the fore part of which the crystalline lens (7) is imbedded. In front of this, and partly surrounding it, is the iris (fig. 88—8; 86—8), the circular aperture in

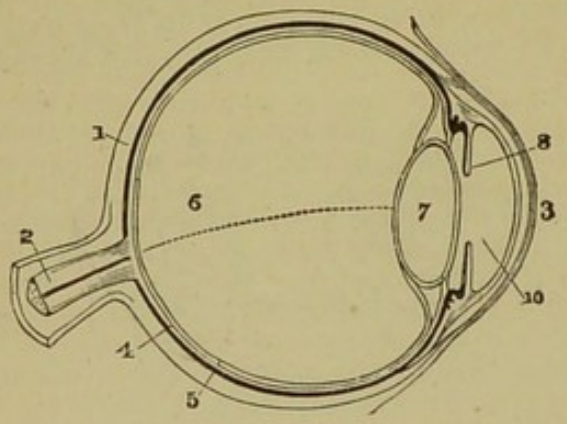


Fig. 88.

which (fig. 86—9) constitutes the pupil. In front of the lens, between it and the cornea, is the chamber of the aqueous humour (fig. 88—10), so called from the watery fluid with which it is filled. It will be remembered, that the entire fore part of the globe, or white of the eye, and the clear cornea, are covered with the conjunctiva, as already mentioned.

To give the sense of vision, the rays of light from surrounding objects penetrate the eye first by the cornea (fig. 88—3), pass through the aqueous humour, the lens, and the vitreous humour (10, 7, 6), and, in doing so, undergo a series of refractions, which bring them at last into focus in the retina (5), where the picture of external objects is formed, and where the impression is conveyed to the brain by the optic nerve (2). The object of the black or choroid coat (4) is to absorb the superfluous rays of light, which would otherwise be reflected within the eye, and confuse vision.

This rapid and necessarily imperfect sketch of the construction and functions of the organ of vision will, it is trusted, assist the unprofessional reader in gaining some rational idea of the dangers and diseases to which so important a portion of his frame is liable. The membrane (or conjunctiva) which covers the inside of the lids and white of the eye is, from its exposed situation, liable to become inflamed from various causes. Minute particles of dust, or other substances, getting into the eye, and becoming fixed in the lining of the upper eyelid, between it and the globe, cause an amount of pain and irritation, which could scarcely be credited from their size, but which is well accounted for by the accurate apposition of the two surfaces between which they lie. A particle so situated, may be discovered without much difficulty, by a second party examining the sufferer with the head thrown back, whilst he slightly everts the upper lid with the thumb and finger; particles may also be removed by drawing the upper lid over the lower, and pressing them together while the upper lid returns to its normal position. The slightest speck of foreign matter must be removed, and no better instrument can be employed for the purpose than a piece of not over-stiff writing paper, twisted like a match. Those who work in metals are apt to get minute scales imbedded in the fore part of the ball; they cause much irritation, and are often so extremely difficult to remove, that a surgeon's assistance is required. The effect of these mechanical irritations is to cause inflammation of the conjunctiva (see description); this, however, may often arise, and frequently does, from cold, from disorder of the digestive organs, &c. The first symptom of inflammation is a sensation as if a particle of some kind had lodged in the eye, and if an examination be made, there will be seen, not only an enlargement of any small blood-vessels that may be generally visible on the white of the eye, but a new development of others, the appearance varying from the slightest apparent increase of vascularity, to the most intensely red inflammation; at the same time there is considerable increase in the mucous secretion—not in the tears, as is often supposed—and in bad cases this becomes purulent or mixed with matter. There is, sometimes, considerable swelling of the surface usually distinguished as the white of the eye. The above is the most superficial form of inflammation to which the eye is subject: if neglected, it may extend itself over the cornea and produce permanent blindness. It is distinguishable from the next form or inflammation of the sclerotic coat, by the size and winding character of the small blood-vessels, and by their being slightly movable, along with the conjunctiva itself, when the lids are drawn down. It is important that these distinctive characters should be attended to in the first place, that no error may be committed between this form and a more serious and deep-seated inflammation of the eye, but also that proper treatment may be used. A great error is committed in treating this form of inflammation by means of warm fomentations, &c., applications tending rather to keep up than to cure the disease, which is generally quickly removed by astringents. A drop of laudanum or of Battley's solution in the eye, repeated two or three times, will often cure the disorder, or a lotion of sulphate of zinc from one to three grains to the ounce of water, will be found efficient; but the best of all is the solution of nitrate of silver, or lunar caustic, of the strength of two grains to the ounce of distilled water. Of this a few drops may be introduced into the inflamed eye, twice or three times in the twenty-four hours. The best plan of introducing drops into the eye, is to draw down the lower lid with the fingers, and turn the eye upwards. The operator then pours the drops into the affected eye from a quill, or from a piece of folded paper of about an inch square, made into a kind of small

trough. The eye, of course, should be exercised as little as possible, and if the bowels are confined, or the stomach disordered, a few doses of the blue pill and colocynth will be found useful. If the disease is obstinate, a blister to the back of the neck may be applied with advantage.

The disease which has just been treated of, is a comparatively mild disorder, but under certain circumstances it becomes much more virulent; the secretion of matter is very great, and acquires the power of propagating the disease by contagion from one person to another. The well-known Egyptian ophthalmia is of this nature, and among other means is carried from individual to individual by the flies, which, according to travellers, seem to have acquired an instinctive tendency to attack the eyes in that country. Newly-born and young infants frequently suffer from a severe form of purulent ophthalmia, which often shows itself within three days after birth. The inflammation is intense, and the matter often accumulates largely between the lids, gushing out when they are separated; in scrofulous children especially the affection is often obstinate. The nitrate of silver solution is the best application, and small doses of quinine the best internal remedy. Syringing between the lids with a solution of alum—four grains to the ounce of water, six or eight times a day, is also recommended; a little vaseline should be used on the edges to prevent them sticking together.

In inflammation of the sclerotic or outer coat of the ball itself, there is more actual pain, it is more deeply seated, the redness seen on the white of the eye is more of a pink hue than in the conjunctival affection, the vessels appear much smaller and straighter, radiate as it were from the cornea, and are not movable: the affection is, moreover, generally a more serious one than the other. The more interior structures of the eye may also become inflamed, and especially the iris; in all these cases of deep inflammation of the eye, the constitution is much affected, there is shivering, followed by thirst, fever, &c.; the pain in the organ itself is often most severe, and extends to the forehead; light cannot be borne. If the iris is the part affected its colour is changed, and often becomes of a dirty brick red; the pupil at the same time is irregular.

In these, and indeed in all affections of so precious an organ as the eye, whenever proper medical treatment is attainable, it should be taken advantage of. If this is impossible, the adoption of the following rules will, in judicious hands, prove beneficial. If the eye be very red, and the vessels large and full, with no pain on exposing the eye to the light and with at the same time some discharge, the use of astringent lotions, such as alum, in the proportion of four grains to an ounce of water, is indicated. If there is little redness, and what there is of it is confined to the portion around the clear part or cornea, with much pain, inability to open the eye, and bear the light, and if the pupil is sluggish, astringent washes will do harm. In such cases the eye must be bound up with belladonna lotion applied to it. In young children, especially of a scrofulous tendency, small ulcers often occur on the eye, which give rise to the symptoms mentioned. The belladonna lotion is best adapted for such, and in addition, an ointment containing two grains of yellow oxide of mercury to a drachm of lard or vaseline, should be applied to the eye at bedtime. Along with the local treatment, cod-liver oil and steel wine should be taken regularly. For information respecting the more chronic affections of the eye, the reader is referred to articles *Amaurosis*, *Cataract*, &c. In some eye affections the lids are apt to become glued together during sleep by the secretion; this is best prevented by smearing the edges with some simple oil or ointment. The edges of the lids, likewise, are apt to become affected with a succession of small pustules, or abscesses, which often continue to form in spite of treatment, depending probably on some disorder of the digestive organs, which should be attended to. The local treatment consists of alum lotion and the application to the edges of the lids, night and morning, of an ointment composed of one part of nitrate of mercury ointment to eleven parts of lard or vaseline.

In some exceptional cases of eye disease, there is needed a continuous application of lotion, fomentation or irrigation of the affected eye; this is best done by a simple apparatus (which may be obtained at the

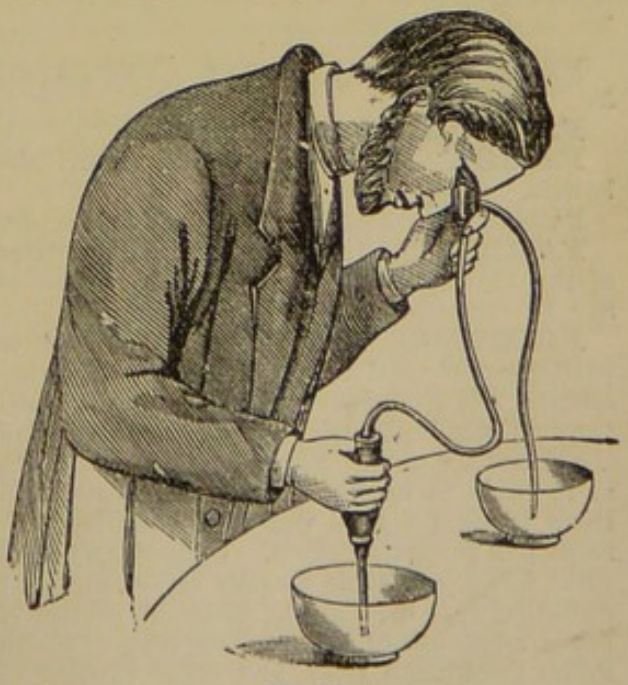


Fig. 89.

instrument-makers) called an *eye-douche*, or fountain, which consists of an india rubber bag with nozzle in connection with an india

rubber tube to which a small rose is attached, and which is represented in action in the illustration from Maw & Son's Catalogue (fig. 89).

The lachrymal sac, or some of its ducts (fig. 86) are apt to become the seat of inflammation, and to be blocked up in consequence; the tears, not escaping by their natural outlet, run over the cheek, causing painful excoriation, and the corresponding nostril is dry. The disorder is not only troublesome to bear, but often to manage, and should be seen by a surgeon.

A stye in the eye, or rather the eye-lid, is a small abscess, and often gives great pain; it is best treated by fomentations.

Blows on the eye frequently give rise to effusion of blood beneath the conjunctiva, which occasions the white of the eye to become of a deep, almost black, red colour, and to present a very alarming appearance. The state of matters may be distinguished from inflammation by the uniformity of the redness, and by the absence of those characteristic symptoms enumerated above. Such effusions, the result of the rupture of a small blood-vessel, are harmless, and disappear without any treatment.

Disorded vision may be the result of causes, such as cataract, &c., which interfere with the transmission of the rays of light, it may also arise from disorder of the digestive organs, and not unfrequently from incipient disease of the brain. Persons who become suddenly and unaccountably affected with disorded vision, should manage themselves as directed in article *Amaurosis*, and get medical advice as speedily as possible.

Refer to—*Amaurosis*—*Cataract*—*Vision*, *&c.*

FACE.—See COUNTENANCE—COMPLEXION, &c.

FACEACHE.—See NEURALGIA.

FÆCES.—The excrement from the bowels.

Refer to—*Alimentary Canal—Digestion, &c.*

FAHRENHEIT.—The German inventor of the thermometer which bears his name.—See *Thermometer.*

FAINTING, or SYNCOPE, is a state of partial, or of total unconsciousness, in consequence of diminished circulation of blood through the brain, the result of depression of the heart's action. Some persons are much more liable to become faint than others, and there is often a good deal of peculiarity with respect to the acting cause. Certain objects of sight will cause some persons to become faint immediately, the most general, probably, being accidents or their consequences, which injure the human body, and cause effusion of blood; certain smells affect others, and cause immediate faintness; even the smell of a rose has been known to have this effect. Affections of the mind, and sudden emotions, debility, habitual or temporary, weakness of the heart itself, loss of blood, or, in fact, whatever depresses the acting power of the central organ of circulation is apt to produce faintness.

A person about to faint becomes affected with ringing in the ears, the sight fails, the ideas are confused, and the mind incapable of exertion, the countenance becomes deadly pale, cold sweat breaks out over the forehead, the power over the limbs either becomes very unsteady or fails altogether, and if actual fainting happens, the individual sinks down, and is really in a condition which much resembles death, and might pass into death.

As said above, the direct cause of fainting is diminished circulation of blood through the brain; it must be obvious, that in the endeavours to restore a person who has fainted, this condition must be altered as quickly as possible; and for this purpose, the individual should be laid quite flat down, the head on a level with the body, so that the feebly acting heart may not have to propel the blood upward, but horizontally. The neck and chest should be exposed, fresh air admitted freely, a little water sprinkled on the face, and stimulant vapours, such as ammonia, held to the nostrils at intervals. Sal volatile or a little spirits or wine and water or from twenty to thirty minims of chloric ether, if the person is capable of swallowing, may be given. The new remedy, nitrite of amyl, is found useful, and being inhaled only, is more easily administered. Friction over the region of the heart with the hand or rough cloth should be vigorously employed with other means, when there is a difficulty in restoring animation.

It must be remembered that the first period of some apoplectic or paralytic seizures is one of faintness; and also, that where the affection is the consequence of loss of blood, its continuance to some extent may be the safety of the patient. In either case the use of stimulants must be a very cautious one.

Refer to—*Apoplexy—Hæmorrhage, &c.*

FAITH in medicine is one of those strong emotions of the mind which, like hope and despondency, exert much influence upon the progress of a case of illness, whether it attaches itself to the medical attendant, or to the system of treatment pursued by him. The history of popular delusions connected with the treatment of diseases, is rich in illustration of how far simple faith in some method of treatment which has acquired reputation will add to the apparent curative powers of that method, in consequence of results which are due to that tendency to cure—*vis medicatrix naturæ*—which has no more powerful assistant than the hopeful and trusting, even if mistaken, mind. It sometimes becomes a nice question in medical ethics how far medical men are justified in using this agent in the treatment of their patients. With the intelligent and unprejudiced, a true faith in curative means,

grounded in clear understanding of the nature of their case, and the requisite treatment, is always to be preferred to a blind and unreasoning trust, however implicitly given; but amid the ignorant, if they will employ a fomentation more assiduously because it has a few chamomile flowers in it, or such like, and if it will ensure their greater faith in the treatment generally, it is a concession to prejudice at least, which ought to be made. Many persons err in placing too great reliance—faith—in mere medicines and drugging alone, to the neglect of the equally important general aids in the treatment of disease, so often alluded to in this work. Such persons are not content, and do not think themselves properly—"actively"—treated if they are not constantly swallowing physic. The error must in a great degree be ascribed, in England at least, to the foolish, absurd, and it may be said, degrading system, which has so long prevailed of making the remuneration for the time and skill of a medical attendant depend upon the price—and that a factitious one—of his drugs. The author cannot refrain from taking advantage of the opening afforded him by the present work to assure the public how gladly the whole body of the medical profession would change the system. Many are endeavouring—and, the author can speak from his own experience, successfully—to do so; but still a large proportion of the payments of medical accounts in England are upon the medicines, and disputes for attendance-charges are constantly being made. The man who will insist upon basing his medical attendant's just remuneration upon draughts and mixtures, must probably, in many cases, be content to swallow sufficient to remunerate. This system, in addition to other evils, has engendered a faith in mere drugging as necessary for the cure of disease, to the exclusion—and this is the main evil—of other essential aids. The public are in many places becoming alive to the absurdity of the old system, and medical men might by an effort overturn it entirely, and by so doing place both themselves and patients in a better and juster position.

Refer to—*Advice, Medical, &c.*

FALLING SICKNESS, or EPILEPSY.—See EPILEPSY.

FAMINE.—See STARVATION.

FARCY.—See GLANDERS.

FARINA—derived from "far," corn—means literally the meal or flour formed from grain, when ground, and consists, therefore, of starch, gluten, &c.; the word, however, is sometimes applied to the farinaceous matter contained in other vegetable products, such as the potato, when it consists almost entirely of starch or fecula; also in beans, peas, &c. The farinaceous matters, or particles, are contained in a network of cells.—See *Fecula.*

FARINACEA.—Articles of food generally which contain farina.

FARINACEOUS FOOD comprises such articles of diet as are prepared from one or other of the cereals or tuberous roots, in a way to render them easy of digestion. Articles of this kind are now so numerous, and appear every day with such rapidity, that a bare enumeration, even, would be impossible. One of the most celebrated and best known, is "Liebig's food," which contains all the elements of a nutritious food for infants or for invalids, when mixed and taken according to directions.

Brown & Polson's patent corn flour, prepared from maize or Indian corn, forms an excellent and firm jelly. It may also be used boiled with milk as a diet for children, and it is a useful article in the cookery of the sick-room, for thickening beef tea, soups, &c.

Another superior corn flour is that known as Maizena, which received a prize medal, and was favourably spoken of by the judges at the International Exhibition. Semola, pearl semoule, cerealina, embden groats, patent groats, and patent foods of all kinds, have their advocates, and it must be remembered that one which will agree with some children, will cause purging, griping, and acidity, with others, so that we are often forced to try several, before we find out which agrees best with the delicate stomach of an infant. Sago, arrow-root, and tapioca are familiar to every one, and may be looked upon as the types of a large class of dried farinaceous foods which are imported into this country, but their use has been in some measure, at all events, supplanted by several of the preparations above noticed. All these kinds of food consist more or less entirely of starch; they have very little, if any, flavour of their own, requiring to be seasoned by condiments, and have a very low nutritive value, unless they are cooked with milk. They absorb a considerable quantity of water. By this means they increase greatly in bulk, and may be used either as puddings and jellies, or as drinks resembling gruel.

Dr. Edward Smith, in his *Practical Dietary*, highly recommends maize as a cheap farinaceous food for the poor. The great objection to its use is its rough taste, so that it is never a favourite article of diet with those who have been accustomed to wheaten flour. Since the potato famine in Ireland, it has been of the greatest service to the poor of that country. Dr. Smith says:—"When the 'col' or head of maize is yet young and the grain soft, it is commonly gathered whole, and boiled in milk, &c., is a delicious food; but when ripe, the grain must be ground before it is cooked. In the western parts of America, the grain is freshly ground in a handmill and mixed with water and a little salt, and sometimes a little soda is added; and when paste is made it is spread into a little cake, about one inch in thickness, and baked before or over the fire. When milk and eggs are allowable, they may be added, with great advantage to the flavour of the bread. In

Ireland, it is generally made like the Scotch porridge, by scalding it and stirring it into boiling water, until a hasty pudding is prepared, when it is poured out and eaten with a little sugar or treacle, if obtainable, and with milk. This is called stirabout, and has a rough and not agreeable flavour. When prepared in a peculiar manner, as in the Oswego corn flour, it offers excellent and agreeable farinaceous material for puddings, but so prepared its cost is much enhanced.

"The nutritive qualities of maize are very considerable, since it offers more carbon and nitrogen than is found in an equal weight of wheaten flour, viz., 2800 grains of carbon and 121 grains of nitrogen in each pound, besides a considerable quantity of free hydrogen, which is found in the fat, a substance in which the grain is somewhat rich. In point of economy it exceeds all other grains, since it is sold at a penny per pound, and offers the above large quantities of nutriment for that sum. It is, however, highly probable that it is not fully digested when taken in large quantities, for the amount which leaves the bodies of those using it daily is very considerable, much more than would be found with a bread dietary."

If at any future time food threatens to become expensive, it is not unlikely that maize, or Indian corn meal, may be more generally used in this country. We therefore give Dr. Smith's practical instructions to the poor, as to the best methods of preparing it.

"When you can buy it, you will find it a stronger and cheaper food than flour. Make into:—

"1*st.*—Hasty pudding, by sprinkling it into boiling water, and boiling it for a short time. Eat it with milk, sugar, treacle, or butter.

"2*nd.*—Cakes, by stirring it well in hot water or skim milk, and then baking it in the frying pan or dutch oven, or upon the hot hearth; or spread upon a board, and lay near to the fire. Eat them hot, with milk, butter, or treacle.

"3*rd.*—Puddings with milk, fat, or spice."

Among the many varieties of "farinaceous food," there are few which do not consist of flour highly baked, or subjected to some heating process. Sometimes a little lentil, or pea flour is added, or a little potato flour, or arrow-root.

Refer to—*Cookery for the Sick—Food—Gluten—Grains, &c.*

FASTING.—The remaining without food for a longer period than usual may *sometimes* be a useful proceeding, as a kind of negative remedy, for those who have been living too freely; but even then abstemiousness, that is, the partaking of a reduced quantity of very plain food, is better than complete denial of aliment. Fasting, as a term, is more properly applicable to a condition in which the desire for food exists. When the appetite fails, as it does in disease, and its failure is a natural indication that the system is not in a fit condition to receive nourishment, it can scarcely be said that a person fasts. The power of fasting depends greatly upon habit, constitution, climate, and other contingent circumstances. It has been, and still is, the custom of many nations to take but one meal in the twenty-four hours, but if into that meal must be crowded the entire nutriment required for the body during that space of time, it is needless to remark that for some time after, the individual can be fit for little beyond digesting his food, and that such a division of duties would but ill suit the arrangements of civilised life, even if it could be followed without serious detriment to health. As a general rule, it may be said that it requires more than an average of constitutional vigour to enable an individual in this country and climate to do with but two meals a day, that is, to fast twelve hours at a time.

The consequence of too long fasting is physical exhaustion of the body generally, in which the stomach, of course, is involved; consequently, when a person has gone longer than usual without food, especially if undergoing fatigue at the same time, although the system at large requires nourishment, the stomach is so weakened, that it cannot digest a full meal. The inability to fast with impunity is increased the more rapid the changes going on in the system; thus, children and young people tolerate fasting worse than others; and for the same reason, physical exercise or fatigue, which quickens all the usual functions within the body, also renders undue fasting less easily borne, and more injurious. External circumstances, again, such as shelter, clothing, climate, all exert much influence as regards the toleration of fasting. It has been shown in more than one article in this work, that a certain proportion of the nutriment taken, is required as fuel, that is, as a chemical agent, to assist in sustaining the bodily temperature, and it is evident that the less abstraction there is of animal heat,—in other words, the better either man or animals are protected from the cold,—the less occasion have they for food within a certain limit; and as a necessary inference, fasting may be practised with less injury in a warm than in a cold climate, and such is found to be the case among civilised people. Barbarians, or uncivilised tribes, such as the Esquimaux, who feed to a repletion which would kill other persons—and thus lay in a store of nutriment—are of course exceptional. Perhaps the best instances of the power—not exactly of fasting, but of extreme abstinence, is in the runners of Northern Africa, who are said to travel immense distances and at a very rapid rate, with only the sustenance of a limited portion of gum during the journey. The Arab horses, too, have often excited the wonder of travellers from their powers of endurance on extremely small supplies of nourishment, when

compared, at least, with what is required by the same animal in this country. Hereditary constitution and habit, however, undoubtedly assist the influence of climate.

As a general rule, it may be taken that entire abstinence from food by persons in health in this country for more than six or eight hours, must, if habitual, be injurious, and the more so the younger and more delicate the constitution. Very many cases of stomach disease date from the practice.

The marvellous cases of long fasting, which have from time to time been brought before the public, have turned out, on strict investigation, to be impositions, although they have served to exemplify the power of sustaining life on extremely small quantities of nutriment. The power of fasting, without injury, seems to be considerably increased in cases of insanity, and if it is so in one form of nervous excitement, it may be so in other excited conditions of mind.

The subject of fasting has been treated in this article in an every-day life point of view, as it applies to society generally, more especially at the present day in this country, and without any reference to Scriptural history, or to those miraculous powers which are recorded, either in the case of our Lord Himself, or of holy men of old, when for His good purposes they were imparted; the remarks *are* made to impress the fact that absolute fasting is injurious to the majority, the more so if habitual, and may lay the foundation of disease.

The apparently well-authenticated case of Dr. Tanner of New York, who fasted experimentally for a period of forty days, is quite exceptional, and shows the extraordinary power of water alone in sustaining the vital powers for a prolonged period. In drawing inferences from this case it ought to be kept in view, that the experimentalist had neither the tension of mind nor the sufferings which a person deprived entirely of food by shipwreck or accident would have to endure, for there can be little doubt that the knowledge, that at any moment hunger might be appeased, had a powerful effect in enabling Dr. Tanner to accomplish his quixotic enterprise.

Refer to—*Animal Heat—Blood—Digestion—Food, &c.*

FAT is universally consumed, and among the hydrocarbons used for food it forms the most important heat and force-producing, its power in this respect being two and a half times greater than the carbohydrates, represented by starch and sugar. The properties of oils and fats are due to a fatty acid, and to glycerine. They are in their various combinations in food readily separated in the process of digestion, and absorbed into the circulation, after being reduced to a milky emulsion by the action of the pancreatic juice. They afterwards perform most important offices in the animal economy, in the building up of certain tissues, but mostly in maintaining the animal heat. Under the name of adipose tissue, fat is deposited in greater or less amount beneath the skin, and in and about the internal organs, where it is stored up when wanted for the purposes of the animal economy. It gives roundness to the form, equalises pressure, retains internal warmth, and renders the tissues supple and elastic; but its accumulation may become so great as to amount to disease, and to produce an impediment to the performance of the duties of life, as well as a cause of its shortened duration. The following remarks from the high authority of Dr. Chambers ought to be universally diffused. After adverting to a species of "monstrous" obesity, or fatness, which dates from birth, and is generally associated with intellectual deficiency, and fortunately proves fatal before the age of puberty, he remarks:—"When the disease"—that is, obesity—"begins in childhood, or about the time of puberty, we must not be deterred by the circumstance of its being hereditary from attempting to remedy the inconvenience arising from it. We cannot truly reduce our patients entirely to the average size and weight; but we may enable them to pass life with comfort and usefulness. The later the disease commences, the more controllable it is by management, until the middle period of life is passed, and then old age impedes in some degree the benefit which we may confer; not by rendering our measures inert, but by preventing our employing them quite so actively as we should have done earlier.

"The first thing indicated, in all cases, is to cut off as far as possible the supply of material. Fat, oil, butter, should be rigorously interdicted in the diet table. But all eatables contain some portion of oleaginous matter, and especially those most convenient to advise the use of for a lengthened period; and almost all are capable of a transformation into fat, when a small quantity of this substance is previously present. It is desirable, therefore, that the mass of food should lie in the stomach as short a time as possible, in order that at least a fatty fermentation may not be set up in it. Very light meals should be taken at times most favourable to rapid digestion, and should consist of substances easy of solution and assimilation. To this end, the time of the meals should be fixed for an early hour in the day, before exertion has rendered the power of the organs of nutrition languid and weak. Breakfast should consist of dry toast, or what is still better, sea biscuit; and, if much active exercise is intended, a small piece of lean meat. Dinner at one, on meat with the fat cut off, stale bread or biscuit, and some plain boiled maccaroni, or biscuit pudding, by way of second course. Liquids should be taken, not at the meal, but half an hour after, so as not to im-

pede the action of the gastric juice upon the mass. Here should end the solid feeding for the day; no second dinner or supper should follow, nor, indeed, any more meals be taken sitting down. A piece of biscuit and a glass of water can be taken standing up, if faintness is experienced; a cup of gruel, or a roast apple, before going to bed.

"The smallest amount of nutriment consistent with the health of the individual can be found by experiment only; but we need not fear that ten ounces of solid food a day is too little. It may be remarked, by the way, that it is often advisable to add a small allowance of malt liquor at dinner, as otherwise the craving of the appetite is less easily appeased. The beers to be avoided are of course the thick sweet kinds; but that which is thoroughly fermented, at a low temperature in the Bavarian way, seems to contain very little injurious matter. I do not know that any advice concerning sleep is peculiarly applicable to obese persons, beyond what we should recommend to all classes of men. They are usually uneasy sleepers, and though lethargic, by no means averse to early rising.

"In cases where the fat is largely accumulated in the abdomen, it is very convenient for the patient to wear a band round the cavity, which may be tightened gradually. The support thus given to the abdominal muscles relieves the dragging sensations in the loins which many persons, whose viscera are heavy in proportion to their strength, experience. It enables exercise to be taken with more facility, and appears also, by pressure, to afford some assistance to the absorption of fat. The above remarks will apply equally to all forms of obesity; the abstinence recommended can be borne even by the aged, and only comfort be experienced.

"As respects exercise, however, a distinction requires to be made. The young and vigorous, whose obesity does not prevent the use of their legs, cannot employ them more usefully than in walking as long as they are able. The greater number of hours per day that can be devoted to this exercise, the quicker will be the diminution of bulk. But as riding, by the gentle shaking of the abdomen excites the secretions of the digestive organs more, it should, when practicable, be employed in addition. Where freedom of motion has once been gained, rowing, shooting—any, or all, of the forms of British gymnastics, should be adopted as regular habits. . . . .

"Purgatives, I have generally found not needed in the plethoric form; the bowels usually act once or twice in the day. But in the asthenic obesity of *old people*, where the abdominal walls are weakened by long pressure of an unnatural weight, it is necessary to employ them.

"But there is one class of medicine so universally applicable to *all* cases of obesity that I think a trial should never be omitted. The chemical affinity of alkalies for fat, points them out as appropriate alteratives in this complaint, and experience proves that they are suitable to the state of the digestive organs. The most eligible one is liquor potassæ, and it may be administered in much larger quantities than any other. If given in milk and water we may safely commence with half a drachm, and raise the dose to a drachm and a drachm and a half, three times a day. The milk covers the taste of the potash better than any other vehicle. It has, truly, the advantage of saponifying a portion of the remedy, but there is no evidence to prove that its efficacy is thereby endangered; indeed, soap itself has been strongly recommended."

Vinegar, which is sometimes foolishly taken largely, with a view to reduce fat, can only do so by disordering the digestive organs.

Food of a fatty nature is generally difficult of digestion, and persons suffering from consumption have usually a dislike to it. As a remedy in the cure of disease, the fats of various animals, deer, vipers, &c., were formerly used in medicine. These have all given place to the oil expressed from the liver of the cod. In some cases of irritability or low inflammation of the lining membrane of the stomach, fatty food seems to be serviceable.

Refer to—*Axunge—Bacon—Digestion—Food—Banting system.*

FATUITY.—Mental imbecility.

FAUCES,—The Gorge.—The space and its sides between the back part of the tongue and upper part of the gullet.

FAVUS—a peculiar skin disease, generally developed on the head, but occasionally elsewhere, and remarkable from the yellow cupped scabs being the site of development of a minute fungus.

FEAR, the exact opposite of faith, is one of those depressing agents which always act unfavourably in cases of confirmed disease, and lay the person open to the attacks especially of contagious or epidemic maladies. Sudden fear has sometimes acted beneficially, and paralytics have been known to recover the use of their limbs in their efforts under a paroxysm of terror; more generally, however, its operation is the reverse, and many cases of epilepsy, mania, heart disease, &c., date from fright. In children, particularly of a nervous temperament, the influence of fear, either in jest or earnest, is most sedulously to be avoided. Above all things, care should be taken, that circumstances in which children may be placed accidentally, or individuals with whom they may necessarily have to come in contact, are not made sources of terror. This is too often practised, and threats of what the "doctor will do," so terrify a child, that when visited in illness, fright quickens the pulse, the tongue will not be shown, and the sounds of the chest are so obscured by sobs, that it is next to impossible

to arrive at an accurate judgment of the case. Further, if a child has been systematically frightened about the dark, &c., it may, if accidentally placed in it, suffer serious injury from fright.

FEBRICULA—a slight fever.

FEBRIFUGE. — Any medicinal agent which has the power of subduing fever; but the only true febrifuge is cinchona bark and its alkaloids. The term was much more used in former times than it is now.

FECULA, or STARCH, is a principle universally diffused throughout the vegetable kingdom, nearly approaching gum in composition; it is found in various parts of plants, where it is evidently destined to be a store of nutriment for their young or newly-developed parts; thus, in seeds it nourishes the young plant; in tubers, such as the potato, the bud shoots; in the sago palm, the young leaves. Before, however, it can afford suitable nourishment, it must be converted into sugar, and this is done by the influence of *Diastase*, a substance already treated of. It need scarcely be said that whilst starch fulfils its peculiar office as regards the vegetable, it is a no less important provision for animal wants; it is, in short one of the chief elements of nourishment derived from the vegetable kingdom for the support of animal life. Amid other examples, arrow-root is nearly pure starch. Starch occurs in the form of granules, which vary considerably in size and shape, according to the tribe of plants from which they are obtained; of this fig. 90, *a*, *b*, *c*, *d*, are instances; these represent respectively the starch granules of West India arrow-root, East India arrow-root, Tahiti arrow-root, and potato arrow-root, as seen magnified by a microscope. These granules are composed, as represented, of concentric layers, the outer of which, when exposed to a temperature of 160° in water, burst, and allow the inner layers to be dissolved, consequently starch of any kind, after exposure to the above heat, can never be restored to its original condition. It is scarcely requisite to remark, that starch is insoluble in cold water, differing in this respect from gum.

The composition of starch is simple, that is to say, it is made up of carbon and water, or of equal parts of carbon and the components of water, oxygen and hydrogen, but it contains no nitrogen, no earthy matter. From this it is evident that the nourishing power of starch, and of starchy articles of food generally, is limited, that is to say, they cannot yield what they do not possess, nitrogen and earthy salts; but as these are requisite for the full nourishment of every portion of the frame, starchy food, either alone or in too great preponderance, cannot sufficiently nourish the body, particularly during the period of growth. This will bear out remarks made under articles *Arrow-root*, *Bread*, *&c.*, which show that animals may be starved to death if fed on starch alone, or articles principally composed of starch, and that through ignorance of these facts, infants and children have been seriously injured by the improper regulation of their food. But though



Fig 90.

starch, and such-like compounds, *e. g.*, sugar, gum, &c., cannot build up bone and muscle, they can protect them, they can furnish respiratory aliment, or fuel, and also, when not thus required, assist largely in the formation of fat.

Refer to—*Food*—*Blood*—*Digestion*, *&c.*

FEMORAL ARTERY.—The great artery of the thigh.—See *Artery.*

FEMUR.—The thigh-bone.—See *Thigh-bone.*

FERMENTATION is a process of decomposition, or of change, in the relations of the various elements of fermentable bodies. For the action of this process of decomposition or of fermentation, it is indispensable that certain "azotised" substances, named ferments, should be present. The substances all belong to the albuminous principles; bodies which in a *moist* condition putrefy and decompose spontaneously. Thus, a solution of pure sugar will not ferment, however long it may be kept; but if a decomposing—putrefying—azotised ferment, either animal matter or vegetable albumen, or gluten, or yeast, be added to the solution, the change quickly commences, and goes on until fermentation is complete. Vegetable juices, such as that of the grape and others, and even a solution of brown sugar, take on the process of fermentation spontaneously, because they contain sufficient azotised principles—approaching the putrescible albuminous animal matter in composition—to act as ferments. Milk also takes on a spontaneous process of fermentation for the same reason, but it is not the alcoholic; no gas is evoked, and instead of spirit, a peculiar acid, the

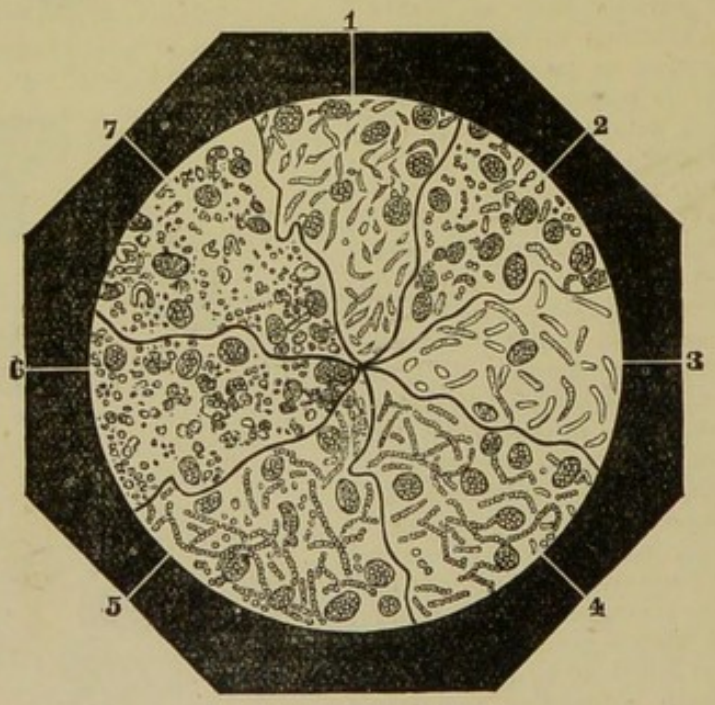


Fig. 91. (After Pasteur.)

1. Turned beer—filaments simple or acidulated into chains of different size; diameter $\frac{1}{11000}$ inch.
2. Lactic ferments of beer and wort—small, fine, and contracted in the middle; diameter a little greater than No. 1.
3. Ferments of putrid wort and beer—mobile filaments generally, which appear at the commencement of fermentation when it is slow; invariably the result of defective working.
4. Ferments of *viscous* wort and ropy beer, rare.
5. Pungent sour beer with acetic odour—chaplets of *Mycoderma aceti.*
6. A wort deposit.
7. Beer of a peculiar acidity—having a detestable taste and smell, generally found with No. 1, but more to be feared than No. 1.

"lactic" is generated. Temperature, moreover, exerts much influence upon the process of fermentation, and some juices yield either alcohol or lactic acid according to whether the process is carried on under a low or high temperature. The acetous fermentation or that which results in the production of acetic acid, or vinegar, is carried on in a temperature of from 70° to 85° Fahr., and of course likewise requires the presence of a ferment. A certain amount of moisture and elevation of temperature is essential to the process of fermentation; dryness and cold alike stop the action.

"The identity in composition of the chief constituents of blood, and of the nitrogenised constituents of vegetable food, has certainly furnished, in an unexpected manner, an explanation of the fact, that putrefying blood, white of egg, flesh, and cheese, produce the same effect in a solution of sugar as yeast or ferment."

The explanation is simply this, that ferment or yeast is nothing but a vegetable principle, resembling these animal ones, in a state of decomposition. As it is that modification of sugar only, named grape sugar, which is capable of being converted into alcohol, all fermentable substances, whether containing cane sugar, or starch, must be, and are, as the first step of the process, converted into grape sugar. Antiseptics stop the process of fermentation.

"The maturation, as it is called, or sweetening of winter fruits, when stored up for their preservation in straw, is the result of a true fermentation. Unripe apples or pears contain a considerable amount of starch, which becomes converted into sugar by the nitrogenous constituent of the juice passing into a state of decomposition, and transmitting its own mutations to the particles of starch in contact with it."

The researches of chemists and physiologists in connexion with the phenomena of fermentation, have thrown much new light on the subject, especially as regards its bearing on the origin and communicability of what is now termed zymotic disease. Pasteur, the eminent French chemist, has clearly shown that correlative with the chemical changes noted above, there always occurs in the process of fermentation a continuous production and reproduction of minute organisms, which begin life and terminate it with the process. Also, that the varieties of ferments are numerous, and that each ferment possesses its own peculiarities and characters, sometimes aiding, often checking, and frequently proving detrimental to the processes when combined. Of the causes giving rise to alcoholic fermentation, the growth of the yeast plant is the best example; the wine ferment, and that occasioned in the expressed juice of fruit, although they partake much in common with yeast, differ from it materially in the size and shape of the cell globules. When fluids become sour and stale, the changes in their composition are due to the action of some particular ferment. The illustration from Pasteur (fig. 91) represents several stages in the growth of the globules and bacteric filaments, which are to be found in sour beer.

The lactic acid fermentation, which takes place in milk when it becomes sour, is traced to the presence of a small oval-shaped bacterium. The butyric acid ferment and the numerous changes allied with the decomposition of urea and other animal substances, owe their existence to living cells derived evidently from the lowest forms of plant life. In fact, all substances liable to putrefy acquire the property of fermentation, and become capable of originating the process afresh in any organic matter of a like character brought within their sphere.

Refer to—*Alcohol*—*Antiseptic*—*Vinegar*—*Germs of Disease*—*Yeast*, *&c.*

FERMENTED LIQUORS—that is, beverages which have undergone the process of alcoholic fermentation—may almost be considered a natural product of warm climates, from the readiness with which vegetable juices take on the process in these situations. The pure juice of the grape, if left to itself in a suitable temperature, will ferment in a few hours, and the palm-juice of Africa and other tropical countries, and the "pulque" of Mexico, are instances of the same thing. Ancient records, including those of Scripture, all tend to show that fermented liquors have been known and used from the earliest periods. In the present day, the principal fermented liquors in use are—1. Grape wines; 2. Domestic or home-made wines, which are for the most part rendered fermentable by the addition of sugar; 3. Liquors made from the fermented juice of the apple or pear; 4. Malt liquors from various grains, principally barley. For further information the reader is referred to the individual articles on the above subjects, also to *Drinks*, *Food*, *&c.*

FERN, or MALE FERN—or, as it is called in botanical language, the *Aspidium filix mas.*—is a common native plant, noted principally as a remedy in tape worm, but until lately too much neglected. It is one of the best vermifuges we possess. The male fern (fig. 92) grows chiefly on strong ground, in



Fig 92.

slightly-shaded situations; no description could guide an unprofessional and unbotanical person to gather it with certainty if it cannot be recognised from the illustration, but, perhaps the safest plan for any one wishing to use it, would be to have the plant either collected for him, or to have its distinctive characters pointed out by some competent person. Dr. Christison gives the following directions:—"The root, which is the part of the plant used, should be collected between the end of May and the middle of September. It should be cleared of foreign matters, root fibres, and old or decayed tufts, but without being washed. It should then be dried quickly and thoroughly in the open air without heat, and in the shade; these tufts, as well as the parts of the root-stock, which are greenish internally, should alone be detached, and immediately reduced to powder; and the powder must be kept in well-closed bottles." It should not be trusted to when above one year old. The usual dose of the powdered root, is from one to three drachms; but the oil extracted by means of ether is the best preparation, the dose eighteen

grains given at night, either in pill, emulsion, or mixed with castor oil, and repeated again in the morning. It is better to avoid much food just before taking the dose of either powder or oil, or during their operation, and it is always requisite to follow the last dose taken with some aperient—castor oil is perhaps the best—two or three hours afterwards. The worms are discharged dead. A good way of employing the remedy is to take one drachm of the oil, ten grains of tragacanth powder and half an ounce of water, to which add an ounce and a half of new milk. The patient should be a day without food before taking the medicine, which ought to be taken in the morning, the bowels having been previously relieved by a table-spoonful of castor oil. If the draught does not purge in twelve hours, another dose of the oil should be given.

Refer to—*Kousso—Worms, &c.*

FERRUGINOUS—connected with iron.

FETOR is a bad odour of any kind. In many cases it is the result of the process of putrefactive decomposition or fermentation, and may be developed either on the external or in the internal parts of the body. The use of chlorine, charcoal, carbolic acid and other deodorants, in various ways, is the best corrective. The mercurial fetor is a peculiar odour, always acquired by the breath when the constitution is sensibly affected with mercury.

Refer to—*Chlorine—Mercury, &c.*

FEVER is that condition of the body in which the pulse is quickened, the skin hotter than natural, thirst present, and the functions generally disordered. This feverish state of the system may arise from, and be the concomitant of, various local and other affections, but it may also constitute a disease in itself, and it is in this light that the present article applies.

FEVERS constitute a large class or classes of diseases which owe their origin to a specific virus, the nature of which science has not yet been able to elucidate, and which may exist in the air, or in water, or in the clothes we wear; and when it enters the body it finds there a genial soil on which it may not only live, but fructify. The poison thus introduced lies dormant for a time, during which it is said to be germinating or incubating, and after an interval certain constitutional changes take place, not affecting any special organ like the heart, brain, or lungs; but, in the first instance, manifesting themselves in the blood, by an increase of the pulse and heightened temperature. This condition, constituting the first stage of fever, does not determine what the issue may be, but after another interval, varying from three, four, seven, or eight days, and even longer, certain symptoms supervene, of such a definite type that a medical man is able to pronounce what the nature of the fever may be. The best marked forms of fever, may be divided into those attended with a rash, technically called *exanthems*, continued, and periodic fevers. The first comprise small-pox, measles, and scarlet fever, to which might be added typhus and typhoid fevers, as they are each attended with a rash, though usually placed in the category of continued fevers. The remaining fevers most usually met with are febricula, relapsing, yellow, remittent, and intermittent fever or ague. The spotted fevers, and some of the others, are specially commented on under their respective headings, and the following article will mainly refer to such fevers as are not separately noticed.

Fever, Typhus.—The history of typhus is a melancholy record of famine, dirt, and overcrowding. We come across its path in old writings, where it appears under a variety of pseudonyms, connected with a kind of spontaneous origin, such as *Jail fever*, in cases where prisoners were too closely packed together; *Hospital fever*, when it invaded the wards of ill-ventilated and crowded asylums for the sick; *Camp fever*, when it broke out among the wounded in war times; and *Ship fever*, when it occurred in emigrant vessels or slave ships on long voyages. It has followed the track of invading and retreating armies, as every nation in Europe has known to its cost, and in the middle of the last century it did not scruple in London to invade the courts of justice; the name of the "black assizes" becoming historical in the city annals from the fact of the Lord Mayor, two of the judges, and other eminent personages having fallen victims to the pestilence which they had contracted from the prisoners. During the present century, many wide-spread epidemics of typhus have occurred in the United Kingdom, especially in Ireland, conterminous with periods of mercantile depression, high prices, and great scarcity of food; and the disease being extremely contagious, it has spread rapidly among the poor, as well as amongst those who had relations with them, especially among medical men, catholic priests, and nurses.

Typhus fever sets in eight or ten days after exposure to the contagion, with intense headache, languor, and weariness, gradually passing into confusion and stupidity. It reaches its height in about fourteen days from the commencement of the symptoms, and in favourable cases a week after this or about the twenty-first day, the person as a rule is comparatively well. When the complaint is severe, delirium, coma, and utter prostration, come on, followed often by death between the twelfth and the twentieth day. Then the eruption by which typhus is distinguished from other fevers and which is said to be present in 90 cases in 100, appears often as early as the third day on the arms, on the chest, or on the abdomen, lasting generally for a week or more, as small dark red or purple spots like flea-bites, disseminated over the skin, and persisting when pressure is applied over them. The rash is attended, as in most

cases of spotted fever, with a pulse ranging from 100 beats to 150 in a minute, and with a body temperature ranging from 102° to 107° Fahr., combined with a brown furred tongue, red at the tip and edges, and with hurried respiration. These symptoms are usually well marked from the first onset of the disease, and show little inclination to diminish till the turn of the fever, the highest temperatures being most marked in such cases as are attended with a fatal termination. Suppression of urine is not an uncommon symptom of typhus, and may account for the delirium and great nervous prostration; when the suppression is complete the disease is always fatal.

Treatment.—Medical men are now pretty well agreed that the main object in treating fever is to ward off death, by sustaining life with food, and, if necessary, with stimulants, until the force of the fever has expended itself. With a quick pulse and high temperature, the oxidation of the tissues proceeds at a much quicker pace than in health, and it has been ingeniously calculated that a person lying in bed in a state of high fever loses as much force, in the course of twenty-four hours, by the chemical changes taking place in his blood, as would enable a person in health to walk fifty miles in the same time with one cwt. of coals on his back. It is thus essential that the waste of tissue should be combated as far as possible; that the vital force should be restrained and husbanded, and this is best done by nourishment in a concentrated form, beef tea, milk, and stimulants; for stimulants in fever act as tonics, as well as food. It is often said with considerable justice, that the successful treatment of a patient suffering from fever depends as much on the nurse as upon the doctor, because the nurse has the feeding of the patient very much in her own hands. It is well, then, that unprofessional persons should fully understand the importance of this mode of treatment, and that when typhus fever is fully established,—say, from the third to the fourth day,—nourishment should be administered every three or four hours, and should be continued throughout the course of the disease. Beef tea, mutton broth, meat juice, arrow-root, milk and light puddings, are the mainstays; while wine and spirits, though not usually required in the first week of the disease, may be necessary in the second, and if given at all, should be continued till the crisis is past. A large well-ventilated apartment is the best for a person suffering from typhus, as that implies greater safety to the attendants, as well as health and vigour to the sufferer. If a sufficient amount of fresh air can be had, less apprehension need be entertained of infection, for the contagion of typhus, like the effect of a strong drug, loses its virulence by dilution, and those are comparatively safe who remain at a considerable distance from the bedside of the patient. Although the zone of contagion may be thus limited, it is well that those who must be in close relation to typhus patients should avoid catching their breath, as it is mainly from the lungs that the disease is propagated. Quiet, fresh air, a free supply of iced water, milk, and beef tea are the best helpmates in typhus; but the patient requires to be well watched, and the pulse and temperature taken frequently, so as to assist in the administration of food and stimulants, and stimulants when ordered must not be taken at a gulp, but at regular intervals. The headache in typhus is often distressing, and must be treated with cold applications to the forehead—icebags are the best; it may even be necessary to apply a few leeches to the temples, but the patient requires all his strength to enable him to surmount the malady.

Fever Typhoid.—See Enteric Fever.

Fever—Febricula—is the mildest form of all fevers. A person suffering from it may be scarcely conscious of its existence, and will probably put it down to the effects of a severe cold. It is very common in children, and mothers dread its appearance, lest it should be the precursor of some more serious complaint, as measles or scarlet fever; when, after a few days, varying from two to three, their fears are dispelled by the restoration of the child to its ordinary health. There are, however, the usual characteristics of the febrile state in febricula, the rapid pulse, the high temperature, pains in the back, great thirst, and often constipated bowels. All these symptoms subside after a little aperient medicine has been administered, or even without it, and usually on the appearance of a copious perspiration.

Fever, Relapsing. — Although periodic in character and name, relapsing fever is always classified in the category of continued fevers. It is not endemic with us, as typhus and typhoid fevers are, but it occassionally visits some of our large towns as an epidemic, at long intervals of from fifteen to twenty years. It is by no means a deadly disease, but is spread by a contagion peculiar to itself, as has been frequently observed in hospitals appropriated for the purposes of fever, when patients recovering from typhus or typhoid fever have been seen to be attacked with relapsing fever, and the converse also holds true. From the history of the epidemics of relapsing fever in the United Kingdom, and especially in Ireland, the disease must be regarded as a kind of famine fever, attacking for the most part the starving population of the country; while from its essentially contagious character, doctors and nurses cannot enjoy an immunity from its attacks. It is a singular disease, and as the name indicates, it is attended by a repetition of the same phenomena which it had previously exhibited on the occasion of the first attack. After a week or so from the onset, all the febrile symptoms disappear, and the person is not only able to

leave his bed, but feels capable of, and sometimes actually returns to, his ordinary employment, when about the fourteenth day dating from the commencement of the disease, he is seized suddenly with a relapse of all the febrile symptoms, which continue from three to eight days longer. Such is the usual course of the complaint, but in many instances, the relapse is repeated two or three or more times before the patient is entirely restored to health. In hospitals and sick asylums, where people suffering from relapsing fever are usually treated, there is often great difficulty experienced in persuading the patients to remain during the interval between the first and second attack, as they feel themselves quite able to return to their usual employment. An attack of relapsing fever is ushered in with great suddenness; shivering and chilliness, combined with a moist and white tongue, quick pulse, and high temperature, are the prominent symptoms. The temperature of the body increases towards the crisis, when it is said to rise as high as 106° Fahr., and afterwards suddenly falls to a normal state, and even below it. The complaint is readily distinguishable from all other fevers by the sudden onset and equally sudden cessation of the symptoms, by the absence of any rash on the skin, and above all, by the certain relapse which accompanies it. It is a peculiarity of the disease also, that in many of the patients, about a fourth, but varying in proportion with the type of the fever, there are marked symptoms of jaundice with nausea and vomiting, showing great derangement of the biliary secretion, the disease in some respects resembling yellow fever.

With regard to the treatment of a person suffering from relapsing fever, little need be said. Nothing will cut short the fever or prevent the relapse, but it is a wise precaution to relieve the bowels, which are apt to be constipated, from the commencement, by castor oil, or the colocynth and hyoscyamus pill of the pharmacopœia, or by some equally harmless aperient. The disease is not a deadly one, nearly all persons attacked with it recover, but severe cases do occasionally occur, the severity being in most instances due to suppression of the urine, occasioning coma and nervous prostration; very unfavourable symptoms which were noticed to accompany most cases of typhus fever. In cases of this character, the medical man endeavours by every means to promote the action of the kidneys; diuretics, such as the bitartrate of potash, or compound jalap powder, or nitrate of potash, are among the safest remedies. Dr. Murchison recommended diluent drinks, such as barley-water, to which a certain quantity of nitre should be added.

Fever, Yellow, is a disease all but unknown in England, and although various marsh fevers, attended with yellowness of the skin, exist in hot countries all over the world, true yellow fever has its habitat mainly in the West Indian islands and on the tropical coasts of North and South America. It has occasionally been imported by vessels into Europe, especially into France and Spain, and also into England; but it has never been known to extend beyond the ports of Plymouth and Southampton; nor has it been known to propagate beyond 48° north latitude, nor when the local temperature falls below 72° Fahr. The disease, like typhus, is spread by contagion of a virulent character, and one attack preserves an immunity from a second. It differs from most malarious fevers, in the absence of remissions and intermissions, its chief symptoms, such as yellow skin, delirium, and hæmorrhage, being continuous throughout the attack. Naval and military doctors, who have had chief experience of yellow fever, describe it as presenting three or four marked types, in keeping with some prominent symptoms, which they have named respectively the *algid*, or rapidly fatal form; the *sthenic*, or more febrile condition; the *hæmorrhagic*, attended with effusion of blood and hæmorrhage from the bowels or stomach, sometimes called black vomit; and lastly, there is in yellow fever, as well as in many other disorders, a condition of the system to which the term *typhoid* is applied, and which is usually recognised by great nervous depression and stupor. Most observers refer to albumen being usually found in the urine about the third day of the disease, and always in fatal cases; suppression of urine as in other fevers is not uncommon and is always to be dreaded.

It might reasonably be thought that, in a disease originating from malaria, and pronouncing itself by a derangement of the biliary secretion, the ordinary remedies, comprising quinine and mercurials which act directly on the liver, would be found serviceable; but it does not appear from experience that their use in yellow fever has been attended with much benefit. The best authorities place more reliance on simpler remedies, such as injections of common salt and olive oil, with a pint or more of warm water, with the view of relieving the large intestine, and restoring vigour to its secreting surface. Where there is hæmorrhage from the bowels, it is usual to add a small quantity of spirits of turpentine to the enema. The most distressing symptom of the complaint, however, appears to be the excessive irritability of the stomach, for which various remedies are recommended. These are the same as have been found useful in similar conditions of the stomach unattended with yellow fever, and include hydrocyanic acid, chloroform or chloric ether, brandy, iced effervescing waters, and chlorodyne in the doses in which they are usually administered.

Fever, Intermittent.—See Ague.

Fever, Remittent. — Remittent fever is endemic in most hot climates, where there is much decaying vegetation combined with

moisture, and is hence called *malarious*. It is characterised by repeated remissions or relapses and is accompanied with a good deal of disturbance in the functions of the liver, which shows itself often in a yellowness of the skin, but is not nearly so marked as in yellow fever. There are great varieties in the character and severity of the fever in different countries, and in each district where it prevails it appears to have a different name. In Europe, on the borders of the Mediterranean, it is known as the Levantine fever, or the *autumnal* fever, as it usually occurs with the fall of the leaf; in India it is spoken of by our countrymen, who frequently suffer from it, as the puka, jungle, hill, or Bengal fever. On the west coast of Africa, where Europeans seldom escape an attack of it, it takes its name from the continent or the colony, namely, African or Sierra Leone fever, and on the borders of some of the American inland lakes, it is best known by the term lake fever. Besides the above places, it is endemic in Central Africa, Southern Asia, the American tropics and the West Indian Islands. In a disease so universally diffused, and presenting many local varieties, it is not easy to give a very accurate description of its features, but it is well to know that it usually affects new comers to the country, and that it is attended with a cold followed by a hot stage. The cold stage is preceded by languor, restlessness, and a certain amount of chilliness, which last for a day or two prior to the shivering fit; this is succeeded by the hot stage, which continues usually for ten or twelve hours. Throughout the febrile attack, the pulse is full and compressible, beating from 90 to 120 in a minute, the tongue is dry and furred, and pain is felt at the pit of the stomach, and is often accompanied with vomiting. The duration and severity of the symptoms vary with the type of the disease, and the character of the attack; the hot stage or paroxysm ranging from seven or eight to forty-eight hours, when it subsides usually with full perspiration, but occasionally without any perceptible action of the skin. The interval between the first attack and the next paroxysm, may range from eight to ten, to thirty or thirty-six hours, and these periodic remissions continue for days and weeks without any well-defined course, unless the disease is checked by remedies. It is generally understood, that the second paroxysm will be more severe than the first, but serious symptoms, when they occur, do not usually appear before the third or fourth attacks; these are mostly caused by the brain and nervous system becoming involved in the constitutional disturbance.

In a disease of such tropical prevalence, it is not surprising that the remedies employed in its treatment, should have been very numerous, and comprised in the list are to be found blood-letting, cold affusion, purgatives, diaphoretics, mercury, quinine, arsenic, and opium. All these from universal experience give way to the paramount advantages of quinine; so much is this the case, that when our countrymen proceed to explore new countries, in distant parts of the world, they invariably take with them a quantity of the drug, not only for the treatment of remittent fever, in the event of their being attacked, but as a preventive from the fever. Our best Indian physicians laud the efficiency of quinine, and consider that in its virtues they have found a perfect antidote for the malarious poison. They recommend that before administering it, the bowels should be thoroughly evacuated, that the period of remission should be carefully watched, and that, when the first symptoms show themselves, not less than fifteen grains of quinine should be administered to an adult, and if rejected by the stomach, it should be thrown into the rectum by injection. It has also been introduced into the system by means of subcutaneous injection, which must be done repeatedly in order to get the full amount introduced. As a specific remedy for remittent and intermittent fevers, quinine occupies an almost analagous position to vaccination as a protection from small-pox.

All patients who lie long in fever, become liable to bed-sores, or ulcerations on the prominent parts of the body, which are subject to pressure as they lie; these are, especially, the back and hips, points of the shoulder blades, back of the head, tips of the ears, &c., When these ulcerations form, they not only add materially to the suffering of the patient, but may become the cause of a fatal termination to a case that might otherwise have recovered. They should, if possible, be prevented by the means recommended under the article *Bed-sores*.—See *Bed-room—Contagion—Disinfection—Disease—Debility, &c.*

FIBRINE is that constituent of the blood which, along with the entangled globules, forms the clot. It is a composite substance found in greater quantity in arterial than in venous blood, and to a less extent in lymph and chyle. Fibrine, it was formerly thought, was identical with albumen, and constituted the fibre of flesh or muscle, but these views have undergone considerable modification of late years, blood fibrine being found to contain more oxygen than albumen, and muscle fibrine is now known by its chemical name of *syntonine*. In inflammatory diseases, there is usually found a larger amount of fibrine in the blood, which is apt to form into clots and plug the blood-vessels.

Refer to—*Albumen — Blood — Digestion — Food, &c.*

FIBULA.—The small bone of the leg.

FIGS, the well-known fruit, contain a wholesome and somewhat aperient pulp, but the thick tough rind is indigestible, and should not be eaten.

FILBERTS are liable to the objection to nuts generally, and are difficult of digestion.

FILTER is an agent for separating solid impurities from fluids. Filtering papers made for the purpose, or white blotting-paper, are most usually used as medical filters, being supported by the well-known funnel or tundish, which ought to be of glass or porcelain, and ribbed inside (fig. 93). To make a paper filter,

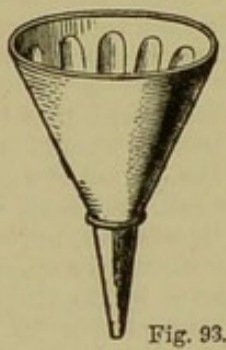


Fig. 93.

the paper used must be square (fig. 94). By the first fold the corners 1, 1, are put together, at the next 2, 2, are put together, thus forming a triangle (1, 3, 2); 1 and 2 are next put together, making a triangle (4, 3, 2), and one

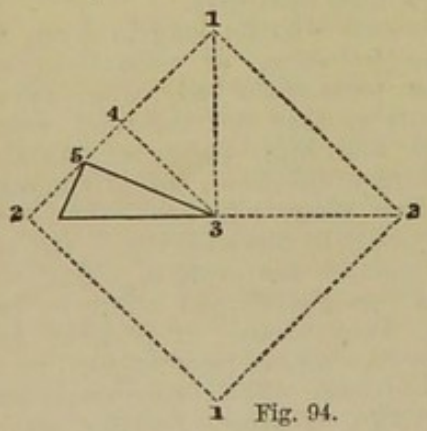


Fig. 94.

more fold (5, 3, 2) completes. The top being squared off, the filter is made, and may be opened out and placed inside the supporting tundish. In filtering through paper, it is always desirable to pass the first few ounces of the fluid through a second time, as a small amount of impurity generally escapes at first. When the solids to be separated by filtration are not in very fine powder the operation is more quickly done through linen or flannel.

There are many varieties of filters in the market, but the best known are the various kinds of loose carbon filters, the Silicon Carbon filter, and the filter of the Water-purifying Company. Filtration will remove any foul smell the water may have, arresting at the same time, particles of dirt, and other organic or inorganic matter that may be suspended in the water, and, in doing so, it also removes the atmospheric air from it, thus rendering the water less sparkling than it would otherwise be. As charcoal has little or no power of decomposing animal matter, it was reasonably thought that iron, which has that effect to a limited extent, might be employed in the process of water filtration, and this has led to the introduction of the spongy iron filter, which promises to supersede the charcoal filter. Bischoff's spongy iron filter removes much of the organic matter from water, and it also removes any lead it may contain. Filters made in blocks of solid charcoal can have the blocks readily removed, and the outside parts scrubbed with a brush, after which a solution containing four ounces of Condy's fluid undiluted, ten drops of sulphuric acid, and half an ounce of hydrochloric acid, with two gallons of water, should be added, and the whole passed through the filter before it is again used. When an ordinary filter is unobtainable, a very good substitute for it may be improvised from a large flower pot, in which has been placed a layer of coarse pebbles covered with a few inches of charcoal. The flower pot should be raised high enough from the ground to admit of a receptacle for the filtered water being placed underneath. The above filters are useful for removing gross solid impurities, but cannot be relied on to separate or destroy noxious bacteria. The Berkefeld or Pasteur filter must be used to remove these.

Caution!—Too much faith must not be placed in filters. There can be but little doubt that domestic filters, as a rule, are worse than useless, and add to the impurity in a water rather than remove it. This arises from the fact that the apparatus is credited with some magical power which is everlasting, and the idea that no attention is required in order to maintain its efficiency. Unless a filter is periodically cleansed (and to allow of this each part should be removable), filth will collect in its pores, putrefaction will take place, and the water which passes through it, although possibly clear, will have imparted to it deleterious organic substances, the presence of which will soon become apparent by the foul smell which the water will give off on its being stored for any length of time. For this reason, then, the only domestic filter which is at all permissible is one which allows of easy cleansing, as directed above, and all fixed filters in connection with cisterns should be abolished. With this limitation, a domestic filter is a useful appliance. At the same time, if reason exists for suspecting that water may contain any specific poison, the only safe proceeding is to boil all that is used for dietetic purposes. Refer to—*Water.*

FINGERS from their constant exposure, are liable to many accidents and diseases,—fractures, dislocations, whitlow, separation of the nail,—all which are treated of under their respective articles; there is, however, one mishap which does not fall under any particular head—

A ring which cannot be removed.—When this occurs, the use of cold to the finger and hand, the hand and arm being elevated at

the same time, may cause sufficient shrinking to permit of the removal; if this does not succeed, the following may:—A piece of fine packthread, or linen thread, is to be wrapped evenly and firmly round the finger, from the tip as far as the ring, through which its end is to be inserted, which being done, the packthread must be gradually unwound by means of the end thus placed. If this process does not succeed, the ring should be filed off. It cannot remain without risk.

Very useful shields and gloves composed of india rubber may be had at the india rubber shops. They are of great service to those who have wounds or abrasions on their fingers, or who are exposed to any sort of manual poisoning from their occupation.

FIRE.—See HEAT.

FISH, as an article of diet, generally is wholesome; it is neither so nutritive nor so heating as animal food, and on these accounts is often to be permitted when the latter is not.

Fish are classed as fresh-water, salt-water, and shell-fish. Dr. Paris remarks, "Turbot, cod, whiting, haddock, flounder, and sole, are the least heating of the more nutritive species; and the flakiness of the fish, and its opaque appearance after being cooked, may be considered as true indications of its goodness, for when the muscles remain semi-transparent and bluish, after sufficient boiling, we may reject it as inferior in value, and not in season. When fish is in high perfection, there is also a layer of white curdy matter resembling coagulated albumen, interposed between its flakes. The whiting, "the chicken of the sea," is well adapted for weak stomachs, on account of the little viscidity which it possesses; it is at the same time tender, white and delicate, and conveys sufficient nutriment, with but little stimulus to the system. The haddock is firmer in texture. Cod is not quite so digestible as the two former, but it is nutritious. Turbot is wholesome, *without lobster sauce.* Sole is tender, and yet sufficiently firm; it is, therefore, easy of digestion, and affords proper nutriment to delicate stomachs. Salmon is very nutritious, but, being one of the oily fishes, is less digestible than many others—vinegar in some degree corrects the fault. Eels are always indigestible." From these observations the value of fish may be appreciated, and the qualities which entitle them to selection easily understood. Firmness of texture, whiteness of muscle, and the absence of oiliness and viscidity, are the circumstances which render them acceptable to weak stomachs. The flesh of fish contains kreatine (see *Kreatine*). Shell-fish may, without exception, be considered as indigestible. Oysters eaten raw are undoubtedly nutritive, but by some they are not easily digested. Many persons are liable to cutaneous eruptions after the use of some descriptions of shell-fish, and some suffer from diarrhœa.

In those places, as the coast of Norway and Sweden, where a diet of fish alone is habitual, the people are very liable to chronic cutaneous disease.

The most wholesome method of cooking fish is by boiling; frying is not suitable for the invalid. It is well known that certain species of fish are poison at all times, others appear to be so only occasionally, and under peculiar circumstances. Of these, the common mussel has proved more injurious than any others. The oily fishes also, such as salmon, herring, &c., when too long kept, have given rise to symptoms of irritant poisoning.

Refer to—*Poisons, &c.*

FISTULA is a canal or passage formed by disease, and healing with difficulty, which opens from the surface of the body. The word fistula, alone, is generally used popularly with reference to the disease when situated at the fundament (see *Rectum*).

FITS.—The term is applied popularly to any form of convulsion or spasm of the voluntary muscles, such as *Epilepsy*, *Hysteria*, and *Convulsions* generally, either in adults or children. To these heads the reader is referred.

FIXED AIR—the name given by Dr. Black to carbonic acid gas.

FLANNEL—a woollen texture, is an article of clothing which should be worn next the skin by every man, woman, and child in this kingdom, and perhaps in every other, notwithstanding its prohibition (!) by Preissnitz, amid other hydropathic regulations. Under the head of flannel, is included, of course, woollen clothing generally. Wool being a bad conductor of heat, is, in consequence, the best protection against sudden vicissitudes of temperature, such as occur in this climate, and also against chills which may supervene upon the profuse perspirations of a warmer one. Of course the thickness of the woollen material worn next the skin may and ought to be varied, but wool it ought to be, if of no stronger texture than gauze. The experience of our military and naval surgeons all tends to prove that there is no greater preservative from the dysenteric and febrile affections of hot climates than woollen clothing next the skin, and every medical man's experience in this country confirms the fact of its protective power. Notwithstanding, it is astonishing how many carelessly neglect this indispensable article of clothing. Some few persons with extremely irritable skin cannot wear flannel next it; in such cases, a dress of thin cotton should be worn, and flannel over. Flannel should be worn in summer, but of a thin texture.

FLATULENCE, or the collection of gas in the stomach and bowels, is very commonly the result of indigestion; but it is often also the effect of nervous disorder. In the former case, it is probably chiefly due to the evolution of gas from the badly-digested food mass in a state of partial fermentation; in the latter, it

is only possible to account for the enormous amount of flatus or wind by its formation, "secretion," in the bowels. In the course of typhoid fever and in many acute diseases of the intestinal tract, flatulent distension of the bowels, or "tympanites," as it is called, is always an unfavourable symptom.

Persons who suffer from flatulence require sedulously to avoid most kinds of vegetables and fruits; individual experience, however, is the best guide on this head. When a severe attack of flatulence comes on, carminative (see *Carminatives*) and stimulating remedies are generally resorted to, and often prove useful; but in many cases, particularly in nervous individuals, with pale tongue, the mineral acids will often be of more service—either twenty to thirty drops of dilute nitric acid in a wine-glassful of infusion of orange peel, or some other warm bitter, or better still, aromatic sulphuric acid in ten-drop doses in a wine-glassful of water. A favourite remedy is the nitro-hydrochloric acid given in doses of ten or fifteen minims in water three times a day. Carbolic acid in one-grain doses twice or even thrice a day is a powerful counter-agent to flatulence. It is easily taken in a little peppermint water with glycerine, one ounce of the one to half a drachm of the other. In general flatulence of the bowels, with difficulty of expulsion, enemas of assafœtida or turpentine are most useful.

Refer to—*Children—Enema—Indigestion.*

FLESH.—The muscular substance of animal bodies, composed of syntonine. It is a popular error to suppose that flesh is merely present in the body "as flesh," and it is not understood that every particle of the substance is muscle, and employed as such in the movements of the living body.

Refer to—*Beef—Fibrine—Mutton, &c.*

FLESH-BRUSH—a brush for cleansing and stimulating the skin.—See *Skin.*

FLOODING. — Hæmorrhage from the womb. — See *Abortion—Child-Bed—Menstruation, &c.*

FLOUR.—See GRAINS—FARINA.

FLOWERS OF SULPHUR.—Sublimed sulphur.—See *Sulphur.*

FLUCTUATION—in medical language, is the movement given to fluids in cavities—either natural or diseased—by the fingers of the medical man, whilst at the same time he endeavours to make himself acquainted with the various peculiarities which characterise the collection.

Refer to—*Abscess.*

FLUOR ALBUS.—See MENSTRUATION.

FLUX.—An increased discharge from any of the passages of the body, such as the bowels, lined by a mucous membrane. The term has gone out of use.

FŒTUS.—The term is applied to the infant from the early months of pregnancy till the period of birth.

FOMENTATION is a simple and effective method of applying moist heat to any part of the body, by means of flannel wrung out of boiling water, or any other medicated hot fluid. It possesses advantages in many cases, and is to be preferred to poultices, as it is lighter and cleaner, and can be frequently repeated without much trouble. In extensive inflammations, especially of the abdomen, in erysipelas, and to allay spasms in deep-seated parts, as in cases of renal and biliary calculi, repeated fomentations are always to be preferred to poultices. When moist heat is prescribed for inflammatory disease of the joints, or as a mild derivative in rheumatic fever, to relieve the articular pain, fomentations will be found serviceable. Much depends on the way in which the fomentation is prepared. It ought to be applied as hot as the skin can bear, and, although moist, the hot water should be thoroughly squeezed out of the flannel applied to the skin. A large piece of coarse flannel folded, is employed for the purpose, and, after being soaked in boiling water, it should be enveloped in a coarse towel, and the hot water may be thus wrung out of the flannel by simply twisting the ends of the towel several times round the fomentation cloth. In hospitals where fomentations are in constant use, a very simple apparatus (fig. 95) is used to protect

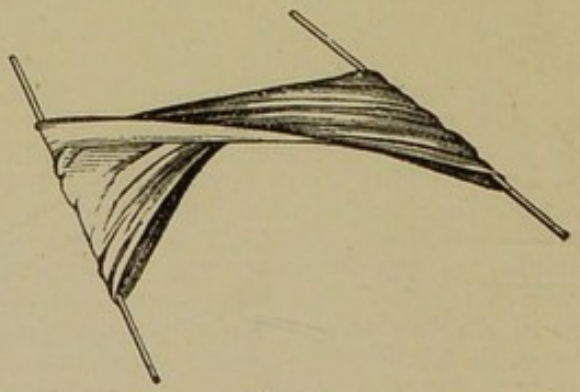


Fig. 95.

the hands of the nurse from being scalded. This consists of a wringer made from a piece of canvas, on which the fomentation flannel is laid, and by means of wooden rods fixed to each end, the canvas is twisted round by the hands until the last drop of boiling water is squeezed out of the fomentation cloth, which can then be applied to the skin of the affected part without scalding it. To retain the heat and the little moisture still remaining, it is advisable to apply a layer of dry flannel over the wet, and to envelop the whole with a piece of mackintosh cloth. If there is any danger of the fomentation slipping, a few turns of a bandage round the part will secure it. Solutions of opium, belladonna, aconite, or other narcotic substances, may be sprinkled over the fomentation flannel if it is desired to produce a soothing effect, or a few

drops of spirits of turpentine may be added, if the object be to induce slight counter-irritation. A favourite fomentation is made by adding poppy heads or chamomile flowers to the hot water used, but it is doubtful whether the latter, at all events, has any medicinal effect employed in this way.

See *Bran—Heat—Poultice, &c.*

FOMITES.—See CONTAGION.

FOOD, that by which the living body is nourished, in its widest sense comprehends both liquid and solid aliment. In the following article, the subject will be considered chiefly with reference to the principles which regulate, or ought to regulate, the food of man, and on which, as far as ascertained, the nutriment of his material frame is conducted. Much special information connected with the subject is scattered through this work in the papers which treat of the individual articles used as nourishment, and such papers as *Alimentary Canal, Digestion, Dietaries,* &c., bear directly upon it.

The food which we daily consume is absolutely necessary for the support of life, which in all warm-blooded animals has two essential requirements, the maintenance of heat, and the repair of waste tissue continually taking place in every part of the system. That we may better understand the wants of the body, it is necessary that we should have a knowledge of the elementary materials and their compounds, which contribute to its build. Out of the 60 or more elements which go to make up the world of nature, not less than 14 enter into the composition of the body, in the following proportions, assuming for the sake of quantitative accuracy, the weight of the body to amount to about 154 lbs.:—

	lbs.	oz.	grs.
Oxygen,	111	...	...
Hydrogen,	15	...	...
Carbon,	20	...	...
Nitrogen,	3	9	...
Phosphorus,	1	12	190
Sulphur,	...	2	217
Calcium,	2	...	...
Fluorine,	...	2	...
Chlorine,	...	2	382
Sodium,	...	2	116
Iron,	...	...	100
Potassium,	...	...	290
Magnesium,	...	...	12
Silicon,	...	...	2

These elements are not found in their simple state in the body, but are combined with each other in various ways. Thus the two first on the list combine to form water, which constitutes rather more than two thirds of the body's weight, and is continually ebbing and flowing throughout the system. Oxygen, hydrogen, carbon, and nitrogen, are termed the organic elements, and compose the great bulk of the body. Next to water, gelatine, fat, fibrine, albumen, phosphate, and carbonate of lime, make up the greater part of the complex structures, after which there are the various salts of soda and potash, together with iron, which gives the red colour to the blood, and silica, minute traces of which are necessary to give hardness to the enamel of the teeth.

The alimentary principles in food which have to make good the tear and wear of tissue-substance, and support the animal temperature, are divided into the *organic* and the *inorganic*, the latter being represented by water and the salts which we take with our food, and which necessarily belong to the mineral kingdom; while the organic constituents have been classified by Liebig, Playfair, Parkes, and most modern authorities, into two sub-divisions, derived alike from animals and vegetables, one of which, because it contains nitrogen, is termed the *nitrogenous*, and the other because it contains no nitrogen is called *non-nitrogenous.*

The nitrogenous group of substances, called also the *albuminoids*, supply the body with albumen, fibrine, and caseine, obtainable alike from the animal and vegetable kingdom, and gluten, which is found in vegetables alone. These substances, sometimes called "proteids," are the flesh-formers of the human body, and are absolutely necessary to make good the waste. It was at one time supposed that they were also the agents of force, which was believed to be attended by an elimination of the waste products of the proteids from the body, but this doctrine is no longer held.

The non-nitrogenous group of foods are variously named carbonaceous, respiratory, heat-giving, and force-producing. They consist of the three simple elements—carbon, oxygen, and hydrogen—in different proportions, which renders it necessary to classify the compounds into two well-marked subdivisions; one of which comprises sugar, starch, and gum, called *carbo-hydrates*, because they contain hydrogen and oxygen in exact proportion to form water; while the other includes fat, butter, and other oleaginous substances, which contain but a small proportion of oxygen, and are known by the name of *hydro-carbons.* All these agents supply heat, by the union of the oxygen of the air in the lungs, with the carbon floating in the blood, evolving at the same time carbonic acid and water. The fats are more important than the starchy and saccharine substances, because they aid materially in the assimilation of other foods, pass directly into the circulation, and are stored up in the tissues for future needs.

Among the inorganic agents, apart from water, sulphur and phosphorus are furnished from the flesh and bones of animals, from milk and eggs, and from those products of the vegetable kingdom which abound in gluten. The salts of lime are obtained both from animal and vegetable substances, while the salts of

potash are derived chiefly from vegetables. Common salt, or chloride of sodium, as important as any of the mineral constituents, exists in most food stuffs, and is liberally added to them in the process of cooking, as well as in eating, while iron is a constituent of the blood of the lower animals, and fluorine exists in the bones and teeth of animals. When the human body maintains a complete standard of health, the balance between the income and the outgoings should be equalised, and something like a debtor and creditor account might be established, showing not only the metamorphosis which occurs through the chemical changes that take place, but also the details of expenditure through the different outlets. Thus, in estimating the income, we allow somewhat more than 18 ounces of water-free food, with water and oxygen in due proportion; hence, we have a daily income of:

	Grains.
Solid dry food, . .	8,000
Water, ...	37,650
Oxygen, ...	13,000
	58,650

After undergoing transformation in the body, these separate constituents are expelled as waste through the four excreting outlets, and the amount expended at each outlet may be calculated as follows:

	Grains.
From the lungs, . .	20,000
From the skin, . .	11,750
From the kidneys, . .	24,100
From the intestines, . .	2,800
	58,650

The total amount, 8 lbs. 6 oz. is eliminated in a gaseous, solid, or, mainly, in a liquid form through the organs; the nitrogenous matters, escaping chiefly through the kidneys in the form of urea, and the non-nitrogenous through the lungs and skin, as carbonic acid. When disease sets in, the appetite fails, and as happens in fever and consumption, the body wastes, the expenditure greatly exceeds the income, the balance of health is interrupted, and the abnormal condition cannot be rectified till recovery takes place.

It might reasonably be supposed that as people differ greatly in their appetites, effects on their constitution would be marked in proportion to the amount of food consumed; but so long as they maintain a tolerably healthy standard this is not observable. Notwithstanding this fact, rude health usually co-exists with a healthy appetite, and according to the amount of exercise mental and physical, so must the allowance of food be proportioned. A man engaged in much physical labour, requires a larger amount of food than a person at rest, and a patient in bed needs less than either. Public dietaries for prisons, workhouses, and hospitals are all arranged on these principles, as measures of ecomony, as it would be practically impossible in any other way to meet the varied requirements of the inmates. As a rule more food is consumed in cold than in warm weather, and men eat more than women, unless the latter take an equivalent amount of exercise. Children and growing youths in a state of health eat more in proportion to their size than grown up people, and in old age the appetite fails, and the stores of fat which had accumulated during middle age disappear in the course of years.

It is very possible that, if more care and attention were bestowed on the selection of foods containing azotised and heat-giving properties in abundance in a concentrated form, a more economical and nutritious diet might be adopted than that in general use among both rich and poor. Such a diet is provided by the fare of the vegetarian, when he does not exclude from his menu, milk, and perhaps eggs. The poor of many countries subsist almost entirely on one or other of the grain crops which abound in starch, gluten, and fibrine, supplemented with milk, fat or other oleaginous substances. Beans and peas contain both albumen and starchy matter in abundance, and would of themselves support life, but they are liable to produce flatulence when much indulged in. The poor in Scotland, Ireland, and in the North of England, had at one time little else to subsist on than oatmeal, potatoes, and milk, and the inhabitants were ranked among the finest peasantry in the world; but now the taste for animal food has pervaded all classes alike, and though the opinion is generally entertained that a mixed diet of animal and vegetable substances is best adapted for mankind in general, there is no doubt that more harm accrues from an excess of food than from a deficiency, and the tendency of late has been rather to indulge in the former than to suffer from deprivation. Too much animal food produces plethora, and too much respiratory food induces corpulence and indigestion, and these are diseases from which people sometimes die. It is wiser to adopt the golden mean, and content ourselves with only a moderate amount of the good things vouchsafed to us.

It would be impossible in this article to deal separately with the various articles of food, though a few remarks on those chiefly used may not be out of place. Of vegetable productions, bread made from wheat flour is universally acknowledged as the staff of life, containing gluten, starch, and mineral matter in sufficient abundance to maintain vitality though few persons would adopt a bread and water diet from mere inclination. The other cereals, rye, barley, oats, Indian corn, and rice, though they contain in varying proportions all the essential elements of food, are not so available for bread-making as wheaten flour, and to render them equally nutritious,

digestible and palatable, it is desirable that they should be taken with milk or fat; though oatmeal contains a considerable amount of the latter, which adds much to its strength as an article of food. Among tuberous roots the potato stands pre-eminent, and in its mealy condition is nutritious and digestible, and is always a favourite article of the diet table. Its chief alimentary constituent is starch, but it contains also salts of potash, and is one of the best antidotes to scurvy and other diseases of mal-nutrition. Other roots, such as the turnip, carrot, and beet, are made up in great bulk of water, and owe their chief nutritive value to the starch they contain. These also, as well as all green vegetables, possess anti-scorbutic virtues, on account of the mineral matters in which they largely abound.

The animal productions in most use as foods are, beef, mutton, veal, pork, eggs, and milk,—which all contain the two essential elements of alimentation; lean meat representing the most purely nitrogenous, and fat pork the most carbonaceous. Mutton is generally reckoned more delicate and digestible than the flesh of most animals, then beef, lamb, veal, and last of all, pork, which is very unsuitable to the invalid. Poultry and fish are less nourishing than the meat of animals which nourish their young, though from their delicacy of flavour and easy digestion, they are very suitable for the sick-room as well as an agreeable change from the ordinary diurnal routine of beef and mutton. Boiled meat is a trifle more digestible than roast meat, and if the fluid in which the meat is boiled is partaken along with it, the juices as well as much of the mineral matter of the meat are saved; and there can be no doubt that boiling is a more economical plan of disposing of meat than roasting it, as in the process of roasting, meat loses nearly a third of its weight. Most people, and especially invalids, prefer roast meat to boiled, and it has become a question of importance in public institutions, as well as in private households, how the roasting process can be best accomplished. Cooking before an open fire, though attended with more waste, is preferable to cooking in a close oven; but much of the unwholesomeness of the latter process has been removed of late years by a better construction of oven, and the general introduction of gas in public kitchens, as a method of roasting, has almost entirely removed the objections associated with the closed kitchen range. Game, especially pheasants and partridges, though somewhat less digestible, are similar in their chemical relations to poultry, and it may be assumed as a rule which generally holds good, that white meat of every kind, though somewhat less nourishing, is more delicate in flavour and easier of digestion, than red. Milk may be regarded as the type of all food, and there is no better illustration of its utility than the fact of the infant being reared upon it to the exclusion of other food. Butter and cheese, the products of milk, represent respectively its heat-giving and flesh-forming properties, as butter is almost equivalent to fat, though of more delicate flavour, while cheese contains the nitrogenous substance caseine, combined, however, with more or less of the fatty constituents. Cheese is consequently one of the most nourishing of foods, but it is not suited for the invalid or for delicate children. Milk is sometimes used of itself as a diet in fevers, and in injuries to the head, accompanied with or without a loss of consciousness, it is now generally prescribed to the exclusion of other foods, until convalescence is established. The properties of the egg possess some analogy to milk, inasmuch as the young chick is formed from its constituent elements, which are rich in albumen and fat. Eggs, lightly boiled, are easy of digestion, and seldom pall even on the sickly appetite.

By instituting a standard for comparison, and massing together a large number of analyses, collected from the investigations of the best chemists, Professor Atwater, of Connecticut, has prepared a series of tables of much value in estimating the nutritive properties of different foods. As a basis of comparison, he has selected beef of a medium character (neither too fat nor too lean) as a standard, at a nutritive value of 100, and the following table represents in figures the nutritive properties of the following articles of ordinary consumption, meat, game, and fowl:—

Animal food.	Nutritive value.
Beef (lean),	91·3
Beef (medium),	100·0
Beef (fat),	112·0
Veal (fat),	92·4
Mutton (medium),	86·6
Pork (fat),	116·0
Smoked beef,	146·0
Smoked ham,	157·0
Venison,	88·8
Hen,	93·9
Duck,	104·0

From this table it is noticed that fat pork, so largely consumed by the poor in this country, stands highest in the nutritive scale among fresh meats, while smoked beef and ham represent a much higher value than is usually attached to them, a value attributable to the deprivation of moisture to which they have been subjected in the process of drying and compression.

Milk and its products form a most important group of animal substances of which all classes partake, and it is interesting to notice how the cheapest of these manufactures, namely, cheese made from skimmed milk, also possesses the highest nutritive properties. The value of the egg, as an article of food, has been based on the average of several hundred analyses, which varied only from 71 to 73·5.

Animal Produce.	Nutritive value.
Cows' milk (normal), .	23·8
Cows' milk (skimmed), .	18·5
Cream from Cows' milk, .	56·0
Butter, ...	124·1
Cheese from whole milk, .	151·0
Cheese from skimmed milk,	159·0
Cheese from milk, with cream added, . . .	103·8
Hens' eggs, . . .	72·2

The analyses pertaining to fish have been made from the edible parts only; thus white fish has a nutritive value calculated at 104·5, but this only means for 13·69 per cent. of the whole fish, so that as a food it would be far inferior to duck, which has the same numerical nutritive value. The percentage of edible solids in each species of fish is given in the table.

Fish, Fresh.	Per cent. of edible solids.	Nutritive value of edible parts.
Flounder, .	5·97	42·4
Cod, .	11·45	68·2
Haddock, .	8·88	74·9
Eels, .	22·50	95·6
Mackerel, .	15·48	90·9
Salmon, .	32·99	107·9
Salmon trout,	14·38	95·7
White fish, .	13·69	104·5
Smelts, .	12·51	73·8
Herring, .	11·52	100·4
Turbot, .	15·61	84·4

Prepared fish and shell-fish are shown in the same way to possess the following nutritive values.

Nutritive values.	Per cent. of edible solids.	Nutritive value.
Boned Cod, .	30·91	106·9
Salted Cod, .	20·45	102·5
Smoked halibut,	31·63	102·2
Smoked herring,	28·66	163·2
Canned Salmon,	29·95	107·2
Salt Mackerel,	30·97	111·1
Lobsters, .	7·98	50·3
Scallops, .	17·47	68·8
Oysters, .	...	21·8

When we partake of food, we are scarcely aware of the existence in it of the mineral salts which are almost as necessary for nutrition as the other constituents. Apart from the four or five pints of water which a person is in the habit of consuming daily, either in the form of beverages or in the food itself, there is or ought to be fully an ounce of mineral matter of various kinds. Water is itself the most necessary of all foods, as it is concerned in every physiological change which takes place within the body, and maintains an equilibrium of temperature by continuous evaporation from the skin. It contains usually salts of lime and soda in small amounts, supplemented by the mineral matter in the food itself; but the chief salt, chloride of sodium, is mechanically added to the food to the extent of about half an ounce a day. It is doubtful if this addition is absolutely necessary, as almost all solid food contains salt in appreciable quantity; but its mechanical addition not only elicits flavour and assists taste, but undoubtedly aids the process of digestion.

Existence upon vegetable food alone is much more common than that upon animal food alone, and, indeed, is the rule with many nations and people, who unquestionably maintain high strength and vigour upon it; it is, in fact, only requisite to look at the grass-eating bull to feel convinced of the possibility of the fact, and did space permit, it would be easy to cite abundant confirmatory examples; but if man lives on vegetables, he must, like the vegetable-eating animal, consume a comparatively large bulk to obtain sufficient nutriment; and so it is, the Irishman and the Hindoo must eat seven or eight pounds of potatoes, or of rice, at a meal. These, however, are extreme instances, for potatoes and rice are comparatively innutritious, in as far as building up the fabric of the body is concerned, being composed mainly of starch and water; the cereal grains and pulses, on the other hand, possess albuminous principles largely—the gluten of the former corresponding to the animal fibrine, and the caseine of the latter to the curd of milk. Those persons, therefore, whose vegetable food is composed chiefly of the above, require, of course, to consume less, and there cannot be the slightest doubt that man may lead a most active and healthy life upon a grain diet alone, and especially if it be combined with milk. But what is possible may not always be expedient, nor suited to man's circumstances, and on this hinges the argument respecting the nature of food on which man ought to live. No physiologist would dispute, with those who maintain that man ought to live on vegetables alone, the possibility of his doing so, or that many might not be as well under such a system, or better than under any other; but no physician acquainted with the requirements and constitutions of men generally, who live according to the usages—certainly, it may be allowed, too artificial—of this and other civilised countries, will allow that a vegetable diet could become the rule to the majority without serious injury. The healthy active countryman, constantly exercised in the open air, will do well on a vegetable diet, under which the city artizan or man of business, the delicate female, the pale, perhaps scrofulous, child would become diseased, or sink and die. Their organs of digestion and assimilation cannot extract from the vegetable mass sufficient blood nourishment, neither do they receive sufficient stimulation from it. It may be contended that the evil is an artificial one, engendered by artificial life; that may or may not be the case, but so the question stands at present, and as

man *generally* is circumstanced at the present day, he will best consult his own comfort, convenience, and usefulness, by using a mixed diet, the power to use which has been bestowed upon him by his Creator. He will, if possible, consume albuminous material, animal food in quantity sufficient to supply the waste of his bodily, especially muscular tissues; and will mingle it with such respiratory food, that is, saccharine, or starchy, and oleaginous substances, as will supply the carbon and hydrogen requisite for animal temperature, without his being compelled to undergo the muscular exertion of the half-savage hunter.

To review the principles which regulate food and nourishment: We have vegetables as the first agents for taking up the elementary forms of matter, and combining and transforming them into such components as are suited to the digestive organs of the vegetable subsisting animal which consumes them, and in which they are built up into the blood-filled animal frame, of muscle, nerve, and bone, ready for the consumption of the carnivora, or flesh-eaters, and to yield sustenance suited to the wants of man. We have these nutrient principles, consisting of albuminous compounds, fitted to nourish albuminous tissues, gelatinous to nourish gelatinous, and saccharine and farinaceous to supply the matter of fuel, and to take part in all the other operations of the system, or to be stored up as fat. Lastly, we have water, the aqueous principle, as the necessary medium without which these varied operations could not be carried out.

To apply these principles to man, we find him so constituted as to be able to maintain health and life on animal food alone, or on vegetable food alone, but we also find him fitted by organisation to subsist on a mixed diet, such as is most in accordance with the habits and usages of civilised communities.

It is not easy to assign to every article of food its proportionate degree of digestibility, as this so largely depends on the methods of cooking employed, as well as on the quality of the meat and the length of time it has been preserved. Again, digestion is greatly influenced by what may be termed the idiosyncracies of the individual, which is expressed by an old saying, that "What is one man's meat is another man's poison." On this account it is scarcely legitimate to draw any definite conclusions from the well-known series of experiments, made by Dr. Beaumont of America, on a man with a hole in his stomach, through which opening Dr. Beaumont watched the process of digestion of a large number of animal and vegetable substances. It must also be borne in mind, that the act of digestion is far from being completed with the escape of the chyme from the stomach, and that the changes which the fats and starchy foods undergo in the small intestine are of the most elaborate character, occupying varying intervals of time. Most persons discover by experience what foods best agree with them, and their knowledge in this respect is often extremely serviceable to the medical man in prescribing for them in illness.

Owing to increased population and inability of home production to meet its wants, numerous methods of preserving food have been introduced of late years. Curing and drying as well as smoking, are old methods of preservation in use in all countries. The meat is steeped in brine, a strong solution of common salt or nitre, which hardens it and renders it less digestible, but enables it to be kept from decay for a considerable time. The drying process is chiefly had recourse to with fish, but in some hot countries strips of meat are dried by exposure to the air, and eaten afterwards in the form of soup. Meat prepared in this way loses its flavour and palatable qualities, though it may retain most of its nourishment. An attempt to introduce it from South America as a cheap substitute for the meat of this country, was abandoned after a short trial, and its place was taken by the cooked meats imported from Australia and other countries, but chiefly from Australia. This branch of food industry has attained considerable mercantile success, besides being a great boon to the poorer classes, who, however, in their individual capacity, do not appear to appreciate it as it deserves to be. To preserve it, the meat freed from bone is closely packed in tinned cases, subjected to a high temperature considerably over the boiling point for several hours, and when the air is thoroughly driven out of the vessel and the steam still escaping from an aperture in the case, the opening is soldered down and the case is thus hermetically sealed from injury from within or from without. In this state meat may be kept fresh for any length of time, and it is exceedingly convenient and handy in hot weather, and at any other times when ordinary raw meat is apt to go bad. Tinned meats are largely used in workhouses, prisons, and other public institutions, though they have not found favour as a dietary for sick people.

The most successful method yet employed to meet the increasing demand for meat, is by preserving it in a cold temperature, as we are able in this way to draw upon the inexhaustible supplies of cattle in the United States, and probably in a short time from those in Australia and South America as well. Of late years vessels have been built specially fitted for this branch of industry, with chambers partly lined with ice, in which the dead meat is suspended in its passage across the Atlantic. After landing in this country, the meat is quickly bought up by dealers, and sold to the public, generally at a lower rate, than home produce, although in no respect inferior to it in quality. There is some reason to suppose that much of the meat exposed for sale and bought as home-fed beef and mutton, is of

American growth, and it really requires an experienced eye to detect the difference; but there is little doubt that had it not been for this welcome supply, the price of meat to the consumer would by this time have been greatly enhanced.—See *Dietaries* and special articles on various foods.

FOOT BATH.—See Bath.

FORCEPS are instruments used in medical and surgical practice as substitutes for the hands or fingers, not only for the sake of cleanliness, but as being capable of introduction into positions where the hands or fingers cannot go. A pair of the common dressing forceps would be found useful for many purposes in domestic management, if for nothing else than taking off plasters, and it would be well if responsible persons generally, who reside at a distance from medical assistance, were provided with a pair of artery spring forceps. This instrument, which differs entirely from the other in shape, is provided with a spring catch which keeps its points perfectly closed when required (fig. 96). In many cases of wounds involving the severance of an artery, an unprofessional person could not perhaps employ any means for stopping the bleeding with such probable certainty and ease.

Refer to—*Hæmorrhage*—*Artery*—*Dressing.*



Fig. 96.

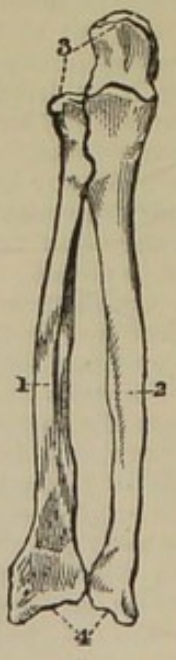


Fig. 97.

FOREARM.—The lower arm, between the elbow and the hand. It contains two bones (fig. 97) the radius (1) and the ulna (2). These are articulated or jointed at their upper extremity (3) to the single bone of the arm; at their lower extremities to the small bones of the wrist. The bones in the forearm are very often broken, and, of children, are often bent by accident, without fracture.—Refer to *Fracture.*

FOWL.—See Poultry.

FOX-GLOVE.—See Digitalis.

FRACTURES OF THE BONES are accidents which, from their nature, can only be treated with certain efficiency and success by the educated surgeon; but on the other hand, from their frequent occurrence, particularly in situations where no surgical assistance can be readily procured, it is highly desirable that unprofessional persons should be able to manage them in something like an intelligent manner.

The existence of fracture is, in some situations, made out with difficulty, even by the skilful; this is particularly the case in the vicinity of joints, such as the ankle, hip, shoulder, &c., but in others, as in the middle of the long bones, such as those of the leg, thigh, forearm or arm, the fact is often too obvious to be overlooked by the most careless. The general symptoms of fracture having occurred, are pain and loss of power over the injured limb, which is altered in shape or crooked, probably swollen and shortened. Its lower extremity hangs loosely, and is more movable than it ought to be, motion being generally accompanied with a sensation of grating, perceptible both to the sufferer and to the person handling the limb. The broken ends—generally the upper one—probably project against the skin, or, it may be, protrude entirely through it, constituting a compound fracture. Much of the displacement of the fractured ends of the bone is due to the contraction of some of the muscles of the limb, which are, from the nature of the injury, freed from the controlling counter-action of other muscles. This fact it is important to remember in the treatment, during which, when it can be done without sacrificing too much the other essential points, the injured limb should be placed in a position which allows the muscles generally to be in a relaxed condition. In addition to these local signs, a person who has suffered from severe fracture is generally faint and depressed for some time after.

In many cases of fractured bones, however, the symptoms are far from being so plainly marked as described above.

The fracture of a bone is, of course, in itself, a severe injury, but it is rendered infinitely more so by the wounding and tearing of the soft parts of the limb by the, generally, ragged ends of the bone; this, therefore, it is desirable to prevent, as much as possible, both in removing the sufferer and afterwards.

It being ascertained that a fracture has occurred, if surgical assistance is not immediately at hand, the removal of the sufferer will probably be requisite. If the upper extremity be the part involved, it should be well supported by a sling in the meanwhile, and the

sufferer will find walking a much easier and less painful mode of locomotion than any other. Much injury and suffering are often inflicted upon persons who have fractured a lower extremity, by hasty and injudicious management in the removal; the lower end of the limb is left entirely unsupported, or at best, is carried by some of those around, causing thereby great pain, increasing the wounding of the soft parts within, or, it may be, occasioning the protrusion of the bone through the skin; and thus, especially if the last should occur, diminishing greatly the chances of a good recovery. A person who has fractured the leg, if he be not already lying on the ground, should be placed there till a shutter, a door, or flat board of some kind can be procured; this should be placed along side, covered of course with coats or the like, and the sufferer, gently, rather slid than lifted upon it; on this *he is to be hand-carried*, even if the distance is considerable, as much preferable either to cart or carriage conveyance. Before lifting, however, the fractured limb should be secured from motion as much as possible, either by tying it to the sound one by means of handkerchiefs, or by straw or other material placed about it: in the meanwhile, a *firm* bed should be prepared for the patient; a mattress is most suitable if procurable, if not, a board of sufficient length, passed under the ordinary bed, will do; the object of this is to prevent the sinking which inevitably occurs from a person lying long in one place in bed, a circumstance which much interferes both with comfort and treatment. In most cases of fracture of the leg, relief will be given at once by bending the knee and placing the leg, lying on its outer side upon a pillow or other soft material. The object in view in the treatment of a fractured bone, is to preserve the broken ends in contact, as steadily and as exactly in their proper relative positions as possible, so that the curative and consolidating process may proceed without disturbance, and that when this is complete, the symmetry of the limb may be unaltered. In giving directions as to the management of fractured bones by unprofessional persons, the author feels how difficult the task, of conveying the information, is to himself, and how still more difficult it must be to those unaccustomed to deal with such matters, to treat them at all satisfactorily from a written description; at the same time cases do occur, in which the choice lies only between perfect ignorance and some amount of information of the methods to be adopted. For such cases this article is written; for certainly no sufferer from fracture, in his senses, would submit to, nor any unprofessional person undertake the treatment, if skilled assistance was *in any way* procurable. In addition, the author would strongly advise those who are likely, in their course through life, to be thrown much in out-of-the-way circumstances, and who would wish to be useful, to see for themselves in some hospital the mode of putting up fractured bones. A few hours, even, of observation, would teach them more than all written descriptions, though these might afterwards refresh the memory.

Either after or before the patient is placed in bed, the clothes must be removed, *cut off* if necessary, from the injured limb; of course by the seams if possible. The proper applications must meanwhile be got ready as quickly as may be. These are, splints, such as are recommended in each particular form of accident, with their cushions and bandages (see *Bandage*). Some surgeons delay the application of the splints for several days, till the swelling, which always occurs more or less after fracture, has subsided, and some cases *may* occur in which this is desirable; but the majority of practitioners put the splints on as soon as possible after the accident, and this is certainly the preferable practice. There almost always exists a tendency to spasmodic starting of a limb which has been fractured, for some time after the accident, and this constantly tends to displace the bones, and to increase the laceration and swelling of the soft parts; this may in great measure be prevented by the early steadying of the whole limb by the splint, which, however, need not be bound tightly, and may be so applied as to be loosened at once if requisite. This tendency either before or after the splints are put on, may be in a great measure obviated by pinning a handkerchief over the fractured limb on both sides, to the bed clothes, so as to keep it perfectly steady. The injection of a small dose of morphia, by means of the hypodermic needle, will also do much to relieve painful startings or spasms in a fractured limb.—See *Hypodermics*.

A splint is simply an agent which can be bound to a fractured limb, and which will keep it in the straight position; it may, therefore, be made of wood, iron, leather, or even straw. The variety of splints is very great, but as this article is written for use in situations where only the simplest means are supposed to be at hand, the simplest modes of management only will be adverted to.

Moreover, fractures may be treated without splints, properly so called, as by gum and chalk, plaster of Paris, starch bandage, or the like, or by position simply. As the continued contact of hard splints would occasion pain, they are usually cushioned or padded; this may be effected by any soft material, care being taken that the padding projects everywhere beyond the edges of the splint, to which it may, if convenient, be attached by tapes (fig. 98) or common adhesive plaster.

Pasteboard, gutta percha, leather, and a manufactured material called poroplastic felt, softened by immersion in hot water, are all employed in making splints. Lastly, all things being arranged, the setting of the fracture remains to be effected. This, which

is always painful, consists in bringing the broken ends into contact, as much as possible in their proper relative position. In some few cases, as in the leg, it may happen that

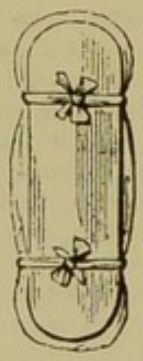


Fig. 98.

although there is fracture, there is no displacement; but in the majority of instances the broken ends overlap one another, being drawn by the action of the muscles; the main requisite, therefore, in the reduction of a fracture, is by gentle but steady drawing down of the lower extremity of the limb—whilst the upper is fixed—to bring the ends to a level, and, if possible, place them one against the other; in the drawing down, however, the hand should not grasp the extremity of the fractured bone, but should be applied below the joint. Thus, in setting a fractured thigh, the surgeon grasps the leg, not the lower part of the thigh, &c. After a fracture has been once set, it should never, if possible, be disturbed again. This does not mean that the appliances are not to be removed, and the progress of the case inspected; for if this be not done, and if by any chance the proper position should have been disturbed, the bones may become solidly fixed in an improper manner, and deformity result, or the skin may become ulcerated; but the appliances should not be removed if possible before the end of the first week, and if all seems going on well, not moved again for ten days at least, unless for some special purpose. If a fracture is often disturbed or pulled about during the process of consolidation, it may chance that this will only be effected imperfectly, and what is called a false joint formed, that is, the broken part, instead of being firm, moves like a joint, and the limb is useless. It had better be crooked or shortened.

Lastly, much care is always required that a limb which has been fractured is not used too soon after the accident, otherwise it may either be snapped again, or it may be bent. The first advance towards the cure of a broken bone, is the throwing out of a jelly-like matter around the ends; this gradually becomes more solid, and, at last, is converted into a thick ring of bone; but for this latter change the lapse of some months is requisite: although, therefore, the uniting material, or "callus" as it is called, may be strong enough for ordinary purposes a considerable time before ossification has been effected, yet the limb will not bear extraordinary efforts.

With respect to the general treatment of a person who has suffered from fracture, it is always advisable, that for some little time after the accident the diet should be lowered, but that when the inflammatory stage is passed, the individual should return as much as possible to his ordinary food. Care must be taken, if the person has been accustomed to much alcoholic stimulant, that it is not *unduly* abstracted, otherwise the powers of the constitution will be so reduced, that the reparative process cannot take place, and the fracture will remain ununited. In fractures of the lower limbs, the use of a bed-pan and urinal of some kind will be required, and attention must be given to the back, that it does not get sore. An elastic horse-shoe cushion (see *India rubber*) will be a great comfort in such cases.

Fractures of the skull have been already alluded to under article *Brain*.

Fracture of the lower jaw is generally tolerably evident. The simplest treatment when displacement exists is to apply a four-tailed bandage. This is made from a yard of calico about six inches wide and torn apart from either end, to within three inches of the centre. A slit is made in the centre of this undivided piece to receive the chin, and the two lower ends are tied over the crown of the head, and the two upper crossed behind the head, and tied over the forehead. Or two handkerchiefs may be used as represented in the accompanying figure (99). For permanent use a piece of



Fig. 99.

gutta percha, cut as represented (fig. 100, *a* and *b*) softened in very hot water, then moulded to the jaw and secured by a four-tailed bandage, is the most suitable; pasteboard, tin, lead or other flexible material will do as well as gutta percha, but whatever is used must be padded inside with cotton wool before being applied. The patient should rinse his mouth frequently with a weak solution of Condy's fluid or with tincture of myrrh and water.

Fracture of the bones of the spine is a rare accident. It may be suspected, when after injury to the spine, loss of sensation in, or of

power over the part, ensues below the site of the accident. In such a case, nothing could be done by unprofessional persons beyond placing the sufferer in as easy a position as possible.

Fracture of the ribs is known by the pain which is felt at the injured spot in every motion of the body, even by breathing. The sufferer feels a grating sensation, which may be felt by another person laying the hand on the place. The chief risk involved in fractured ribs is from injury to the lungs by the sharp ends of the bone, and when this occurs it is apt to give rise to inflammation, which will require the usual treatment of the affection, from whatever cause arising. On this account, an individual who has suffered from fractured ribs should be especially careful, and for some little time after the accident should reduce his usual diet considerably. The application of the hot bran bag for some days after the accident will afford much relief, and it may be used over the usual bandage. When ribs on both sides of the chest are injured, this, with leeches, if requisite, should be the sole application; the patient being confined to bed for at least a fortnight or three weeks in the posture found to be the easiest, which will probably be a half-sitting one, supported by pillows, or some other means (see *Bed*). When the ribs

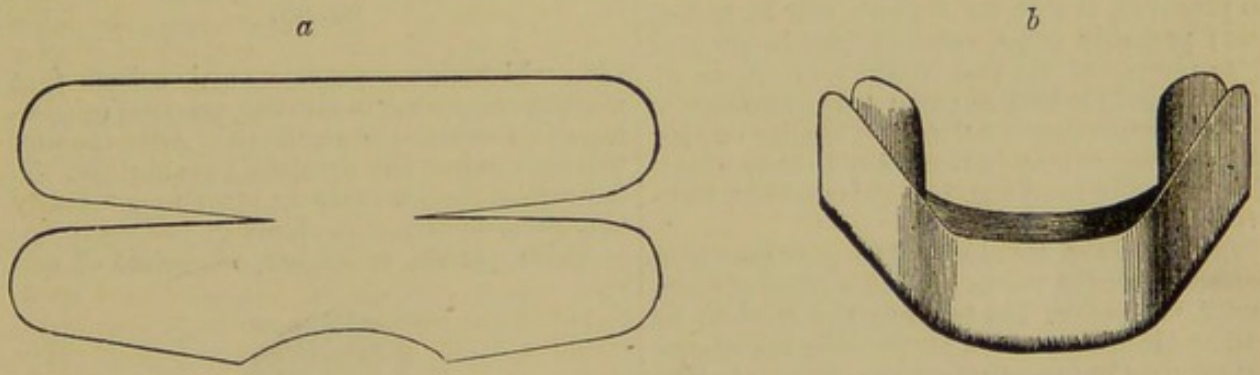


Fig. 100.

on one side only are injured, less confinement is required, but the chest should be encircled, as firmly as can be borne comfortably, with a band of stout calico, from eight to ten inches wide, and double; this should go once and a half round, and be sewn; a month will probably be required for the cure. When possible, it will be found better to apply broad pieces of adhesive plaster to the injured side only. These should reach from the spine to the middle line in front, and run parallel to the ribs, and should extend from three inches above the fracture to three inches below. A flannel bandage put lightly round the chest will prevent the plaster from separating.

Fracture of the collar bone is a frequent accident, usually from falls on the shoulder. It is generally easily detected. As the use of the collar bone is to keep the shoulder back,—when broken, the shoulder of the injured side falls forward, pushing the broken ends over one another. The object of treatment, therefore, must be to keep back the shoulder by artificial means, until the bone has recovered its solidity. This might be done by keeping a person confined to bed, and in such a position that the weight of the shoulder falling backwards would pull the bone into position without any other means being used; few persons, however, will submit to the confinement necessary, and other methods are resorted to; they are varied, but the following will most easily, and with best prospect of success, be adopted by the unprofessiona.. A wedge-shaped pad, of any firm material—a pair of stockings folded will do—is to be enveloped in the middle of a soft shawl or handkerchief of suitable size. The pad is then to be placed in the arm-pit of the injured side (fig. 101—1), the ends of the shawl must

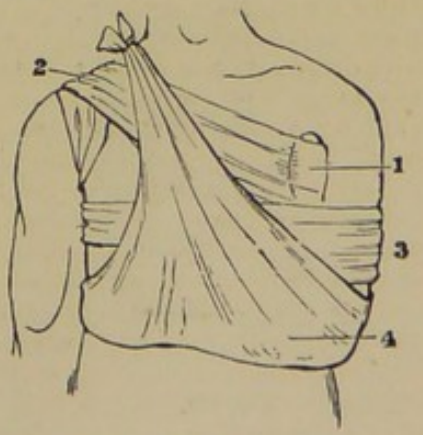


Fig. 101.

next be crossed over the opposite shoulder (2) and tied in the arm-pit, as represented; folded cloth of some kind being interposed to prevent fraying of the skin. Another handkerchief or band of some kind is next to be applied (3), so as to bind the arm down to the side in such a manner that the pad in the arm-pit acts as a fulcrum, or gives such a "purchase" as allows the outer end of the broken collar-bone to be

pulled outwards, as the arm is bound to the side; a sling enveloping the whole forearm is next to be applied, and completes the apparatus, which should be worn for a month at least. If carefully attended to, this apparatus will prove very effectual, and the means for it can always be procured. It should be understood that the principle of the treatment is, extending the broken bone by means of the pad in the arm-pit. It is sometimes requisite to apply a bandage from the fingers upwards to prevent swelling.

Fractures and other injuries about the shoulder joint are often so obscure that no uneducated person could distinguish them. The best management until surgical assistance can be procured, if it is far distant, will be perfect rest; probably much comfort may be derived from the use of the pad in the arm-pit, as recommended for broken collar bone, and also of a sling supporting the forearm, wholly or only at the wrist, as may be most easy to the patient. The confining band (fig. 101—3) *must not*, however, be used.

In fracture of the shaft of the arm bone it is better to put the whole limb in a sling at once, and if the person has to *go* to the surgeon, he will find it easier to walk than to ride in any conveyance. Confinement to bed may be requisite for some days at least, after the accident—the injured limb being laid in an easy position on a pillow, and a couple of splints of wood or

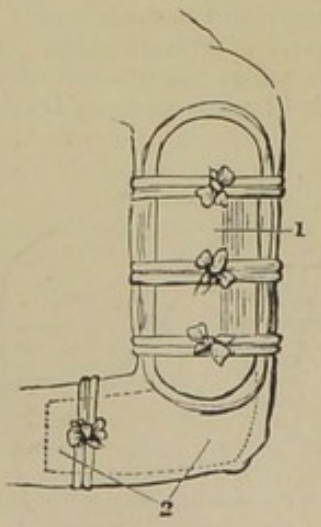


Fig. 102.

other firm material two and a half inches wide, applied one on each side the limb (fig. 102—1) and secured with just sufficient firmness to prevent movement by means of two or three-looped bandages. This bandage (fig. 103), is made by taking a doubled length, sufficient for the purpose required, of the common roller bandage; one end, or "tail," of the bandage (1) is passed through the looped extremity (2) and may then be tied to the other tail (3). This form of bandage has the great advantage of being easily loosened if requisite, should swelling ensue. Temporarily the arm may be put up in any stiff material, and held in position by a handkerchief or the triangular bandage, as in figure

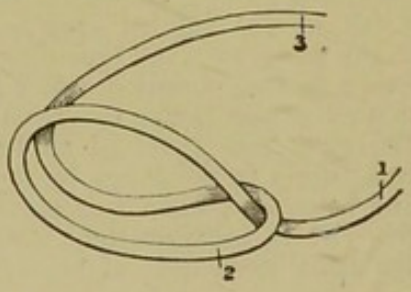


Fig. 103.

104, which represents temporary splints that might be employed in military practice, consisting of a bayonet and scabbard. After the first few days, when the swelling has subsided, the fracture of the arm may be put up more firmly and permanently. A splint of pasteboard or of gutta percha, or leather, or indeed of any



Fig. 104.

firm material, is to be put on each side of the limb (fig. 102). These ought, however, to be shaped as represented by the dotted line (2) to come along the forearm as far as the hand, and having been previously shaped on the sound arm, instead of the looped bandage, should be well fixed by means of the common roller, which may be kept from slipping by the addition of starch or paste as it is put on. Instead of the splints, however, the starch bandage alone, if the individual is not very muscular, may be used; but in this case, both the inner and outer bandage must be well saturated with

strong starch-flour paste, gum, white of egg, or plaster of Paris, and it is well to make the addition of strips of stout paper, pasted down over the inner bandage, and covered by the outer one, to give additional firmness. In this case, it will be requisite to keep the arm very quiet till the paste has dried, or a wooden splint may be tied outside the bandages till this has taken place. This method is not to be practised by the uninitiated. A sling will be requisite to support the hand and wrist, *but not the elbow*, which should be allowed to hang, the weight tending to keep the bone straight. The splints should be employed for a period of not less than four weeks.

Fracture of the forearm is a very common accident. In children the bones are most frequently partly broken and partly bent; in adults both bones or one only may be broken; in the latter case, the sound bone acts as a splint to hold the other in place; and should the accident be detected, a perfectly straight splint of light wood, applied to the inside of the arm, and extending from the elbow to the tips of the fingers, fixed by a common roller, or by some looped bandages, is all that is required; and indeed, when both bones are broken, the same treatment will be sufficient, though it is better to apply a splint on each side. After the lapse of a fortnight, in adults, the splints may be taken off, and starch bandage used; but in children, who are liable to falls, it is better to give them the protection of the wood for some time longer. In fracture of the forearm, the sling ought to give support from the elbow to the ends of the fingers, and the limb must of course be kept bent at the elbow during the period of cure. The patient should begin to move the fingers in a week after the accident, especially if the injury is near the wrist, to prevent subsequent stiffness.

Fracture of the fingers is treated by a narrow, straight, wood splint, or by starch bandage.

Treatment of *fracture of the lower extremity* by an unprofessional person must be a most unfortunate contingency; but the simpler the means used, the more likely will its management be conducted with some efficiency. Until splints are prepared, long cylindrical bags filled with sand to the extent of two-thirds of their capacity should be placed on each side of the limb, and one across, above, and another below the seat of the fracture.

In a case of *fracture of the thigh*, the removal and preparation of the sufferer having been effected as already pointed out, the following apparatus is such as an unprofessional person might, with a little care, manage efficiently; and the materials for its construction can scarcely ever fail to be procurable. Three pieces of wood, about three-eighths of an inch in thickness, will be required, and the measurement as to length should be made on the sound extremity. One of the pieces must be sufficiently broad to extend completely under the limb, and sufficiently long to extend from just above the middle of the thigh (fig. 105, 106—1, 1) to below the calf of the leg, being edged

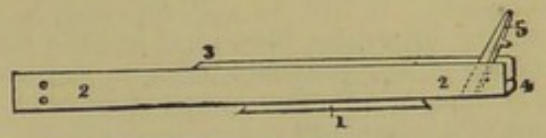


Fig. 105.

off at either end. The next piece (2, 2) to be fixed on the outer side of under one, should extend from just above the hip to a little beyond the foot, and must be pierced with two

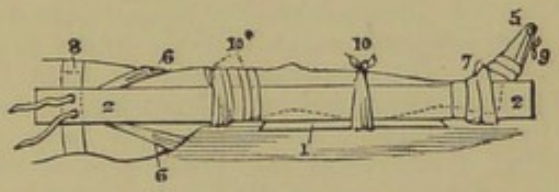


Fig. 106.

holes at the upper end; the remaining piece (fig. 105—3) should extend from about two-thirds up the thigh, to a little beyond the foot; being fixed to the inner side of the under piece, and connected with the outer piece at the lower end (4), a slanting support for the sole of the foot, and about the same width, being fitted in, so that it will admit of the limb being extended to quite its full length; this being ascertained by measurement of the sound leg. The middle of the apparatus forms a kind of box. A soft handkerchief padded must now be placed between the thighs (fig. 106—6, 6). At this stage the limb must be set. One person should hold the body of the sufferer firmly at the hips, whilst another grasping the leg just above the ankle, by a gentle and steady pull, straightens the injured limb to the same length as the sound one; the broken ends of the bone being by this means brought into contact. The apparatus having been previously well padded with any soft material—even chaff or dried leaves will do—the broken limb, still kept on the stretch, should be gently placed in it. The foot must then be secured to the padded foot board by means of a bandage or handkerchief (fig. 106—7), the heel being also well supported by the same or some similar application. The heel may be still further supported by means of a double tape sewed to the toe of a sock, previously put upon the foot; the tape being carried over the top of the foot board, and tied to a nail or peg, fixed to the back. The ends of the band (6, 6) passed between the thighs are to be passed through the holes in the upper part of piece No. 2, and tied with sufficient firmness to keep the limb on the stretch. *This is the essential part of the treatment*—the foot bound to the foot board, and the band tied through the holes in the upper

part of piece 2, act against one another, and keep the limb extended. The upper end of 2 must next be secured by a band (8) passed round the body, and the fixing of the apparatus is complete. It will be well, however, to fill up all the interstices between it and the limb, by means of soft material stuffed in, and when this is done, as a further means of security, to fix one or two bandages or handkerchiefs (10, 10) round both apparatus and limb.

The above contrivance is a modification of the one most used by surgeons for the treatment of fractured thigh, but requires much less bandaging, and is, for this reason, preferable. In the usual form of long thigh splint, the entire efficiency of the arrangements depends upon the application of the bandage, and no unprofessional person is likely to put it on properly. The apparatus may be used for fractures of the upper part of the leg, as well as for the thigh. Another simple mode of treating fractures of the lower part of the thigh, or upper part of the leg, is by means of two pieces of wood similar to No. 2, fig. 105, but shorter, and a large cloth, such as a table-cloth, in each side of which one of the pieces is to be folded up, until there is just space left to contain the limb, which being set, and placed in the space so left, the boards are to be tied up to it on each side by means of handkerchiefs, or stout tapes. This plan is represented in the following figure (107). Again,

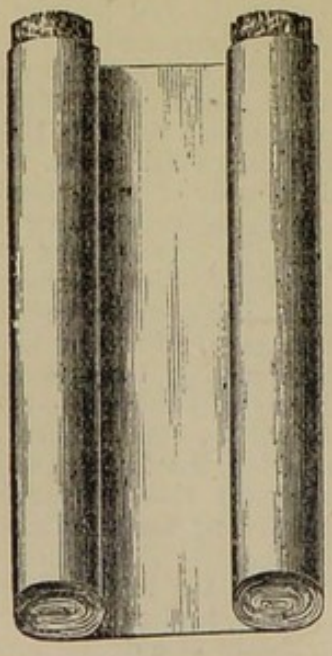


Fig. 107.

the sound limb may be made to act as a splint to the broken one. Pads of some soft material should be placed between the most prominent points of each, such as the knees, ankles, great toes, &c.; and padded bands, two or three yards long, are to be wound round the legs as they are placed together, just above the ankle and just below the knees. Or the broken thigh may be laid on a pillow, on its outer side, in the easiest position for the patient, and retained by sand bags.

Under the former of the two last-mentioned modes of treatment, a short splint, extending the length of the thigh, of wood, tree bark, or any other firm material, may be applied on the outer side, and will give additional support; under the last-mentioned, such a short splint may be used on each side.

In fractures of the legs, particularly of the lower portion, a different apparatus must be used, although in many respects the mode of management as regards padding, &c., is the same. In setting the limb, however, the thigh must be grasped by one person, and the foot by the other. The easiest position for the limb will be with the knee bent (figs. 108, 109),

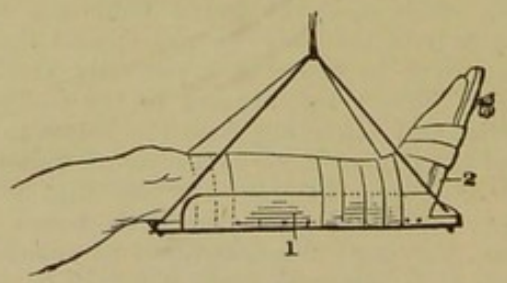


Fig. 108.

and either of the contrivances figured may be easily constructed of any common wood. The upper one (fig. 108) is merely a board adapted to the size of the limb, with side pieces (1) and foot board (2) fastened to it, and slung by cords from the corners, so that it can be suspended, as represented, from a rafter or any other convenient support. This is a very easy kind of apparatus, especially on board ship. The other apparatus (fig. 109) is also to be constructed from boards, as represented, with side

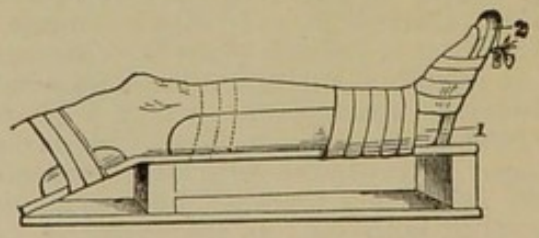


Fig. 109.

board and foot board (1 and 2). In both these, it will be an advantage to scoop out a hollow for the heel and pad well, equally with the whole contrivance, with soft materials.

Should a person break his leg—that is, fracture the bone between the knee and ankle—in any ordinary situation, the probability is that there would be immediate requisition for the attendance of a regular surgeon, and that the accident would be treated by him in his own mode. But limbs may be broken far away from skilled assistance; and it is in such cases

that the swing mode of treatment becomes the most valuable to the sufferer, and the most easy to the unprofessional attendant. The principle of the swing splint is a semi-circular receptacle for the limb, proportioned of course to its size, which can be swung by means of bands of any sort to a cradle or framework, of which fig. 110 may be taken as a sample; *a* being a

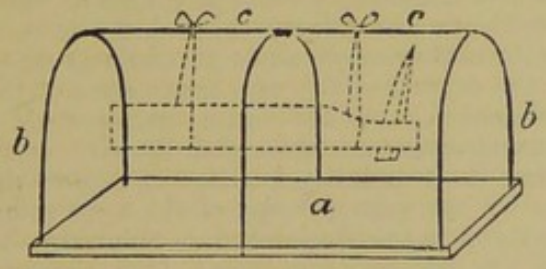


Fig. 110

board to which are fixed the iron rods, *b*, across which runs the piece of iron or wood, *c*, this forming a support from which the splint (fig. 111), containing the leg, is hung. Of course, this framework (fig. 110), may be made of any material that may be at hand, such as green wood, or any other of which an ordinarily suggestive mind may avail itself. Likewise, the splint for the limb (fig. 111, *a*) may be

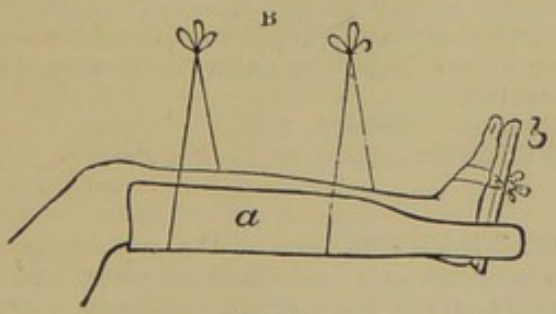


Fig. 111.

formed of rough slats of wood tacked together, or of a piece of bark, or, indeed, of any sufficiently firm material that can be formed into the splint, and be strong enough to bear a support for the foot (*b*). This receptacle for the limb could be cushioned with tow, cotton wool, or any soft material, and slung in its cradle (fig. 110) with pieces of cord, if nothing better presents itself. The apparatus being ready, the fractured limb should first be arranged as straightly and comfortably as possible in its splint (fig. 111, *a*), and should then be slung in the cradle in the *mode and position most comfortable to the patient*. It is scarcely requisite to point out, even to the unprofessional person, how great must be the comfort and ease to a sufferer from fractured leg, to have the injured limb placed in an apparatus which yields to every movement like a well-springed carriage, even should the limb not be set in quite the best surgical mode. It does happen that sufferers from such accidents have to be taken long distances before they can reach professional aid. In such cases the swing splint, constructed by some intelligent person, upon the principles above enunciated, will be found of much value.

To recapitulate,—the principles of the apparatus are: a semi-circular receptacle for the limb, padded with some soft material; a support for the foot, also padded; a cradle as above described, and swing supports—cords or such like—by which the splint is swung from the cross bar of the cradle (see figs. 110, 111); a cavity formed or cut out of the splint where the heel rests. Reference to the foregoing portions of this article, especially that on fractured thigh, will sufficiently explain the general management of these cases.

Again, the first removal of a patient who has suffered a fracture, should always be conducted with the care enjoined in the first part of the article. The bed for a patient suffering from fracture must always be a firm one. The adjustment and "putting up" of a fracture should be effected as quickly after the accident as circumstances permit, allowance being made for swelling, and if this becomes extreme, loosening of the apparatus resorted to. In setting, the bones above and below the injured one, *not the injured one itself*, are to be grasped; parts, such as the heel, &c., are to be relieved as much as possible from the effects of the continued pressure which they must necessarily undergo during the treatment. It must always be borne in mind, that whatever appliances are used in the treatment of fractures, they are all but different means to the one end—that of keeping the broken extremities of the bone in continued steady contact with as much ease to the patient as possible: that when this has been done for three or four weeks, lighter applications than those used at first may be employed, such as the starch bandage, &c.

In conclusion, the foregoing article will be of small benefit to those dwelling in the midst of civilisation; but its hints—and our space admits of but little more—may prove invaluable to those dwelling, or who may be destined to dwell, in a thinly-peopled country, or in such situations as on board ship, in which fractures are far from being uncommon accidents. Even if proper assistance be ultimately procurable, the intelligent management of a case for the first few days may be of the highest importance; and if it should happen, that throughout it has to be left to unprofessional management alone, even should a limb somewhat deficient in symmetry be the result, its cure is not likely to be more tardy or less painful, because those around are not in total ignorance of how it ought to be conducted.

Compound fractures are those in which there is a wound through the skin, permitting access of the external air to the seat of the fracture. The contingency is a truly serious one to be without the assistance of a surgeon. Sometimes

the bone protrudes considerably through the skin, and its end requires to be sawn off before it can be returned to its proper position. The great object is to heal the external wound as quickly as possible, and probably as good a plaster as any will be a piece of linen soaked in the blood, and when this is separated by the discharge, the simple water dressing.

FRECKLES. — The well-known brown spots on the skin, are most frequent upon those parts exposed to the influence of light, such as the face, neck, hands, &c., and in persons of fair complexion, especially with red hair. Water, weakly acidified with lemon juice, is sometimes useful as a wash. Sir Erasmus Wilson recommends the liniment of lime water and oil, with the addition of a little ammonia; but freckles are not to be regarded as a disfigurement to the countenance or as incompatible with health, and attempts to remove them by cosmetics are liable in the long run to prove hurtful to the skin.

FRICTION, or rubbing a portion of the body, either with the hand or with some interposed material, is of much importance as a curative agent. Applied to the skin by means of rough towels, hair gloves, &c., it excites its nervous sensibility, and the circulation of blood through its capillary vessels. Friction with the hand in thickenings and congestion of parts beneath the skin is often of much service, and in none is its beneficial effect more obvious, than where the breasts are painfully distended with milk after child-birth. In great emaciation from chronic disease where exercise cannot be taken, friction, kneading, or shampooing of the muscles of the limbs is often of service to maintain their nutrition. The various oils, &c., used along with friction, are generally secondary to the manual effect, and are chiefly serviceable in facilitating the movement of the hand; some, however, are really beneficial, the stimulant applications by exciting, and the anodyne by soothing; moreover, some, such as cod-liver oil, turpentine, &c., appear to exert a specific effect.—See *Circulation—Constipation.*

Refer to—*Liniment, &c.*

FRIGHT.—See FEAR.

FROST.—See COLD.

FRUITS.—See the individual articles upon the various fruits.

FRYING is a mode of cooking very ill-adapted for persons of weak digestion.

FUMIGATION.—See CONTAGION—DISINFECTANTS—BATH, VAPOUR, &c.

FUNCTIONAL DISORDER. — See DISEASE.

FUNGI.—See MUSHROOMS.

FUNIS.—The navel cord.

FUR, as an article of dress, may be either extremely beneficial or the reverse, according to the manner in which it is used. When worn *over* other clothing in the open air, or as a regular *fixed* article of clothing in itself, the bad conducting power of fur renders it one of the most efficient protectors against cold, or rather preservers of heat, we possess; but when it is used as an *occasional* article of dress, it is a dangerous one, and has proved so in the various forms in which it has been worn by females. When kept close to the skin—as of the neck or throat—for any length of time, it produces excited action and perspiration, which is liable to be suddenly checked the moment the fur is thrown off, and cold and sore throat are the consequences; very many cases of this kind occur, and the cause unsuspected, is repeated again and again with the same effect, laying the foundation perhaps of serious disease by the improper use of the very means employed to guard against it. Many females, liable to cold and sore throat, have been surprised how that liability has vanished with the laying aside of the use of fur round the throat. The change must, however, be made at first with caution. It is not, however, the fur which is at fault, but the uncertain mode of using it; moreover, its power of exciting the skin renders it a valuable agent when worn permanently next it, particularly on the chest in winter, by persons with delicate lungs. It not only protects from cold, but keeps up mild counter-irritation. A prepared hare or rabbit skin lined, makes as good a fur chest protector as any other. Furriers, accustomed to employ mercurial preparations in their manufacture, are liable to suffer from mercurial poisoning.

Refer to—*Clothing, &c.*

FURUNCLE—a Boil.—See *Boil.*

GALBANUM, one of the gum resins, is procured from an umbelliferous plant, and is brought chiefly from Persia and India. It is stimulant and carminative, but is not much employed in medicine at present. Its best preparations are the plaster, which is stimulating, and the compound assafœtida pill, which is a compound of equal parts of assafœtida, galbanum, and myrrh, and is useful in nervous affections, flatulence, &c.

GALL.—The Bile.

GALL BLADDER, the receptacle for the bile, is situated beneath the right lobe of the liver, almost exactly at the boundary line between the epigastric and right hypochondriac region (see *Abdomen*). It is pear-shaped (fig. 112—1); from its smaller end proceeds a duct (3) which shortly joins a similar duct from the liver (4), the two together forming the common bile duct (2), which enters the duodenum (5) in its descending portion. During its retention in the gall bladder, the bile becomes thicker from the absorption of part of its water.

GALL STONES are concretions formed from the peculiar crystalline ingredient of the bile—the cholesterine. The concretions are of every variety in point of size, up to that of

a walnut; when small, the number, either passed by the patient, or found in the gall bladder after death, is often very great. These concretions may, and often do, exist in the gall bladder, without giving rise to any unpleasant symptoms; their presence only being discovered on examination after death; but should one of them, from any cause, pass into the duct, it gives rise to most violent spasmodic pain, which continues with little intermission until the stone has descended into the bowel through the ducts.

The ordinary calibre of the gall duct is about that of a goose-quill, and the stone is generally of much larger size; the passage therefore of a gall stone is often a protracted one.

Symptoms of gall stone often supervene suddenly; the person is seized with the most agonizing pain in the region of the gall bladder; probably, there is severe shivering and vomiting, and these do not disappear till the stone has passed; there may or may not be jaundice, probably not, as long as the obstruction does

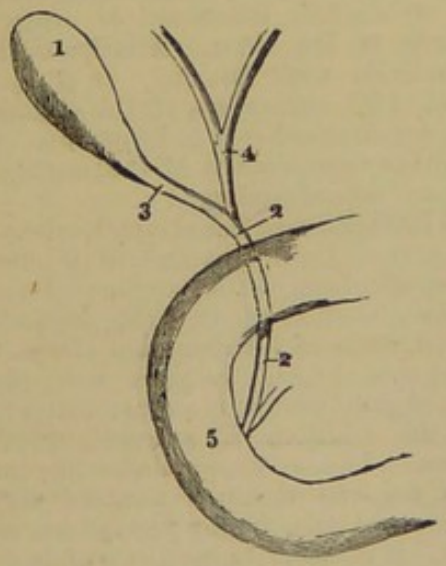


Fig. 112.

not pass into the common duct (fig. 112—2) and so stop the flow of bile from the liver. If jaundice comes on, the evacuations from the bowels become white and chalky in appearance. The fact of there being no fever present, and that the pain caused by a passing gall stone is relieved instead of aggravated by pressure, is sufficiently indicative of the absence of inflammation. After the occurrence of the above symptoms, it is always proper to examine the evacuations from the bowels, to verify the disease by finding the cause. Gall stones are easily detected in the evacuations, as they *float* upon water.

When an individual is suddenly seized with symptoms of gall stone, no time should be lost before applying hot applications over the seat of the pain, or getting the sufferer into a warm bath. Opium ought to be given at once, either by the subcutaneous injection of morphia or by the mouth. If by the mouth, thirty drops of laudanum may be administered at once, and failing relief, the dose may be repeated in a couple of hours. As the retching is often severe, and liquids of every kind are vomited as soon as taken, the subcutaneous injection is preferable. Persons who are liable to repeated attacks of gall stone should keep one grain opium pills beside them to take when necessary. There is generally much distressing acidity of stomach whilst a gall stone is passing, and Dr. Prout's plan of giving full and frequently repeated draughts of hot water, containing in each pint a full tea-spoonful of carbonate of soda, affords much relief, whether vomited or not. Of course laudanum may be added to the soda solution if requisite. If the stomach will not retain the remedies, the opium may be administered by enema; a pint or more of gruel, with forty drops of laudanum, repeated if requisite. Mustard plasters over the seat of the pain may be useful, but are much inferior as an application to the hot bran poultice, on the surface of which laudanum may be sprinkled.

The suddenness of the attack of gall stone, and the agony of the pain, render it one of the diseases in which unprofessional persons may afford most valuable assistance by judicious management; and by following the above directions they will certainly give relief, perhaps from many hours of suffering, if medical assistance is distant. A person who has once suffered from gall stone ought, of course, to be examined medically, but much may be done to ward off attacks by attention and management as indicated in the articles *Diet*, *Bile*, *&c.*, and by regular and sufficient exercise either on foot or horseback, and, in addition to these, the use of special cholagogues or liver medicines. For long, mercurials, as blue pill, calomel, and such like were chiefly used as liver regulators, but of late years we have had some most valuable vegetable substitutes, which can be regularly and freely used. Of these podophyllin has been best and longest known, but it has peculiar disadvantages, and is now being greatly superseded by euonymin and iridin, either of which may be taken in doses of two grains each in the form of pill. Their action is easy, almost insensible, and yet very effectual in regulating the liver functions.

Refer to—*Bile*—*Diet*, *&c.*

GALLS, or GALL NUTS, are excrescences produced upon the twigs of a species of shrubby oak, by the prick of an insect for the purpose of depositing its eggs. They are brought from the shores of the Levant, and from Asia. Galls are powerfully astringent, owing to the tannin, or astringent principle they contain, which, in its separated forms, of gallic and tannic acids, is now largely used in medical practice. These acids possess the same properties, and when employed by themselves, or in the more popular form in combination with

glycerine, they check the secretions by their astringent action; and by their power of precipitating albumen, they protect wounds and bleeding granulations from exposure to the air. The preparation of tannic acid, one part to four of glycerine, of the British pharmacopœia is an extremely useful one, and is employed for an infinite number of purposes. For offensive discharge from the nostrils and ear passages, to allay the intolerable itching in the common skin disease called eczema, as an application to the throat in aphthous ulceration, elongated uvula, and even in hooping cough, glycerine tannin has been found very serviceable. A mixture of glycerine tannin and glycerine of carbolic acid checks and deodorises the offensive discharge from the uterus, in cases of malignant disease of that organ. Gall ointment is a useful application in piles in persons of relaxed or enfeebled constitution, but is quite the reverse in those of full habit, in whose cases the piles are generally in a state of active inflammation. The best form of ointment is,—galls, in very fine powder, two drachms; opium, in powder, one drachm; lard, one ounce; well rubbed up together. Gallic or tannic acid is the best antidote to poisoning by tartrate of antimony, and in poisoning by strychnine or morphia, it would be given to render these agents less soluble.

GALVANISM.—See ELECTRICITY.

GAMBOGE or **CAMBOGE,** the well-known pigment, is a drastic cathartic, too powerful to be used alone with safety, as a domestic remedy. In an overdose it seriously irritates the lining membrane of the stomach and bowels, causing inflammation of a dangerous or fatal character. Gamboge is said to form a constituent of some of the quack purgatives, and certainly any compound medicines containing it cannot be safely adopted for general or "universal" use, however valuable the medicine may be when administered in proper cases. When simple purgative action is required, gamboge cannot be requisite whilst we possess safer and equally effective drugs; but from its property of producing free watery evacuations from the bowels, in cases of dropsical swelling, it is very serviceable. Gamboge is most safely and advantageously given in combination, and the compound gamboge pill is a powerful cathartic adapted for those in whom confined bowels accompany a full and strong habit of body. The gamboge pill mass is composed of the following ingredients, gamboge in powder, Barbadoes aloes, and compound powder of cinnamon, of each one drachm, hard soap in powder two drachms, with a sufficiency of syrup to make a mass when beaten up. The dose is from five to ten grains.

Refer to—*Dropsy—Cathartics.*

GAME.—Wild animals used as food, the flesh of which is a little less digestible than poultry and beef and mutton, but suited to many persons on account of the less proportion of fatty or oily substance which it contains. Of course game, like other articles of food, may be rendered hurtful by sauces and modes of dressing.—See *Food.*

GANGLION, in anatomy, means an aggregation of nerve substance. In surgery, it is applied to the elastic swellings which appear upon the wrist or top of the foot, generally about the size of a hazel nut. These may often be removed by bursting the small bag or cyst of which they consist, and thus effusing the contents—which resemble the white of egg—into the surrounding parts; a bandage being applied afterwards. The case is best submitted to the surgeon.

GANGRENE.—See MORTIFICATION.

GAPING, or YAWNING, is a nervous affection, indicative of nervous exhaustion and depression of the circulation. Persons in health are, as is well known, liable to gape when tired. Like other nervous affections, it is apt to give rise to imitation in others.

Gaping is, however, a not unfrequent symptom of disease, functional or organic, particularly of the chest. Attacks of hysteria accompanied with fainting, or of spasmodic asthma with depression of the action of the heart, are often ushered in by gaping. Persons who suffer from disease of the heart are also liable to "fits of gaping."

GARGLES are liquid applications to the back part of the throat and to the mouth, in various affections of these organs. Gargles are too often used as astringents, particularly in the first stage of inflammation of the tonsils, &c., or sore throat. In these cases, the warm water, or gruel gargle, is a much better remedy, with the addition of a small quantity of vinegar. The common domestic gargle of "sage tea and vinegar" answers very well. As a general rule, in the first stages of "sore throat," it is better to use the simple soothing gargles, nearly as warm as can be borne; in the latter stages, when there is often much stringy phlegm about the throat, the more stimulating and astringent gargles will be useful. For the latter, from four to five drops of hydrochloric acid in the ounce of water is as good a form as any; or the infusion of roses with ten to fifteen drops of dilute sulphuric acid to the ounce of water. Another very useful gargle in cases of relaxed sore throat is made with a drachm of alum, half an ounce of tincture of myrrh, and water sufficient to make up a pint. Perhaps one more useful still is made by adding from thirty to fifty minims of tincture of steel to half a pint of water. Cayenne pepper is also used as a gargle (see *Capsicums*). In cases of chronic weakness of the throat, with tendency to frequent swelling and inflammation, a gargle of oak bark decoction, or of salt water, is of much service, used every morning for some time. Gargling the throat with an antiseptic, such as chlorate of potash or

Condy's fluid in solution with water, removes the fetor from offensive ulcers of the throat. Gargling is effected by throwing the head back, and, consequently, the fluid back in the throat, and expelling the air through it from the lungs; it is thus worked, as it were, into every part of the throat. The application of medicated spray to the back part of the throat by means of Siegle's spray instrument is now much employed for the same purposes as gargles, and with equally good results.

GARLIC.—See ONION.

GAS is an elastic fluid, which is permanently aëriform at all ordinary temperatures, being distinguished from vapours, which are only temporarily elastic and aëriform. The gases alluded to in the course of this work are—

Ammonia.
Azote, or Nitrogen.
Carbonic Acid and
Carburetted Hydrogen.
Chlorine.
Hydrogen and
Sulphuretted Hydrogen.
Oxygen.

Refer to separate Articles.

GAS STOVES.—See *Ventilation* and *Warming*.

GASTRIC JUICE is the acid viscid fluid secreted in the stomach when that organ is excited by the presence of food; the office of this peculiar secretion being the solution of the nutriment, or rather the reduction of its albuminous and gelatinous portions to a state in which they are fit for absorption into the system. The gastric juice owes its solvent properties, which are very powerful, to the hydrochloric acid and peptones it contains.

Refer to—*Digestion—Food—Indigestion.*

GASTRITIS.—See STOMACH, INFLAMMATION OF.

GELATINE, or GLUE, is an azotised component of animal bodies, of simpler constitution than the azotised albuminous compounds (see *Food*). It may be extracted from tendons, skin, &c., by long boiling, and from bones by dissolving out their earthy matter by acids; it occurs pure in many fishes, the air bladders of which are formed of gelatine; isinglass, so well known as a jelly-making compound, being the prepared swimming or air bladders of the sturgeon, cod, ling, &c. The gelatine sold as such is generally prepared from bones. Many persons have a prejudice against this gelatine, and imagine it not so good as that extracted from calves' feet, or prepared from isinglass. The amount of nutriment in gelatine is very small, but gelatine has a remarkable facility for assimilating with other food, and with sugar and wine (the common way in which it is administered) it forms a very agreeable adjunct to the limited fare of the invalid. There is no reason to believe that the manufacture of gelatine from other substances than isinglass or calves' feet is otherwise than properly conducted, and it is a pity that many should deprive themselves and others of so convenient an addition to cookery for the sick.—See *Cookery—Food, &c.*

GENERAL HEALTH.—By the term is meant the state of the body and its functions collectively, in contradistinction to the condition of any special portion of the frame. The state of the general health is always an important consideration, with respect to local maladies, both as regards their treatment and ultimate prospects. The latter must always be more serious when the general health begins to suffer.

GENTIAN ROOT is obtained from the *Gentiana lutea*, or yellow gentian, which is a native of the more elevated ranges of the Alps, Pyrenees, &c. The root is brown externally, irregular, knotty, ringed, and from half an inch to an inch in diameter; it is yellow within. Like the gentians generally it is extremely bitter, and on account of this property it constitutes one of our most extensively used and most serviceable tonics and stomachics. The most useful medicinal preparations of gentian are, the extract, the infusion, and the compound tincture. The extract is chiefly used in from five to ten grains—or more—doses, as an ingredient in tonic or aperient pills. The compound tincture may be taken in one or two tea-spoonful doses, in water. Quite the best preparation, however, for general use, is the infusion prepared in a concentrated form, according to the following process: To every ounce of sliced gentian root add a quarter of an ounce of dried orange peel, and infuse these—not boil—with successive quantities of boiling water poured over them, until their strength is entirely exhausted. The whole of the infusion thus made, being separated from the root and peel, must next be concentrated by boiling in a well-tinned or porcelain-lined saucepan, until the quantity is so far reduced that there is left half a pint of the concentrated infusion for every ounce of gentian used. To each half pint of this concentrated infusion half an ounce of alcohol is to be added. The effect of this addition of spirit is, to coagulate a quantity of jelly-looking substance, which must be separated by straining through flannel. The infusion will thus be got clear, and will keep for a great length of time, the dose being one tea-spoonful in an ounce of water. When the fresh infusion for immediate use is required, a quarter of an ounce of gentian root sliced, with the addition of a little orange peel, to the pint of water, will be a proper strength, if infused for an hour or two.

GERMS OF DISEASE.—It has long been admitted that certain forms of disease, especially such as in their epidemic form have decimated large bodies of people, were communicated by something latent in the atmosphere, or were spread from person to person, by infecting particles or germs having the property of reproduction to an alarming extent.

under circumstances favourable to their development; but it is only within the last few years that this theory has obtained practical demonstration. Many circumstances apart from contagion tend to favour this view of the parasitic origin of disease. The analogy which exists between the process of fermentation, when associated with the growth of the yeast plant, and the febrile conditions caused by the introduction of infection, or diseased matter into the blood, naturally led observers to infer that a zymosis, or ferment similar to what takes place out of the body, had its nidus also in the interior. Hence the term "zymotic" came into common use to specialise the character of numerous diseases, originating from a virus of a specific character in an organised or live state, allied, or rather supposed to be allied, to what we know of the nature of ferments. We are greatly indebted for our knowledge of the bacteria to Pasteur, the celebrated French chemist, who, by a series of elaborate experiments, first recognised the fact (see *Fermentation*) that wherever there is fermentation, there must be vitality to originate, develop, and complete the process; and by the discovery of the special characteristics of numerous ferments, each capable of reproducing and multiplying its own micro-organisms, and no others, naturally led up to the understanding that each well-marked form of disease was attributable to its own peculiar living germs. These germs or bacteria, representing the lowest forms of growth, or matter in an organised state, and bearing an analogy to the minute globules developed by yeast, are to be seen by the higher powers of the microscope in all stages of the process of putrefaction; in the progress of wounds, especially such as are of an unhealthy character, as well as in the fluids and tissues of the body in numerous diseases. It was until very lately assumed that bacteria pervaded the fluids of the body in a state of health; but this doctrine is now denied by the best and most recent authorities, and if their opinion is to be received, the ground is cleared for the more favourable investigation of the organisms of disease. Hitherto it has been chiefly among the lower animals that the specific germs of some well-known diseases have been studied, and in one well-known complaint variously named, malignant pustule, charbon, and splenic fever, which occasionally occurs in man, the micro-organism and its characteristics have been minutely investigated, and with manifest advantage, as proved by the success which has attended the measures for attenuating the virulence of the organisms, by a process corresponding to vaccination. In this complaint, which chiefly attacks sheep and oxen, the disease germs are well defined, are always found in myriads in the blood of the affected, and animals inoculated with the virus die in the course of a few hours. From the disease with which it is associated, the name of "bacillus anthracis" has been given to the infecting agent, which may be separated from the blood and tissues of the body, and cultivated apart from all surroundings through successive generations of bacilli, without losing a particle of its potency. Pasteur has even shown that the remains of animals which had died from malignant pustule were still infected with the organism after the lapse of twelve years,

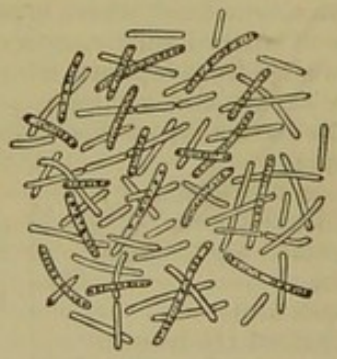


Fig. 113.

by reproducing the distemper in all its virulence in others. The bacilli in question are formed of translucid filaments of a more or less segmental shape; these, when examined by high microscopic power, are seen to contain spores, having the property of reproducing the organism afresh by subdivision and elongation into the rod shape represented (fig. 113).

Malignant pustule is said to be as fatal to cattle as small-pox is to the higher animals; but since experiments on a large scale have been made in France, with the view of diluting its virulence, and by subsequent introduction of the attenuated virus into the animal's system, the ravages of the distemper have been immensely reduced. Similar investigations have been made by Pasteur on the specific character of the bacteria which are the cause of chicken cholera, and by Klein on the parasitic organisms which produce a typhoid fever peculiar to the pig; but by far the most important of these microscopic discoveries is that in which Koch, of Berlin, by pursuing a series of careful and elaborate researches, has shown those minute organisms to be intimately associated with consumption and the category of diseases allied with it, to which the name of "tuberculosis" is applied by medical men. Koch has demonstrated that in this disease there are always to be found micro-organisms or bacilli of a well-defined shape and character totally distinct from other disease germs; and these, when separated from the body and their surroundings, are capable of reproducing themselves, and the disease in question and no other, among the lower animals, and doubtless in man. They are like other bacilli, of a delicate rod shape,

from a fourth to a half the diameter of a blood-corpuscle in length, and are found constantly present in the expectoration of consumptive persons. In the tubercular deposits in the lungs, and other organs of persons who have died from consumption, they are found in large colonies (especially in deposits where the growth has been active and recent), and more sparingly distributed in old tubercles where the disintegrating process has ceased.

All observations tend to show that, however much the germs of organic life pervading all nature resemble each other in their growth and characteristics, there are numerous species which have the power of conveying and reproducing, under favourable circumstances, distinct forms of disease; and although not yet clearly established, there is every reason to believe that each one of the well-marked species of infectious diseases is propagated by its own peculiar virus latent in these organisms, which, finding a genial soil in the human body, grows and fructifies therein. On the other hand, there is a limit to this vitality as there is to the life of all organic products, and the same chemical agents which we are in the habit of employing to stamp out infection, namely, heat, chlorine, sulphur, carbolic acid, &c., have the power of rendering the micro-organisms referred to, though in different degrees, comparatively innocuous. The application of this theory, if the term "theory" can any longer be applied to it, is the foundation of the system of antiseptic surgery introduced by Lister. Some of the practical results of the more exact knowledge now possessed may be gathered from the article on *Disinfection*, and from the remarks under the heading *Enteric Fever*. It is still an open question whether germs are the direct cause of the diseases with which they are associated, or whether the cause is to be attributed to the generation of poisonous materials consequent upon their existence; but this does not affect the main fact, that their presence is an essential element in the production of the diseases referred to.

Among other important results attributable to our more exact knowledge of the relation of germs to the diseases with which they are associated, may be mentioned the attention which has thus been directed to our food supply as a danger to health. For example, outbreaks of scarlet fever associated with the milk supply have more than once been fairly conclusively proved to be connected with trivial affections in cattle, which had previously been looked upon as unimportant. Again, startling evidence has been recorded which points to a connection between diphtheria and certain affections from which our domestic animals may suffer. Consumption, also, and tubercular affections generally, which have been proved to belong to the germ class of diseases, are more than likely to be produced in man by milk and butcher's meat from animals suffering from tuberculosis. Notwithstanding these facts, however, which, no doubt, as time goes on, will be more positively proved, we must not forget that by far the most important element in the propagation of infectious disease is personal communication, either direct or indirect, through the various media already indicated.—See *Disinfection*—*Fermentation*.

GESTATION.—See PREGNANCY.

GIDDINESS,—DIZZINESS,—in medical language "vertigo," is a sensation of confusion, and loss of the power of balancing the body, which is frequently momentarily experienced even by persons in good general health, and is unquestionably often attributable to stomach derangement solely. An abnormal condition of the supply of blood to the brain is a probable direct cause of giddiness, and this tendency is most palpable after persons have been confined to bed, or to the horizontal position for a short time and on first assuming the erect posture. Intoxication is an example to a certain extent of the same thing. A mere passing giddiness is probably owing to some cause which a little attention to the state of the stomach will correct; but repeated attacks, especially if accompanied with palpitation of the heart, or pain and heat about the head, require medical examination without delay.

GIN, the well-known liquor, also known as Geneva, or Hollands, contains oil of juniper, and when first introduced was used simply as a diuretic medicine; it ultimately, however, became an object of trade and of general—too general—use. It certainly often increases the flow of urine in a marked degree.

GINGER, the well-known spice, is the creeping root of a tropical plant. That used in Britain is chiefly brought from the East and West Indies. Two kinds of ginger are met with, the dark coated, and the pale peeled ginger; the latter is the best. "The rhizomes, or root pieces, of ginger of good quality have no epidermis, or outer skin, are plump, of a whitish or faint straw colour, soft and mealy in texture, with a short fracture, exhibiting a reddish resinous zone round the circumference; the taste should be hot, biting, but aromatic. The rhizomes of ginger of inferior quality are frequently coated with epidermis, are less full and plump, often constricted and shrivelled; of darker colour, being of a brownish-yellow; of harder texture, termed flinty; and more fibrous, while the taste is inferior and less aromatic." Ginger root is chiefly adulterated by means of processes used to give the inferior quality the appearance of the best; for this purpose, whitewash, chloride of lime, sulphur fumes, &c., have been used.

As an aromatic, especially when added to medicines to correct their griping properties, ginger is peculiarly useful. For persons of relaxed habit it is well suited as a spice, but by

those of full habit, especially with tendency to the head, it should be sparingly used in diet.

GLACIAL ACETIC ACID, the strongest form of vinegar, is the best application for destroying corns and warts; a drop or less should be applied by means of a small glass rod to the excrescence, which it usually removes after one or two applications.

GLANDERS, the malignant disease to which the horse, the ass, and the mule are subject, is also capable of being communicated to man, certainly by inoculation, perhaps by simple contact with the skin. In the above animals, the disease is manifested by a yellowish, bloody, fœtid, adhesive discharge from the nostrils, the lining membrane of which is ulcerated. Should any of this discharge come in contact with an abrasion of the skin, or even get lodged on the sound skin, as of the hands, or be snorted upon the nostrils or eyes of man, it is capable of originating this horrible disease. From two days to a week after inoculation, the attack is ushered in with fever symptoms, or by vomiting and diarrhœa; then small tumours appear which ulcerate and discharge from under the skin in various situations, and there is yellow viscid discharge from the nostrils, &c. Almost every case of this fearful disease has proved fatal. The object for mentioning it here is to impress caution upon all who may be exposed to the contingency. The immediate destruction of an affected animal should, of course, be effected, and its entire body at once buried.

GLANDS are bodies situated in various parts of the animal frame, their office being either the elaboration of some fluid, or the separation of some secretion from the blood; of the former the mesenteric glands are examples; of the latter, the liver, salivary glands, &c.—See *Absorbents—Digestion, &c.*

GLAUBER SALT, or SULPHATE OF SODA.—See SODA.

GLOBUS HYSTERICUS.—See HYSTERIA.

GLOTTIS.—The superior opening of the larynx.—See *Larynx.*

GLUTEN is an azotised principle which exists in the grains, and corresponds to the fibrine of animal bodies; it is, therefore, highly nutritious.—See *Food—Grains, &c.*

GLYCERINE is a substance which does not exist ready formed in nature, but enters into the composition of all oils and fats, whether animal or vegetable, and was discovered by the illustrious chemist Scheele, in 1779, who called it the "sweet principle of oil." It is obtained in great quantity during the manufacture of candles. Thin glycerine, and also, it may be said, English glycerine, is quite the best. It has been extensively employed in the arts as well as for a variety of medical purposes. At its first introduction the Emperor of Russia caused many little bottles of it to be distributed among the poor inhabitants of the Caucasian mountains, who suffer so much in winter from fissures of the skin, on the hands, &c. The supply was obtained from a candle manufactory at Odessa.

It has been used very extensively as an application to many skin diseases, both alone and as a constituent part of many ointments and soaps. It is also much used as a convenient solvent for many drugs, in the treatment of disease of the eye, throat, &c., and was fairly tried at the Brompton Hospital as a substitute for cod-liver oil, in pulmonary consumption. The results obtained were negative as to benefit, or the reverse. Those who believe in its use in consumption, will find the following a good prescription, especially if there is emaciation, loss of appetite, or profuse perspiration:—Take dilute nitric acid, two drachms; glycerine, two ounces; infusion of quassia, sixteen ounces—mix. A tablespoonful to be taken three times a day. Amongst the most useful properties possessed by glycerine may be mentioned its antiseptic power, that is to say, its capability of preserving substances immersed in it from decay. Hence it is much in use in the preparation and preservation of microscopic specimens of the animal tissues, &c. On the Continent it has been highly praised as a remedy or preventive against hospital gangrene, though surgeons in this country have not the same confidence in it.

One ounce of glycerine added to ten ounces of water, forms a lotion which can be applied so as to constitute a kind of protective varnish, which might be useful in some cases of burns, also in cutaneous diseases.

Borax and glycerine form an excellent combination as a lotion to be applied to many cases of scaly eruptions of the skin. Take twenty or forty grains of borax, one ounce of glycerine, and seven ounces of elder flower water—mix. Apply the lotion night and morning. The following lotion is very valuable in certain cases of skin disease, with much irritation and itching:—Take of glycerine, two ounces; dilute hydrocyanic acid, one drachm; bicarbonate of soda, two drachms; add water to one pint. The lotion to be applied night and morning. Glycerine with tannin and with gallic acid are two favourite methods of applying these remedies to the mouth, throat, and ear when it is necessary to produce an astringent combined with an emollient effect. Equal parts of starch and glycerine form an excellent plasma for various affections of the skin, accompanied with harshness and dryness.

One great objection to the free use of glycerine is that it is rather expensive, at all events, for the poor, to whom it is so serviceable in cold climates. It is to be feared also, in consequence of the diminished consumption of candles, that the price will be further enhanced.

Refer to—*Cerumen—Ear, &c.*

GODFREY'S CORDIAL is one of the dangerous quack carminatives frequently given

to children. It contains opium, and fatal consequences are often the result of its administration. The remarks made upon "Dalby's Carminative" apply equally to this legalised but dangerous compound.

GOITRE.—See BRONCHOCELE.

GOOSE.—See POULTRY.

GOOSEBERRY.—One of our most wholesome fruits. It is aperient, and the seeds of ripe gooseberries add to this property by their mechanical action upon the bowels.

GOULARD EXTRACT is a saturated solution of sugar of lead, which, when diluted, forms goulard water.

Refer to—*Lead.*

GOUT is a disease of the blood. Its exact nature is disputed, but it has been positively proved by Dr. Garrod, that the blood of a gouty patient contains an undue quantity of a peculiar acid named uric acid. This acid is contained in small proportion in healthy blood, but in the disease in question, that proportion is found to be considerably increased. By some, the excess of this uric acid is thought to be the effect, by others the cause, of the malady; however that may be, the fact of its presence is undoubted; moreover, the proper outlets for this acid is by the kidneys, in the urine, which, as a rule, contains it in certain proportions, but in greatly increased proportion in some peculiar conditions of the constitution, when it constitutes one form of gravel; it is even a matter of popular observation, that gravel and gout are nearly connected; they often alternate with one another in the same person, and in the same family are found affecting the various individuals of it; the gout the males, the gravel the females. There is no disease, perhaps, the hereditary tendency to which is more thoroughly established than gout. Generally it occurs in persons of full habit, especially if they consume much stimulating food and drink, and take little exercise, but it also shows itself in the weak and debilitated. The attack is generally preceded by symptoms indicative of derangement of the general health, and particularly of the digestive organs. Dr. Gairdner, one of the best authorities on the subject, enumerates dull pain in the side, headache, confined bowels, high-coloured urine, and scaly eruptions on the skin, as among the most frequent warning symptoms. The attack itself generally comes on in the night, and the sufferer is awakened by the pain in the foot, having, perhaps, previous to awaking, passed through a night-mare or "suggestive" dream (see *Dreams*) in which the scenes are connected with the uneasiness experienced. The ball of the great toe is the part most generally attacked, though not invariably; the pain is very severe. A French author, in describing it, says, "Place your joint in a vice, and screw the vice up until you can endure it no longer; that may represent rheumatism: then give the instrument another twist, and you will obtain a notion of the gout." The part attacked by the gout becomes swollen, hot, red or bluish-red, and shining; these symptoms continue with more or less intensity for some days, and then subside. Along with the local symptoms, there occurs more or less feverishness and disorder of the bowels and urine, but when the attack has passed away, the individual is left in a better state of health than before. This fact has given rise to many erroneous ideas, and much erroneous practice in connection with gout, and by those subject to it; regarding it as a salutary affection, they have rather encouraged it than otherwise—the more so that the encouragement involves indulgence, rather than self-denial—forgetful, that although the outward manifestation of a fit of gout may end in a salutary effect, from its being the disturbance occasioned by the constitution endeavouring to free itself from morbid matter; it must be far better if no such disturbing effort is required at all, and further it is certain, that no *constitution can be the subject of these repeated, violent perturbations, without its becoming permanently weakened, or wholly broken up.* Let none, therefore, who have a gouty tendency, and are periodically renovated, as it were, lull themselves into security by the idea that they suffer no injury, for the constitution cannot fail to be impaired by the repeated trials. Their only security rests with themselves, in avoiding those habits and modes of life which engender that state of system and blood that winds up with a fit of the gout. Moreover, although these fits may at first be more painful than dangerous, this is far from being the case as life advances, and the constitution suffers; then gout may, and often does, attack some more important part than the great toe; and the stomach, the heart, or brain, are apt to become its seat with fatal consequence.

The most undoubted predisposing cause of gout is hereditary tendency, and it is one very widely distributed, though not always actively developed; the other causes are, luxurious habits, the habitual consumption of a larger quantity of food—especially of animal food—than is required by the system, and undue consumption of wine and malt liquor, especially the former. These of themselves will develop gout in the predisposed; but if their use is coupled with deficient exercise in the open air, the exciting power becomes much increased. Moreover, the same acting causes give rise to attacks of red or uric acid gravel, that is, to the excretion of this from the blood, by the kidneys in the urine. Old malt liquor has a peculiar tendency to produce in those consuming it this uric acid, even in spite of regular exertion in labour; and the author has found brewery labourers, who often consume a considerable amount of ale, suffering from alternate attacks of gout and red gravel. In the country, gout is not a common disease, for the popu-

lation generally, whilst they do not consume excessive quantities of meat and malt liquor, have also the constant counter-action of plenty of fresh air and exercise. When gout is met with in the country, it is generally in those connected with inns and public houses, who consume malt liquor largely, and take little exercise.

From the above it is evident, how much any one with a liability to gout has it in his own power to prevent its occurrence; malt liquor he should never touch, wine very sparingly, or if he must have some stimulant, though he is much better as a general rule without any, a little gin or brandy and water. Meat should be eaten sparingly and only once a day; never at night. Whole meal bread, vegetables generally, cooling fruits and milk preparations, are the safest articles of diet for those predisposed to gout; but tea, and especially coffee, should not be taken strong. Further, early rising, attention to the condition of the skin by frequent washing and regular daily exercise, are the best adjuncts to temperate diet. It is perhaps not saying too much to affirm, that persons predisposed to gout may almost wholly escape its attacks by attention to the above rules of health. In advising exercise, however, the caution must be given, that it is not violent and fitful exertion which is recommended, this being, in fact, more likely to develop the disease than to prevent it. The regularity of a sufficient amount of daily exercise is the essential: indeed, not only does *violent* physical exertion, especially of an unusual kind, tend to excite a fit of gout, but even strong mental emotion or violent passion has been known to do the same.

Regarding the best treatment of gout during the existence of the attack, there is considerable diversity of opinion. Little is to be done to the inflamed part; certainly cold applications, which have been recommended and used, are dangerous; but a piece of flannel, wrung out of warm water, laid *lightly* over the joint, and covered lightly with a piece of oiled silk will give relief, or the lotion of sugar of lead and laudanum may be used warm, perfect rest it is almost superfluous to enjoin, as the pain makes that compulsory. In some cases where the inflammation is not excessive, nothing affords so much relief as to envelop the painful part in cotton wool, and then cover this over with oiled silk, till profuse perspiration is induced. The moist wool can then be removed and dry substituted without any waterproof covering. As regards constitutional treatment, where the powers of the constitution are vigorous, a perfectly low diet should be observed; in some cases an active purgative answers well, in others, but chiefly old standing cases, it so certainly aggravates the attack, that patients from their own experience will not resort to the remedy. Ten to fifteen-grain doses of carbonate of potash may be given three times a day, dissolved in half a tumblerful of water, either simply or made effervescing by the addition of lemon juice. *The* remedy, however, for gout, is colchicum. A medical man may, of course, give it more boldly than an unprofessional person; but still should it so happen that the person suffering from gout is not under medical treatment, ten drops of colchicum wine may be given safely three times in the twenty-four hours. The power of colchicum, in subduing both the pain of gout and the disease itself, is often most striking. The following instance will exemplify it:—A lady suffered from repeated attacks of severe shooting pain through the region of the heart, and was treated without relief; at length one of the joints of the forefinger became suddenly affected with gouty inflammation; this gave an immediate clue; colchicum wine was prescribed in ten-drop doses twice a day and before six doses were taken, both the pain at the heart and the inflamed joint were cured; the same thing has occurred repeatedly since in the same patient.

It is undoubtly better, safer, quicker, even in mild attacks of gout, for the case to be treated by a medical man; but patients who know what the disease is, will not always have recourse to his aid; in such cases, the perfect rest both of body and *mind*, the warm moist flannel, low diet, gentle regulation of the bowels, the cooling saline, and the small doses of colchicum will be the safest measures; but safer still will be attention to those preventive measures already pointed out, which any may follow by the aid of their own common sense—a faculty which ought to renew the reasons for, and the reasonableness of, such a course. Many persons who have suffered from repeated attacks of gout become affected with chalk-stones (see *Chalk-stones*), which impede greatly the usefulness of the hands; the constitution too gives way. In these cases, medical assistance ought never to be dispensed with, and there are few old sufferers from gout, in whose power it is not to procure it of the best. A much less reduction in diet will be required than in more recent cases and stronger subjects; the medicines must be of a warmer character. Fifteen grains of calcined magnesia, ten of rhubarb, and forty drops of sal volatile, in a wine-glassful of water, will form a draught which may be repeated twice a day. It may also be given with advantage with double the quantity of sal volatile, and twenty or thirty drops of laudanum in the event of gout receding to the stomach, as evidenced by pain and other signs of disorder of the organ, and by the sympathetic faintness, accompanying the attack. A glass of brandy may be substituted for the above with good effect; these stimulants, however, being given under the caution that no extreme tenderness, indicative of inflammation, exists at the pit of the stomach. The carbonate of lithia and the citrate of lithia, are now very much employed in the treatment

of gout, the dose of the former is from three to six grains three or four times daily, and of the latter from six to ten grains. Lithia water, an effervescing beverage, containing ten grains of the carbonate of lithia in a pint of water, is a favourite form in which the drug is taken. In addition, in an attack of "retrocedent" gout, either to the stomach, or elsewhere, the feet should be immersed in hot water with mustard, or a mustard plaster should be applied to them, with a view of attracting the disease to its more usual site. These attacks of gout shifting to internal organs are often so quick in their seizure, and so rapid in their progress, that it is highly desirable that such measures should not only be understood, but thoroughly carried out. The aged and debilitated sufferer from gout must not at any time reduce much his usual mode of living. Gout is often confounded with rheumatism and with rheumatic gout, which has features characteristic of both. The mistake is not likely to occur in the earlier attacks of gout affecting only the joint of the great toe; in later attacks more generally distributed the history of the disease distinguishes it. Gout affects the small joints, and generally but one at a time, while rheumatism affects the larger, and is usually more widely distributed over the body.

Refer to—*Colchicum—Gravel—Rheumatism—Urine, &c.*

GRAINS, or, as they are sometimes called, the "cereals," are the seeds of plants which belong to the order of the grasses. They constitute a large proportion of the food consumed by the human race, and likewise form no inconsiderable amount of the nutriment of vegetable feeding animals generally. They are, perhaps, in one sense the most direct link between the animal and mineral kingdoms, for in them the nutrient compounds prepared by the vegetable from the mineral elements of the soil, and from the gaseous constituents of the atmosphere, are so transformed and elaborated that they are presented to the digestive organs and assimilating powers of animals in forms more fitted for affording direct nourishment to their tissues, and more direct support for their bodily functions, than any other kind of vegetable nutriment, with the exception of that yielded by the pulses, beans, peas, &c., which are not, however, so universally employed as food.

The grains chiefly used by man are wheat, oats, barley, rye, millet, maize or Indian corn, and rice; the nutritive powers of these, however, differ greatly. The nourishment afforded by the grains to animal bodies may be classed under three distinct heads,—the azotised nourishment, represented by the gluten, which is adapted to build up and supply the waste of the muscular, or fibrinous, and albuminous tissues; the non-azotised nourishment, represented by the starch, which goes to supply respiratory food, and to form fat, &c.,—and the salts, principally phosphates of the alkalis and earths, which supply the mineral elements to the bones, the nerves, and to the tissues generally. Upon the proportions, therefore, in which these different kinds of nourishment, represented by these different elements, are contained in the grain, depends its nourishing power. Wheat, of all the grains, contains gluten most largely in proportion to its other constituents. Oats are next to wheat in this respect. Barley and rye are inferior to both wheat and oats, and maize and rice are very far below any of the above; the former of the two not containing above five per cent. of azotised matter; the latter not above three or four per cent. In contra-distinction to the above, the starch constituents are in much larger proportion in rice and maize, than in wheat and oats. The mineral constituents of the grains vary considerably as regards proportional amount, but they consist chiefly of phosphates, with oxide of iron; they are contained most largely in the seeds of the cereals and of the pulses, and appear to be no less necessary to the perfect formation of the seed, than they are to the blood of animals, which cannot be properly nourished, unless the food from which it is formed contains these mineral constituents in certain proportion—a beautiful instance of the harmony and universal adaptation of all things which prevails throughout the works of the Creator.

The grains also contain a certain proportion of fatty or oily matter. Maize does so largely, and oats in very considerable proportion.

The grains, therefore, from their constitution, are capable of supporting, with the addition of water, the animal frame and functions. It is evident, however, from science, and experience confirms the fact, that a larger proportion of barley, and still more so of rice or maize, is required to sustain the muscular development, than of either wheat or oats, which contain a greater amount of the gluten or nitrogenised, or plastic element of nutrition. For further information on these points refer to—*Blood—Digestion—Farina—Fecula—Food—Gluten, &c.*

The flour, or meal, prepared from grain, partakes of course of the characters of that from which it is formed, and is also modified by the mode of preparation, whether ground fine or coarse, whether entirely deprived of bran or not (see *Bran—Bread—Farina, &c.*). Under the microscope, the various kinds of flour, particularly their starch granules, present very different appearances; this agent therefore has become valuable as a means of detecting adulteration, which could not otherwise have been discovered with certainty. At present, owing to the abundance and cheapness of wheat and wheat flour, there is no temptation to its adulteration (see *Bread*)—may that temptation never be again in action! Besides being ground into flour, some of the grains are otherwise prepared artificially for food, as in

the case of pearl-barley and groats formed from the oat.—See *Barley—Oat, &c.*

GRANULATIONS are the small red rounded points which cover the surface of a healing sore. They are very vascular, and bleed easily. When the granulations are deficient, the sore is depressed, smooth, and glazed-looking, and is not healing well. When the granulations are excessive they constitute what is called "proud flesh." In this state they are paler than they should be, and require depressing or astringing by some caustic or astringent agent, such as lunar caustic, blue vitriol, &c. — See *Caustics — Ulcers, &c.*

GRAPE.—The fruit of the vine, one of, if not the most wholesome of fruits. When ripe it contains sugar abundantly, vegetable jelly and mucilage, and the characteristic tartaric acid in combination with potash; also an azotised albuminous constituent, on which depends its property of ready fermentation, in which respect the juice of grape excels all other vegetable juices, undergoing spontaneously the necessary change, and becoming converted into true wine by its own inherent power of fermentation. The juice, if kept a few hours, will spontaneously ferment. As a cooling article of diet, ripe grapes are most wholesome, and invaluable in many cases of illness; but must be forbidden when their aperient properties may prove injurious. Some years ago, what is called the "grape-cure" was introduced into Germany; the persons undergoing it living chiefly on grapes—of which they had to consume many pounds weight per day—and bread. It is probable that in some states of constitution this cooling system of diet may be useful; it has, however, at least one serious drawback: the continued application of the acid of the fruit to the teeth completely dissolves off the enamel.

Refer to — *Fermentation — Raisins — Wine, &c.*

GRAVEL.—See URINE.

GRAVE-YARDS. — See BURIAL and DEATH.

GREEN-SICKNESS.—See CHLOROSIS.

GREGORY'S POWDER, or compound powder of rhubarb, is composed of two parts of rhubarb, six parts of calcined magnesia, and one part of ginger. It is taken either simply, in water, or with water along with some stimulant, such as a tea-spoonful of sal volatile; it is a good stomachic and gentle aperient; but persons sometimes get too much in the habit of taking it regularly, and injure the tone of the stomach by the undue amount of magnesia. In severe cases of colic, attended with constipation and griping, a tea-spoonful of Gregory's powder with thirty drops of sal volatile may be taken in a wine-glassful of peppermint water every three hours till relief is obtained.

GRIPING is pain produced in some portion of the bowels, in consequence of irregular contraction of the muscular coat; it is in fact a minor form of colic, or spasm, and is to be relieved by the management recommended under those heads. Some medicines are more liable to gripe than others, and some individuals are more than others susceptible of these griping properties. The inconvenience is generally and successfully remedied by the addition of some carminative or aromatic, such as one of the essential oils—clove, cinnamon, &c.,—or by ginger, &c. Pills which are apt to gripe are more effectually corrected by the addition of one or two grains of extract of henbane, when that medicine is admissible. Some medicines are rendered griping by faulty preparation. This is especially the case with senna. It may be pointed out, that nothing gripes more severely than the passage of morbid or acrid bile through the bowels; hence when medicines act energetically upon a torpid or disordered liver, and cause a free discharge of such bile, there is apt to be severe griping, for which the medicines get the credit, whereas it is only indirectly caused by them in their really beneficial action. The spontaneous discharge of bile in bilious disorder causes griping when no medicine has been taken.—See *Senna.*

Refer to—*Colic—Spasm, &c.*

GRIPPE.—The French name for the epidemic influenza.

GROATS are oats when deprived of the husks; "Embden groats" when they are bruised also. They are used and useful for making gruel.

GROWTH, or increase of size of the body, as a whole, or of any part of it, is dependent, as a healthy process, first on a proper amount of nervous excitation, and second on a due supply of healthy blood. When any part, such as the arm of a workman, is regularly and vigorously exercised, the nervous power, and the flow of blood, are directed to it in increased proportion, it acquires additional substance, or grows; but should the same arm become paralysed, how quickly will it diminish in bulk. Up to a certain period of life the body grows; in animals this varies with the species; in man, the process continues, generally, up to the twentieth year, or even beyond. When growth ceases, it is not that new material ceases to be added to the body, for this is unceasingly being effected to supply the place of those constituents of the frame which are continually being used up; but the balance between the food taken and assimilated, and the waste of the body, is equalised, and after growth has ceased, this balance—with the exception of fatty deposits—is, *during health,* maintained with but little variation during the years of life's prime. When old age comes on, that is after the sixtieth year, the balance inclines the other way; the waste now exceeds the reparative nutriment which it is in the power of the system to receive and elaborate,

and the tissues all diminish in bulk, the stature even becoming less.

Young persons require nutriment, not only to sustain the wasting processes of respiration, and of motor change or movement, but they require also sufficient to supply the growing tissues of their entire body with the various elements which go to perfect their composition; if these elements are not supplied, development is either arrested, or, the tendency to growth continuing, the bones and tissues generally lengthen, without acquiring their healthy substance. As a rule, the appetite of a healthy growing child for *plain and wholesome* food, ought never to be stinted.—See *Children—Digestion—Food, &c.*

GRUEL.—See COOKERY.

GUAIAC.—The wood and gum resin of a tree, which is a native of the West Indies. They are both used in medicine. The wood is extremely hard and tough, of a striped yellowish-green colour; the resin is a greenish-brown. Guaiac, as a medicine, acts upon the skin, and is often extremely useful in chronic rheumatism and in syphilis. The most convenient form of administration is the ammoniated tincture, which may be given in one or two tea-spoonful doses at bedtime; milk is the best vehicle for its administration; when taken in water it must be drunk as soon as mixed, otherwise the resin separates and floats on the top. The guaiac mixture of the British pharmacopœia is made with the gum resin, refined sugar and gum arabic, combined into an emulsion with cinnamon water. The dose is from one ounce to an ounce and a half.

Guaiac sometimes occasions sickness, in which case it is better abandoned.

GUARANA consists of the powdered seeds of a plant, *paulinia sorbilis*, a native of Brazil. It has of late years been much recommended for sick headaches, and contains an alkaloid identical with that in tea and coffee. The dose of the powder is from fifteen to twenty grains taken every night, or every three hours during an attack.

GUINEA WORM is a parasitic, long, round worm, about the thickness of a violin string, which burrows beneath the skin, chiefly of the feet and calves of the legs. It is met with principally in tropical climates, particularly on the African west coast, but is sometimes brought to this country by individuals who have resided in the tropics. The length of the animal varies from a few inches to five or six feet. After remaining under the skin for a longer or shorter time, the head protrudes through a small boil which forms on the skin. The only treatment is seizing the head when it presents itself, and gradually, from day to day, winding out the worm, care being taken that it is not broken, for should this happen, the portion which remains is apt to occasion severe irritation. Persons native to the situations where these parasites prevail, will always be found skilled in the mode of extracting.

GULLET—THE GULLET, or ŒSOPHAGUS, is a tube which extends from the throat or fauces to the stomach. Down, or through it, the food is propelled by the action of the muscular fibres, which form one of its coats. It is narrowest at its upper end, and it is here that choking from food most generally occurs.

Choking may occur from various causes; either the gullet may be contracted from some cause or other at a particular point, or the morsel of food may be too large, or of such a hard irregular character that it cannot pass down easily, or the cause of the impediment may be spasm, more especially of a hysterical character. Impediment to swallowing from contraction of the gullet tube, is generally a serious matter; the cause should, as soon as possible, be examined by a medical man; sometimes it follows recent injury to the lining membrane, such as scratching by sharp-pointed bone, or after poisoning by irritant agents. In a case under the author's care, it followed upon a damson stone having been swallowed some months previously, scratching the throat in its descent; the power of swallowing, which was nearly lost, in consequence, probably, of thickening of the tissues immediately beneath the lining membrane, was restored by the administration of cod-liver oil for a few weeks. When a large morsel of food gets fast in the gullet, it may occasion death by pressure upon the windpipe; at all events, it causes much distress for the time. If at all within reach of the fingers, of course they may be used for its extraction at once, if too far for this, a surgeon's assistance will be required to push the morsel beyond the upper narrow portion of the gullet into the wider; this he will effect by means of the probang (fig. 114), an instrument consisting



Fig 114.

of a piece of round whalebone about two feet long, to one end of which a portion of sponge about the size of a large marble is firmly attached, and which requires oiling or greasing before use. In passing the probang, care has to be observed that it is kept well to the back of the throat, and the patient's head well thrown back at the same time; it is then to be pushed steadily but quickly down till the obstruction is felt to pass readily before it, and away from it. Œsophagus forceps are also made to seize fish bones, pins, and sharp substances which may run into the gullet, and which cannot otherwise be extricated.

These particulars are mentioned, not to induce unprofessional persons to attempt the operations when a medical man is procurable; but if he is not, an unprofessional operator and an extempore probang, made from an umbrella

whalebone, a cane, or even a curved stick, with a small bunch of some soft material *securely* fastened to one end, would be preferable to choking entirely, or partially even, for any length of time. A few smart blows on the back will, in the case of children especially, often dislodge a morsel sticking in the upper part of the gullet. Sharp pointed or irregular bodies, such as pins, fish bones or other bones, may get fixed in the throat, and it is generally in the upper part of it; the fingers may be able to remove them, if not, a piece of bread coarsely masticated and swallowed, will often, especially if followed by a draught of water, carry down the impediment. In some cases, an emetic may be useful. Frequently, after a sharp-pointed body has stuck in the gullet, and has scratched its lining membrane, the sensation of its still remaining may be felt for some time after it has passed away. It is well to keep this in mind, that continued, unnecessary efforts to relieve may not be persevered in. Children not unfrequently swallow coins, which may be extracted when within reach by a special instrument called a coin-catcher. If the coin has passed into the stomach, the child should have a full meal of porridge with a hard boiled egg and some dry bread, followed in a couple of hours by a dose of castor oil. If a sharp body remains fixed in the upper part of the gullet, pressure at some point or other will almost certainly cause a pricking sensation. The gullet is sometimes spasmodically affected, the food being either stopped in the passage downward, or passed with pain and difficulty; this affection falls partly under the head of *spasm* and *hysteria*, but it is sometimes the result of too great haste in eating and swallowing. As explained under article *Digestion*, the food does not simply fall into the stomach down the gullet tube, but it is conveyed into the digestive organ by the regular action of the muscular fibres of the tube, which, whilst they propel forward, also close behind the morsel being swallowed. It must be evident, therefore, that if morsels follow one another in too quick succession, this action must be interfered with, and if it is, spasmodic pain at least, is produced, and not improbably choking.

Choking from things getting fixed in the gullet must not be confounded with the sensation of suffocation produced by foreign bodies getting into and irritating the upper portions of the windpipe which lies in front of the gullet (see *Lungs*). In the latter cases, sudden, violent, spasmodic cough ensues, and the appearance and dread of suffocation is generally much more quickly and strongly marked.

Refer to—*Alimentary Canal*, and more especially to *Digestion—Lungs, &c.*

GUM ARABIC, or Gum Acacia, is the produce of certain species of acacia, and is brought chiefly from North Africa, Egypt, Nubia, Barbary, &c. Gum is contained in greater or less proportion in the juice of most plants, and by many it is exuded in form of round concrete drops or "tears" as they are called, such as the gums of cherry and plum trees, which are familiar to all. The gum of the acacia is, however, most generally used and esteemed as a demulcent, in affections of the throat or air passages, in irritations of the urinary organs, &c. When gum is dissolved in water the solution is named mucilage, and in this form it is one of the most convenient vehicles for other medicines, particularly those which require some degree of suspension in liquid, as, for instance, in the common chalk mixture; it is also useful for facilitating the mixture of oils, camphor, &c., in watery mixtures; but for this purpose milk is preferable. The powder of gum acacia, *when genuine*, is probably the best form for keeping, as it is dissolved in a few minutes, whereas gum in its ordinary form takes a considerable time, and when made into mucilage, on the other hand, is very apt to spoil. Gum is nutritive in some degree, probably in the same degree as starch or sugar, and is used as an article of diet in the countries whence it is procured. It is much more used in medical practice in France than in this country, both for its nutritive and its demulcent properties.

Gum tragacanth, another species of gum, brought chiefly from Asia Minor, Persia, &c., is procured from a tribe of plants belonging, like the acacia, to the leguminous or pod-bearing family. It possesses many of the properties of acacia gum, but not being so soluble, is not nearly so convenient for internal use. With hot water and prepared chalk, it forms an excellent basis for a plastic splint after fracture of the long bones. The composition is spread betwixt two layers of coarse flannel, which are wrapped round the limb and allowed to dry, after which it becomes an unyielding support of the fractured bones.

Mucilage of gum acacia may be conveniently made by dissolving ten ounces of the gum in twenty fluid ounces of water, either by gentle heat, or by suspending the gum—tied in a muslin bag—in the water.

GUMS.—The gums, which closely invest, but do not adhere to the teeth, are composed of mucous membrane of a dense insensible character. In the investigation of disease, the gums frequently afford valuable information respecting general constitutional disorder. In sea-scurvy, the gums become spongy and swollen, extend over the teeth, and bleed easily; the symptom is always strongly corroborative of the bodily disorder. In persons who have been long subjected to the action of lead, slowly introduced into the system, either in the course of their occupation, or as sometimes occurs, from the ordinary drinking water having become impregnated with the metal from lead pipes, a blue line is often observable along the edge of the gum. A pink line in the same situation has also been pointed out

as showing itself in persons affected with pulmonary consumption. In constitutional affection by mercury it is well known that the gums become inflamed, sore and spongy, in some cases of disease affecting the mouth the gums become dark or black in colour, and the breath is extremely fœtid.

Of course, in cases where the state of the gum is indicative of constitutional affection that must be attended to (see *Scurvy, &c.*), but the condition of the gums, in any case, may generally be much relieved by the use of astringent substances in the form of washes; none, perhaps, is better than the tincture of myrrh, but camphor dissolved in alcohol may also be used, or, indeed, almost any one of the astringents. A drachm of alum dissolved in a pint of water makes a very good and cheap wash.

In the case of black-looking gums, with fœtid exhalation, a wash made of two drachms of hydrochloric acid to the pint of water will be found most useful, or two drachms of the solution of chlorate of soda or chlorate of potash, may be used with equally good effect. Such a case, however, must require medical attendance. The gums in the teething of children require much attention.—See *Children.*

GUM-BOILS are small abscesses connected with the root of a decayed tooth, and are often caused by the fang or stump, which remains after extraction or the decay of the tooth. They give rise to great pain and local swelling. The abscess opens usually through the gum, and occasionally through the skin, and may discharge for a long time, indeed until the tooth is extracted. In the early stage of the affection an abscess may be warded off by holding hot water in the mouth, or better still, by applying a leech to the pained part. A free cut into the gum, with a lancet, will often relieve the uneasiness and irritation caused by an old stump. After an abscess has formed, the best method of treatment is the immediate extraction of the tooth. This precaution is more necessary, as such abscesses sometimes open and discharge under the chin, below the eye, or into the nasal cavities, and may keep discharging for months.

GUN-SHOT WOUNDS.—See Wounds.

GUTTA PERCHA.—This substance, now familiar to all, and so extensively used in so many different ways, is obtained from a tree native to the Malay peninsula. In medical and surgical practice it has been adopted for many purposes, such as, splints for fractures. Probably, its most valuable property, in a domestic point of view, is its being waterproof, and forming a cheap and efficacious protection to bedding, in many cases in which this is apt to be spoiled by the discharges, natural or otherwise, from the sick. Gutta percha sheeting is now universally employed to cover, and to retain moisture in the different varieties of dressings applied to wounds. Many instruments and appliances are also made of this useful substance. The gutta percha solution of the Pharmacopœia is prepared with one ounce of gutta percha and eight ounces of chloroform, to which an ounce of carbonate of lead in fine powder is added. The mixture after being well shaken is to remain at rest in the bottle, until the insoluble matter in it has subsided, when the clear fluid can be decanted. The solution is mainly used in the preparation of mustard paper.

Refer to—*Bed, &c.*

GYMNASTICS are exercises regularly practised, with the object of developing the physical energies, as the mind is trained by regularly appointed studies. The one is as essential to the full enjoyment of life as the other, for bodily vigour tends to increase the mental power. The object aimed at in gymnastics is the exercise of the muscles, and this is arranged in such a manner as to bring into harmonious action all the muscles of the body. Combined movement of the various parts, and not feats of strength being the aim, all accessories in the way of gymnastic apparatus—such as dumb bells, clubs, and the like, should be of comparatively light weight, much lighter than the person can readily lift. Boys as a rule have sufficient exercise in the various games popular at school, but girls brought up in towns, and especially in London, have little or no opportunity of physical development beyond the regulation walk. For these, light gymnastic exercises once or twice a week, carried out in a loose costume, to enable the muscles to have full play, seem essential. Swimming, which is now becoming a popular amusement amongst girls of the better classes, is a good means of maintaining the health. In the case of deformities, such as contractions and stiffness of the joints, and paralysis of the limbs, no remedy is so efficient as regular exercise, since it is the voluntary attempt to work the muscles from which most benefit is to be derived. Rubbing the part is often persevered in till the joints become hopelessly stiff, whereas in half the time regular exercise or gymnastics would have effected a cure. Let no one with a stiff finger or a paralysed limb despair till he has tried patiently this plan of attempting regular movements. A half-hour can be given up twice a day to train the muscles how to act, and in the case of a child, the teacher can count "one, two, three," and then tell it to perform a certain movement, illustrating the action at the same time. In this fashion the youngest child may be taught in a similar way to its being taught the alphabet, and numerous deformities may be prevented.

HABIT.—The connexion existing between the influence of the will and certain sensations and motions in the living body, is a fact of

which every one must be conscious from personal experience; when, however, the actions resulting from these sensations and motions, are, after frequent repetition, performed without a distinct and conscious exercise of the will, they are said to be the result of habit. These habits, however, are of the body, and are distinct from habits of the mind, influences which act upon the will itself, with lesser or greater power, and impel the individual to certain acts.

It is, perhaps, needless to advert to the proverbial power which habit exercises, not only over man but animals, becoming to them a "second nature," and to their offspring a natural tendency. So powerful an agent, both mental and physical, as habit, cannot fail to be largely implicated in the consideration of the nature and treatment of disease. It is sometimes of the greatest consequence, not only to break the influence of habits of which the mind is conscious, but even of habits of disease over which the mind has generally no control. This is particularly the case with respect to periodic diseases of the nervous system, such as ague, &c., which, after a time, appear to be continued rather from the habit of the constitution than from any other cause.

Still more widely connected with the treatment of disease, is the acquisition of good habits, in the room of bad ones, which are often the causes of impaired health. Some individuals constantly eat and drink too much, from mere habit, others take little or no exercise "from habit," and, although conscious of these and other negligences, often require considerable exertion of the will, aided by the almost despotic commands of a medical attendant, before they can break through them. The good effects of habit in persons liable to constipation have already been pointed out in the article on that subject; in this case the habit originating in the will, becomes, after a time, partly or wholly involuntary.

There is, however, another state of disorder, and a more intractable one, in which the influence of habit may be most beneficially exercised. It is that state of hypochondriac unrest called the "troubled mind." In such a condition, nothing is more valuable than the habit of daily, at certain fixed times, forcing the mind to bend itself to some definite *continuous* employment, one which it will require some degree of mental exertion to carry on, and which will maintain its interest, perhaps an increasing one, from day to day.

HÆMATEMESIS.—Bleeding, or vomiting of blood, from the stomach.—See *Hæmorrhage.*

HÆMATURIA. — Flow of blood from the bladder.—See *Hæmorrhage.*

HÆMOPTYSIS. — Bleeding from the lungs, or "spitting of blood."—See *Hæmorrhage.*

HÆMORRHAGE, Bleeding, is the escape of blood from its own proper vessels, but the term is usually applied to cases in which the effusion takes place in considerable quantity, and is rapidly poured out. Hæmorrhage may be either external or internal; in the former instance it is almost invariably the result of wound of some blood-vessel, either artery or vein; in the latter, the blood *may* also be poured out by a large vessel, but generally it is exuded through the lining membrane, or into the tissues of the part in which it occurs, from the minute vessels, so minute indeed, that after fatal cases of internal hæmorrhage, the closest examination may fail to detect any visible opening, or openings from which the blood can have escaped.

For information respecting external hæmorrhage, or such as occurs from arteries or veins, the reader is referred to the articles under these heads.

Internal hæmorrhage, when it does occur from a large vessel, is the result of that vessel having given way, owing to disease of its coats, as in aneurism, or by ulceration. The most common situations for this accident are the brain and the large vessels near the heart. In the former, it is called apoplexy; in the latter, sudden death usually occurs, and is popularly attributed to heart disease.—See *Apoplexy—Brain.*

Internal hæmorrhage may be either of an active or a passive character; that is, in the former case the effusion of blood is preceded and accompanied by feverish symptoms, quickened pulse, thirst, with a sensation of fulness, and heat in the part whence the blood flows; in the latter, these symptoms are absent. The effect of active hæmorrhage is, generally, to give relief, either to the constitution at large, or to the particular part; indeed, by some, active hæmorrhage is regarded as a natural cure of what might otherwise prove an attack of inflammation. Passive hæmorrhage, on the other hand, almost invariably weakens; it is the result of weakness and relaxation, which its occurrence tends to increase.

As may be imagined, in the treatment of hæmorrhage generally, medical men have to keep these differences distinctly in mind, lest, by interfering with, too precipitately, or checking too soon an active hæmorrhage, they may thwart the natural curative effort; or by permitting passive loss of blood to continue, they allow a patient to be unnecessarily, perhaps irremediably, weakened. Moreover, it is necessary, in the treatment of hæmorrhage, to consider whether the flow may not be what is called "vicarious," that is, a substitute for some natural discharge which has been checked, or whether it may not have become a habitual safety-valve. In such cases, before actively restraining the hæmorrhage, attention should be given to improving the health and to restoring if possible the discharge which the

hæmorrhage seems to replace. Thus, where bleeding from the nose or stomach seems to take the place of menstrual discharge in women, steps must be taken to restore this flow. Habitual hæmorrhage from piles usually results from sluggish and congested circulation in the bowels; this condition should be relieved by exercise and saline purgatives before directly treating the piles.

As regards the management of or interference with continued cases of hæmorrhage, therefore, unprofessional persons ought not, and cannot with any propriety have anything to do; but when the occurrence itself actually takes place, a knowledge of the best mode of proceeding may be of much service, for though in the case of active hæmorrhage benefit *may*, up to a certain point, be derived from the circumstance, the process might, possibly, especially if improperly managed, run on to an undue extent, and even affect life.

Hæmorrhagic exudation of blood is more liable to occur from some parts of the body than others, and particularly from the mucous membranes which line the nasal and air passages generally, from the alimentary canal, and genito-urinary organs. "Another important fact in respect to hæmorrhages by exhalation is, that they proceed more frequently from certain parts of these mucous membranes than others, according to differences in age. Thus, in children they are most common from the membrane that lines the nasal cavities; in youth, from the mucous membrane of the lungs and bronchi." In middle life, from the bowels or bladder, or in the head.

When an individual is suddenly seized with bleeding or hæmorrhage from any part, as a general rule, perfect quietude of body and mind should be observed, and cold is the simplest and readiest astringent, applied in the various forms of cool air, cold water, &c. Medicinal astringents may be resorted to, such as tannic acid, perchloride of iron, diluted sulphuric acid (see *Astringents*), also ergot of rye, especially when the active principle, ergotine, is given hypodermically. Should the resulting depression be extreme, stimulants *may* be required, but their administration calls for the greatest caution, and it must be remembered, that the state of depression may be the chief security to the patient against an immediate return of the bleeding.

The causes of hæmorrhage are various. As might be expected, general plethora, or superabundance of blood is a common one; hence, persons who take but little exercise, and live freely, are liable to it more than others. Perhaps the most general cause of hæmorrhage is congestion, or accumulation of blood in any one part or organ of the body, in consequence of some impediment to the circulation; thus, disease of the heart, by damming up the blood in the lungs, or disease of the lungs themselves by impeding the flow, may, either of them, cause spitting of blood; or disease of the liver or intestines may cause hæmorrhage from the bowels. In some particular states of constitution, there appears to exist a strong tendency to effusion of blood, this is seen in scurvy, and in the disease called purpura, or, popularly, the "purples." Moreover, there is a certain constitutional tendency, or "diathesis," called the "hæmorrhagic," in which a more than usual liability to bleed from slight wounds exists. In persons subject to this complaint, to which the name *Hæmatophilia* has recently been given, even the extraction of a tooth may, and has proved fatal, in consequence of uncontrollable bleeding. The tendency is hereditary, and those who inherit it must be extremely cautious before submitting to even trifling operations, which involve breach of surface and effusion of the vital fluid.

Bleeding from the nose, *Epistaxis*, is sometimes very profuse, and either on this account, or from frequent repetition, may be the source of great weakness, in constitutions that can ill afford the drain, for its occurrence is not uncommonly associated with tendency to chest affection. Many various methods for its suppression are had recourse to, but cold applied to the forehead, spine, or other parts of the body, is the most general. Raising both arms above the head and retaining them there, stops the flow usually, or a small quantity of solution of alum, as strong as it can be made, may be thrown up with a syringe; or a piece of linen, soaked in the solution, may be stuffed up the nostril. From ten to fifteen drops of dilute sulphuric acid may be given in water at intervals, according to the nature and persistence of the attack.

Bleeding from the nose, in persons advanced in life, must be much more cautiously dealt with than in the young. In the former, it is generally preceded by symptoms indicative of congestion about the head, and, consequently, is a natural relief. It may, of course, go to an extreme extent, and require checking.

Bleeding from the lungs, or spitting of blood, is generally preceded by symptoms indicative of undue determination or congestion of blood to, or in these organs. Oppressed breathing, cough, pain in the chest and feverish symptoms usually precede the attack, and just previous to it a saltish taste is generally perceived. Bleeding from the lungs may occur in every degree, from a mere tinge of the expectoration, to the copious coughing up of fluid blood. The blood is coughed up, whereas, when it comes from the stomach, it is vomited, a distinction which *appears* evident enough, but which is not always readily made in practice. The management of hæmorrhage from the lungs, must be that recommended for hæmorrhage generally. Until medical assistance can be procured, perfect quiet is to be observed, cool air, especially on the chest, freely admitted, and cold, or iced and acidulated

drinks given plentifully. Alum will also be found useful (see *Alum*). Should the attack continue, and medical assistance still be absent, dry cupping on the chest, or between the shoulders, might be had recourse to. Sulphuric acid may be given as recommended for bleeding from the nose; or in an extreme case, when medical aid is far distant, one grain and half of sugar of lead may be given, made into pill with crumb of bread, every two, or three, or four hours, being washed down by a draught of vinegar and water. Gallic acid or tannic acid may be also employed, in doses of four or five grains, either in the form of mixture, or pill, or lozenges (the latter contain each half a grain of tannic acid); or catechu lozenges, each containing a grain of catechu, may be freely administered. When the cough is troublesome, it will be best allayed by a few drops of laudanum or chlorodyne.

The causes of hæmorrhage from the lungs are such as have been named above. Persons of scrofulous constitution, or who have any malformation of the chest, are most liable to suffer from it. It rarely occurs in children. The exciting causes of this form of hæmorrhage are such as call the lungs into active, strong, or continued exertion, such as violent bodily movements, much loud exercise of the voice, playing on wind instruments, &c.; these things must therefore be sedulously avoided by those who have any tendency to the disorder. Temperance and moderation, strict attention to the condition of the bowels, and to any accidental disorders of the chest, will be the best safeguards. Whilst treating of this subject, it should be mentioned that persons are often needlessly much alarmed, from thinking they are expectorating blood, whilst the fluid simply comes from the throat or gums, or, it may be, is the consequence of blood from the nose trickling down the back of the throat. It perhaps is scarcely necessary to add, that the above details of management are *not* meant to stand in the place of competent medical advice. This should never be dispensed with in so serious a disorder as spitting of blood.

In hæmorrhage from the stomach, "*Hæmatemesis*," the blood is vomited, not coughed up; its causes and treatment, modified, of course, by the difference in the organ, and its site, are similar to those detailed in hæmorrhage from the lungs. Vomiting of blood in young females is not a very uncommon accompaniment of disorder of the menstrual functions, and can scarcely be considered a dangerous affection. The restoration of the proper excretion is, of course, the most effectual remedy.

Vomiting of blood may happen in consequence of blood which has been effused from the nose having been swallowed; in this case it is generally darkened by the digestive action of the stomach. Blood from the lungs is generally much more frothy than that ejected from the stomach. In either case, the more florid the hue, the more active or inflammatory the hæmorrhagic tendency. Profuse discharge of blood from the bowels often occurs in the course of enteric fever and dysentery, or from diseases of the abdominal organs, such as the liver, &c. Flow of blood from the bladder,—*Hæmaturia*,—will be adverted to under article *Urine*.

Refer to—*Abortion*—*Artery*—*Child-birth*—*Piles*—*Veins*—*Wounds*—*Hazeline*—*Emergencies*.

HAIR is a development from, it might be called a prolongation from, the outer or scarf skin. Each separate hair (fig. 115—1) is contained in a pit which passes into the true skin, and through it into the tissues beneath. Into this pit the outer or scarf skin (2) is folded, and at the bottom of the bulbous follicle (3), there is a small papilla of true skin, from which the hair is developed, consisting of an external or denser portion, composed of flat over-lapping scales, and under this, closely packed together, numerous horny cells, while, in some instances, a central space is left for the medulla or pith, which consists of fat cells and colouring matter. The hair follicles are usually supplied with a pair of sebaceous glands (4), whose ducts either enter the follicle or open on the surface of the skin close to the hair.

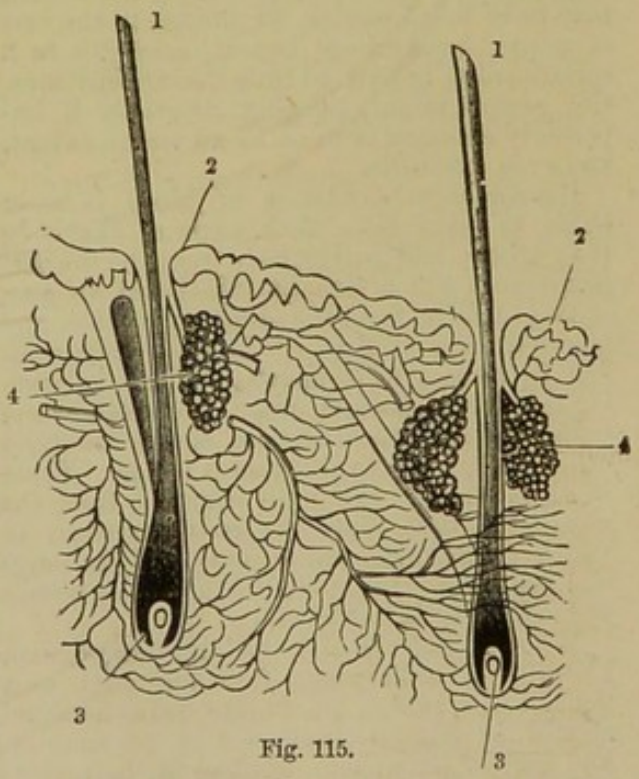


Fig. 115.

The condition of the hair is often highly symptomatic of the bodily condition; at the same time it is, of course, liable to alteration from local influences.

The hair is apt to become split, or forked, in consequence of weak growth; this generally occurs in persons in a debilitated condition. Keeping it cut tolerably short is a good preventive, but of course removal of the bodily

weakness of which the state of the hair is symptomatic is essential. The colour of the hair is indicative of constitution and temperament (see *Temperament*). Its changes in colour indicate generally the advance of years, but sometimes the premature grey speaks of continued mental toil and trouble, and it has followed at once upon violent mental emotion, a few hours sufficing for the change.

The unfortunate queens, Mary of Scotland and Marie Antoinette, are both said, among many others, to have been instances of this effect of mental emotion upon the hair; and the fact of this direct connection between the condition of the body and the colouring matter of the hair, renders it probable, that permitting the hair of children to be kept long is really subjecting them to a source of constitutional weakness.

Falling out of the hair occurs from weakness, either of the body generally or of the hair bulbs or "follicles" themselves. Various stimulant local applications are used in such cases (see *Baldness*). Balsam of Peru,—a drachm stirred well into an ounce of simple cerate when melted,—is said to be a good application.

Removal of the hair is a proceeding frequently called for in the treatment of disease, especially of febrile and inflammatory affections affecting the head. In these cases, it may be entirely removed, at once, without risk, and should be *shaved* off when the full effect of the procedure is required. Some persons, especially females, are often much vexed at the shaving of the head in fever, &c. Its necessity is, of course, or ought to be, answer sufficient; but it often happens, that if the hair has not been taken off during the course of disorder, it must, from tendency to shed afterwards, be shaved off during convalescence.

When the hair is removed in persons not suffering from acute disease, it must be done cautiously, especially if this natural clothing has been somewhat long and thick. Where it must be taken off entirely, and at once, the head should be protected by a cap of flannel, otherwise neuralgic or rheumatic attacks may be the consequence.

Frequent cutting undoubtedly strengthens the growth of the hair, and frequent brushing and washing are quite the best methods for preserving its health and cleanliness, and ought, along with the assistance of the one-sided comb, to be solely trusted to—the irritating "small tooth comb" ought to be banished from use entirely.

The hair, especially in childhood, is liable to suffer from parasitic disease, in which case it falls off, leaving bald circular patches (see *Ringworm*).

In Poland, a peculiar disease is met with, in which the hair becomes thickened, succulent as it were, and matted together by a peculiar glutinous sweat. It has been erroneously reported that the hair in this condition not only bleeds but possesses feeling; the latter idea having, doubtless, arisen from the irritability of the skin at its roots.

Refer to—*Baldness*—*Skin*.

HAMMOCKS, for the transport of the sick and wounded in long journeys, are invaluable, and may be had recourse to with safety and comfort, so long as the bones are uninjured, or where the condition of the patient is such as to require his being kept flat on his back. When the stretcher becomes necessary, hammocks made of netted cord are much the most convenient and comfortable, being equally serviceable for invalids and for persons in health who may be camping out, or engaged in long voyages by sea or land. The weight of a serviceable net hammock need not exceed a couple of pounds, and it may be carried by a pedestrian over the shoulder, and used as a bed, either in the open air or in a hut or shed where the simplest means of support exist. For a person recovering from illness, the network affords a luxurious swinging couch, and may be employed with advantage out of doors, either on the lawn or suspended between a couple of trees; in the former case, it requires to be supported at either end by bamboo poles, each about four feet in length, steadied by ropes and tent pegs (fig. 116) in the manner represented



Fig. 116.

in the figure. But it is chiefly as a means of transporting invalids by rail or road that the convenience and comfort of the tent hammock is most appreciated in a medical sense. On the occasion of the Ashantee campaign, this form of ambulance was first introduced into the British army; but since then the Indian Government has furnished the Transport Military Service with net hammocks for the use of wounded or invalid soldiers, who require to undertake long journeys by rail; and the same facilities for travelling have frequently been extended to invalids in this country requiring change of air, probably to a distant coast. In either case, the hammocks are suspended from strong hooks in the roof or sides of a railway carriage, usually in the guard's or luggage van, which, in many instances, are already furnished with this means of adjusting the ropes. In the ordinary compartment of a railway carriage, children could be readily provided with a comfortable cot, by slinging a small net hammock to hooks in the roof of the compartment; and grown-up people might obtain the same luxury in a saloon carriage, provided the railway companies did not object to having carriages fitted with removable poles, about three or four feet

in height, in the centre of the floors, and hooks at the side to which the loops or ropes of the hammock could be attached. For journeys by the road, any covered spring van of sufficient length will answer the purpose of an ambulance hammock. The drawing (fig. 117) represents a spacious vehicle for this purpose, with the hammock in use, suggested by Messrs. Seydel and Company, of Birmingham, to which firm is due the merit of having first introduced the various uses and applications of the net hammock to public notice. There can be little doubt, from its cheapness and portability, not less than from the ease and comfort it affords, that this simple apparatus will be largely adopted both in military and civil practice as a convenient means of transport in long journeys.—See *Ambulance.*

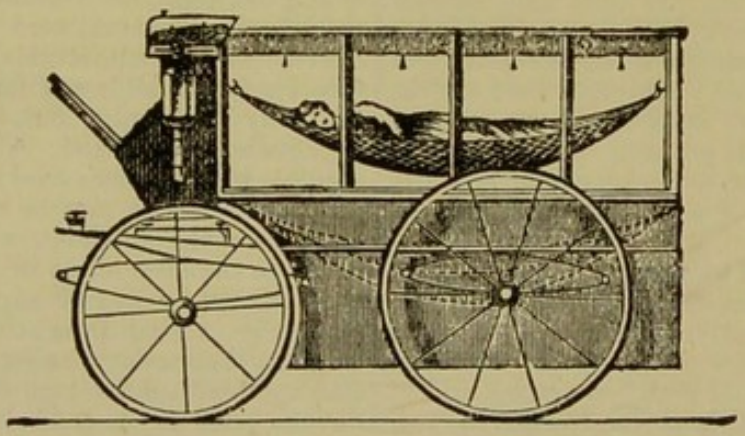


Fig. 117.

HAND.—This wonderful agent of the human mind is much exposed to injury. When this occurs, as it often does, at a distance from medical aid, one principle must ever be remembered, that the preservation of as much of the member as possible, even of a single finger, or of part of one, is of the highest moment with reference to future usefulness. In a crush of the hand, when bleeding is not great, the best treatment will be to place it in a large warm poultice, and keep it at rest until medical aid is procured. The management of various accidents, &c., will be found under such heads as *Artery, Dislocations, Wounds, &c.*

HANGING—suspension of the body by the neck—may cause death in three distinct modes: by compressing the windpipe, and producing suffocation; by compressing the veins of the neck, and causing apoplexy; or more rarely by dislocating the neck. The two former modes may be combined; the latter, when it does occur, is in consequence of a "fall," such as is given at a public execution; it of course causes instantaneous death. Recovery from hanging must in some degree depend upon the completeness or not of the interruption to the passage of air through the windpipe for any time; it is not likely that resuscitation will be effected if complete interruption has continued four minutes. The first thing to be done when a person is found hanging is, of course, to cut him down at once, to loosen the material around the neck, to dash cold water over him, and to bleed. In such an emergency, a person would be quite justified in cutting across the temple, where the artery beats (see *Artery*), with a pen-knife, and allowing blood to flow to the extent of ten or twelve ounces. The bleeding could be controlled until the arrival of a surgeon, by means of pressure against the bone. In most respects, the treatment of a person hanged must be similar to that of one drowned, except that the application of heat would scarcely be requisite in the same degree. In a medico-legal point of view, it is important that the bystanders should observe carefully the surroundings of a body found hanging, in order to determine whether the case is one of suicide or murder, or whether the person has first been murdered, and then suspended, so as to make it appear that he committed suicide.

HARE, like other game, is extremely easy of digestion, apart from the various dressings and stuffings.

HARE-LIP, or Cleft-Lip, is a deformity with which infants are occasionally born; the lip being cleft at the furrow, to a greater or less extent. Sometimes the fissure extends through the roof of the mouth. The case ought to be very soon submitted to the surgeon for remedy by operation.

HARROGATE.—"Dr. Hunter divides the Harrogate springs into four classes: 1. Springs impregnated with sulphuretted hydrogen gas and saline matter. 2. Saline chalybeate springs. 3. Pure chalybeate; and 4. Springs containing earthy salts, with little iron and no sulphuretted hydrogen.

"Of the skin diseases in which Harrogate water is likely to be beneficial, Dr. Hunter mentions *lepra, psoriasis, porrigo, herpes,* and *impetigo.* He says, 'It speedily and safely carries off the effects of intemperance in those

who, having spent the winter and spring in festivity, resort to Harrogate with their system loaded with impurities from the excesses of the table, and whose stomachs are debilitated by these and similar causes. Its use is acknowledged in those predisposed to apoplexy. In chlorosis it has been usual to drink the sulphur water for some time, and then to take the chalybeate.' Scrofula, scurvy, secondary syphilis, gout (regular, irregular, and atonic), hypochondriasis, jaundice, chronic rheumatism, stone, and gravel, are also among the diseases enumerated; and, inasmuch as they arise for the most part from the same disordered condition of the system, they are most likely to be alleviated by the use of these waters. Used in the form of bath, the water must be heated to the required temperature; and would, if employed alone, be productive of but slight medicinal effects beyond stimulation of the surface, from the sulphurous impregnation, and the salts contained in the water."

HARTSHORN.—See AMMONIA.

HASTINGS. — This much-frequented watering place lies in a valley, enclosed towards the north, north-east, and west by hills, which shelter it from high and cold winds, and conduce to its being, perhaps, more than any other place, resorted to in winter by invalids to whom a mild climate is applicable.

The soil, as in most parts of Sussex, is clay, with a substratum of sand, and the ground in Hastings and its neighbourhood dries soon after rain. "Those," says Dr. Mackness, "who have resided where the character of the soil keeps the surface continually moist, and who have at the same time suffered from some of those maladies which have their origin in, or are aggravated by a cold and humid atmosphere, can fully appreciate the advantage which Hastings owes to its geological formation alone. Rarely is it necessary for the invalid, however delicate, to be confined to the house for any length of time, even in the most stormy weather."

The south and south-westerly winds are most prevalent; the latter are at times, especially in spring, severely felt. These winds, however, when not high, agree well with the majority of visitors who are not in a weak state of health. The south wind being to a certain extent impregnated from the sea, is beneficial to most persons labouring under disease of the respiratory organs; and these constitute the chief proportion of winter visitors, who are induced to seek advantage from the climate of Hastings.

The sea bathing is good; a fine sandy beach extending for a considerable distance at low water.

HAY ASTHMA, or HAY FEVER, is one of the most troublesome diseases which the physician is called upon to treat; one, too, which varies extremely in its severity, presenting in one person the symptoms of an aggravated common cold, and in another, in addition to these, the disagreeable and alarming accompaniment of spasmodic asthma. It is decidedly ascertained to be caused by the odours of certain flowering grasses which cattle will not eat; by spring grass generally, and by the odours of certain drugs, as ipecacuanha, the merest whiff of the powder of which causes some susceptible persons to be immediately seized with paroxysms of sneezing, so violent as to be very painful, if not alarming to witness. A sufferer from this troublesome complaint is indeed entitled to sympathy. His head aches, his eyes are suffused, he sneezes violently, and there is an acrid discharge from the nose, with harassing cough. Attacks of spasmodic asthma follow, accompanied, it may be, with great difficulty of breathing, and a sense of impending suffocation. There is nothing for it in such a case but to remove from the cause of the disorder, otherwise it may run on for a month or more. A change to the seaside is often attended with beneficial results.

The treatment of the disease must be naturally divided into that required during an attack, and that which it is desirable to employ in order to render the system less liable to the disease. During a paroxysm, perhaps the most simple and efficacious remedy is the smoking of tobacco, which generally gives relief, if continued till slight nausea comes on. Such is the relief to the breathing in some cases, that the patient has been known to fall asleep with the pipe in his mouth, so great had been the previous exhaustion from the struggle for breath. The inhalation of the vapour of creasote, as recommended by Dr. Walsh, and the use of antispasmodics generally, as ether, lobelia, with the compound tincture of camphor, should be used; or the vapour of camphor may be inhaled by means of Siegle's spray-producer. As the disease is generally supposed to be induced by particles of pollen from the grasses during the season of haymaking, it is suggested that those who are liable to attacks should wear a respirator composed of cotton wool or other impervious material during the period. The recently invented and specially useful form of respirator-inhaler, introduced by Dr. Coghill, may be employed for the purpose. It is made to contain either simple cotton wool, or the same with any medicated inhalation thought desirable (see *Inhalations*). While free from attack, the constitution of the patient should be strengthened by a liberal use of tonics, specially iron, strychnine, arsenic and quinine, either alone or in combination.—Refer to—*Respiration.*

HAZELINE is a clear fluid, the active principle of the witch hazel. It has powerful astringent and curative properties, and, though but recently introduced, it has been largely employed as an external application in medical practice, having been found particularly serviceable in checking hæmorrhages, allaying

irritation from piles and cutaneous sores, as well as in bruises and sprains. It is said also to be a most useful application in cases of chronic and intractable ulcers, which have resisted other means of treatment.

It may be given, too, with much advantage internally, in doses of thirty minims thrice daily. In this way, it has been found by the writer to check, in more than one instance, a tendency to nasal and intestinal hæmorrhage that had defied treatment for years. In cases of piles, it may be injected into the bowel diluted with one or two parts of water.

HEAD.—See Brain—Giddiness—Skull—Wounds, &c.

HEADACHE, "Cephalalgia," is one of the most frequent ailments, the result of a great variety of causes; consequently, many varieties of headaches are enumerated by medical writers. The consideration of all these in a work like the present would tend rather to confuse than to enlighten. The subject will probably be rendered most clear and useful to the unprofessional reader by considering it generally under the divisions of—

Headache from overfulness of blood.

Headache from deficiency of blood, or debility.

Headache from excited or inflammatory action.

Headache from sympathy; and

Headache from nervous causes.

Headache is so frequent an ailment that people generally seem almost to forget its connection with so important an organ as the brain. There are, it is true, many transient slight headaches, and even severe ones in the predisposed, which do not call for much attention; but it must be remembered, that there are others which it is dangerous to neglect; and an individual who *becomes* subject to headache, frequently recurring, should consult a medical man on the subject. This is more imperative from the fact, that there is often considerable difficulty in determining the real nature and cause of some headaches, and that an error in this respect—in diagnosis—may, by leading to erroneous treatment, cause the most serious consequences. The most diverse line of treatment may be requisite, in two different individuals; in one, abstraction of blood may, if had recourse to, save from a fit of apoplexy; in the other, the same treatment might induce paralysis, or epileptic convulsion. The lowering measures, in fact, which cure the one, may kill the other. From these considerations, a few general remarks on the subject of headaches will probably be more safe and useful than an elaborate and detailed account.

If a person who suffers from headache is of full habit generally; if he is sleepy, dull, the vessels of the face full; if the uncomfortable sensation in the head is aggravated by stooping, by an abundant meal, by stimulants, or by sleep, overfulness is the probable cause; and reduction of the diet, purging the bowels with calomel and colocynth, and with occasional doses of saline medicine, exercise, bathing the head with cold water, and, if the symptom is very severe, the application of a few leeches to the temples will be beneficial. If the urine is deficient, cream of tartar in some form may be taken with advantage. The above species of headache, the result of general overfulness of blood, may also be occasioned by whatever impedes the circulation, such as affection of the heart or liver; when the latter is the cause, the pain is frequently most severe at the back of the head. When, on the other hand, headache occurs in a person of weak constitution, when it is produced by or aggravated by exertion of mind, much talking, &c., when there is listlessness both of mind and body, rather than oppression—the face pale, the pulse weak—debility is the probable cause, although at the same time there may be overfulness of blood in the interior of the head itself; very frequently, however, in this kind of headache, the head is hot, without there being any particular flushing of the countenance. This form of headache also is frequently accompanied with indigestion, and is very common in students and anxious men of business. Anything like abstraction of blood will certainly prove injurious; but cold to the head may be of service, not only as a temporary remedy, but habitually used by means of washing with cold water. Exercise, attention to the state of the bowels, without purging, some care in diet, and relaxation of mind, particularly by means of change of scene and air, will be most useful. In such cases, the whole system is weakened—the brain and nervous system, the circulating system, the digestive organs—and they act and react on one another.

Headache from excitement or inflammatory causes, is such as occurs in the first stages of inflammation of the brain, and in some forms of fever, or it follows violence to the head. It of course falls to be treated under the articles on these contingencies generally.

Sympathetic headache is very common, and is evidently connected with disorder in some organ of the body, such as the kidneys, womb, &c. Headache, sympathetic with disorder in the stomach or some part of the alimentary canal is, however, the most frequent form. The presence of bile, or of indigestible food in the stomach, almost certainly occasions dull pain in the forehead; an alkaline, or too acid condition of the contents of the organ exerts the same effect. The various symptoms of indigestion will generally point to the cause. In the first two, an emetic, or some aperient, such as the compound rhubarb pill, or a stimulant, will probably remove the disorder. A vegetable acid, such as vinegar, many persons know from experience, will at once cure headache, especially if it occurs from the use of oily or greasy

food; and again, when acid eructations, heart-burn, &c., indicate the presence of superabundant acid, a dose of soda, potash, or magnesia will correct the cause, and remove the effect. Frequently, a brisk walk for half an hour will remove a bilious headache.

Under the head of nervous headaches, may here be classed all such as are not referable to any distinct cause. They constitute a considerable proportion of the cases of headache generally, and most frequently owe their origin to a disordered condition of the nervous system, and are named from this cause brow ague, megrim, or hemicrania. Various remedies are used for this complaint, the most simple consisting of strong tea, coffee, and guarana. Bromide of potassium, in doses of fifteen or twenty grains, often cuts short an attack of the complaint, and galvanism applied along the course of the nerve is sometimes beneficial after other remedies have failed to give relief.

It would be possible, did space permit, to extend this article to much greater length; but its intention is rather to convey some idea of the general causes of this common ailment, than to enter into the minutiæ of its symptoms, relations, or treatment. Most persons are aware of the best mode of managing their occasional headaches, but when the affection assumes a severe character, the medical man should invariably be consulted.

Refer to—*Brain* — *Fever* — *Indigestion* — *Phenacetine*, *&c.*

HEALTH. — See GENERAL HEALTH—PUBLIC HEALTH.

HEALTH RESORTS.—This term, now so common, was first used by the author, and made the title of a work on the subject, entitled *Health Resorts of Great Britain; and how to profit by them*, published in 1860. In this book England is divided into certain health districts, and it is sought to instruct the reader as to the advantages and disadvantages of each, as well as their adaptability for individual cases of sickness. The question of climate is largely entered into, and advice is tendered on bathing, and the use of mineral waters.

It is strongly recommended that in case of illness, an invalid, whilst following the advice of his or her trusted medical attendant, should always, on going to a health resort for health reasons, add to the advice which sent them from home, that of some medical man of reputation resident in the locality they have been sent to. None but local practitioners can be fully conversant with the requirements to be observed and the advantages to be gained, and even a single consultation may make the difference between benefit derived and time saved, or the reverse.

The standard book on British climate and health resorts has yet to be written; but this cannot be done by one man. A flying visit from place to place, testing and tasting and bathing in the water, or looking over the squares and crescents, can give no adequate idea or sufficient foundation for a trustworthy guide. A thorough work on the subject must be a compilation from succinct reports or short treatises furnished by one or more of the most competent practitioners of each locality; or, better still, by a committee, as in the case of the excellent publication, *Harrogate and its Resources*. The principal drawback to a work so compiled would undoubtedly be the natural tendency of each individual to magnify the resources and advantages of his own locality, but this would not be irremediable, and would be quite counterbalanced by the good achieved.

It is very certain that many people, from want of proper information on the subject, make a very bad choice of a health resort, and that there are many more who, to say the least, do not make the best choice, and do not reap all the advantage which they might derive from residence in a place suited to their wants. Hence before starting, each person should ask himself what is to be the object of his sojourn from home, and what it is he goes to seek. Is it merely pleasure and society, either inland, or at some of our fashionable sea-side quarters? or does he wish to avail himself of one of the sheltered places with which the southern part of our island abounds, where he may find a refuge from the cutting east wind, and all the horrors of damp and cold? Is it a place to spend the winter at, where even the most delicate may leave the house and breathe the fresh air every day, instead of being afraid to leave the fireside, or to pass from one room to another? Or, finally, is it a watering place that is desired?—in which case it is highly necessary the patient should be well-advised, not by enthusiastic friends, but by a medical man, as to the waters he is to drink or bathe in, as well as the climate he seeks.

Persons in the early stage of consumption, or those who are liable to attacks of bronchitis in the winter; persons suffering from certain forms of heart disease, with its numerous complications, from asthma, and emphysema of the lungs, as well as persons of a weak and feeble constitution generally, will often derive benefit and prolong life by passing the winter at one of our warm and sheltered health resorts, provided always that it be well selected according to medical advice, and provided, also, that the best locality for the individual case is chosen by the advice of those to whom the place itself is well known.

Among the most favourite resorts for such cases may be mentioned Bournemouth, Hastings, Margate, Torquay, the Undercliff of the Isle of Wight, Clifton, Brighton, St. Leonard's, Ramsgate, Dover, Folkestone, and the islands of Jersey and Guernsey.

Bournemouth is one of those places which has sprung into notoriety from absolutely nothing, owing to its semi-natural advantages, consisting of finely sheltering pine-clothed

hills. The pine, or rather fir-trees are, unfortunately, however, now greatly destroyed by the cupidity of builders, and consequently the power of protection from bleak winds is considerably impaired. Upon the slopes of the hills are to be seen many beautiful and picturesque villas or cottages. The place is now firmly established as a winter residence, and has received the name of the winter garden of England. The temperature is rather lower than that of the Undercliff and Torquay, but, on the other hand, it is less relaxing and depressing to some people, and has the great advantage of fine walks and drives.

It speaks well for the healthiness of the locality, that after careful consideration this was selected as the site of the sanatorium, in connection with the far-famed Brompton Hospital for Consumption and Diseases of the Chest. Patients, who are admitted on the recommendation of governors, each pay a small sum weekly.

There is pretty good sea-bathing to be had at Bournemouth, though it is not an agreeable summer residence, owing to the abundance of sand, which is blown about in great clouds when the wind is high. It is strongly recommended as a residence for those who, having lived in warm climates, have become morbidly susceptible to the effects of cold and damp, and for rickety and delicate children, who are said soon to recover strength and tone from the constant exercise that may be allowed, in the warm, dry, and beautiful playground afforded by the beach.

Hastings is so well sheltered by the tall cliffs which guard the little valley in which the town lies, from the dreaded east and north winds, that it is often chosen as a refuge, especially during the months of January and February, for those to whom these winds oftentimes bring disease and death. Besides the shelter of the cliffs, which are from 300 to 600 feet in height, it has all the advantage of southern exposure, and of close proximity to the sea. Sir James Clark says of Hastings: "As might be expected from its low and sheltered situation, it affords a favourable residence generally to invalids labouring under diseases of the chest; hence, delicate persons, who require to avoid exposure to the north-east winds, may pass the cold season here with advantage. But in recommending Hastings as a residence in such cases, it will be necessary to take into consideration the full influence of the sea air; for owing to the close manner in which the place is hemmed in on the sea by steep and high cliffs, it has an atmosphere more completely marine than almost any other part of the coast, with the exception of St. Leonard's. Judging from my own experience, I should say that the climate of Hastings is unfavourable in nervous complaints, more especially in nervous headaches, connected with or entirely dependent upon derangement of the digestive organs, and also in cases where a disposition to apoplexy or epilepsy has been manifested; but it will be understood, from what has been already stated respecting the topographical relations of Hastings, that this effect of its climate is chiefly experienced in the lower and more confined parts. Nor is such an effect peculiar to this place; it is common, I believe, to all places similarly situated. The class of persons alluded to, if induced to reside for any length of time at Hastings, should avoid the more confined situations below the cliff, and rather seek such quarters as are more open and elevated, yet in some degree protected from north and north-east winds.

"These remarks on the climate of Hastings apply to it as a winter residence; as a summer residence, the more open and exposed situations should be sought; and for many persons, the high grounds behind Hastings would be preferable to the lower situations close to the shore."

Like most other watering-places of the same class, all parts of the town are not alike sheltered, and consequently medical advice should be taken as to the best situations for particular cases, and those parts which are exposed to the cold winds should be studiously shunned by the delicate in their walks. The sea-bathing is excellent, with a sandy beach; and those who visit the town find every accommodation.

Torquay.—Perhaps no town can boast of a situation more favourable for the mildness of its climate than Torquay, which is placed between the river Dart, on the one hand, and the rivers Ex and Teign on the other. It is said to be almost entirely free from fogs, and to be remarkably dry and warm. It is particularly well sheltered from north-east and north-west winds, and, like other places, allows of considerable variety of climate at different seasons, and to different classes of visitors. The surrounding country, varied by wooded cliff and cultivated slope, encompassing the beautiful bay, has been called the garden of Devon, and presents the most charming variety of scenery. The irregularity of the coast is such, that even within the town itself, the medical adviser is enabled to choose different situations for his patients, according to the description of atmosphere which he thinks will be most beneficial for them; and it can readily be imagined how the warmth of the lower and more sheltered parts of the town may be favourable for one class of cases, while the stimulating breezes of the higher and more exposed parts may be required for others; hence, there is no place in Great Britain which has a higher reputation for relieving the symptoms and prolonging the lives of patients suffering from consumption and chest ailments generally. It is, perhaps, warmer during the winter than any other place in Britain, whilst it is comparatively cool in summer. In

winter, it has a mean temperature of three degrees above the Undercliff of the Isle of Wight, and of five degrees above Clifton and Hastings. It abounds in pleasant walks, and is in every way a most useful, interesting, and beautiful health resort.

Most persons are aware that Torquay derives its chief celebrity from the comparative warmth and mildness of its climate, as contrasted with other places in Britain; and hence its high claims to usefulness in the case of consumptive invalids. Mild, however, as the climate is, its equability, not only as regards humidity, is perhaps a more striking and beneficial characteristic. Although the climate of Devonshire, generally, is a damp one, it would appear that Torquay is drier than other parts of the county, and drier, when compared with other districts of Britain, than it has generally been considered; the reason we have already given, being the attraction of the rain, by the vicinity of the rivers and of the elevation of Dartmoor. The following, copied from Mr. Vivian's tables, will best illustrate the above:—

Taking the

Average Number of Days upon which Rain falls.

		Annual.	Winter.	Spring.	Sum.	Aut.
At Torquay	it rains	132	35	30	32	35
,, Undercliff	,,	146	39	32	33	42
,, Clifton	,,	169	45	36	41	45
,, Hastings	,,	153	39	31	33	49
,, London	,,	178	48	43	44	43

Again taking

The Quantity of Rain in Inches.

		Annual.	Winter.	Spring.	Sum.	Aut.
At Torquay there falls		28·20	6·82	5·61	6·38	9·39
,, Undercliff	,,	23·48	4·65	4·06	4·29	9·48
,, Clifton	,,	32·56	8·43	5·69	9·44	9·00
,, Hastings	,,	32.81	7·59	5·80	6·40	13·02
,, London	,,	24 80	5·85	4·80	6·67	7·43

As might be expected, even without reference to the above table, the autumn and winter months are considerably the most damp at Torquay. Moreover, as stated by Dr. Shapter, in his work on the climate of the south of Devon—"During the winter season the south wind is often accompanied by a warm thick mist, which is particularly relaxing, and, from its frequency, not inaptly styled 'Devonshire weather.' This wind, traversing the Atlantic from the warmer latitudes, reaches the coast charged with a greater degree of moisture than the air can contain, when cooled by the lower temperature of the local climate; the result is the misty appearance of a great dew deposit." Evidently, then, if Torquay is not so regularly moist in every season of the year as it has been usually considered, it is, in winter, a moist and relaxing climate, and this point requires to be taken into consideration by those persons who, either of their own accord, or in accordance with medical opinion, fix upon it for a residence. For, however beneficial the soft moist atmosphere may be in some diseases and states of constitution, it is no less injurious in others—an illustration of the fact that no place or climate is adapted to all constitutions and idiosyncrasies.

Since the foregoing remarks were penned, the writer has had the advantage of many years' residence in Torquay, and can well endorse what he then wrote, although, since then, the beautiful wide-spreading villa town has been greatly extended in all directions, some say, to the detriment of the natural beauties of the place, but nevertheless, a strong testimony to its continued popularity as a health resort. In 1801, the population of Torquay was 838; at the last census, it exceeded 27,000. Moreover, among other improvements has been the introduction into the town of a full supply of the finest and purest water, brought from the Dartmoor Hills; and equally important, there has been carried out a system of thorough main drainage, by which all impurities are carried off into deep ocean. In fact, few, if any, places of residence in the kingdom possess so fully as Torquay the conditions calculated to maintain health; and consequently, few have a lower death rate; for in spite of the invalids who come simply to prolong life, but ultimately to die, and in spite of the fact that numbers of the residents, both tradespeople and others, have come to Torquay in delicate health, the death rate average is but from 15 to 16 per 1000. It was formerly a complaint that Torquay was deficient in sources of amusement. That has been greatly done away with; for in addition to many other means of enjoyment, it now possesses an energetically managed winter garden, and as pretty and well-conducted a little theatre as can be met with out of London. It need scarcely be added, that the spiritual needs of the population are provided for by churches and chapels of nearly every denomination. Lastly, by the excellent railway arrangements, it is brought within little more than five hours' journey from London.

The Undercliff of the Isle of Wight, with *Bonchurch* and *Ventnor*, may be taken as the most favourable situations in that island for those who wish all the advantages of fine scenery with warm climate and shelter from cold winds. Sir James Clark says of it:—"The whole of the Undercliff, which presents in many places scenery of the greatest beauty, is dry and free from moist or impure exhalations, and is protected from the north, north-east, north-west, and west winds, by a range of lofty downs, or hills of chalk and sandstone, which rise boldly from its upper termination of a series of terraces composed of chalk and green sand, which have slipped down from the cliffs and hills above, and been deposited in irregular masses upon a substratum of blue marl." Thus the Undercliff is only exposed to the south, south-east, and south-west winds. The beautiful scenery is especially to be recommended, for it is of that kind which is particularly pleasing to invalids,

presenting a combination of wooded cliffs and knolls, the trees being covered with foliage of the greatest luxuriance, and serving to add beauty as well as shelter to the many handsome and picturesque villas which adorn this charming neighbourhood. The village of St. Lawrence, beyond Ventnor, is said to be the most sheltered spot of the Undercliff district, a point to be borne in mind by those to whom such a situation has been specially recommended, for here the most delicate may enjoy many delightful days in the open air, even in the month of December.

Clifton, which is close to, or rather a continuation or suburb of Bristol, has lately become a resort for invalids suffering from consumptive tendencies, or from delicacy of chest, &c. It is said to be the mildest and driest place in the west of England, being drier and more bracing than Devonshire, so that Clifton is preferable for those whose constitutions are easily relaxed, who suffer from a want of tone, from indigestion, and debility; while such a place as Torquay, with its comparatively more humid and soothing atmosphere, is preferable for those who suffer from very irritable affections of the chest.

The locality is picturesquely wooded, the town is sheltered by rocky cliffs, and the crescentic form of the buildings in the town itself, affords a shelter in many of the terraces from the cold northerly winds.

Brighton, in the later summer months especially, is a most delightful residence for those who are not likely to be injured by the high winds, which are, however, often a source of real danger to those who are ignorant of their intensity, and who expose themselves freely to them in their walks on the pier and on the downs. Of no place, perhaps, in Britain need it be said more than of Brighton, that it is highly necessary to choose a suitable part of the town for a residence, seeing that there is a remarkable difference of climate between one situation and another not far distant from it. Dr. Wigan gives the following sagacious advice on this point. He says:—"An invalid resorting to Brighton should be sure that he is well advised, in the first place, in going at all; in the second, that the season of the year is the proper one; and thirdly, when he gets there, that he chooses his site of residence where he is likely to derive most benefit from the climate." It must be understood that as a winter residence for invalids, Brighton is not so well sheltered and warm as Torquay, Hastings, and several other places which might be mentioned, and that from its exposure to high winds, it is not at all a desirable place of abode during the months of March, April, and May.

It stands unrivalled as a general place of amusement and resort for those who require a holiday with the pleasant adjuncts of society, fresh air, and plenty of it, with amusements and recreations of all sorts.

Jersey.—The climate of Jersey and the Channel Islands generally, may be described as somewhat similar to that of the warmer parts of the south-west coast of England, so that in a word, while it is suitable for cases of irritable chest affection, especially during the winter, which is very mild, it is too relaxing for many invalids who suffer from indigestion, general relaxation, and want of tone of the system.

The mildness of the winter in the Channel Islands is shown by the fact that many flowers and delicate plants can be easily collected there, in the open air, which would certainly never survive the rigour of a British, or even a Continental winter.

Dover and *Folkestone* are scarcely to be recommended as health resorts for the invalid, though they are now a good deal frequented by those who require a modified winter climate. It is not to be supposed that Dover, with its high winds, is suitable for many cases of delicacy of chest for instance, while it will be found a pleasant resort for those who are able to enjoy rambling over its fine cliffs, and inhaling its invigorating sea-breezes.

Having now given a short sketch of some of those places which are best adapted for consumptive invalids, or for those who are delicate, and require to choose a warm climate, more especially in winter, we proceed to indicate the best resorts for those who, suffering from disease of a peculiar kind, are directed to seek the aid of mineral waters, which are to be drunk, or bathed in, or both. It is scarcely possible to over-estimate the general value of mineral waters, it being a fact well known to physicians, that many patients can take medicines in this form, who cannot bear them in any other. Among the principal and most valuable mineral waters of England, may be mentioned the saline aperients of Leamington, Cheltenham, and Scarborough, the hot springs of Bath, Buxton, Bristol, and Matlock, the chalybeate springs of Tunbridge Wells, the chalybeate and sulphureous water of Harrogate, the waters containing iodine and bromine of Woodhall, with those containing bromine of Moira and Ashby de la Zouch.

Of these, the waters of Bath, Buxton, Bristol, and Matlock are hot, while the others are cold. Perhaps the diseases for which mineral waters are most frequently sought as a remedy are indigestion in all its manifold forms, with depraved appetite, debility and nervous symptoms, gout, chronic rheumatism, paralysis, and chronic diseases of the skin. They are especially useful in those cases which prove intractable to other remedies, and in which the patient suffers from depression of spirits, or has had an excess of mental labour. With regard to indigestion, it would be impossible to recommend any one water which would be suitable for every case of this Protean malady; and indeed, it may be urged that in all cases of disease, of what kind soever, medical

advice should be resorted to before and during the taking of the mineral water, and, if possible, advice from medical men on the spot, who have had experience in the action of the waters upon different diseases in different constitutions.

In gout the waters of Bath, Buxton, Leamington, and Cheltenham have a high reputation; while abroad, recourse may be had to the waters of Vichy, Carlsbad, Wiesbaden, or Aix-la-Chapelle. For the old standing and painful forms of chronic rheumatism, often not amenable to ordinary treatment, which are always tedious in their progress to recovery, and in which the symptoms consist mainly of pain, swelling and stiffness of the affected joints, great benefit has often been derived from the diligent use, both external and internal, of the waters of Harrogate, Buxton, Bath, Strathpeffer, Droitwich, and Woodhall Spa; or from the springs of Baden-Baden, Wiesbaden, Carlsbad, Marienbad, Vichy, or Aix-la-Chapelle on the Continent.

In the treatment of *diseases of the skin* of long standing, the sulphureous waters of Harrogate enjoy an unrivalled celebrity, and no doubt this is due in great measure to the beneficial influence exerted by these waters upon the system generally, when judiciously applied, and especially to their alterative and corrective power upon dyspepsia, in all its numerous and varied forms, arising from malassimilation of the food in its passage through the stomach and intestines, and connected with derangements of the liver, pancreas, and other organs.

There is a very good sulphureous spring at Moffat and at Strathpeffer, in Scotland, and the most celebrated on the continent, are those of Barèges, Bagnères-de-Luchon, and Eaux Bonnes, in the Pyrenees, Aix in Savoy, Aix-la-Chapelle, and Enghien.

Chalybeates, or mineral waters containing iron, are useful in certain cases of *anæmia* and *debility* where the features are blanched and pale, and the red particles of the blood are obviously deficient. Now, it often happens that when iron cannot be borne by the stomach, in the shape of medicine properly so called, these chalybeate mineral waters come into play, and are not only borne, but quickly restore colour and freshness to the faded cheek, and health and vigour to the system generally. In certain menstrual derangements, also, they are invaluable. The principal in this country are Tunbridge in Kent, Scarborough, Harrogate; Moffat, or rather Hartfells, and Strathpeffer, in Scotland; and abroad, we have Spa, Pyrmount, Passe, Forges, and Bussang.

Gaseous, or acidulated mineral waters, called also soda or beer springs, depend upon the carbonic acid gas which they contain for their curative or medicinal properties. They *sparkle* when drawn from the spring, or when poured into a glass. They have a peculiar and characteristic sharp, acidulous taste, which, however, they soon lose, and become quite vapid if exposed to the air. Owing to the action of the carbonic acid gas, they are soothing and grateful to the stomach, stimulate the nervous system, increase the appetite, and hence, are of great value in cases of dyspepsia and hypochondriasis. Of course, their properties are modified by the nature of the saline ingredients which they contain. Amongst the most celebrated are those of Cheltenham and Scarborough in England, of Seltzen, Spa, Nauheim, Pyrmont, Bar, and Chateledon, and the sweet springs of Virginia.

Many of the mineral waters both of this country and of the Continent, may be had bottled, and sent to all parts of the world; but there can be doubt that in nine cases out of ten, in addition to all the advantages to be derived from change of scene and climate, it is better to drink them as they issue from the spring. Mineral water salts are also sold, as, for instance the far-famed Cheltenham salt, which is made sometimes from the waters, but oftener, probably, according to some such formula as the following:—Take of common salt, sulphate of magnesia or Epsom salt, and sulphate of soda, of each, one pound; dissolve, filter, evaporate to dryness; then add half an ounce of sulphate of iron. Artificial Cheltenham water may be made of,—Epsom salts, twelve grains, iron filings, one grain; Glauber's salts, four ounces; water, four gallons, impregnated with carbonic acid gas. Harrogate salts and artificial Harrogate water are also well known.

The waters of Bath have a temperature of from 112° to 117°, of Buxton 82°, of Bristol hot well 74°. Those of Buxton are tepid, and those of Matlock and Malvern scarcely tepid. The reader is referred for further information to the author's work on the *Health Resorts of Great Britain.*

HEART.—In connection with this article the reader is referred to *Artery*, *Aorta*, *Chest*, *Circulation.* The heart (fig. 118), the central organ of the circulation, is placed obliquely in the chest, the base upwards, the point, or apex, being so situated as, in the living body, to strike the side of the chest, or beat, between the fifth and sixth ribs, about two inches below the left nipple; this point, however, and indeed the position of the heart generally, is liable to *alteration according to the position of the body.* The size of the heart is generally computed to be a little more than that of the closed fist of the individual; the organ is contained in its own proper bag, or pericardium, which in the healthy state is lined by an extremely smooth moistened membrane; this membrane is also reflected, or carried over the surface of the heart itself; and thus during the constant motion the two surfaces glide easily, and without friction, over each other; the heart lying sufficiently loose in its bag to permit of free movement. The heart is often described

as a hollow muscle; it consists of four cavities, surrounded by muscular walls, and is in fact a double heart; this being requisite for the performance of the double circulation—through the body and through the lungs (see *Circulation*). Of these four cavities, the left auricle and ventricle are devoted to the circulation of the blood through the body, after its return in a purified state from the lungs; the right ventricle and auricle being devoted to the lung circulation. In fig. 118, which represents the heart and lungs and their appendages, the large blood-vessels communicating with the heart are shown in their relative positions within the chest. The course of the circulation may be traced through the great veins, which ultimately terminate on the right side of the heart in the right auricle; the blood then passes into the right ventricle, from which it is propelled through the pulmonary artery into the lungs, where, coming into contact with the air, it becomes arterialised or purified; it is afterwards returned to the left side of the heart to be propelled by the left

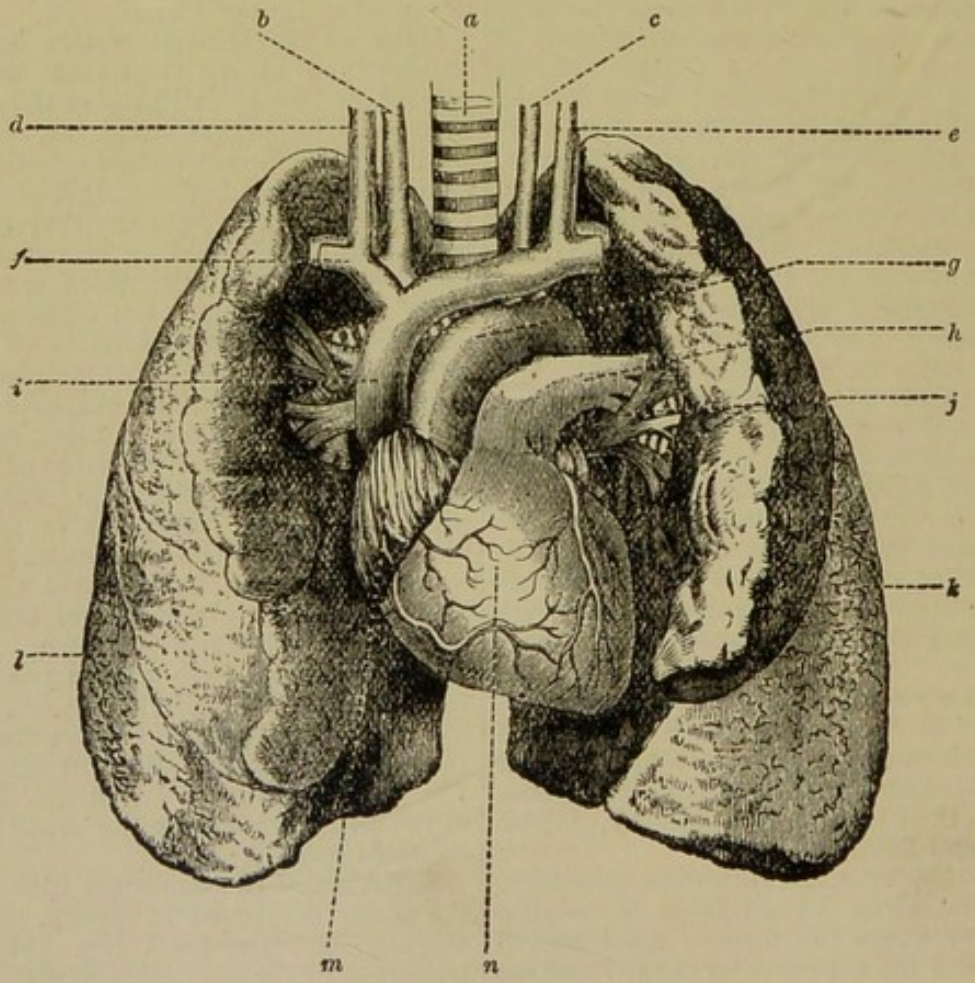


Fig. 118.

a. Trachea.
b. Right Carotid Artery.
c. Left Carotid Artery.
d. Right Jugular Vein.
e. Left Jugular Vein.
f. Right Subclavian Vein.
g. Arch of Aorta.
h. Pulmonary Artery.
i. Superior Vena Cava.
j. Bronchi and Blood-Vessels.
k. Left Lung.
l. Third Lobe of right Lung.
m. Right Auricle.
n. Right Ventricle.

ventricle to all parts of the body, through the medium of the large blood-vessel, the aorta. The auricle and ventricle on the right side of the heart have not, when properly formed, any communication with the corresponding cavities on the left side; but the auricle and ventricle on each side are separated from each other, and the ventricles from their emergent blood-vessels by means of valves—so arranged and governed in the motions of the heart, that the blood can only pass in the right direction when the valves are in a healthy state; but should these valves become diseased in any way, the proper currents of the blood are interfered with, and disease is the result. Thus, the passage from the heart to the great blood-vessel, the aorta, is closed by three "semilunar" valves (fig. 119), which allow the blood to pass freely into the vessel, but should it attempt to return, these bag-like valves instantly close the passage,—the blood itself acting as the closing agent,—and this action takes place once for every beat of the heart. If, however, from

any cause, one or more of these valves should become deficient, it is evident, that each time they close, a small portion of blood will pass back, or "regurgitate," into the heart, and this actually occurs in cases of disease; and the consequence of the long-continued and constantly repeated disordered action, is to cause stretching, or "dilatation," of the cavity which receives the regurgitated blood. This example



Fig. 119.

will explain how one slight derangement in the nicely-balanced machinery of this important organ gives rise to another. From somewhat analogous causes, the blood may regurgitate into, or be dammed up in the lungs or in other parts of the body, causing hæmorrhage, dropsy, and other morbid effects.

Again, there may be impediments to the circulation; the valves above alluded to, or others in the cavities of the heart, may not yield as they should do, or there may be other causes which render it difficult for the heart to propel the blood through the body; in such a case, the heart, like any other muscle under similar circumstances, acquires increase of substance, in consequence of the continued and increased exertion demanded of it, to maintain the proper circulation; and thus we have a cause and effect, producing enlargement of the heart, an evil certainly, but a lesser evil to prevent a greater, for in this very enlargement —this strengthening, as it were, of the heart to do its extra work—the patient's safety for the time lies.

There are, of course, many other forms of heart disease, but the above instances will convey some rational idea of the nature and peculiarities of the disorders of the organ in general. It would be quite profitless in this work to enter into anything like detail respecting diseases of the heart or their treatment; disorders so varied in their nature and symptoms can only be properly investigated and managed by a medical man, conversant with the mechanism and the functions of the human frame at large, and *in their relations of mutual dependence.*

As might be expected, affections of the heart generally, are evidenced by pain in the chest, difficult breathing, cough, palpitation, &c.; and at other times by faintings, giddiness, irregular pulse, &c.; but there is not one of these symptoms, or any combination of them, which may not be developed under certain bodily conditions, although the heart is perfectly sound; none, therefore, need alarm themselves merely because such symptoms occur; they happen at times more or less to all, still they ought not to be neglected; if they continue to recur, a medical man should be consulted. If there is no disease the mind is set at rest, and any general disorder which may have caused the symptoms will probably be rectified. The above cautions are given, because there is no class of diseases of which people are so apt to fancy themselves the subjects as those of the heart; and the more they ponder over their feelings, the more likely are the symptoms to continue or increase, on account of the organ being so intimately associated with the emotions of the mind. Again, even if the heart be unaffected, it is by no means advisable to permit it to continue to be functionally disordered, either by mental emotion or by sympathy with other organs, for the functional disorder may end in organic disease; that it does so sometimes is evident from the fact, that there is no more fertile source of heart disease than those convulsions, either commercial or political, which occasionally agitate society.

If disease of the heart, either incipient or confirmed, does exist, the person should be placed under medical supervision, and the necessary precautions and regulated mode of life adopted: for with these precautions a large majority of persons who are the subjects of heart affection, may not only continue to live for years, sometimes many years, but to enjoy life. True, the knowledge to any one that he is himself the subject of heart disease may be uncomfortable, but it cannot be unprofitable; he may be aware that heart diseases are sometimes apt to have a sudden termination, and that *his* life *may* be somewhat more in jeopardy than that of an unaffected person; but surely to every right thinking man, this fact would rather be an argument why he should know his real condition. The possibility of his being called away from the affairs of this life without warning, should be a reason for his keeping them well arranged; and still more important, should it be a reason that in conducting his earthly stewardship, he should do it, not only with reference to this world, but to give account of it in another; and when the many chances and contingencies of life are considered, the consciousness of being the subject of heart disease amounts to little more than such contingencies assuming a more prominent position in the mind, and to the individual it may be a merciful dispensation. It may seem to some that in writing thus the author is assuming the character of the clerical rather than of the medical adviser; it is not so, it is but taking advantage of the privilege which falls to the lot of the physician, when he has in his power times and opportunities in his relations with society, when the word in season cannot be out of place, so far as the welfare of those entrusted to his care is concerned.

The causes of affections of the heart are very numerous; as already noticed, mental disturbance and agitation is a most frequent one, also mental depression and grief, which, if long continued, appear to exert much influence over the organ, and to make the phrase "a broken heart" not altogether a poetical fiction. Violent passion strongly affects the heart—its indulgence may lay the foundation of disease, which its repetition strengthens, and may bring to a fatal termination. Rheumatism, or rather rheumatic fever, is probably another of the most fertile sources of heart affection. In this disease, inflammation of some portion of the membranes covering or lining the heart (see *Carditis*) is apt to occur, and to be followed by such effects as induce permanent change. Violent physical exertions, dissipation of all kinds, particularly the abuse of spirituous liquors, are all originators of the above affections. It has been said that persons with heart affections may continue to live and enjoy life, but it must be under a more regulated and restricted system of living than is imperative on persons in health. Everything which may be a cause of heart affection must also be a source of aggravation; all mental or physical excitement especially so. When these are guarded against, the rest may be summed up in—strict attention to the general health. Whenever an old symptom becomes aggravated, or a new one, such as swelling of the legs, &c., appears, medical advice should always be taken. The great secret in these affections consists in maintaining the balance of the various functions, and this can only be done by the judicious management of a medical attendant.

Refer to—*Angina pectoris—Carditis—Circulation—Hysteria—Palpitation*, *&c.*

HEART-BURN.—A burning or irritating sensation, felt either at the pit of the stomach or top of the throat, and occasioned by undue acidity, or by acrid matters, in the stomach. It is generally relieved by an alkali—potash, soda, magnesia, or chalk—which neutralises the acid. It is not, however, advisable to have too frequent recurrence to these palliative remedies, for they are only palliatives, they cannot be taken habitually without weakening, not only the stomach, but the system generally. Heart-burn cannot continue to recur without there being an error somewhere; either the diet is badly regulated, or the digestive organs require something more than simple neutralisation of the superabundant acid. This acid is a badly-formed gastric juice, and if it is neutralised, whatever digestive power it might possess is destroyed, consequently the stomach is called upon to secrete another supply before the food can be digested—a call upon its powers which cannot fail to be injurious. Moreover, persons finding how quickly a dose of alkaline medicine removes the uncomfortable sensation of heart-burn, are very apt to trust to the palliative, and continue their indulgences, rather than to practise the self-denial requisite to effect a cure of the cause. Much benefit is derived from the use of bismuth in heart-burn. A mixture consisting of ten grains of subnitrate of bismuth with an equal amount of compound powder of tragacanth in an ounce of water for a dose, and repeated two or three times a day, is a good mode of administration. If accompanied with pain and eructations, the addition of ten minims of hydrochlorate of morphia solution, and ten grains of bicarbonate of soda, will be found to give relief. A small tea-spoonful of powdered charcoal taken at bedtime, will often allay heart-burn, if liable to occur in the night.

Some persons find Spanish liquorice a good palliative in heart-burn.

Refer to—*Indigestion*, *&c.*

HEAT.—The agent which gives to our senses the feeling of heat, is in scientific language called caloric, to distinguish it from the term heat, used to designate the sensation. In this article, however, the one term heat is employed. It is not requisite here to enter into a consideration of the nature of heat; its best known source is the great fountain of heat, the sun; there is also the minor development of heat in the interior of the earth; that produced, or at least manifested by friction, and also by combustion, chemical change, and in the bodies of animals (see *Animal Heat*), and in the growth of plants.

Heat is interesting in a medical point of view; first, from its effect upon the healthy body—its physiological effect; and second, from its effects as a remedy in disease—its therapeutical effect.

Of the first, the physiological effects of heat, much has been said under *Acclimation*, *Animal Heat*, *Bile*, *&c.*, which it is unnecessary to repeat here; these articles sufficiently point out the effect of continued high temperature—from 80° to 110°—such as occurs in tropical climates, upon the human body.

When the heat becomes very intense, particularly if there is direct exposure to the rays of the sun, more immediate and marked effects result; the brain may be affected, and sunstroke, or "coup de soleil," as it is called, be the consequence. This affection, which is not uncommon among the European residents in India, and especially among troops on march, is sometimes also witnessed in the case of harvest-labourers in this country, in very hot summer weather. The affected person falls insensible, the face flushed and swollen, and the vessels beating violently. The most efficient remedies are said to be pouring cold water on the head, and the administration of a small quantity of stimulant, ammonia or brandy.

The skin of persons exposed to extreme heat is liable to be affected with what is called "prickly heat;" an eruption of small pimples, or of minute blisters. In either case, the use of a tepid bath, with a little lead lotion, will allay

the symptoms; and it may be well to take some cooling saline aperient.

Although continued exposure to heat produces these effects, it is now well known that the living human body is capable of supporting, with impunity, exposure to an atmosphere of very elevated temperature, considerably above that of boiling water, provided the air be dry. The development of unusual heat at any part of, or over the whole body, is attendant on all feverish and inflammatory attacks, and gives an indication of the extent and character of the malady. The temperature of the body is taken by means of a small thermometer, placed in the arm-pit, or under the tongue, for a few minutes. The normal temperature, or the temperature of health, is 98° Fahr., that of fever may rise as high as 106° or even 108° Fahr.

The use of heat in the treatment of disease is very frequently alluded to in this work, more especially because it is not only one of the most extensively useful, but also one of the safest and most generally applicable remedial agents which can be placed in unprofessional hands. Heat may be used as a remedial agent, simply as a soother, or—if we may be allowed the expression—an anodyne. It may be used as a derivative, or as a counter-irritant. Its application in the latter form will be found alluded to under the article on the subject. In cases of severe pain, such as colic, gall-stones, gravel, &c., heat properly applied seems to act as heat simply upon the nervous system, exerting an anodyne effect and relieving the spasm. For this purpose it may be used, by means of stoneware bottles or tins filled with hot water, or by hot bricks; but these solid bodies are not so useful or pleasant as other more yielding agents; and bags filled with heated grain, oats, salt, bran, or some such material are to be preferred. India rubber bags or cushions, which can be filled with hot water, are also admirable for the purpose. When a derivative (see *Derivative*) action is required, as it is in inflammation and inflammatory pain, then heat with moisture must be used, and nothing answers better than hot bran poultices or fomentations of hot water. The great effect of the heat and hot vapour when used, in these cases, is to produce perspiration from the part, and thus to combine this means of relief with the anodyne action of the elevated temperature. The use of heat, especially of moist heat, in the treatment of disease, is especially pressed upon the attention of the unprofessional reader, for it is a remedy almost always procurable, and almost always safely usable. There are, however, a few exceptional cases, in which the use of heat is not desirable. These are such as call for astringing rather than relaxing. Bleeding from, and swelling of, various parts may be increased by heat, which must therefore be avoided.

Refer to—*Animal Heat—Bran—Fomentation—Poultice, &c.*

HECTIC, or Hectic Fever, is an intermittent form of fever which occurs in the latter stages of consumption, and also of other diseases of a slow wasting character. The paroxysm of hectic usually comes on towards evening, the person becomes heated, perhaps thirsty, the eyes are brighter than usual, the cheeks reddened,—sometimes beautifully coloured,—and display the circumscribed "hectic flush," at the same time, an almost morbid elevation of spirits is not uncommon. Towards midnight the stage of fever is succeeded by that of perspiration, which increases as morning approaches, till towards four or five o'clock the patient is completely soaked in moisture, and is left in a state of painful exhaustion.

Refer to—*Consumption, &c.*

HELLEBORE.—A wine prepared from the root of the white, and a tincture made from the root of the American or green, hellebore, are admitted into the British pharmacopœia. These act powerfully as emetics and purgatives, causing great irritation of the mucous membrane of the mouth and alimentary canal. The green hellebore depresses the pulse, and has been much employed in America as a febrifuge, as well as a remedy in gout and rheumatic fever. It has not met with the same favour in this country. The dose of the tincture is from five to twenty drops.

HEMICRANIA.—Pain confined to one side of the head. It is generally of a neuralgic, or rheumatic character, and is often relieved by quinine in large doses or by galvanism.—See *Headache.*

HEMIPLEGIA.—See Paralysis.

HEMLOCK. — Conium Maculatum. — This well-known native plant belongs to the umbel-bearing tribe. Persons frequently call all plants of this tribe "hemlock," but erroneously. The true hemlock may at once be distinguished by its being the only British plant belonging to the *umbelliferæ* which has a *smooth spotted* stem. The knowledge of this fact may be useful in case of alarm, not unfrequent, from children having eaten the leaves of such plants in mistake for parsley. The leaf of the hemlock is a very deep green, and, when bruised, emits an odour like that of mice. Hemlock is used by medical men as an occasional substitute for opium. Domestically, the leaves may be used externally, as a poultice, in painful ulcerations or tumours. The expressed juice of the fresh leaves, to which rectified spirit is added in the proportion of one part to three parts of the juice, is the best preparation for internal administration. It may be given in doses varying from a half to two tea-spoonfuls.

In persons poisoned by hemlock, the symptoms are giddiness and dimness of sight, convulsive twitchings, paralysis, perhaps vomiting. The same treatment as that recommended in poisoning by belladonna may be adopted until

medical aid can be procured. The use of strong coffee or green tea will also be advisable.

HÆMORRHAGE.—See HÆMORRHAGE.

HEMP, or INDIAN HEMP, from which the "Haschisch" of the Arab, the Bhang and Gunjah of the East Indian is obtained, is used by Asiatics on account of its intoxicating power, and it has come into use in medical practice in this country for its anodyne and antispasmodic properties, particularly in neuralgia, asthma, tetanus, and hydrophobia.

HENBANE—HYOSCYAMUS NIGER—is a native of Britain, and of Europe generally, being found on the road sides and uncultivated ground, particularly in the vicinity of houses. It is, however, cultivated for medicinal use. Henbane grows from one to three feet high; its leaves are large, the edges waved,—sinuous,—pale green, and viscid, the flowers are dingy yellow, and much and darkly veined, the whole plant smells disagreeably. Henbane is one of the narcotic substitutes for opium most generally employed. It is given either in tincture, extract, or juice. The dose of the tincture and juice is from thirty minims to a tea-spoonful; of the extract from five to ten grains.

The action of henbane is, in many respects, similar, but much inferior in power to opium; it possesses, however, one great advantage over that drug; it does not confine the bowels; it is, therefore, a most admirable addition to medicines, particularly purgatives, which are apt to gripe; in many cases the addition of one-third of extract of henbane to the compound colocynth, and other aperient pills, is of much service. It sometimes occasions—in too large doses—a peculiar state of delirious hallucination. In a case of poisoning by henbane, treatment similar to that recommended under *Belladonna* should be adopted.

HEPATIC.—Belonging to the *Liver.*

HEPATITIS. — Inflammation of the *Liver.*

HEREDITARY TENDENCY. — The transmission of a tendency towards certain forms of disease from parents to children, and from ancestry generally to their descendants, has been an acknowledged fact from remote ages; a proof of the unmistakable character and frequency of the incident. Some portions of the body are more liable to be affected by transmission than others, "but no organ or texture is exempt from the chance of being the subject of hereditary disease;" and although some diseases are well known to be much more generally inherited than others, we have no means of determining how far the limitation extends, or whether indeed it does not include diseases generally within its bounds.

Although there are maladies, such as syphilis, which are so directly inherited that the offspring is actually found to be affected with them when born; this is not the common rule, the hereditary taint acting rather by giving the bias to the development of the disease; and it is observed, that those children which more nearly resemble the parent in physical conformation, are more likely also to resemble in liability to certain forms of hereditary affections. It is not necessary, however, for the transmission of hereditary disease that it should be developed in the parent, who, although the connecting link between a grandparent and grandchild as regards the disease bias, may yet have been entirely free from the transmitted disorder. In other words, a hereditary tendency to disease seems often to skip over one generation.

Hereditary predisposition may be derived from a parent without special hereditary tendencies, in whom a definite disorder has been developed, from injurious habits or unhealthy environment; whatever debilitates the system, whether it be advanced life, dissipated habits, or the like, is almost certain to affect the children, and may originate a tendency to scrofula in a family previously free from it. Even a transient bodily condition seems frequently to influence the offspring, more particularly as regards the nervous system; drunkenness in the parent produces idiotic children; mental excitement communicates its own tendency.

Again, disease apparently hereditary may be developed in a family without its being traceable in the descent, that is, the children, many, or all of them, may be liable to certain forms of disease, towards which neither the parents or ancestors generally had displayed any marked tendency. The fact is one not uncommonly met with.

Scrofula and consumption, gout and rheumatism, insanity and paralysis, asthma, epilepsy, blindness, and a good many other diseases are well ascertained to be transmitted by hereditary tendency. It is not, however, necessary that the tendency should develop itself under the exact form of the disease of the parent; thus, scrofula instead of showing itself as consumption, may take the form of insanity, or gout may be substituted for gravel.

The practical importance of a knowledge of these hereditary tendencies is self-evident. There are perhaps few, if any, who do not inherit some predisposition to certain forms of bodily disorder; it must, therefore, be not only to the advantage, but it must be the duty of every responsible person to consider what these predispositions are in himself, and to endeavour, as far as circumstances will permit, to avoid their being excited; still more important is it. in the contraction of marriage, to consider whether union with one having similar hereditary tendencies will not certainly entail upon offspring an irremedial predisposition to disease thus inherited from both parents. This argument derives tenfold force if the parents happen to be nearly related by blood. for even

in healthy families the marriage and intermarriage of near relatives almost certainly leads to the production of weakened and weakly descendants.

Refer to—*Marriage.*

HERNIA means the protrusion of a portion of any organ from the cavity in which it is naturally contained; thus, there is hernia of the brain, or of the lungs; the term is, however, most generally applied to the protrusion of part of the contents of the abdomen.—See *Rupture.*

HERPES.—A disease of the skin, characterised by the eruption of aggregations of small blisters. Shingles is a form of herpes.—See *Skin.*

HERRING, like the other oily fishes, is apt to disagree with weak stomachs.

HICCUP is a spasmodic affection of the diaphragm (see *Diaphragm*). Generally a trivial and transient inconvenience, its occurrence in the last stages of acute disease is a grave, often a fatal, symptom, indicative of giving way of the nervous system generally.

Continued and obstinate hiccup sometimes occurs in the persons more especially of young females of a hysterical tendency, and may continue for weeks without cessation, except during the hours of sleep, in spite of all kinds of treatment. The causes of ordinary hiccup are generally fasting, or some sudden stimulant taken into the stomach, such as highly-seasoned soup; and the affection generally subsides of its own accord. When inconvenient, nothing is so likely to remove it as some active emotion of the mind suddenly excited. The continued sipping and swallowing of cold water or sucking of ice, are frequent domestic remedies; or antispasmodics, such as sal volatile, may be useful. In the attacks of continued hiccup above-mentioned, a medical man should be consulted; but the disorder will frequently run its course in spite of his treatment.

Refer to—*Hysteria.*

HIP-JOINT.—The hip-joint is formed on

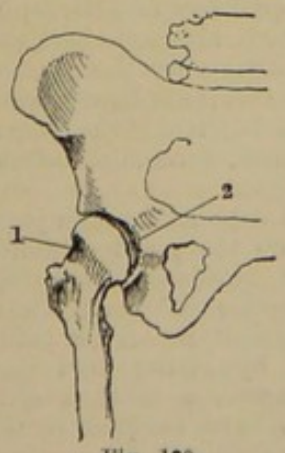


Fig. 120.

the one hand by the head of the thigh bone (fig. 120—1), and on the other by the deep cup, or cavity (2), which is excavated for its reception in the bones of the pelvis, or hips, thus constituting a ball and socket joint, which, although it may suffer dislocation, can only do so from extreme violence in peculiar directions, and in peculiar positions of the limbs.

HIP-JOINT DISEASE, Morbus Coxarius, is a disease of the joint just described, to which children of a scrofulous constitution are more peculiarly liable. It is of the highest importance as regards ultimate results that this affection should be placed under proper surgical treatment in the earliest stage in which it can be detected; but its approaches are often so insidious that in most cases it has made considerable advance before it is even suspected by parents that there is anything wrong. The following description by the late Professor Syme may perhaps put some upon their guard:—

"Hip disease prevails in cold moist climates, and attacks chiefly children between the ages of seven and fourteen, though it is not unfrequently met with both before and after this time of life. The first symptom complained of, is generally pain of the *knee* which often exists for months before any indication can be perceived of the true seat of the disease. Sooner or later the patient is observed to walk awkwardly and less vigorously than usual; and when the circumstances on which this difference depends are investigated, it appears that the affected limb is elongated and emaciated,—that the convexity of the hip is flattened so that the furrow between it and the thigh is less distinct and more oblique in its direction,—and that, in standing, the foot is advanced a little before the other one, with the toe slightly everted, and that the patient does not rest his weight upon it. Pain is now felt in the hip-joint itself, and though aggravated by motion, often becomes more severe from time to time without any such cause of irritation. It is most apt to do so during the night, particularly when the weather it wet and changeable. In this second stage, the disease remains generally several months, and sometime a year or two. At length the symptoms which have been mentioned, either disappear, and the limb recovers its former condition, or they are succeeded by others still more disagreeable. In the latter case, the limb becomes considerably shorter than the sound one; its mobility at the same time being much impaired or altogether destroyed, and permanent rotation either inwards or outwards also taking place. Collections of matter now generally make their appearance, most frequently on the outer side of the thigh, but occasionally in the groin and hip. In some few instances, but very rarely, the fluid of these abscesses is absorbed, but the ordinary course, which it follows, is to issue externally through openings formed, either by ulceration, or artificially by the surgeon. The patient then, after a tedious illness, becomes hectic and dies; or recovers with a stiff joint, and a wasted use-

less limb." Great advance has been made in the treatment of hip disease, since the foregoing description was written. It is now considered essential to keep the joint entirely at rest. This is best done by placing the child on a tolerably firm mattress, and keeping the limb still by means of a weight attached to the foot of the affected side. The foot is protected by a closely-fitting shoe, made of some soft material, and fastened by means of a string from the sole to a weight. For a child of five years, the weight should be about four pounds six ounces, and should be increased in proportion to age. In addition to this, a long splint reaching from the arm-pit to two inches beyond the foot, to which the entire limb is bound, and the upper end fixed by a band encircling the chest, will ensure a straight leg, should the joint become fixed. Frequently the surgeon finds it necessary to excise a portion of diseased bone from the hip, before a cure is effected. When a large abscess forms, and the strength of the patient is being reduced by the discharge, the operation referred to is usually considered advisable.

HOME-SICKNESS, or NOSTALGIA, is a peculiar affection of the mind to which the natives of mountainous countries, especially the highlanders of Scotland and the Swiss, are liable when at a distance from, and during prolonged absence from, their homes. They are seized with a vehement desire to return, and if this is not gratified, melancholy, loss of sleep and appetite, and finally, perhaps, disease of the lungs, supervene. The emotion is liable to be excited by whatever recalls forcibly to the mind the beloved scenes; national music does this most strongly; so much so, indeed, that it has been found requisite to prohibit for a time the performance of certain airs when troops have been stationed abroad.

HOMŒOPATHY is the system of treating disease founded by Hahnemann, upon the principle that diseases presenting certain sets of symptoms are cured by medicinal agents, which have the power of exciting similar symptoms in the body of a healthy person to whom they may be administered. In conjunction with this principle, practical homœopathy enjoins the administration of the above medicinal agents in inconceivably minute doses. In a work like the present, it would be futile—in the limited space which could be allotted to the subject—for the author to attempt to lay before his readers those reasons which, to his own mind, would render him loth to trust either his own life or the lives of his patients to homœopathic treatment. Of late years the majority of homœopathists have increased the doses of their medicines to such an extent as at times to equal, if not exceed, those given by allopathic physicians. It is somewhat difficult to reconcile this change with the alleged cures effected by the infinitesimal doses.

HONEY, the well-known substance collected by bees from flowers, consists almost entirely of sugar, partly crystallisable, and partly not so; the first being similar to grape sugar, and capable of undergoing at once the vinous fermentation. Honey varies in degree as regards fragrance and taste, according to the flowers from which it is collected, and in some instances it is even of a poisonous nature, in consequence of being collected from poisonous plants. As an article of diet, honey is wholesome for most persons, although with some it causes acidity, and others it gripes. It is slightly aperient. For medicinal purposes, especially domestically, honey is frequently used, and answers well as a pleasant addition to cough mixtures, &c. Mixed with a little vinegar or lemon juice, it is useful in cases of sore throat and cough, with adhesive expectoration. Honey is frequently used mixed with borax in cases of thrush in children, and in sore mouths generally.

Refer to—*Borax.*

HOOPING or **WHOOPING COUGH,** or CHIN COUGH, may be described as a spasmodic catarrh. It is one of those diseases of which one attack confers immunity from all future liability to the affection, and as it is generally passed through in childhood, hooping cough is comparatively seldom met with in adults, although they are by no means exempt from it.

The first symptoms of hooping cough are those of common cold, which, having continued unrelieved for ten days or a fortnight, gradually assumes the spasmodic character of the disease, that is, the cough comes on in prolonged paroxysms, which present the following symptoms. After a succession of violent expulsive coughs, a long-drawn inspiration is made, accompanied with the peculiar crowing, or "hoop," which characterises the disease, and gives it its name; this inspiratory effort is again immediately followed by the same expulsive coughs, and the alternation continues until the child is relieved by the expectoration simply of a quantity of glairy phlegm, or by vomiting, which also expedites the expectoration. Very soon after the paroxysm is over, the child resumes its ordinary condition, whatever that may be; and if the stomach has been emptied of food, generally, before long, complains of hunger.

Whilst the expulsive cough is going on, the child seems on the point of suffocation; the face becomes swollen and livid, the veins turgid, the eyes projecting; the whole frame is so shaken, that the little patient seeks to steady itself by laying hold of some fixed object,—its nurse, a table, a chair,—indeed, children who have suffered some little time from hooping cough, instinctively run to some means of support as soon as they feel a paroxysm *coming* on.

The severity of hooping cough varies greatly; sometimes it is so mild a disease that it is

carcely possible to pronounce whether it has existed or not, no more than one or two "hoops" having been heard during its course; at others, the paroxysms of hooping and cough occur many times in the twenty-four hours. At first, the expectoration is thin, and got up with difficulty; as the disease advances, especially if favourably, it becomes more consistent, and is more readily parted with.

When hooping cough is on the decline, the paroxysms occur only at more distant intervals, and are shorter, in consequence of the greater freedom of expectoration. Bleeding at the nose is not at all an unfrequent consequence of a fit of coughing, and, in stout children, may be regarded as a relief. The duration of hooping cough may be from one month to six, according to circumstances, such as season, summer being the most favourable. When it exists alone it is not a serious disease; but when, as is too frequently the case, it becomes complicated with affections of the brain and nervous system, such as convulsions, or with inflammation of the lungs or air passages, it is transformed into a most dangerous malady, and carries off numbers of children, particularly very young children—under two or three years of age—to whom it is more fatal than to those at a more advanced stage of life, and who have passed the age of teething.

There is no question as to the contagious nature of hooping cough, and children suffering from it must be kept apart from those who have not had the complaint. The nursery should be kept warm and comfortable.

In one respect, hooping cough is like fever; it is a disease which, as far as our present remedies are concerned, has a course to run, and one we cannot prevent; but we can guide the disease in that course, and by watching symptoms, and meeting them (should they assume a conspicuous or alarming character) by appropriate treatment, prevent the affection from those complications which constitute it a disease of danger. In many cases, if the attack of hooping cough is tolerably mild, parents never require medical attendance; but in the event of their not doing so, it is their duty to watch their children closely, and on the slightest appearance, either of inflammatory affection of the lungs, or of a tendency to convulsion, to call in proper advice, using in the interval—if there must be one—such modes of management as are recommended under these articles. As regards the actual treatment of the disease itself, it is questionable whether any system of medicine is of very great service, but much depends upon proper and judicious management. The diet of the child should be strictly attended to, and ought to consist chiefly of milk and farinaceous preparations—in short, a mild unheating diet, meat being better avoided altogether, unless the child is very delicate, in which case, tolerably good broth will be the best mode of giving animal food. The bowels ought to be kept in as regular a condition as possible by means of simple aperients, and the child protected from the influence of weather (see *Clothing*). Indeed, if hooping cough occurs in winter, the safer plan is to confine the child entirely to the house, and especially during the prevalence of the east winds in spring.

When expectoration is difficult, it ought to be facilitated by ipecacuanha wine, which may be given in tea-spoonful doses, two or three times a day. Sometimes the paroxysms are so severe as to require the administration of a sedative or antispasmodic. A little chloroform dropped on the palm of the hand, and applied in this way to the mouth and nostrils of the child, will often mitigate a paroxysm of coughing. Belladonna, henbane, and even opium, are given by the mouth for a similar purpose. Belladonna is particularly useful in relieving the distressing spasms, and is best given in the form of tincture, of which from five to ten drops may be taken in a little water three times daily. Many other internal remedies for hooping cough are given and recommended, such as alkalies, cochineal, iron, &c., but these already mentioned are sufficient for the management of the disease. External remedies, such as embrocations, are often employed; "Roche's Embrocation" has been in much favour for the purpose; it is said to consist of olive oil two parts, oil of amber and oil of cloves, each one part; it is, therefore, stimulating, but probably any other stimulating embrocations, such as camphorated or ammoniated oil, would answer equally well. If anything can be said to cure hooping cough, it is change of air, which, in the *latter stages* of the affection, seems to act like a charm, and should always, when circumstances permit, be had recourse to. When the disease has passed, or is passing away, if the child, as perhaps it may be, is much reduced, strengthening remedies, tincture of steel, &c., with good diet may be required. For some time after an attack of hooping cough, more than ordinary care must be taken to guard against cold, which is very apt to bring back—in degree—the symptoms, and even the "hoop."

It is repeated, hooping cough is not in itself a disease of danger, and, especially if it occurs in summer time, may be safely and tolerably easily passed through with judicious and simple management; but should it become complicated, as mentioned in the foregoing article, it may require all the care and skill of the physician to save life.

Refer to—*Bronchitis*—*Catarrh*—*Convulsion*—*Expectorants*, &c.

HOPS, the well-known bitter agent, are the seed "catkins" of the *Humulus lupulus*, or hop-plant, which is native both to Europe and North America, and belongs to the nettle tribe. The elegant twining hop is too well-

known to require description. The hop is an agreeable aromatic bitter; it is, therefore, a stomach tonic; it possesses also narcotic properties, though not strongly marked ones; a pillow stuffed with hops is frequently used to procure sleep, and hops heated in a flannel bag are a common remedy for toothache, neuralgia, &c. The use of hops to impart bitterness to beer was commenced in this country in the reign of Henry the Eighth, and there is no question that the addition is a perfectly wholesome one when not in excess; with this view, the highly-hopped bitter India beer, or pale ale, may also be regarded as a medicinal tonic; but it must also be a matter of doubt, whether its *continued* use, in cold climates at least, is beneficial. Bitter tonics, generally, should not be habitually persisted in, and there seems no reason why bitter beer should be an exception to the rule. The practice, therefore, of drinking it *regularly* cannot be recommended —as far at least as its tonic properties are concerned. The infusion of hop is a good tonic, in weak and irritable states of the stomach, either taken alone or combined with an alkali; it is made by infusing an ounce of hops in an imperial pint of water: the dose half a teacupful. The young shoots of the hop plant are, in some places, cooked and eaten like asparagus, for which they do not form a very bad substitute.

HOREHOUND, or WHITE-HOREHOUND, botanically named *Marrubium vulgare*, is a tolerably common native plant; it is, too, much cultivated in gardens in the country for domestic use, horehound tea being in much request for coughs, &c.

HORSE-RADISH, the well-known condiment, is the root of the *Cochlearia armoracia*, one of the scurvy grass tribe. It is powerfully stimulant. An infusion may be made in the proportion of an ounce of the scraped root to a pint of boiling water, and might be used in the absence of other stimulants; or a poultice made of the scraped root might be used instead of a mustard plaster. The infusion made into a syrup with sugar, and frequently sipped, is said to be useful in loss of voice from cold. It is well here to state the fact, that the root of the common monkshood (*Aconite*) has been used by mistake for horse-radish, and caused death in a very short time. The reader is referred to the illustration and description of both roots given under *Aconite*.

HOSPITALS were institutions unknown to heathen ages. Their origin is distinctly due to Christianity, and they have been general in Christian nations from very early times. Among ourselves, although the suppression of the monasteries in this country in the reign of Henry VIII. retarded for a period the extension of these benevolent institutions, the surrender of two of the oldest hospitals (St. Bartholomew's and St. Thomas's) to the citizens of London in the years 1547 and 1558, kept alive the public interest taken in the welfare of the sick poor. In the course of the eighteenth century the desire to extend the benefits of hospitals to the sick took a practical form, by the establishment, in nearly every town of any importance in the United Kingdom, of an hospital supported by voluntary help to which the sick or injured could be taken. Prior to the Reformation, lazar and leper houses existed in large numbers and in all parts of the country, being chiefly attached to religious houses where the patients were superintended and medically cared for by the monks. Substitutes for these, founded on a more liberal scale, and more in accordance with the wants of the community, are now universally known as hospitals or infirmaries, their growth having kept pace with the increase of population and the requirements of medical education. The accompanying table (page 324) gives the date of foundation of hospitals for the sick in Great Britain and Ireland prior to the present century, with the exception of the two oldest already named.

During the present century an immense accession has been made to the above, while the majority of the establishments named have either been rebuilt or greatly enlarged. As medical education advanced, and the wants of the poor became better understood, the propriety of classifying and isolating various forms of disease became obvious, and special hospitals for contagious and epidemic complaints, as well as institutions for diseases of special organs of the body, such as the eye, the skin, or the lungs were established. In times more recent, convalescent hospitals (or homes as they are more frequently called) have been established in the country or at the sea-side, and give effectual help to the hospital system; while lastly, numerous village or cottage hospitals, each containing from six to twelve beds have been erected in various rural districts, which formerly felt the want of immediate aid in sickness and accident. Notwithstanding all this charitable help, ostensibly intended for the industrious poor, there remains still a large residuum of pauper population who cannot avail themselves, for many reasons, of the benefits of hospitals supported by voluntary charity. For these, as well as for others who choose to become paupers, the legislature has made ample provision in the numerous infirmaries attached to the unions in large towns.

Apart from their history as schools of medicine and surgery, there is nothing which brings the past and present history of hospitals into stronger relief than that which relates to the means taken from time to time to improve their sanitary condition. In the past, they acquired a bad reputation for high death rate, induced by over-crowding, especially during epidemics, when contagious complaints were drafted into the same hospitals, which admitted non-infectious maladies; and persons suffering from severe wounds, or who had undergone import-

ant operations, were liable to succumb to disease induced by the unhealthy atmosphere. The first step to remedy these evils was to separate the contagiously-affected from the others, and the second, to provide for each class an adequate amount of individual accommodation, combined with freedom of ventilation. In hospitals constructed in the pre-sanitary period (1840, or thereabout), it has been often found difficult, from original faults in the buildings, to remedy the latter defects, especially, as often happened, when the windows were confined to one aspect only of the building. This condition was also complicated with another equally, if not more, inimical to a healthy atmosphere. The fact is now becoming daily more apparent that less attention was paid in those days to drainage, to the trapping of waste water and soil pipes, to cleanliness, and, in fact, to all questions relating to health, which are now considered of such vital importance for the successful treatment of the sick. The experience of almost all the older hospitals, and of many of the new, can point to partial outbreaks of local epidemic disease which owed their origin to one or other of these causes.

The entire subject of hospital construction engaged so much attention in connection with

	Date of Foundation.		Date of Foundation.		Date of Foundation.
LONDON.		PROVINCIAL.		IRISH.	
Westminister, .	1719	Cambridge, . .	1719	Jervis Street, .	1726
		Salisbury, . .	1716		
Guy's, . . .	1723	Bristol, . .	1735	Steeven's, . .	1733
		York, . . .	1710		
St. George's, .	1733	Edinburgh, . .	1736	Mercer's, . .	1734
		Windsor, . .	1736		
The London, .	1740	Aberdeen, . .	1739	The Meath, . .	1756
		Northampton, .	1743		
Middlesex, . .	1745	Exeter, . .	1745	House of Industry, .	1774
		Manchester, .	1753		
Special Hospitals—		Chester, . .	1755		
		Newcastle, . .	1751		
The British Lying-in,	1749	Glasgow, . .	1794	*Special in Dublin—*	
		Norwich, . .	1771		
		Stafford, . .	1769	The Rotunda Lying-in,	1745
City of London Lying-in,	1750	Worcester, . .	1745		
		Leeds, . .	1767		
		Oxford, . .	1770	The Lock, .	1754
		Leicester, . .	1771		
Queen Charlotte's Lying-in, .	1752	Dumfries, . .	1775	The Westmorland Lock,	1755
		Hereford, . .	1776		
		Birmingham, .	1778		
Small-pox, .	1746	Montrose, . .	1780	Cork, . . .	1720–2
		Nottingham, .	1782		
Lock, female, .	1745	Canterbury, .	1793	Limerick, . .	1759
		Dundee, . .	1795		
,, male, .	1747	Stafford, . .	1797	Belfast, . .	1797

the faulty condition of the accommodation for sick and wounded soldiers, after the Crimean war, that a Royal Commission was appointed in 1857 to consider it, and the result was a report containing numerous recommendations, which have been, more or less, carried into effect in all military and most civil hospitals erected since that time. One main object sought for, and this is the key to all systems of ventilation, was to obtain abundance of light and air, in a manner not to be incompatible with the comfort and well-being of the sick. It was believed that a hospital constructed in a series of oblong blocks or pavilions, running at right angles to a corridor, common to all the blocks would solve the difficulty, and the first example of the system of construction in this country (for it had previously been adopted in France and Belgium) may be found in the Herbert Hospital on Woolwich Common, the plan of which is given below (figs. 121, 122).

St. Thomas's Hospital, on the river side in Lambeth, is perhaps a more familiar, and certainly a less objectionable illustration of the same principle, as the wards or blocks in the latter are confined to one side of the corridor, and the distance between the blocks is ample. Abundance of light is obtained by the

block system, in consequence of the windows being situated on both sides, as well as at the far extremity, of the wards, while the beds are limited to two rows, without the intervention of a spinal wall between them. A similar mode of construction has been adopted in the new infirmary at Edinburgh, and in almost all hospitals erected by the Local Government Board in different parts of the country; but all systems of construction, however elaborate, must yield in importance, in the long run, to the improvement which has taken place in the surgical treatment of the very class for whose benefit these arrangements were primarily designed. The steady employment of numerous disinfecting and antiseptic agencies, which help to deprive the air of the subtle impurities which are prone to deteriorate the atmosphere of the best ventilated buildings, as well as a stricter attention to cleanliness in dressings and the patients' surroundings, have been prosecuted with so much success during the last few years, that there is every reason to hope that hospital disease may be ranked as an opprobrium of the past.

The points to which special attention is usually directed in connection with hospitals, are (1) the site and surroundings; (2) the building itself, including its ventilation and warming; (3) the internal fittings, the dieting, nursing, and general arrangement.

1. *The Site.*—If one of the main objects of a

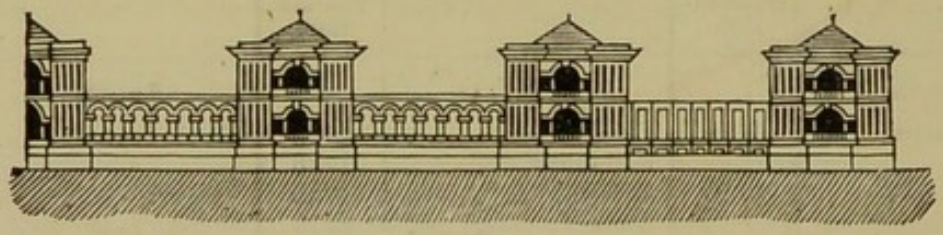


Fig. 121.

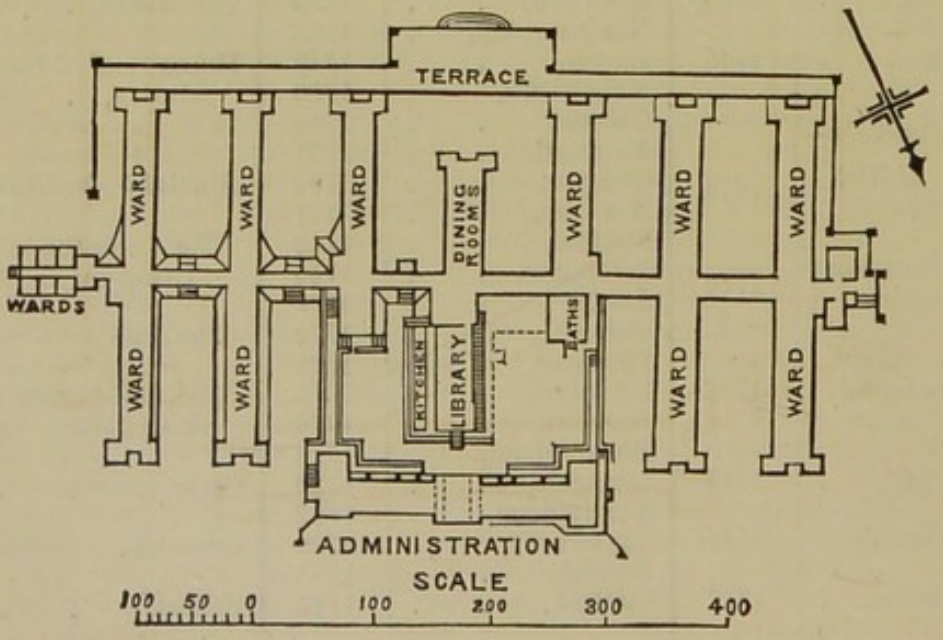


Fig. 122.

general hospital is to render it accessible to the sick poor, it seems paradoxical to recommend that it should be placed at a distance from them, somewhere in the suburbs of a large town, away from the smoke and other abominations from public works. Still, attempts must be made to obtain as good a site as the locality will allow, elevated, if possible, above its surroundings, and situated on gravel or some equally porous material. As important as the site, is an effective system of drainage. In all old, and in many new hospitals, the main drain, as well as the minor conduits, into which waste water as well as sewage entered, were built underneath the basement, and until a comparatively recent period, were constructed chiefly of brick work, which, in course of time, decayed, giving rise to leakage, and the escape of sewage air. In the majority of cases, this defect has been partially remedied by the substitution, for the old-fashioned brick conduit, of glazed earthenware pipes, securely jointed; but no drain, if at all possible, should be allowed to pass under the basement. A still more frequent source of sewage gas originates in faulty trapping of soil and waste water pipes, either underground, or in close approximation to the inhabited parts of the building, and

every precaution must be taken against all danger from this source, not merely by a perfect system of interception, but also by a free communication of the pipes and drains with the external air.

2. *The Building.*—Although the plan of construction of a hospital has been already referred to, in connection with some remarks on the block and corridor system, it may be desirable further to consider the subject, especially as the mode of construction must in some measure depend on the extent and nature of the ground on which the hospital is to be placed.

On account of their limitation of site and available space, nearly all the older hospitals are remarkable for the absence in their original construction of any guiding principle from which they could be extended at will. The majority, however, adopted the rectilinear form in the first instance, though they were soon compelled to deviate from it, as the wants of the population multiplied with its growth. A common mode of extension was to add a wing or block at right angles to the rear of the primary building, thus forming a structure somewhat resembling the letter T. Another plan of extension, even more general than the last named, was to add a wing at right angles to each end of the straight-line building, after the shape of the letter E (E without the central projection); while a third supplemented the T-shaped building with another block parallel, and in all respects similar, to the first structure, thus taking the form of the letter I. The faults of such additions to asylums for the sick

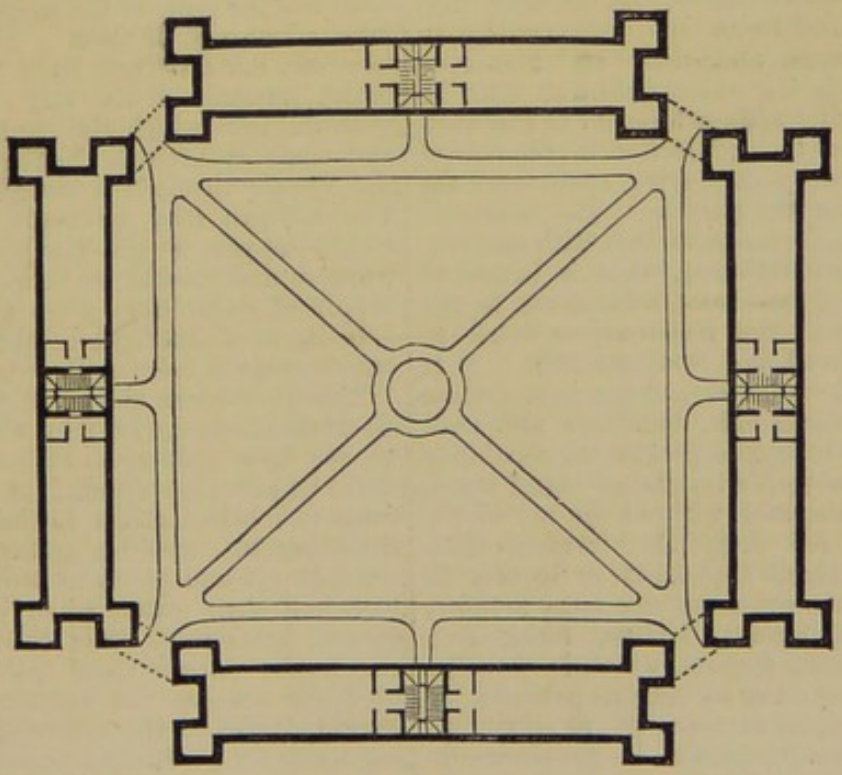


Fig. 123.

are obvious, they obstruct light and air from the outside, and render the ventilation of the interior difficult, and isolation impossible. It is admitted, however, that so long as the building retained its rectilinear form, it met (and more than met) all the objections which the block and corridor principle was originally designed to combat, and it is to be regretted that the former system has not been developed in a way that would further advance its utility. All hospitals founded and supported by voluntary or endowed charity, sooner or later undergo extension, and there is no readier means of accomplishing this than by procuring, at the outset, a sufficient area of ground, on which to construct from time to time blocks or wings (not exceeding four), isolated from each other, so as to form when completed four sides of an open square, with a quadrangle of about an acre in extent in the centre, to serve the double purpose of providing free ventilation for the separate wards, and an airing ground for such patients as are able to take advantage of it. The blocks should only communicate with each other directly by means of a sub-way in the basement, and the spaces between the blocks at the four corners of the quadrangle should be open and ample. Each block must have a central staircase sufficiently wide and open to permit free ventilation, communicating right and left with wards on the separate floors. A design for such a building is depicted in fig. 123.

3. *The Wards* ought to be each capable of

containing from twenty to thirty patients, in beds placed alternately between the windows on both sides. Taking the bulk of hospital patients, and the means now in vogue for their protection from malarious influence, there is no longer any cogent reason why the individual accommodation should exceed a thousand cubic feet of space; and a ward 90 or 100 feet in length, 24 feet in width, and 12 feet from floor to ceiling, would give this amount to twenty-six patients. Besides windows opening on each side of a ward, it is always desirable to have one or more placed at the extreme end facing the entrance, not only for light, but to be able, when necessary, with the doorway to flush the ward with fresh air, when it might be unadvisable to open the side windows. The requisite adjuncts to a ward comprise nurses' rooms, bath room, scullery, lavatory, and water-closets. It is clear that these should not be in too close contiguity with the patients, and there are numerous ways by which the communication can be avoided, either by adding annexes to the ward at the angles, or by a projection in the rear of the building, or by employing space near the entrance door for the purpose. The bedsteads must, of course, be made of iron with the bottom part of iron laths, or, what is better, of strong canvas, either laced with cords to the horizontal bars of the bedstead, or fitted to rollers at the head and foot (see *Bed*). If it can be afforded, no better bed can be had than a mattress of horse hair, but flock and wool make excellent beds, and possess the capability of being shaken up daily, and of being taken to pieces and cleansed without the aid of the upholsterer. All hospitals furnish their patients with small cupboards or lockers in which they can stow away necessary articles, such as mugs, spoons, knives, forks, &c., while their wearing apparel, which is often the cause of inconvenience so long as patients are confined to bed, is disposed of in numerous ways. In some hospitals, it is placed in baskets or drawers beneath the beds; in others, it is stowed away in cupboards in the wards, while in many it is preserved in a separate room, until the patient is able again to wear it. Perhaps the best plan with dirty patients is to allow the friends, if they have any, to remove their clothes from the hospital until the owners have sufficiently recovered to use them; or, if the clothes happen to be infested with vermin (as is sometimes the case), they ought in the first instance to be subjected to the powerful heat of the disinfecting oven.

4. *The Patients and Internal Arrangements.*—The characters of the complaints for which patients are admitted to hospitals, differ much according to locality, the facilities or otherwise of admission, the special objects for which the hospital has been instituted, and its application to the requirements of a medical school. As a rule, the diseases of patients admitted to Metropolitan hospitals, and the hospitals of large manufacturing towns, are of a more severe and fatal character than those admitted to country hospitals, and the pressure on the accommodation of the former is infinitely greater than on the latter. The consequence of this continued pressure is felt by the necessity which exists everywhere to discharge the patients as soon as, or shortly after, they are able to leave their beds, so as to make room for others. There is less reason on this account to urge the expediency of adding to the ward accommodation already referred to, separate rooms for convalescents or for dining purposes, as has been frequently recommended of late years by writers on hospital construction. For the same reason, numerous water-closets, which at the best are always liable to become a source of nuisance, are to be avoided, since not more than ten per cent. of the inmates can probably take advantage of them. This desideratum, however, must be met by a large soil-pan or basin, placed in an airy and convenient position, into which the contents of bed-pans and chamber utensils should be thrown, and the vessels themselves cleansed and purified. The soil-pan may be made of porcelain or metal (copper is the best), and thoroughly trapped, and should be furnished with a good supply of water from a tap placed above and over it, at a sufficient height, so as to rinse out the vessels more easily.

Though modern ideas would banish cooking altogether from the hospital ward, it is difficult to see how numerous sick-room necessaries could be provided without the aid of a kitchen range and boiler, either in the ward or closely adjoining it. Beef tea and other food stuffs, warmed up and given at irregular intervals, lose half their value when prepared in the general kitchen by other hands than those of the nurse. Apart then from the open fires used for heating the apartment only, there should always be the means of obtaining boiling water for poultices or fomentations as well as for cooking delicacies. This may either be done in the ward itself, or what is better, in a well-aired recess or projection from the building, communicating directly with the ward. To economise labour, lifts are now freely made use of in hospitals as well as in most public institutions. There are usually two kinds of lifts in use, one for food, of small dimensions, and readily worked by the hands, and another of larger size for coals and other weighty materials, worked by hydraulic means. The latter may also be used for raising patients, though they, as a rule, prefer being carried in a reclining chair to the apartments and beds they are intended to occupy.

The regulations regarding admission to hospital treatment, though restricted in a measure to the recommendations of subscribers to the respective charities, are usually of a very elastic character, and allow freedom of admission

to all cases arising from accident, as well as to other persons whose complaints can be promptly remedied by treatment. Much has been said against the system of out-patient relief as now administered at most hospitals, and there can be no doubt that it is occasionally taken advantage of by persons who could afford to pay a small fee to the doctor. The medical men, however, employed in this department of hospital work, are all but unanimous in the opinion, that the abuse of the privilege is trifling in comparison with the benefits conferred. It is also but fair to bear in mind, that industrious, moderately poor persons, have no other way in which they can secure the opinion of a consulting physician or surgeon, for their often protracted and frequently obscure maladies.

5. *Ventilation and Warming.*—In rooms, night and day occupied with sick people, next to cleanliness there is nothing so essential for the inmates, as a comparatively pure atmosphere. A *perfectly* pure atmosphere it is impossible to maintain, where so many causes contribute to its deterioration, but a hospital atmosphere may be kept comparatively pure by continuous renewal of the element. To obtain this desideratum has taxed the ingenuity of architects, engineers, and sanitarians at all times, and there is still much difference of opinion as to the best means of acquiring it. In the warm months of the year in this country, the difficulty is reduced to a minimum, as recourse is had at this time to open windows, which may always be planned in such a way as to prevent a down-draught on the patients, but for eight months of the year in Britain, artificial warmth combined with fresh air is equally necessary. Numerous attempts have, in consequence, been made by mechanical apparatus of various kinds to pump artificially warmed air into the wards of hospitals, and similar means have been employed to extract the atmosphere already vitiated. It is hardly necessary to state that most of these mechanical systems have proved failures, and that reliance must mainly be placed on open fires, aided by window ventilation. It is desirable that the temperature of the air inside should not fall below 60° Fahr. in cold weather during the day, and 55° Fahr. during the night; but, in such a ward as has been described, this would be found a practical impossibility with fires alone in certain conditions of the weather, during winter and spring. Recourse is had, consequently, to supplementary means of obtaining warmth, either by warming the air in the course of its admission to the building, in hot air chambers placed in the basement, or by coils of hot water or steam-pipes situated in the wards, or in the staircase and corridors, or in both. Persons suffering from chest complaints, paralysis, rheumatic affections, and some other maladies, do better in a warm atmosphere than those admitted with broken limbs, and the general mass of what are usually termed surgical cases; hence the desirability of having separate accommodation and classification to meet both requirements. In buildings erected before these matters were much thought of, and when windows, as was often the case, were confined to but one aspect of the ward, it has been customary to aid the window ventilation, and, at times, to find a substitute for it, by admitting the air through gratings and tubes communicating directly with the outside. Such contrivances should only be introduced when found absolutely necessary, as they become in course of time harbours for dirt, and very difficult to keep clean. If employed at all, the valves or internal orifices should neither be too near the ceiling, nor too close to the floor,—six feet from the floor is usually considered the best height,—and they ought to be furnished with suitable apparatus for moderating or shutting off the current at will.

6. *Nursing.*—Next to efficient medical attendance on the sick, no department of hospital work requires more care and attention than that which relates to the nursing. To secure this, much self-denial is required on the part of those who devote themselves to the work, and it is a hopeful sign of the times, that so many excellent and good women—ladies, also, of education and refinement—now freely give their labour to a task which at one time was looked upon with a species of abhorrence. But none should attempt the regular duties of a nurse, without a due sense of the responsibility which they have to encounter, and without first undergoing a season of preliminary training to test their fitness. The office is one which deserves the greatest encouragement and help from the community, and no class has more reason to appreciate its value than the medical profession, which is brought into such close relation with it. It is perhaps easier to define the duties and requirements of a nurse, than to have them in all respects satisfactorily performed, as everything depends on the moral capabilities, tact, and discernment of the individual. What are commonly considered essential to the right performance of these duties, comprise the leading virtues of order, discipline, cleanliness, method, self-control, and kindness, combined with more or less knowledge of the laws of sanitation, and the action of remedies; but it would be unreasonable to expect all these concentrated in the individual, though they all contribute more or less to the formation of the character of the efficient nurse. To enable the nurse better to attend to nursing and nursing only, it is desirable that the rough domestic work of the ward should be delegated to other hands, and this is now provided for in the best hospitals by the employment of another class of officials, designated "ward-maids." To render the night nursing in hospitals equally efficient with the day service, it is the rule in some hospitals to make the nurses

take duty alternately night and day at stated intervals, and also to have night superintendents to supervise their attendance in the course of the night. In return for her services, the nurse of the ordinary class ought at least to have the same pay and privileges extended to her as are enjoyed by servants in private families among the higher ranks; and when disabled from work by age or infirmity, some provision should be made whereby she may be protected from want during her remaining years.

There are numerous matters of detail, connected with the management of hospitals, which might have found a place in this article, but as the constitution of each establishment practically varies with its objects, whether these be of an educational, special, parochial, or of a general character, it would occupy unnecessary space to deal separately with them.—See *Bedroom — Bed — Drainage — Nursing — Ventilation, &c.*

HOUSES.—Nothing, perhaps, will excite greater surprise amid future generations, than the condition of the houses or dwellings in which the mass of the inhabitants of Britain,

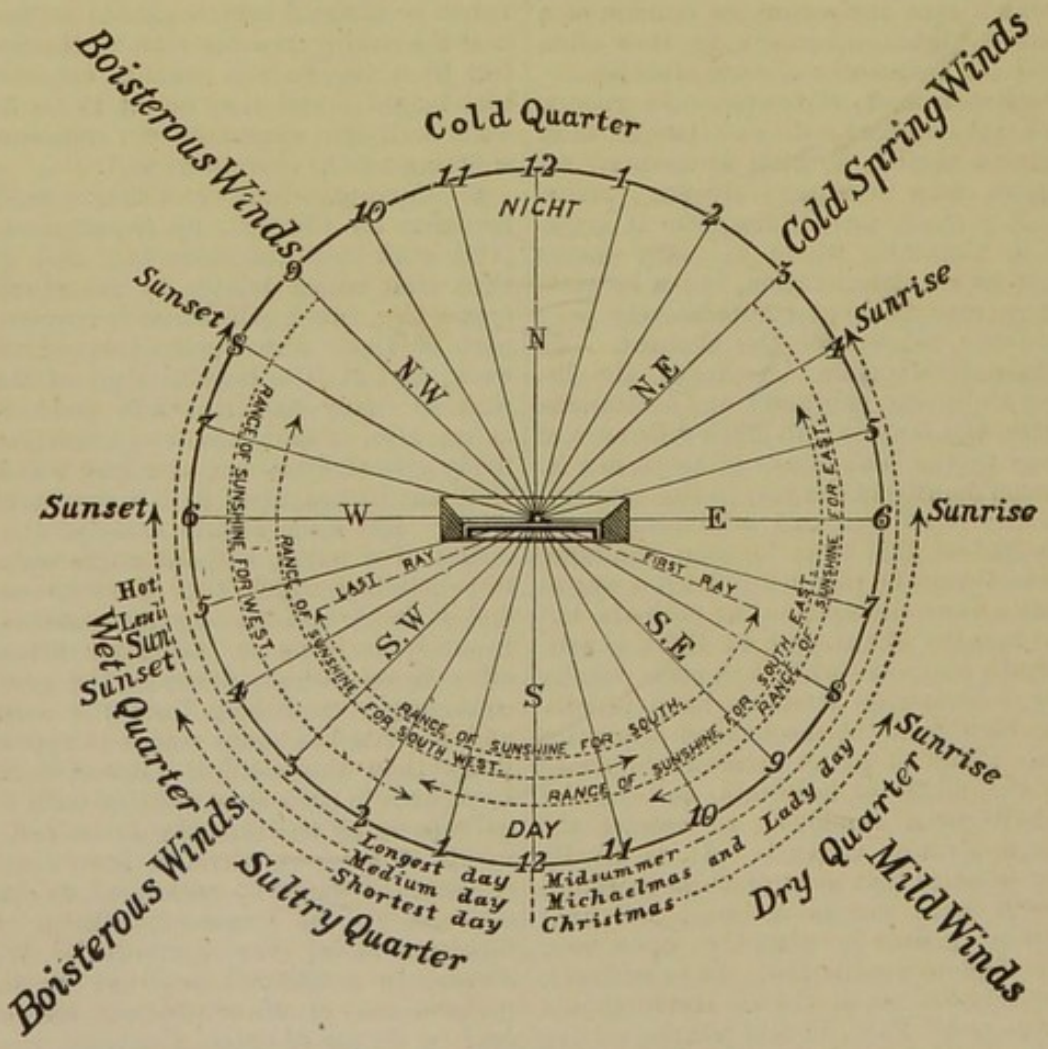


Fig. 124.

of the nineteenth century, were satisfied in some instances, compelled in others, to spend the greater part of their lives.

There can be no question, that to the insalubrity of the dwellings of the poorer classes especially, and often of the rich, much disease is owing. This is, undoubtedly, in great measure due to ignorance, for, spite of the many channels through which sanitary information has been attempted to be diffused of late years, it is astonishing how little real or practical information is retained by people generally.

The materials employed in the construction of houses depend much on the facilities of the locality for obtaining stone, brick, concrete, or wood; but in our comparatively cold climate recourse is usually had to bricks, or stone, to protect us alike from cold or wet, and to keep in the heat. To prevent the habitation becoming a source of bodily disease, some general rules regarding its construction and site may be of service in indicating more especially what to avoid.

1. *Aspect.*—With respect to aspect, which is always considered (and very properly so) one of the most important features of a dwelling,

most people have to submit to circumstances over which they have little control; still, in selecting or in building a house for occupation, there are some points which it is always useful to bear in mind. Sufficient elevation, suitable distance from high walls, hills, rivers or stagnant pools, coupled with good drainage, are, of course, the first requisites; but in addition to these, the weather features of a locality must be taken into consideration. It is always desirable that the rooms most in use of a house should be free from excessive glare of the sun, and from the prevailing winds of the locality. Entrance doors should never, if possible, be made to face south-west, as the wind and rain from this quarter are often excessive. Generally speaking, a southern aspect is preferred to a northern for warmth, and an eastern to a western, so as to obtain more sun, and in the United Kingdom, especially in large towns, we are not usually embarrassed by too much of the latter. Much must depend on the surroundings — whether the house is sheltered by trees, or by rising ground, or other qualifying circumstances. The illustration of the aspect-compass of Professor Kerr (fig. 124), in the centre of which is a window facing the south, will explain the chief guiding points to be kept in view in selecting a site for a house, provided there are no intervening obstacles to interfere with its adoption.

With the aid of the meteorological compass, Mr. Eassie, the eminent sanitary engineer, has constructed the following table, showing the length of time the sun on an average is likely to shine on the exterior of an exposed building. This is an object for comfort as well as for health, both in town and country, and may be a guide to the size, character, and number of the windows, which it would be desirable to insert in the different aspects:—

Window facing	Sun enters at	Is full in front at	Is lost at
East, ...	3 A.M.	6 A.M.	10.30 A.M.
South-east, . . .	4.30 A.M.	9 A.M.	1.30 P.M.
South, ...	7.50 A.M.	10 A.M.	4.30 P.M.
South-west, . . .	10.30 A.M.	3 P.M.	7.30 P.M.
West, ...	1.30 P.M.	6 P.M.	Setting.

Rooms requiring a steady light should face the north, north-east, or north-west; so ought store-rooms, larders, and kitchens, on account of the character of the winds from this quarter; while a south-east exposure for the day rooms would, in the majority of cases, be found most in accordance with comfort and cheerfulness.

2. *Soil.*—The ground on which a house is built should, if possible, be gravel, or some other equally porous material, through which moisture may readily percolate. Nothing favours scrofula and consumption so much as a damp soil, and before fixing on a habitation, one ought to be satisfied that the superficial, as well as the sub-soil, waters may be easily carried off, either of their own accord or by drain pipes.

3. *Site.*—The surroundings of the house should not interfere with the health of its inmates. It should be placed on a higher level than the stables, and other outhouses, in its immediate vicinity, to avoid the danger of sewage passing from these to the basement. For similar reasons, it is undesirable to plant a house at the foot of a hill, or on the banks of a river liable to overflow. It is a common fallacy to suppose that trees and shrubs planted near a house produce dampness, whereas they really tend to absorb moisture from the soil, besides adding beauty to the surroundings. Some species of plants possess this property in a remarkable degree, notably the sunflower and the eucalyptus.

4. *Foundation.*—The house should not be built on made ground, but the surface soil should first be removed to the extent of several feet, and a thick layer of concrete, covered with another of well-puddled clay, should be filled in, in its place, to form an impervious foundation. It is advisable to use the underground floor for cellars, but if this is not done, the space between the foundation and kitchen, and other apartments on the same floor, should admit of free ventilation, by means of perforated bricks let into the walls. What is termed a damp-proof course is often employed for this purpose. This consists of a row of perforated bricks or tiles of terra cotta, from one and a half to three inches in thickness, joined together

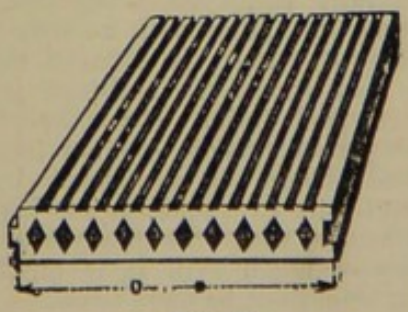


Fig. 125.

with tongue and grooved joints (fig. 125). These, as well as a great variety of stoneware articles for sanitary purposes, are manufactured by Doulton & Co., of the Lambeth Pottery Works.

5. *Walls and Roof.*—The walls of the house should be made impervious to wet, by an open space being left between the outside and inside wall, presuming that the walls are of brick, with damp courses and bonding bricks or tiles to prevent the moisture passing into the inner wall. The illustration (fig. 126) represents the application of Jenning's improved bonding

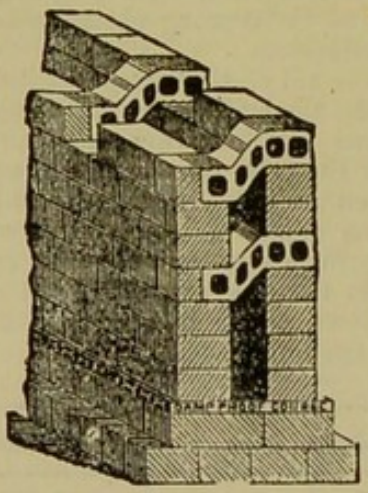


Fig. 126.

bricks for hollow walls. It will be apparent, from its shape and position, that no water can be carried through the bonding brick into the internal wall, as the former is bedded one course higher than that which takes its bearing on the outer wall.

The roof should be either of slates or tiles well set, the former are most used, though the latter, when well made, possess some advantages over slates. Roofs of thatched straw were at one time common in cottages and country houses, they are warm and dry, but being of an inflammable nature, they are now being gradually superseded by slates.

6. *Drainage.*—All houses should be supplied with two water-cisterns, one for drinking-water and cooking, the other for the closet supply and washing; and all soil pipes and drains should be trapped, and ventilated before reaching the main sewer. There are numerous contrivances for effecting these objects, the most generally employed being the syphon intercepting trap, fitted with an inspection as well as a ventilating pipe between the house and the spot where the soil-pipe joins the street or cesspool drain. The soil-pipe should always be placed outside, and not inside, of a house, and should be ventilated by being carried up to the roof, and the top kept open. In small houses, where the water-closet is often the source of much evil, it is questionable whether it would not be more advisable to have the closet placed outside of the house.

7. *Ventilation.*—Every apartment, lobby, scullery, staircase, &c., should communicate directly with the external air by window. Water-closets especially should always be ventilated from without, and never from passages or rooms, as was formerly too much the case. Sleeping places should be freely supplied with light and air; the practice of employing closets and dark recesses for sleeping purposes is most objectionable.

8. *Internal Arrangement.* — The interior walls and ceilings are best lined with plaster or cement, so as to present a smooth surface for paint, lime-wash, or paper. If paper is employed for dwelling rooms, it should be smooth and well varnished, that it may be readily washed down; flock and other showy papers invariably harbour dirt. The floors of sitting rooms and bed-rooms ought to be made of hard and closely-fitting wooden boards, and if carpets are not used, the floor should be stained, and polished weekly, with bees-wax and turpentine. When carpets must be used, a margin of twelve or eighteen inches near the walls should be left uncovered, and treated in a similar manner. Much harm is done by excessive wet scrubbing of floors, on account of the moisture pervading a house in consequence, but it ought not to be discarded altogether, and will be found to be absolutely necessary occasionally.

On the subject of the construction of houses, the reader is further referred to Professor de Chaumont's valuable little book entitled *The Habitation in relation to Health.*—See *Drainage—Bed-Room—Light—Ventilation—Public Health.*

HOUSEMAID'S KNEE.—This affection has been so called on account of its frequent occurrence in servants who have to kneel much upon hard floors, or stairs, as, for instance, in scrubbing hard stone or wooden stairs, passages, &c. In fact it might, with almost equal propriety, be called "scrubber's" knee, although it is met with among others who, from the nature of their occupation, habitually exert much pressure upon the knees. The affection is usually chronic, and presents itself as a colourless, prominent, round swelling, just over the knee pan. When quite chronic, rest, and painting the part over occasionally with compound tincture of iodine, will generally suffice for a cure. When acute, red, and painful, especially if accompanied by a tendency to erysipelas, medical advice should at once be sought, as it will then probably require active treatment to subdue the inflammation. Persons employed in scrubbing should always be furnished with a cushion or pillow, on which they can rest their knees when at work.

HUMERUS.—The anatomical name of the arm bone (fig. 127). This bone is, at its upper end, (1) articulated or jointed at the shoulder to the shoulder-blade or "scapula"; and at the elbow, by its lower end, (2) to the two bones of the fore-arm. See fig. 127.

Refer to—*Fore-arm.*

HUNGER.—The desire for food is an instinctive sensation, evidently connected with

the requirements of the body generally, and not solely with the condition of the stomach. In a healthy state the appetite for food is in proportion to the waste of the body in exertion; in other words, if the transformation, or using up of tissues, goes on more quickly, as it must necessarily do when much exertion is made, the tissue must be more abundantly supplied with nutriment, and *vice versâ*, if exertion be less. In any case, the call for nutriment is made through the medium of the stomach by the sensation of hunger. The direct cause of that sensation is doubtful; some have referred it to a distended condition of the vessels of the stomach, but, however that may be, it is certain the brain and nerves participate largely in the feeling. Dr. Alison remarks, "Whatever be the conditions under which the nerves of the stomach become the seat of these sensations, it is certain that, in the healthy state they are a true index, not only to the



Fig. 127.

state of the stomach, but to the immediate wants of the system at large." To use a simile, the brain may be likened to a great central telegraph office, to which the wires—nerves—convey the information from all parts of the body that supplies are wanted, and this information is transmitted to the stomach by its own special means of communication,—or nerves,—and causes hunger. How and why this is, we cannot tell. Although, however, hunger is felt as a sensation in the stomach, in consequence of sympathy with the system at large, it is appeased by the introduction of food into that organ, long before the digestion of that food can have supplied the waste which called for it; to resume our simile, it would seem as if the stomach telegraphed back to the brain the information that the "order had been received and complied with,"—that food had been taken,—and so the sensation ceases. Moreover, the stomach may give false information, for it is well known that the sensation of hunger may, *for a time*, be appeased by the swallowing of comparatively innutritious substances, which occupy the stomach, but which cannot be digested into nutriment for the system; and further, the sensation of hunger may be allayed by various medicinal substances, such as opium, tobacco, alcohol, &c., which do not nourish. Again, the information respecting the requirements of the system, conveyed to the stomach through the brain, may, so to speak, be stopped in transit; this is seen in the case of accidents; however hungry a man may be, if he should happen to sprain a joint, the appetite will disappear at once. Even mental emotions will, by their effect upon the brain, have the effect of destroying the sensation of hunger; and Shakespeare adverts to this observation, in the words addressed to Wolsey by King Henry the Eighth, along with an unpleasant communication,—

> "Read o'er this;
> And after, this; and then to breakfast, with
> What appetite you may."

Intense engagement of the mind in study or upon any subject which strongly excites its interest, it is well known will often overpower completely the sensation of hunger. This frequently happens to those who are much absorbed in scientific pursuits. The anecdote of the illustrious Newton is familiar to most,—a friend calling to see him was shown into the room where Newton's dinner—a chicken—was spread out; being kept waiting, he ate the dinner and replaced the covers. The philosopher coming in shortly after, and finding his dinner gone, simply remarked, "Dear me, I forgot I had dined!" It is, perhaps, unnecessary to remark, that such complete forgetfulness of the wants of the body is scarcely consistent with continued health, either of it or of the mind; and for it, even Newton paid the penalty.

The influence exerted by mental emotion over the sensation of hunger, may, however, tell both ways, for if it destroy real, it may excite false, hunger, and this it frequently does; very many are in the habit of eating much more largely than the wants—the waste—of the system require. This may be the result of an unhealthy excitement of the nerves of the stomach, but much more generally, it arises from epicurism, or love of excess, the mind being the cause of a false hunger, or desire for tempting and unnecessary articles of food. This is frequently the case with people who live idle and indolent lives, and who, having little else to occupy either mind or body, take refuge in the indulgences of the table. The effects of this excitement and indulgence of false hunger, this habitual consumption of excess of food beyond what the wants of the system require, may, for a time, be compensated for by the various excretory powers of the body, but, sooner or later, disease must be the consequence.

The proper and permanent appeasement of hunger would seem, in some cases, to depend upon the fitness of the food taken for the requirements of the system generally; every one with healthy appetite feels the desire for different kinds of food in winter and summer. Sir John Richardson mentions with regard to his Arctic experience, that under exposure to intense cold, bread and such articles were not desired as food, which was always most acceptable when of as fat and oily a character as possible.

Refer to—*Animal Heat—Appetite—Digestion—Fasting—Food, &c.*

HYDATIDS are parasites belonging to the animal kingdom, the ova of which, introduced into the stomach, are absorbed by the circulation, and become developed in different organs, more especially in the liver, the brain, and the lungs, and which are found imbedded in the tissues, particularly the glandular ones of animal bodies. The hydatid consists of a simple vesicle filled with fluid which has a tendency to increase to a considerable size, and multiplies by the development of young hydatids in its interior. When the cyst nears the surface, as sometimes happens when it is confined to the liver, the fluid may be drawn off and the hydatid with it, so as to effect a cure.

HYDRAGOGUE is a term applied to some purgative medicines which produce copious watery evacuations from the bowels. —See *Purgatives.*

HYDRARGYRUM.—Mercury or quicksilver.—See *Mercury.*

HYDROCELE, a dropsical swelling within the scrotum. It requires proper surgical treatment for its cure, but a patient may derive much comfort by wearing a bag truss, or some similar support, until he is relieved by operation.

HYDROCEPHALUS.—"Water in the Head."—See *Brain.*

HYDROCYANIC ACID.—Prussic acid. —See *Prussic Acid.*

HYDROGEN GAS is the lightest substance known, and when pure, has neither colour, taste, nor smell; the latter, however, is very frequently present in consequence of impurity. Hydrogen gas burns with a pale yellow flame, the product of the combustion is water, this fluid being a compound of oxygen and hydrogen gases in certain definite proportions. The union of hydrogen gas with sulphur constitutes the very offensively smelling gas, sulphuretted hydrogen, which is one of the products of the decomposition of organised bodies, and also forms the characteristic feature of many of the mineral waters, such as those of Harrogate.

Refer to—*Carburetted Hydrogen.*

HYDROPATHY—is the system of treating disease by the use of water, both internally and externally, in the modes introduced by Priessnitz.

Of the utility of water as an agent in the treatment of *certain* diseases, there cannot be a question, when its employment is judiciously regulated, and combined with other methods of cure; but it is equally certain that its indiscriminate and wholesale use, as it has been practised in hydropathic establishments, is too often a most dangerous quackery—a quackery, because it is put forth with pretensions to which it has no claim, and used in an indiscriminate and ill-judged manner. There are many conditions of body—particularly that of the over-fed and the indolent—in which copious draughts of pure cold water, regulated and simple diet, exercise, and promotion of the functions of the skin, must evidently be of the greatest service, nay, are in themselves sufficient to restore health, and medical men have, perhaps, too much neglected such natural methods of cure, in their confidence in mere drugging. It is no less certain, however, that an indiscriminate and extravagant use of even these natural methods cannot fail to prove injurious in many states of the system, and so it has proved in numerous instances, and even death has been the result of the experiments. Still, it must be owned, that the practice of hydropathy has had the advantageous effect of directing the attention of medical men to its intrinsic value, and if the system itself has been mixed up with much which must be considered dangerous error, that should be no reason why the useful suggestions which may be gathered from it should not be taken advantage of; indeed, for medical men to refuse to do so, is to place themselves in the same position as the abettors of an exclusive system, or the vendors of a "panacea." Medical science can only retain its high place by liberal investigation of those new phases in medical treatment, which must ever be arising in the progress of society, when these phases offer reasonable ground for such investigation, and this, hydropathy certainly does. To refuse to investigate, or to refuse to adopt that which is good, because it has been found connected with some irregular system, is in itself quackery of the grossest kind, and is the most certain way of strengthening the hands of charlatans or of fanatics.

Refer to—*Water—Baths, &c.*

HYDROPHOBIA—literally "Dread of water."—This fearful and justly-dreaded disease is especially of a nervous and spasmodic character, and is produced by inoculation with the saliva of an animal labouring under the malady; fortunately it is of so comparatively rare occurrence, that very few medical men ever witness it at all. For the information in the following article, the author is indebted to the "Lectures" of Sir Thomas Watson.

After a person has been bitten by a rabid dog the wound heals in the same manner as an ordinary wound from the same cause would. "After an uncertain interval—which lies for the

most part between six weeks and eighteen months—the following symptoms begin to be noticeable. The patient experiences pain, or some uneasy or unnatural sensation, in the situation of the bite. If it has healed up, the scar tingles, or aches, or feels cold, or stiff, or numb; sometimes it becomes visibly red, swollen, or livid. The pain or uneasiness extends from the sore or scar towards the central parts of the body. Very soon after this renewal of local irritation—within a few hours perhaps, but certainly within a very few days, during which the patient feels ill and uncomfortable—the specific constitutional symptoms begin; he is hurried and irritable; speaks of pain and stiffness, perhaps about his neck and throat; unexpectedly he finds himself unable to swallow fluids, and every attempt to do so brings on a paroxysm of choking and sobbing, of a very distressful kind to behold; and this continues for two or three days till the patient dies exhausted." Hydrophobia has never been cured when once the decided symptoms have shown themselves.

"Generally, the disease, when it has once set in, and shown the peculiar hydrophobic symptoms, runs a short and fierce course. The nervous irritability becomes extreme. The peculiar paroxysms of choking, spasm, and sobbing are excited, not only by attempts to swallow liquids, but by the very sight or sound of them. Even the passage of a gust of wind across his face, the waving of a polished surface, as of a mirror, before his eyes, the crawling of an insect over his skin, is often sufficient to excite great irritation, and the peculiar strangling about the fauces in a hydrophobic patient. Death occasionally takes place within twenty-four hours after the commencement of the specific symptoms. Most commonly of all, it happens on the second or third day," but may be postponed even to the seventh or eighth. In some instances, the symptoms alter before death, and the patient is able to swallow liquids.

With respect to the infection of hydrophobia, Sir T. Watson says:—"We are sure that the disease, by the inoculation of which hydrophobia may be produced in man, is common in the dog, and that it has been communicated by the fox, the wolf, the jackal, and the cat." Mr. Youatt says that the saliva of the badger, the horse, the human being, have undoubtedly produced hydrophobia, and some affirm that it has been propagated even by the hen and the duck. All animals, even fowls, are susceptible of the disorder when bitten by a rabid dog.

The late Mr. Youatt, who had seen more of the disease, probably both in man and in other animals, than any other person in this country, did not think that the saliva of a rabid animal could communicate the disorder through the unbroken cuticle: he believed that there must be some abrasions, or breach of surface. He held, however, that it might be communicated by mere contact with the mucous membranes.

Of its harmlessness on the sound integument, he offered this presumption—that his own hands had many times, with perfect impunity, been covered with the saliva of the mad dog. He records some singular instances in which the disease was transmitted by contact of the saliva with the mucous membranes. "A man endeavoured to untie with his teeth a knot that had been firmly drawn in a cord. Eight weeks afterwards he perished undeniably rabid. It was then recollected that with this cord a mad dog had been confined. A woman was attacked by a rabid dog, and escaped with the laceration of her gown. In the act of mending it, she thoughtlessly pressed down the seam with her teeth. She died. If these cases be authentic, they are conclusive of this question; unless, indeed, the lips of those who perished happened to have been chapped, or abraded. But Mr. Youatt's own opinion was, that the virus could not be received on a mucous surface without imminent danger.

"The disease is said to have been caused by the *scratch* of a cat. But as we know that cats as well as dogs frequently apply their paws to their mouths, especially when the latter part is uneasy (as it clearly is in mad dogs), this fact, of the production of the disease by a scratch, if thoroughly made out, would not *prove* that the disease can be introduced into the system in any other way than by means of the saliva.

"It is still more interesting to inquire, whether the saliva of a human being labouring under hydrophobia be capable of inoculating another human being with the same complaint? Mr. Youatt says, yes, that the disease has undoubtedly been so produced. If this be so, the fact will teach us not to neglect or desert these unhappy patients, but to minister to their wants with certain precautions so as not to suffer their saliva to come in contact with any sore or abraded surface, nor with any mucous surface. On the other hand, all carefulness of that kind will be unnecessary if the disease cannot be propagated by the human saliva. Certainly, many experimenters have tried in vain to inoculate dogs with the spittle of hydrophobic man; but there is one authentic experiment on record, which makes it too probable that the disease, though it may not be communicated often, or easily, is yet communicable,"—enough to enforce all necessary caution upon those engaged in attending upon a hydrophobic patient.

"*Is a man who has been bitten by a mad dog, and in whose case no precautions have been taken, a doomed man?* Will he be sure to have the disease, and therefore to die of it? By no means. *But few, upon the whole, of those who are so bitten become affected with hydrophobia.* This frequent immunity from the disease in persons who have been bitten has tended to confer reputation upon many vaunted methods of

prevention. Ignorant persons and knavish persons have not failed to take advantage of this. They announce that they are in possession of some secret remedy which will prevent the virus from operating: they persuade the friends of those who die that the remedy was not rightly employed, or not resorted to sufficiently early: and they persuade those who escape, that they escape by virtue of the preventive remedy. If the plunder they reap from the foolish and the frightened were all, this would be of less consequence, but unfortunately the hope of security without undergoing a painful operation leads many to neglect the only sure mode of obtaining safety.

". . . . A still more anxious inquiry next arises. Whoever has been bitten by a rabid or suspected animal must be considered, and will generally consider himself, as being in more or less danger of hydrophobia. This dread is not entirely removed, even by the adoption of the best means of prevention. Now, how long does this state of hazard continue? When is the peril fairly over? After what period may the person who has received the injury lay aside all apprehension of the disease? To this inquiry no satisfactory reply can be given. In a vast majority of instances, indeed, the disorder has broken out *within two months* from the infliction of the bite. But the exceptions to this rule are too numerous to permit us to put firm trust in the immunity afforded by that interval.

". . . . Mr. Youatt describes cases in which there had been no symptoms of rabies observed in the dog at the time the injury was inflicted, though soon afterwards the animal became decidedly rabid. It is much to be regretted that the dog is so often destroyed. When a person has been bitten by a dog or cat suspected to be rabid, the beast ought by no means to be killed, but to be secured and kept under surveillance, and suffered, if it should so happen, to die of the disease. If he do not die, in other words, if he be really not rabid, that will soon appear, and the mind of the patient will then be relieved from a very painful state of suspense and uncertainty, which might otherwise have haunted him for months or years. Should the dog die mad, the injured person will be no worse off than if the animal had been killed in the first instance; nay, in one respect, he will be better off, inasmuch as certainty of evil is preferable to perpetual and uneasy doubt.

"There are gross errors prevalent with regard to the signs of madness in the dog. If a dog be seen in a fit in the street, some person charitably offers a conjecture that perhaps he may be mad; the next person has no doubt of it, and then woe to that dog. But Mr. Youatt assures us that the *rabid dog never has fits;* that the existence of epilepsy is a clear proof that there is no rabies. Again, it is a very common belief, that a rabid dog, like a hydrophobic man, will shun water, and if he take to a river, *that* is thought to be conclusive evidence that he is not mad. But the truth is, that the disease in the quadruped cannot be called *hydrophobia;* there is no dread of water, but an unquenchable thirst; no spasm attending the effort to swallow, but sometimes in dogs an inability to swallow from paralysis of the muscles about the jaws and throat. They will stand lap, lapping without getting any of the liquid down. They fly eagerly to the water; and Mr. Youatt states that all other quadrupeds, with perhaps an occasional exception in the horse, drink with ease.

"There is another superstitious opinion not at all uncommon, viz., that healthy dogs recognize one that is mad, and fear him, and run away from his presence, in obedience to some mysterious and wonderful instinct, warning them of danger. This is quite unfounded. Equally mistaken are the notions, that the mad dog exhales a peculiar and offensive smell, and that he may be known by his running with his tail between his legs; except when, as Mr. Youatt says, exhausted he seeks his home."

It will not be out of place to state *what are* the symptoms of rabies as observed in the dog.

"The earliest symptoms," says Mr. Youatt, "are sullenness, fidgetiness, continual shifting of posture, a steadfast gaze expressive of suspicion, an earnest licking of some part on which a scar may generally be found. If the ear be the affected part, the dog is incessantly scratching it. If it be the foot, he gnaws it till the integuments are destroyed.

"Occasionally, vomiting and a depraved appetite are very early noticeable. The dog will pick up and swallow bits of thread or silk from the carpet, hair, straw, even dung, and frequently he will lap his own urine, and devour his own excrement. Then the animal becomes irascible, flies fiercely at strangers, is impatient of correction, seizes the whip or stick, quarrels with his own companions, eagerly hunts and worries cats, demolishes his bed, and, if chained up, makes violent efforts to escape, tearing his kennel to pieces with his teeth. If he be at large, he usually attacks only those dogs that come in his way; but if he be naturally ferocious he will diligently and perseveringly seek his enemy."

"Very early in the disease, as it appears in the dog, the expression of the countenance is remarkably changed; the eyes glisten, and there is slight squinting. Twitchings of the face come on. About the second day a considerable discharge of saliva commences; but this does not continue more than ten or twelve hours, and is succeeded by insatiable thirst; the dog is incessantly drinking or attempting to drink; he plunges his muzzle into the water. When the flow of saliva has ceased, he appears to be annoyed by some viscid matter in his fauces; and in the most eager and extraordinary manner he works with his paws at the corners of his mouth

to get rid of it; and while thus employed, he frequently loses his balance and rolls over.

"A loss of power over the voluntary muscles is next observed. It begins with the lower jaw, which hangs down, and the mouth is partially open; but by a sudden effort the dog can sometimes close it, though occasionally the paralysis is complete. The tongue is affected in a less degree. The dog is able to use it in the act of lapping; but the mouth is not sufficiently closed to retain the water. Therefore, while he hangs over the fluid, eagerly lapping for several minutes, it is very little or not at all diminished. The paralysis often attacks the loins and extremities also. The animal staggers about and frequently falls. Previously to this, he is in almost incessant action." Mr. Youatt fancies that the dog is subject to illusions, for he starts up, and gazes eagerly at some real or imaginary object.

"Frequently, with his head erect, the dog utters a short and very peculiar howl; or if he barks, it is in a hoarse inward sound, altogether dissimilar from his usual tone, and generally terminating with this characteristic howl. Respiration is always affected; often the breathing is very laborious; and the *inspiration* is attended with a very singular grating, choking noise. On the 4th, 5th, or 6th day of the disease he dies, occasionally in slight convulsions, but oftener without a struggle."

It should be observed, however, that there are *two* forms of Rabies—certainly in animals, and possibly in man—*i.e.*, the Furious and the Dumb; that the furious almost becomes the dumb before death, but that the dumb is not always preceded by a furious form.

Cause.—The nature of the virus of hydrophobia is unknown; but there can be little doubt that it is micro-organismal, the symptoms being due to the action of the poison on parts of the nervous system.

The Pasteur Method of Treatment.—Pasteur found that the virus occurred in greatest amount in the nervous system, as well as in the salivary glands. He further observed that the virulence could be increased or diminished by certain means. By inoculating a series of rabbits, *e.g.*, it was found that the virulence could be exalted to a high degree, while inoculation from dogs to monkeys caused a diminution of virulence, or, as it is called, an "attenuation of the virus." Pasteur then worked out a system of treatment by which it was possible to acclimatise an individual, so that the inoculation of very virulent hydrophobic material would have no effect in producing the disease. Pasteur's system is based on the observation that by drying for certain periods the spinal cord of a rabbit which has succumbed to acute rabies, the virus becomes less and less active. The subcutaneous inoculation of an emulsion of such a spinal cord, dried for fourteen days, causes no symptoms of the disease. Following this, injections of cords dried for a shorter period are inoculated at successive intervals, and it is found that complete protection against the most powerful hydrophobic virus is obtained.

There is no doubt that such a course of treatment is effective, if carried out a short time *after* a person has been inoculated with rabies, and the danger of contracting rabies from the treatment is minimal.

Strict muzzling orders, and the destruction of all vagrant curs, would probably stamp out hydrophobia in this country, if such measures were rigorously enforced for a period of at least one year.

When an individual has been bitten by an animal respecting which the slightest suspicion of hydrophobia exists, the *one* certain remedy cannot be too quickly resorted to—complete excision of the bitten part. Some persons have possessed sufficient nerve to do this for themselves, few perhaps could, but it has often been effected by unprofessional persons for others; indeed, there might be more danger in waiting many hours for a surgeon, than in submitting to unprofessional operation. The method of excision most to be trusted is the insertion of a skewer of wood, made to fit into the wound caused by the tooth, and carrying the incision so far round, that the entire hollow or cone of flesh is cut out along with the piece of wood. This might be done with safety in the thick part of the calves of the legs, or in the back parts of the thighs or buttocks. Where excision is not resorted to, the free application of lunar caustic or, preferably, of strong nitric acid (but whichever may be most readily procured) would be advisable; or in lieu of these, a piece of iron, heated to *whiteness*, may be inserted into the wound, so as thoroughly to destroy the surface which may have been poisoned. These may seem severe measures, but they are light compared to the unceasing anxiety of mind which must haunt a person who, after having been bitten, feels that due precaution has not been taken; and light indeed compared with liability to the disease itself. In the event of none of the above measures being submitted to, or available, the wound may be thoroughly washed for hours, by means of a stream of warm water poured upon it from a height; a cupping-glass being applied at intervals. These measures are of course only provisional until the attendance of a surgeon can be procured. The general treatment of developed rabies consists in the attempt to relieve the most painful symptoms by hypnotics.

As might be imagined, the preventive medicines for hydrophobia are very numerous; some have been thought highly of by medical men, but for the most part they are perfectly worthless. It is absolute folly to trust to them, to the exclusion of the only certain preventive—excision or destruction of the wounded tissues performed almost immediately.

When, from the peculiar symptoms (and taken in connection with the circumstances altogether they can scarcely be overlooked), an individual is thought to be attacked with hydrophobia, if the hope of saving life is small, much may be done to alleviate so terrible an affliction by proper medical care, which must be sought for at once; in the meantime, whilst all those sights and sounds alluded to in the first part of this article are carefully avoided as fearful aggravation to the necessary sufferer, laudanum may be given in thirty drop doses, and repeated as circumstances seem to dictate. If ice can be taken, it is said to afford relief put into the mouth in small morsels; it has also been found of service applied to the back of the neck. If, on the arrival of a medical man, he likes to try any of the various remedies which have been proposed in this disease, he of course can do so, but the above-mentioned will be sufficient for lay interference. But as the disease, when fully developed, is invariably fatal, the continuous administration of chloroform by inhalation is probably the best treatment that can be resorted to.

The general interest and anxiety, and the very erroneous ideas on the subject of hydrophobia which are entertained by people generally, have rendered the length of this article necessary; and in taking it almost entirely from the valuable writings of Sir Thomas Watson, the author has endeavoured to draw, from the best possible source, information which, *fortunately*, few medical men have an opportunity of acquiring personally.

HYDROSTATIC BED.—See BED.

HYDROTHORAX.—Water in the chest. —See *Dropsy*.

HYGIENE.—The science of the preservation of health.

Refer to various sanitary articles such as—*Air—Bed-room—Climate—Food—Heat— Ventilation—Drainage—Public Health*, &c.

HYOSCYAMUS.—See HENBANE.

HYPOCHONDRIA.—See ABDOMEN.

HYPOCHONDRIASIS.—See INDIGESTION.

HYPODERMY. — Hypodermic administration of medicinal agents, that is, their introduction into the tissues beneath the skin by means of a suitable instrument, is of comparatively recent date, at least in this country. It has scarcely been practised more than five and twenty years, and is even now not quite so extensively had recourse to as it deserves, considering its value. Although it has been proposed to use a variety of medicines by hypodermic injection, there are comparatively few employed even by medical men, and of these only one or two can safely be intrusted to non-professional hands, and then only in great necessity, and with great caution; but cases do arise, so painful in their nature, which may be quickly alleviated, that when no medical man is at hand, the writer would not hesitate to place both instrument and drug in judicious hands, accompanied, of course, with proper instructions. Two drugs, perhaps, are all that can with propriety be so intrusted, but these are invaluable: they are morphia and ergotine. Those medical men who have had good experience of the effects of morphia administered hypodermically, must only be too thankful to have the command of a remedy upon which they can calculate with all but absolute certainty for the relief of pain, nay, of agony, especially the agony of spasm, as, for instance, that caused by the passage of a gall-stone, about as painful an occurrence as can happen to any one. The pain and starting of a broken limb, the pain of neuralgia, and

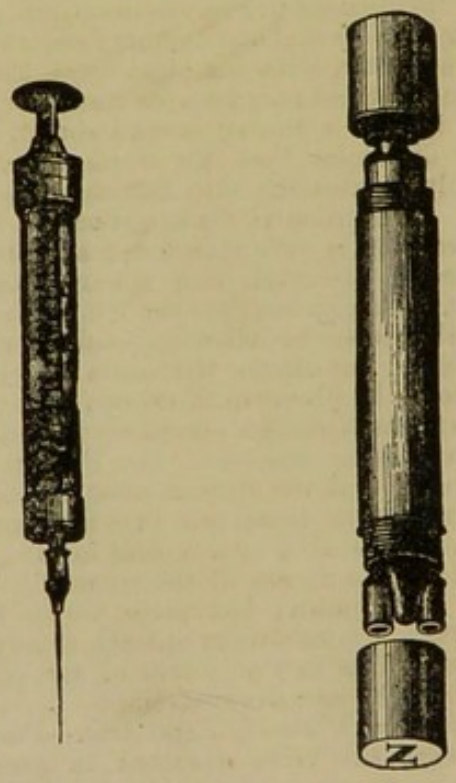


Fig. 128.

that of inflammation of the bowels, of a severe burn, nay, severe pain of all kinds, almost invariably yields to morphia, properly and carefully given under the skin, and that, not after the long waiting for relief, as when the same medicine is given by the stomach, but almost instantaneously. The clergyman in his remote parish, the emigrant—indeed, all who are likely to be far removed from efficient medical aid—would do well to have this invaluable soother of pain in their hands, having made themselves fully conversant with its powers for good or evil, and been instructed in its use.

The instruments used for hypodermic injection are all on the same principle, though differing in strict detail. The annexed illustration (fig. 128) will give an idea, which more or less

comprehends them. There is a glass syringe, marked or graduated into minims, and there is a fine hollow steel needle, which has to be fitted to the syringe when in use, and through which the medicated fluid is passed, after the skin has been pierced. At one time, it was thought necessary to have gold or gilt needles, but this is not required, and such needles can never be made so fine or sharp as steel ones, which can scarcely be made too fine, so as to give as little pain as possible. Steel needles are best preserved in vaseline; and in the instrument invented by the writer, this is done perfectly in a groove provided for the purpose in the syringe case, which is made entirely of metal, and so both portable and indestructible; properties of no light value in hot climates, while at the same time the syringe piston does not become dry as in most instruments. Lastly, the needles are made to plug accurately on the syringe, instead of *screwing*, the *screw* including a washer, apt to shrivel or be lost, thus rendering the instrument useless. Indeed, for the efficient practice of hypodermy, the instrument should always be ready for instant use; it is a miserable thing to see a patient suffering agony, whilst the instrument, which has been unused for some time, is being got into working order, the piston shrunk, or the needles rusted or blocked. The instrument alluded to above, by the writer, he believes provides greatly against these contingencies. It is made by Mr. Hawkesley of Oxford Street.

Given the instrument, how is the morphia best used, when it has probably to be employed at a distance from either doctor or chemist? The best plan, in the writer's opinion, is to have such number as may be thought well of quarter or half grain powders of the hydrochlorate of morphia carefully put up, and *each powder* carefully marked as to strength. Presuming a case occurs in which the practice is called for, a first or trial dose should be given, and this in unprofessional hands should never exceed the twelfth of a grain; this may not give full relief at first, but it is safest. To get the above dose, a quarter grain powder is to be dissolved in thirty minims of pure warm water, and of this ten minims will be the dose. The solution *may* be made in a teaspoon, carefully throwing the residue away at once after use, but the best thing is a two-drachm wide-mouthed white glass bottle, that will admit the syringe. In this the morphia is put, the water measured upon it by the syringe, and by holding the bottle in warm water, solution is quickly effected. The dose required may then be drawn up with the syringe, and the needle fixed on. To draw the fluid up through the needle almost always involves the fine point touching the glass, and being turned. One caution has here to be given. A charge of warm water should always be passed through the needle, before the morphia is used, to ascertain that it is not blocked. It is very unpleasant, both for patient and operator, to find that after the skin has been pierced, the needle is impervious. The fine wire sent with the needles, if passed in immediately after use, will do much to prevent blocking. The dose in the syringe, and the needle fixed, the operation of injecting the solution is the next step. At one time it was thought necessary to inject as near the seat of pain as possible; it is now considered of no consequence, a safe place being much more essential, and for all purposes the outsides of the limbs, arms or thighs, present abundant space for safe hypodermy. As to the mode of passing the needle, five minutes instruction will do more for anyone than pages of print, and the writer would counsel all who may be called upon to use the instrument to get that instruction. In emergency, however, the needle may be safely passed quite under the true skin (a fold of which is pinched up) in the localities above indicated, and when passed, the fluid in the syringe is injected through it, and the needle gently withdrawn, keeping the finger for a few seconds upon the place to prevent the fluid exuding. Not a stain of blood should follow the use of a fine steel needle properly used. Immediately after use, both syringe and needle should be carefully cleansed by warm water being passed through them. The finer the needles, the more are they apt to block. So much for the little operation which, comparatively painless and simple, has perhaps relieved more suffering than all our remedies combined. There are a few people who cannot bear morphia, in any form or dose, however administered, and to such it should not be given, but many will bear it hypodermically who cannot take it otherwise. The dose indicated, one-twelfth of a grain, is a safe one to begin with, and from its effects some judgment may be formed as to what can be given safely, consistent with relieving pain. One-sixth of a grain is perhaps as large a dose as any unprofessional person should venture on without professional sanction.

The writer is well aware that a strong prejudice exists with many against the hypodermic use of morphia, one argument being that once begun it is never left off. This is a complete fallacy; after a very large experience, the writer never knew of but one instance, and then it was a substitute for brandy, in which morphia so given was continued viciously. Certainly, in some exceptional cases, the use of morphia hypodermically *might* prove extremely prejudicial. A great blessing, it is capable of being converted into a curse. To some, opium in any form is as seductive as alcohol is to others, and, strange though it may seem, the use of it in the form of morphia, hypodermically, is specially so. The writer of this article would indeed regret, if, in giving directions for the *legitimate* use of this powerful drug, he should lead any to use it as an

indulgence, a vice that would sap the foundations of health, mental and bodily, and even of life itself. But the *abuse* of a remedy must not blind us to its real, God-given use and value. In cases of incurable and painful disease, such as cancer and the like, it has been a most merciful boon, for which both patient and physician might thank God. This paper will not remove the prejudices of many, but that would be no reason for not placing the instructions in proper hands, and thus giving the means of saving hours, perhaps days, of agony to suffering fellow creatures.

Ergot of rye, or rather its active principle *Ergotine*, was named as the only other medicinal agent to be used by unprofessional hands, but this too might do so much to save, not pain, but life, that its use ought to be known. In bleedings generally, it is most efficacious; but in bleeding from the lungs, bowels, or womb, perhaps no remedy is equal to it. The chief difficulty is to get ergotine pure, and to keep it, but an excellent preparation is now made by Mr. Hugget, of Liverpool. Of this ten minims contain three grains of ergotine, the proper dose to be injected by the needle in case of any severe bleedings occurring as indicated above. The rules for injecting ergotine are the same as those for morphia, only both syringe and needle require more careful washing out. (*S. T.*)

HYPOGASTRIUM.—See ABDOMEN.

HYSTERIA is a disease more particularly manifested through the nervous system, and is, almost without exception, peculiar to females between the age of puberty and the fiftieth year of life.

"Hysteria" is from the Greek word for the womb; it was supposed that the disease arose from disorders of that organ; but it quite as often arises from irritation of other organs, such as the stomach and bowels; in a person predisposed to it probably any uncomfortable sensation may initiate an attack.

Hysteria may manifest itself particularly in three different modes. First, either as a pure nervous and spasmodic affection; second, as a simulator of other and more directly definable disease; and third, as a modifier of other diseases really existing. The varied forms of hysteria, and the way in which it modifies and masks, or closely simulates other more important affections, is apt to render it at times one of the most puzzling disorders with which the physician has to deal; it is one, moreover, especially liable to mislead the young or inexperienced practitioner.

A fit of hysteria may assume different forms, but, generally, the female becomes, *apparently* of a sudden, partially insensible, it may be, falls down, but more generally has sufficient warning to seat herself on a chair; the eyes are closed, the lids tremulous, the limbs are stretched out, and spasmodically and suddenly contracted at intervals, or there is violent struggling; the chest heaves, the heart and vessels of the neck beat violently, the face is more or less flushed; frequently, the patient puts the hand to the throat and neck, as if to dispel some uneasiness, and not uncommonly gives utterance to incoherent or disconnected sentences, generally in a peevish or distressed tone of voice. In most cases the power of supporting the body when seated remains, unless it is worked off the chair in the struggles. At length, the attack, having lasted for a longer or shorter period, from a few minutes to some hours, terminates, probably with a fit of sobbing and crying; the patient recovers consciousness, but is left exhausted and fatigued with the efforts and struggles, and, perhaps, falls into disturbed or heavy snoring sleep. When a fit has terminated, or even during its progress if continued, the kidneys act very freely, and large quantities of urine, almost resembling pure water, are voided.

Such are the leading features of a "fit" of hysteria, but they may be greatly varied; the struggles, especially, being so violent as to require the assistance of two or three strong men to restrain a comparatively feeble female, and to prevent her injuring herself, and sometimes, though not commonly, those around her.

Such are the outward manifestations of a fit of hysteria; but before it comes on, many patients complain of a sense of general oppression or uneasiness, with coldness or numbness of the limbs. Just previous to the accession, the characteristic hysteric "globus," or ball in the throat, is probably felt; it seems as if a ball commenced rolling upwards in the bowels, generally from the lower left side, and as if it kept gradually ascending towards the throat, which it seems entirely to fill up, causing those sensations which induce hysteric patients so often to carry the hand to, and pull at the forepart of the neck or throat.

It would serve no good purpose here to follow the history of hysteria into the minutiæ of its various phases. It might be said, that there is scarcely a disease to which the human body is liable, which it may not simulate so closely as to call for all the tact and discrimination of the physician to detect the difference between the two. Continued, *incessant*, hard cough, loss of voice, delirium of various kinds, paralysis, contractions of the limb, obstinate vomiting or constipation, nay, even pregnancy, may be enumerated amid the various simulated conditions. Neither would it be profitable, in the present work, to enter into an investigation of the way in which the hysteric tendency will modify the various diseases to which the body is liable; this can only be conducted by the medical practitioner; but it is a matter of importance, that not only parents, but that the individuals themselves should be aware of those habits, &c., which tend to develop the hysteric tendency; and,

further, that the best mode of managing a hysterical individual during the fit, and in the absence of a medical man, should be understood.

During the continuance of a fit of hysteria, little either need or should be done, beyond preventing the patient hurting herself during the struggling. Cold water dashed upon the face may be useful, or it may be poured in a stream upon the head for a few minutes at a time, from a ewer or large jug; literally putting the patient under the pump is the best remedy. If there is much flatulence, a teaspoonful or two of sal volatile in water will give it relief. It must be remembered, that in most cases of hysteria, the patient is sensible of what is going on around, and may, in the excited state of the nervous system, be painfully alive to any unguarded or unfavourable opinions uttered by those in attendance; for this reason, it is not to be recommended that, as sometimes is done, severe and violent remedies should be proposed within hearing of the patient with the view of frightening her out of the fit; such a course has had the opposite effect, causing an aggravation of the symptoms. This is a different thing from threatening severe remedies whilst the patients are comparatively well; such a plan of treatment, it is well known, has often succeeded in putting a stop to the spread of hysteria—by imitation—through schools, or similar gatherings of young females.

The exciting causes of hysteria are, remotely, whatever tends to exalt the influence of the nervous system. Among the moderately-fed and hard-working population in the country, hysteria is comparatively rare, but it is not unfrequent in servants who remove from the poor living of their own homes to the stimulating diet of a rich man's house. Most generally, hysteria, although in some degree the result of constitutional tendency, is connected with debility, and irregularity of the usual conditions of female health, all these being aggravated by emotions of the mind, particularly those which are connected with the affections; these, too, when in direct excitement, as well as inordinate physical exertion, which produce exhaustion of the nervous system, must be ranked as among the most general directly originating causes of the hysterical fit itself. If, however, mental influences either of excitement or of depression, connected with the affections, are apt to occasion hysteria, excitement of another kind has been found to be one of the best counter-agents of the morbid tendency. It has been remarked, that amid states of great public agitation, such as revolutions, hysterical affections have decreased in frequency; and instances often occur, of women subject to frequent attacks of hysteria as long as easy circumstances permitted self-indulgent habits, losing the tendency when reverse of fortune or some other cause has forced them into active exertion. Under these circumstances, it is not to be wondered at if marriage, with its new cares and duties and interests, often cures hysteria.

The prevention of a disease, or of the tendency to it, must ever be the most important consideration connected with it, particularly when, as in the case of hysteria, prevention is very possible. Experience testifies to the much greater frequency of hysteria among those classes whose mode of life is comparatively indolent and luxurious, being, in fact, that best calculated to *develop* those hysterical tendencies, of which the *foundation* is too often laid in the absurd education of the girl. This subject has been sufficiently entered into under the head of education, and requires no further amplification here; suffice it to say, that those who would not have their daughters grow up subject to the miseries of "nervousness," should use the rational means of developing their physical health, and give them those habits of healthful exertion, both of body and mind, which, carried up into womanhood, will be the best preventives of hysteria, with its long train of exaggerated ideas and exaggerated ailments, which are too apt to render single life useless and a burden, and, if long continued, to make weak mothers and nurses, if marriage is entered into.

As regards the treatment of the hysterical tendency, it is needed to say but little in a work like this, beyond the enforcement of those general means of health which are laid down in the various articles. As regards medicinal treatment, it requires to be so varied according to each particular case, that it can only be rightly conducted under the care of a medical man, and in a disease like hysteria, long continued; and also a concomitant of artificial life, medical assistance always can and should be procured.

Lastly, although hysteria may be dependent on physical derangements, it must be considered as a disease to a considerable extent under the control of the will, and this fact should be strongly urged upon the subjects of it, even when they are sufficiently sensible, as they most generally are, during the existence of a fit of the disease. Hysteria is a disease which lives and grows on superabundant sympathy and attention, and whilst all kindness and consideration is shown, it is wonderful how much good may be derived from a little wholesome neglect. Whilst recommending that the medical treatment of the hysteric tendency should be committed to the medical man, it is right to caution, that there is always much tendency to a confined, and, consequently, loaded state of the bowels, which it is highly necessary should be obviated. The compound colocynth or compound rhubarb pills, compound decoction of aloes, infusion of senna, or enemata, will be found the best adapted aperient remedies.

Refer to—*Imitation.*

ICE.—Water solidified or crystallised by the action of cold, or more correctly by the abstraction of heat, is often an agent of the greatest value in the treatment of disease—one, indeed, for which there is at times no substitute. As an external application, when cold is desirable for the purpose of reducing the heat of any particular part, such as the head, ice manifestly offers the most efficient means; it may either be permitted to dissolve in the water in which the clothes are dipped, or, better, it may be pounded and placed on the part in bladders, or in ice-bags made of India rubber, which are manufactured for the purpose (see *India Rubber*). As an internal remedy in inflammatory affections of the stomach, in obstinate vomitings, in fevers and in hysteria, small fragments of ice swallowed frequently, or allowed to dissolve in the mouth, are, often, not only of the most essential service, but the remedy is one most agreeable to the feelings of the patient. Under the article *Hydrophobia*, it was stated that ice used in this way had afforded comfort, at least, to a sufferer. Of late, the action of the extreme cold produced by the admixture of pounded ice and salt, has been introduced as a local anæsthetic, and as an external remedial application in neuralgic and other similar affections. The treatment consists in partially freezing the affected part, and is often successful; it is, of course, not adapted for unprofessional use. In inflammatory affections of the throat and upper part of the windpipe, either the result of cold, or of accident, such as that which so often occurs to children in consequence of their swallowing boiling water from the spout of a kettle, ice given in small frequently-repeated morsels will be found at once one of the safest, best, and most agreeable remedies. It has been found useful in loss of voice.

Refer to—*Cold.*

ICED DRINKS, or **ICES,** as articles of luxury, if taken moderately, cautiously, and slowly, and when the stomach is not full of food, are not injurious to healthy persons. It was found, however, in Dr. Beaumont's experiments, that cold fluids and the like produced a reduction in the temperature of the interior of the stomach some 20° or 30° Fahr., and that the organ did not recover its proper heat for some time. As, however, the natural temperature of the stomach—about 98° Fahr.—is necessary for healthy digestion, it is evident that the custom of eating ice after dinner, or after any full meal, must materially interfere with the disposal of that meal. It is right that people should be aware that draughts of fully iced milk may, and have, proved fatal—the lump of iced curd which forms in the stomach acting, probably, as a profound depressant upon the sympathetic nervous system.

Refer to—*Indigestion.*

ICELAND MOSS, which belongs to the class of *lichens*, in some degree resembles the lichen which grows upon the trunks and branches of trees; it is, however, more of an olive-green colour. Iceland moss is found abundantly in the country whence it derives its name, but also in Northern Europe generally, and in Britain. It has been long noted as a nutritive remedy in cases of debility, and, when prepared for food, is frequently first soaked in water, to deprive it of its bitter principle; it is a question, however, whether this proceeding does not materially interfere with the tonic properties of the remedy. Iceland moss may be prepared in a similar way to Carrageen moss (see *Cookery*). The Saxon government published a report upon the nutritive value of the lichen a few years ago; in which we are informed, that six pounds eleven ounces of lichen meal, boiled with fourteen times its quantity of water, and baked in this state with 39½ pounds of flour, produced 111½ pounds of good household bread. Without this addition, the flour would not have produced more than 78¾ pounds of bread, consequently the addition of six pounds eleven ounces of lichen meal, occasioned an increase of above thirty-two pounds of good bread, this increase, however, being owing, of course, to additional water. A demulcent decoction of Iceland moss may be prepared by boiling an ounce of the moss in thirty ounces of water, until it is reduced down to twenty ounces; a wine-glassful to be taken occasionally.

ICHOR is a thin, acrid, often brown or bloody-looking discharge from wounds or ulcers.

ICTHYOSIS.—A disease in which the skin becomes covered with thick hard scales, which make it, in some degree, resemble the skin of a fish. The disease is often hereditary and usually congenital, and is peculiar to certain districts. It is of a very intractable nature.—See *Skin.*

IDIOCY and **IMBECILITY** may be regarded as degrees of deficient mental manifestation, consequent upon a similar disordered or defective state of the brain. Some have defined the difference, that idiocy is congenital, and imbecility acquired; but, generally, imbecility is regarded as a minor degree of idiocy.

An idiot has been defined as one "who knows nothing, wishes nothing, and can do nothing," whose instincts scarce prompt him to seek food under the pressure of hunger; from this lowest condition of all, up to the weak mind or judgment, every shade of idiocy, weak intellect, imbecility or silliness, is met with, and all perhaps are, more or less, capable of improvement, by means of attention to the physical health, and by education of the faculties.

Till within the last few years, the general idea has been, that idiocy was incurable; the unfortunate beings, whether in the families of the rich or of the poor, were allowed to grow up, their physical wants attended to in accordance with the circumstances in which they happened to be placed, but their mental condi-

tion left without attempt at cultivation. Fortunately the error has been exposed, and institutions, both in this kingdom and on the Continent, are now in successful operation, for the end of elevating these unfortunate beings from their debased position. The fact, that idiocy has been regarded too much as a fault of the mind alone, independent of physical influences, has tended in some degree to interfere with the efforts for its amelioration. Attention to the physical health is a matter of paramount necessity. In the case of the cretins of Switzerland, this fact is peculiarly manifest.

Enough has been said to give hope to those who number among their families an idiot, that something may be done to ameliorate the calamity, and to induce them, as soon as the condition of the idiot child becomes manifest, to place it, or, if possible, to get it placed, under judicious management at an early age. Dr. Forbes Winslow remarks with regard to the causes of idiocy: "The great mass of idiots are said to spring from an unhealthy stock, and have either been the children of idiotic parents, or of those of vitiated organisations, of scrofulous diathesis, or of intemperate habits. Three hundred idiots were ascertained to have been the children of drunkards." Dr. Winslow also refers to the effects of intermarriages of near relatives, and to the influence of the mind of the mother, as well as that of the father, upon the condition of their offspring.

Refer to— *Brain—Cretin, &c.*

IDIOPATHIC is a term applied to disease in which the cause is not apparent.

IDIOSYNCRASY is a peculiar state, either mental or physical, which renders an individual more than usually susceptible to certain influences, which do not affect the generality of persons. Thus, some cannot take the smallest dose of any mercurial without suffering from it constitutionally,—that is, being salivated,—owing, as it is expressed, to their peculiar idiosyncrasy: another cannot eat the pip of an apple, a bit of almond, or indeed any of the seeds belonging to the same family—which contain prussic acid—without suffering from cutaneous eruption. These, and numerous others which might be cited, are instances of peculiar idiosyncrasy, and probably every one is subject to such influences in some way or other; every one, probably, has his idiosyncrasy, whether he is aware of it or not. Mental idiosyncrasies are not less common than physical, and neither for one or other is it possible to fix on any assignable cause. It is, however, a matter of considerable importance, when any peculiar idiosyncrasy exists, more especially with regard to medicines, that whenever a medical man is consulted for the first time, he should be informed of it. As there is no traceable cause for idiosyncrasy, it cannot become known to a medical adviser, except by experience respecting his patient's constitution, or by information given him. The latter should always be given at a first visit. It is a very annoying circumstance for an invalid, to find that he has unwittingly taken a medicine which invariably disagrees, and equally annoying is it for a practitioner, having every reason to expect benefit as the result of his prescription, to find that the case has, perhaps, to say the least, been unrelieved, simply because he was not warned that calomel invariably caused vomiting, that colchicum produced distressing nervous depression, or that senna griped most unmercifully.

Refer to—*Diathesis.*

ILIAC PASSION.—See COLIC.

IMITATION.—The tendency to imitate, by which all, perhaps, but especially children, are more or less influenced, is, of course, an important consideration in the education of the latter, particularly with respect to the imitation of involuntary movements or peculiarities, such as stammering, squinting, &c., which young persons are very apt to acquire, if much associated with those who are the subjects of them. The power of the tendency to imitate in causing the diffusion of disease of the nervous system, such as hysteria, epilepsy, &c., is well known. Persons of susceptible nervous system, by exposure to the influence, that is, by witnessing the occurrence of the disease in another, may themselves become, involuntarily, imitators; in some cases, doubtless, quite involuntarily, without power of control, but in others only partially so. That in many cases the power of the will may prevent the manifestation or development of disease from imitation, has often been proved. The anecdote related of Boerhaave is known to most. This celebrated physician was consulted respecting the girls of a school, who, daily, one after the other, became the subjects of fits of hysteria, simply from imitation. Boerhaave had it made known that his mode of treatment must be to apply actual cautery, that is a red hot iron, to the spine. Not another case of hysteria occurred.

Refer to—*Hysteria.*

IMPERIAL, or VEGETABLE DRINK, is made by pouring upon an ounce of cream of tartar a quart or three pints of boiling water, flavouring with a few slices of lemon, and sweetening. When the water cools, a crystalline sediment, which does not, however, possess the acidity of the cream of tartar, remains at the bottom of the jug, and is not available for further use. Imperial forms a cooling drink in feverish conditions of the system, and is a very safe and mild diuretic; sometimes, however, it produces irritation of the kidneys and pain in the back.

IMPETIGO—a pustular skin disease.—See *Skin.*

INCONTINENCE OF URINE.—See URINE.

INCUBUS, NIGHT-MARE.—See SLEEP.

INDIA RUBBER.—The elastic and im-

pervious qualities of this most useful substance, both in its natural condition, and in its numerous preparations, have been abundantly taken advantage of, in the formation of various sick-room appliances, instrumental and otherwise, of which the water or air-bed and cushion, the enema syringe, catheters, pessaries, and water-proof sheeting, are among the most familiar examples. Mr. Hooper of Pall Mall, who was among the first to introduce these useful appliances, continues to adapt the pure rubber to a variety of purposes, apart from the water bed and cushion, having ingeniously contrived to make it available for bed-pans, bed slippers, ice bags, urinals, and other portable apparatus in common use. Fig. 129, A, B,

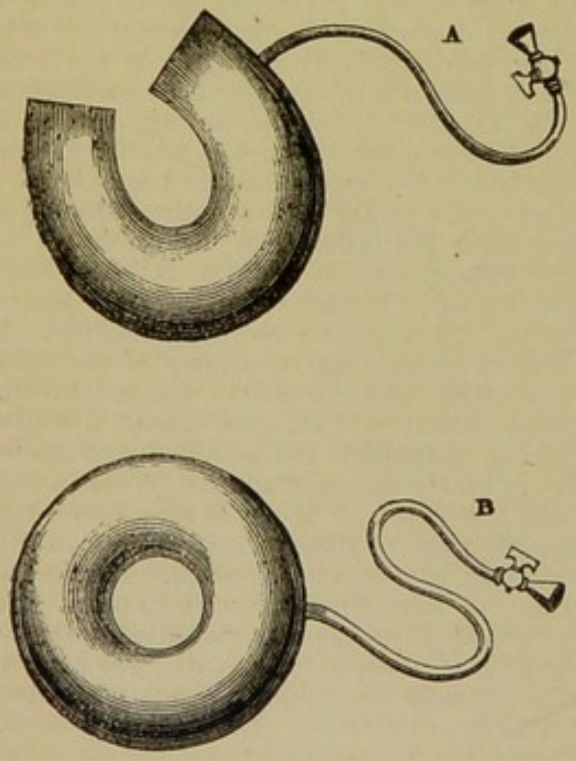


Fig. 129.

represents the horse-shoe, and round forms of the ordinary water cushion, as they may be employed to relieve pressure and prevent sores on parts liable to suffer from long-continued confinement in bed from chronic disease. The India rubber hot-water bottle, of which an illustration is also given (fig. 130) is a most valuable invention, which is coming gradually into general use, as a ready means of applying a dry fomentation to any pained part of the body, and also as a convenient foot warmer. It is all the better for being encased in a woollen cover expressly made for it, or in a roll of flannel. Ice bags for the continuous application of cold are frequently referred to in the course of this work; the accompanying illustration (fig. 131) will convey an idea of the apparatus, which has now taken the place of the bladder, formerly employed with the same object. The ice bag is fitted with a cork of large size, is triangular in shape, and the bottom is made wide and loose, to adapt itself to the irregular surfaces of the body, especially of the forehead and scalp, to which parts it is often ordered to be applied. In most cases, in consequence of the restlessness of the patient, it is necessary to attach the ice bag, by strings or bandage, to the parts affected, and it is absolutely essential

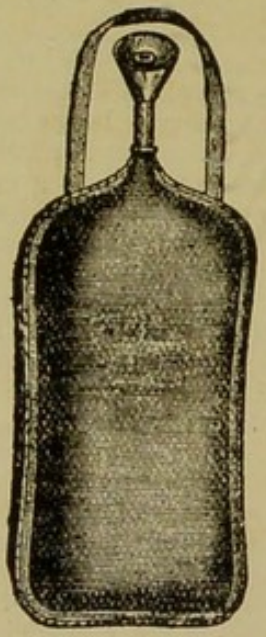


Fig 130.

that the supply of ice fragments should be kept up continuously to render it efficient. The India rubber sheeting employed as a protective to the bed clothes (often called "Mackintosh" from the original inventor), is a cloth covered either on one, or on both sides,



Fig. 131.

with India rubber, and is now universally employed for sick-room purposes. One of the most useful applications of India rubber may be found in the air pad, employed sometimes in trusses, and for a variety of surgical purposes, where it is desirable to sustain an equable pressure on any part of the body. The air

pads are usually made so as to be inflated at will, of any size likely to be wanted, and may be applied to any part, where they exert a gentle pressure, without causing the inconvenience or discomfort, which are occasionally produced by pads stuffed with less elastic material. The illustration (fig. 132) shows how fracture of the collar-bone may be treated by a pad of this

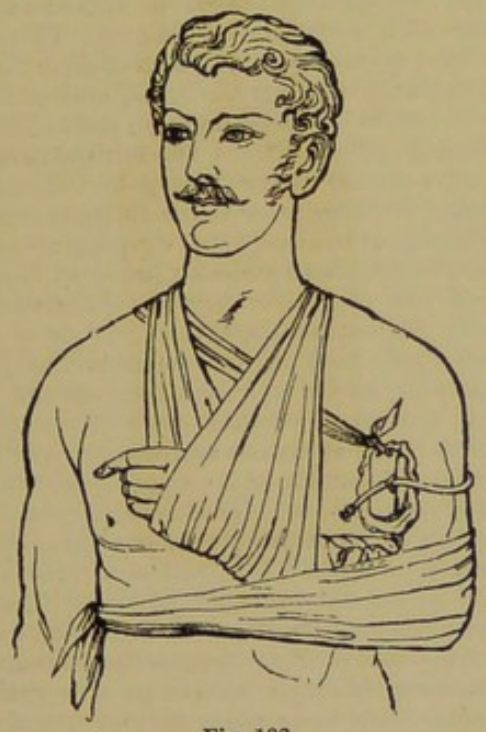


Fig. 132.

kind, placed in the arm-pit of the injured side, and supported by three of Esmarch's bandages (see *Bandage*), in the manner recommended by Dr. Eddowes.

Lastly, the India rubber bandages, elastic belts and stockings, are among the most valuable resources of modern surgery, and are especially useful in supporting and aiding the venous circulation, where there is a tendency to a varicose condition and to ulceration.

INDIGESTION, or DYSPEPSIA.—Under the article *Digestion*, to which the reader is referred, those conditions which are requisite for the healthy performance of this important function were pointed out. It was shown that the due mastication of the food by the teeth, and its admixture, particularly when of a farinaceous character, with the saliva, were essential to its perfect digestion in the stomach by means of the gastric juice, and in the alimentary canal generally, by means of the various secretions which become mingled with the food mass during its progress through that tube. It was further pointed out, that not only is a healthy condition of the organs of digestion themselves requisite for the proper performance of their functions, but that the food must, in some measure at least, bear a relation to the natural constitution and assimilative powers of these organs; and, lastly, that the state of the system at large influences considerably the exertion and progress of the digestive powers; that is, to ensure the vigorous putting forth of those powers, the system must stand in need of the supply of nutriment which the stomach is called upon to elaborate; and partially at least, and for a longer or shorter period, its efforts must be devoted, in efficient co-operation with those of the stomach, to the preparation of the nutriment for its own requirements—plastic material for its tissues, respiratory elements for its animal heat.

When it is considered how much the stomach is under man's regulation and control—how dependent its management is upon his external relations, his habits and caprices, whether these affect it directly or indirectly—it can scarce be a matter of surprise, that in the present condition of mankind, indigestion is universally admitted to be the most common of all disorders. The savage, with his long periods of fasting, terminated by a gluttonous meal of perhaps indigestible, or, if cooked at all, badly-cooked food, suffers from it; the pampered, the luxurious, and the indolent suffer from it; the over-wrought in body, and the over-taxed in mind, are all liable to dyspepsia in one or other of its varied forms. It is, in fact, one of those maladies most closely and evidently connected with man in a state of disorder, or of vice; or of ignorant or wilful disregard of all the conditions of health, either by the individual sufferer himself, or by those from whom he is descended.

Many varieties of indigestion are enumerated; in the present work, it will serve every practical purpose to consider the disorder in the first place, as dependent upon causes directly connected with the digestive organs themselves; and in the second, as indirectly dependent upon causes which, although manifested through the digestive organs, are traceable to certain disordered conditions of the system in general, or of some of its organs not specially devoted to the preparation of food.

It is unquestionable that there exists great difference in the natural digestive power of different individuals; even in childhood this is evident; and when weakness is evinced thus early, it must be considered as a tendency congenital in or natural to the constitution, which will probably continue with it during life. Persons thus constituted, even as children, cannot eat the food—either of the same quality, or in the same quantity—that their stronger companions do; and if they occasionally do so, or, as too often happens, are forced to do so, sickness and vomiting frequently follow. Such individuals, their whole life through, are liable to dyspepsia; with all their care they cannot always escape its visitations, even under the most favourable circumstances; and if placed in such positions, as confined workshops, counting-houses, and the like, they are

perfect martyrs to the disease—are never happy except when their stomachs are empty, and not always then. It is very common to hear such persons say: "If I could live without eating I should be perfectly well." They are always conscious of sensations in the stomach, it is generally most comfortable when free from food, but even in its state of rest is apt to be the seat of pain, or of craving or gnawing uneasiness. After a meal has been taken, instead of the satisfied feeling of health, the stomach and bowels generally feel distended; perhaps there is tolerably acute pain; windy, and acid, very acid, eructations quickly follow; there is heart-burn, perhaps headache, sometimes, though not often, vomiting, and these symptoms continue, with more or less severity, till the food has passed off the stomach in some condition or other. After this there is a state of comparative comfort. Along with these periodical dyspeptic symptoms, the tongue is at all times more or less furred, especially at the back part; on first waking in the morning this furring is notably increased, and the mouth is almost invariably dry; the bowels are costive; the hands and feet are almost always cold, and the face is very liable to be the seat of pimply eruptions. Notwithstanding all these symptoms, the appetite often remains good, too good in fact for the digestive powers.

With such persons, the slightest indiscretion or excess in diet, is liable to bring on protracted fits of aggravated dyspepsia: a little additional anxiety of mind, a little extra fatigue, is almost sure to put them wrong. But yet these species of indigestion, which belong to the atonic or weak form of disorder, seldom tend materially to shorten existence; many pass on from year to year, throughout a tolerably long life, without being a single day quite free from its visitations. It may be that the care they are compelled to take saves them from many of the sources of disease to which those who do not know they have stomachs, and who can take any liberty with them, wilfully expose themselves; but so it is. Medicine (that is, drugs) does but little good in this form of indigestion, except in its occasional aggravation, and aperient remedies, habitually and frequently taken, materially increase the natural weakness of the digestive powers. The best remedies are, strict attention to the laws which regulate health, and to the means of invigorating the constitution. When a young person shows the tendency, the fact ought to influence the choice of the employment for life: if possible, all such as involve close confinement at desks, or work which calls for much wear and tear of brain, should be avoided; agricultural and similar pursuits, which require regular exertion in the open air, should be chosen. A man had better earn his daily bread by the—literal—sweat of his brow—earn as Abernethy used to say, a shilling a day, and live upon it, than be a miserable hypochondriac, dyspeptic, valetudinarian, in the more dignified study or office. In the form of indigestion we are considering, *particular* regulation of the diet is worse than useless; and especially the confinement, once so fashionable, to two or three articles of food—to wit, mutton chops, brown bread, &c.—considered more than usually wholesome. The healthy, strong stomach craves for and requires change, still more the weak one. There are, it is true, certain general rules of diet, such as the avoidance of pastry, cheese, and such-like well-known indigestible articles, to be observed; but this is different from the minute considering, nay, almost the weighing and measuring of food. Nothing is so liable to aggravate and perpetuate a tendency to dyspepsia, as the constant attention to the actions and capabilities of the digestive organs, which minute dietetic regulation involves. It is a well-known fact, that organs, such as the heart, not usually under the influence of the will, may in the course of time come to be affected thereby, if the attention be frequently directed to the organ, which, as a consequence, becomes disordered in action. This is well exemplified in the act of breathing; this function, though generally performed involuntarily, may nevertheless be sensibly affected by the will, and if any one tries to regulate his breathing by his own will, it quickly becomes most fatiguing and necessarily embarrassed; so it is with the stomach, there is no surer way of disordering its functions than by keeping the mind continually attending to its operations. A dyspeptic is more likely to get quit of his complaint by casting aside restraints of diet, if he at the same time untrammels his mind, than by the constant minute dieting, and reference to tables of the digestibility of whatever he eats; within certain limits, a latitude and variety is absolutely necessary. The dyspeptic who, instead of trusting to attention to the general laws of health, trusts to limiting his food to such things as he finds, or thinks he finds, his stomach capable of digesting comfortably, will shortly get himself driven into a corner by the enemy; water-gruel and sago-pudding will succeed the mutton chop and bread; and at last, the stomach, so long allowed its choice of work, refuses it altogether, and reduces its possessor to despair. The author has known such cases, and the very despair has worked its own cure; the dyspeptic has made a rush at some long-dreaded or forbidden viands; a beef steak and a tumbler of porter are perhaps taken, with some floating idea of its being a suicidal act, and, much to the surprise of the despairing invalid, they seem to take up their quarters, and to be most comfortably received by his stomach, which had nothing but acidity for the milk and farinacea. In fact, the stomach only wanted stimulus, and no sooner does it get it, than it

rouses to the proper exercise of its powers. It may be that it will not continue thus after a few repetitions to respond to the stimulus so vigorously; but if reasonable judgment and moderation are exercised as regards food, if the person trusting to the unexpected power does not run into excess, the reverse of his former abstemiousness, and if he attends to the general health and strength, especially, if possible, by means of change of air and scene, he may to a great degree get the better of his former miserable condition. The above case is put to demonstrate that ultra-dietetic regulation is not only useless, but worse than useless in cases of atonic dyspepsia generally, and a large proportion of the cases of the disorder met with in medical practice are of this class; not, it is true, of hereditary or congenital origin, or of life-long continuance, but still, long-continued cases, the effects of the various debilitating and depressing influences which affect the citizens of large towns; the deficient supply of fresh air, and the contamination of this vital element by noxious emanations, the contamination of water, the close confinement and anxiety of business, and the hurried meal, all tend to produce the form of atonic dyspepsia. Such cases may perhaps be relieved temporarily by medicine and regulation; but they have but little hope of cure, without removal from the causes which originated them; they are the cases which confer celebrity upon watering places, and would confer celebrity on any place which happened to become their resort, provided it offered plenty of fresh pure air, and relaxation from care and anxiety. It matters but little—water cure, in *moderation*, grape cure, sulphurous or chalybeate springs, sea bathing, or shampooing, even homœopathy, will suffice—the atonic dyspeptic will get well under the influence of the natural stimuli of fresh air and cheerful exercise.

Persons who suffer from the above form of dyspepsia, if they have been accustomed to the use of alcoholic stimuli, cannot leave them off, at least when following out their usual mode of life, without risk of having their ailments much aggravated, and suffering much both from mental and physical depression. They must, moreover, carefully avoid whatever tends to exhaust the powers of the system, long fasting, long fatiguing walks, especially before breakfast, active exertion or severe study soon after a meal, are all injurious to them. Their digestive organs are so comparatively feeble, that for the first stages of their operation they call upon the whole nervous energies of the system for assistance, and if these energies are called off for other purposes, the function of digestion necessarily suffers. It matters little whether the nervous exhaustion or derivation takes place immediately before or after the meal, the effect is the same. Persons who suffer from this form of dyspepsia, almost invariably experience languor after a full meal, in consequence of the nervous power going to the stomach instead of to the muscular system.

The next form of indigestion to be considered, partakes more of strength than weakness; it occurs in persons of naturally good constitutional powers and digestion. It may be brought on by indolence and close confinement, but is more generally induced by excess in eating and drinking, and is, in most cases, connected with more or less biliary disorder. The appetite fails, the tongue is much furred, there is often sickness and vomiting of bile, the bowels are rather irregular than confined, the urine is high-coloured and deposits red or pink sediments, there is heart-burn and acidity, and generally headache, often pain between the shoulders extending to the back of the head; the condition, in fact, is in great degree similar to that which precedes an attack of British or bilious cholera, and often ends in a "sick headache," or "bilious attack." In this form of dyspepsia, abstinence and exercise may effect a cure, but it is much facilitated by proper medicine; it is in such cases, that the calomel, or blue pill and black draught method, are most useful, *if properly employed;* the system at large, and the whole of the digestive organs, are oppressed and over-loaded, and one or more doses of the above medicines clear them in a way that nothing else will, bringing away large quantities of acrid, dark bile, with immediate relief. After this remedy has been repeated, the bowels ought to be kept lax by means of the blue pill and compound rhubarb, or blue pill and compound colocynth pill at bed-time. If the tongue remains furred, and the appetite deficient, two or three doses during the day, of effervescing mixture, with the addition of a tea-spoonful of tincture of calumba, or of tincture of gentian, to each, will be of service; or a mixture composed of a drachm of carbonate of potash, half an ounce of nitrous ether, and twelve ounces of infusion of calumba or of gentian may be used, a wine-glassful being taken twice a day. In this form of dyspepsia also, the infusion of dandelion, either alone or combined with one of the bitters, is very serviceable. This form of dyspepsia does not call for change of air and scene as the first-mentioned does, although unquestionably—especially if the attack has been a severe one—these remedies are of service, if taken advantage of after the organs have been relieved, and the functions regulated by medical treatment.

A very necessary caution is requisite with respect to the management of this form of indigestion. The immediate and striking relief which follows the clearance of the liver and digestive organs, by the use of the mercurial and purgative, is very apt to induce people to trust to this means of cure, or rather of relief, and to disregard all those methods of self-management and self-restraint which would keep them well. There is, perhaps, no substitute, nothing which will so completely, at the

outset of the treatment of a case of this form of dyspepsia, clear away the causes of its symptoms, and leave a good foundation for after treatment and management; but to trust to this mode of relief alone, and from time to time to persevere in those habits of self-indulgence and of excess in which the disorder originates, is most dangerous, and must, sooner or later, lay the foundation of disease, or at least substitute for the dyspepsia of a strong stomach that of a weak one, and with it of a weak system generally.

The form of dyspepsia of which we now treat is, in so great a majority of instances, the result of excess in eating or *drinking*, and of inattention to proper exercise, &c., rather than of any real weakness of digestive function, that there are few who suffer from it, who might not enjoy, under proper restriction, the best possible health.

The two forms of indigestion above treated of, that which results from weakness, and that which does not, may be taken as the types of dyspeptic ailments generally, and all incline, more or less, to one or other of these divisions. To enter into the varied phases which cases of indigestion assume, and to detail the varied symptoms they present, would demand a volume of itself. Although, therefore, in this article, less is said than in most others respecting application to a medical man, it is not because it is not highly desirable in all cases of continued or aggravated indigestion; there are often so many anomalous symptoms, and the disorder is frequently dependent upon so many causes which skill and experience only can detect, that it is the safer and wiser plan to take advantage of these guides whenever procurable.

One of the most general features of dyspeptic disorder is the mental depression, often amounting to *Hypochondriasis*, or even *Monomania*, which accompanies it. In sufferers from the atonic and continued condition, this is more apt to take the form of constant dwelling upon symptoms and feelings, and magnifying their importance; in fact, such persons' whole time and attention seems to be occupied in registering the various sensations they experience in the course of the day; and, if attended by a medical man, they do not fail—if allowed—to trace the turning and winding of every pain and ache, how much and what they ate for the last week, and so on. In the form of indigestion less connected with constitution, the spirits are apt to be more regularly depressed, and more decidedly hypochondriacal, or even, in some, suicidal emotions are felt. In many cases of indigestion the urine becomes loaded with gravel (uric acid), and sometimes crystals of oxalate of lime are found in it. This condition is most commonly found amongst those who live well, and indulge largely in fermented liquors, and is best provided against by abstinence and alkalies, such as bicarbonate of soda in ten-grain doses, two or three times a day.

Headache, which is so frequent an accompaniment of indigestion, arises from very various and very opposite causes. The most general headache, is a dull persistent pain over the eyes, which comes on from half an hour to two hours after food, and seems to be connected, so to speak, with a negative or inactive condition of the stomach, on which the food remains with but little change. This kind of dyspeptic headache is accompanied with dulness of the mental powers, and incapability of their exertion. It is best relieved by whateve stimulates the stomach: a cup of hot tea, a glass of wine, an effervescing draught, and often a spoonful of vinegar will relieve it, the acid seeming to alter the activity of the nerves, for whatever may be the cause on which the symptom depends, even acid generated in the stomach itself will cause its disappearance, and persons who suffer from this headache, are often aware that it will probably subside as soon as heartburn begins. The same description of headache may be produced in persons of weak stomach by a dose of soda or magnesia, or by any article of food which does not stimulate sufficiently the stomach and its nerves. A headache, exactly the reverse of the foregoing, is caused by the presence of superabundant acid, and is, of course, relieved by the alkaline remedies—carbonates of ammonia, soda, or potash, which neutralise the acid. Persons liable to indigestion often suffer also from various forms of nervous headache, from giddiness, dimness of sight, &c. The chest comes in for its share of disorder when indigestion exists. A peculiarly irritable "stomach cough" is not unusual; palpitation of the heart is almost a constant attendant upon the condition, and shortness of breathing often results from pressure exerted upon the chest by the stomach distended with gas. Indeed, there is scarcely a symptom which may not, some time or other, be met with, traceable to disorder of the digestive powers. The sympathetic connections of the stomach, and its office as preparer of the nutriment which is to supply the body, necessarily make its derelictions felt throughout the system; and gout, gravel, rheumatism, cutaneous affections, scrofula, and indeed most other disorders, may at times be distinctly traced back to faulty digestion. Moreover, the abundant sympathetic connections of the stomach make it liable to be affected by the state of, as well as to affect, distant organs; and it not unfrequently happens, that obstinate cases of indigestion turn out to be not so much the consequence of disorder of the stomach itself, as of its sympathy with disease going on elsewhere—in the heart, the kidneys, or womb; when, therefore, indigestion, in spite of all proper regulation and treatment, continues to harass a patient, something of a deeper-seated and graver character must at least be watched for.

Nervous pain at the stomach, also called gastrodynia, is one of the most painful forms of indigestion, sometimes coming on when the stomach is empty, sometimes after eating. The disorder ought to be treated by a medical man. If there is much tenderness, a few leeches, followed by blister or mustard-plaster, may be applied to the pit of the stomach. Bismuth, in five-grain doses, twice or thrice a day, will sometimes relieve; the author has found the oxide of silver, in one-third of a grain dose, as recommended by Sir James Eyre, of considerable service in some cases. In this affection of the stomach, as well as in other forms of dyspepsia, the rhubarb and magnesia mixture, with or without the addition of sal volatile, is often very useful. When the pain is present, and very acute, a cup of hot water, swallowed as hot as possible, is often of service, with the addition, if there is acid on the stomach, of fifteen or twenty grains of carbonate of soda, or as a possible addition, four or five drops of laudanum, or chlorodyne. A mixture containing ten grains of the subnitrate of bismuth, the same amount of carbonate of soda, and ten drops of the solution of morphia for a dose, may be given three times a day. In many forms of indigestion, and especially when, as is often the case, the disease is a distressing accompaniment of consumption, benefit is derived from the use of pepsin, either in the form of powder, of which five grains may be taken three times a day, between thin slices of bread and butter, or as pepsine wine in doses from a tea-spoonful to a table-spoonful three times a day. In some cases the maltine preparations combined with peptones give much relief. When the pain amounts to spasm, it must be dealt with as recommended in the article on the subject.

The principal features connected with indigestion have now been enumerated; a short general recapitulation of the subject will probably make it more clear to the mind of the unprofessional reader. The first form of indigestion noticed, was that dependent on weakness: in this it may be taken as an axiom, that it is better to bring the stomach up to its reasonable work, than to reduce the work to suit the enfeebled powers of the stomach. In doing the former, the whole system must be attended to and strengthened, and the stomach made to participate in and to *give its proper aid to the strengthening process;* in attempting to do the latter, not only do the powers of the stomach become less and less, shrink away as it were from their work, but the whole system partakes of the enfeeblement.

In the second form of indigestion adverted to, that accompanied by strength, or at least not dependent on weakness, it was shown that medicines and abstemiousness offered the proper means of relief. Lastly, the varied forms, systems, and connections of dyspepsia, were pointed out, to show how often there must be difficulty in determining the treatment and true nature of the case, and to impress the unprofessional reader, that when suffering from anything more than transient indigestion—unless indeed his be one of the cases of constitutionally feeble digestion—the safest, best, and perhaps most economical plan, will be to put himself under proper medical care. Above all things, those who suffer from the form of indigestion dependent on weakness, must beware of purgatives; nothing so completely debilitates whatever digestive powers they may possess. The bowels perhaps (probably) may be regularly costive, but they must be, as a rule, regulated by injections or by small doses of castor oil.

Refer to—*Alimentary Canal—Digestion—Drinks—Food—Exercise—Meals—Dinner, &c.*

INFANTS.—See CHILDREN.

INFECTION.—See CONTAGION—DISINFECTANTS, &c.

INFLAMMATION is an action set up in the living body, which is characterised by redness and swelling of the portion affected, and also by an increase of temperature and pain. When these phenomena occur on a visible part, they are recognisable by all, but when they occur internally, their presence must be judged of by concomitant symptoms. Few diseases are unaccompanied by inflammation in a greater or less degree in some part of their course, and many seem to owe their characters and influence chiefly to its presence. Nevertheless, inflammation is not solely a process of disease tending to disease, it must accompany the reparative action of the wound or fracture; in other words, the means of reparation are the consequences of inflammation and one of its "terminations." When inflammation of a part occurs, the chief effect is, determination of blood to it, the stream being quickened in some parts, and in others impeded, whence arise the characteristic redness and swelling, heat and pain, the latter, especially, being the result of pressure on the nerves by the distended tissues. After the process has continued for some time, it may subside, the parts resuming the same appearance and action which they possessed before it arose. This *termination* of inflammation is named "resolution"; it is of course the most desirable of all, and to bring it about, the efforts of the medical man are directed. In the event of inflammation not terminating by "resolution," it may give rise to effusion of serum, that is, of the watery portion of the blood; this effect is familiar in the case of scald or blister; internally, it happens in pleurisy, in water on the brain, &c.

This effect of inflammation is, undoubtedly, in many instances, productive of serious consequences (see *Pleurisy*). A third most important termination of inflammation is the effusion of what is called "lymph," that is, of an adhesive—at first liquid, after-

wards solid—matter, which becomes a permanent medium of connection between two parts (see *Adhesion*). As, however, this exudation of adhesive matter takes place as a necessary consequence of inflammation, in many cases irrespective of circumstances, it must happen that it is sometimes as much a source of injury, as it is at others of benefit; thus, in the case of inflammation within the abdomen, it may glue the bowels together; in the chest, it may fix the lungs to the side, or the heart to its containing bag. Nevertheless, even internally, it is often beneficial; it may seal parts together in such a way as to prevent the escape of matters, as for instance, from the bowels into the abdomen, which must otherwise have proved fatal.

But inflammation may terminate in none of the ways above-mentioned; it may go on to the formation of pus or matter, as in the case of abscess (see *Abscess*). Or ulceration may take place (see *Ulcer*), or, lastly, the vitality of the inflamed part being completely destroyed, mortification occurs, and the tissues slough or break down into one putrefying mass. These various effects of inflammation, are in some degree dependent upon the violence of the action in the first instance, but they are modified by the nature of the affected tissue. What has now been said, however, will demonstrate how closely this important process is connected with the whole science and practice of medicine, and how greatly all treatment must have reference to it, and, especially, to induce its termination in "resolution," which leaves the affected part uninjured in structure and function.

The means used to procure resolution of inflammation are bleeding, either general from the arm, or local by means of leeches, cupping, and counter-irritation, which relieve the overloaded and obstructed vessels; further, fomentations and poultices, that is, heat and moisture, which relax, and also relieve the inflammatory condition by their derivative action; also medicines, such as diuretics, diaphoretics, purgatives, &c. In some cases, when inflammation is seated on the surface, it is treated successfully by the direct application of astringents to the parts. Thus, inflammation of the covering membrane of the eye is cured by an astringent wash, along with the more directly medical treatment; the diet in most cases of active inflammation requires great reduction.

In addition to the local symptoms of inflammation, there are those of the constitution, which always accompany the process, except in its most trivial forms. These are fever, inflammatory, hectic, or typhoid, according to the nature and extent of the local affection, the part involved, or the constitution of the patient. The first occurs, generally, in the active stage of inflammation; the second, should matter be formed; the third, if mortification or sloughing take place. When inflammation in some of its forms is going on within the body, the blood acquires the peculiar property of becoming buffed, after it has been drawn from a vein, that is, instead of the clot formed by coagulation presenting a red surface, it is covered on the top by a tough yellow coat of greater or less thickness.

Although redness, swelling, heat and pain, when combined, certainly indicate inflammation, they do not do so separately; the redness of blushing is no inflammation, and pain may result from spasm; swelling may be caused by simple effusion; heat by exercise. The above characteristic symptoms, moreover, are greatly modified by the site and nature of the inflamed part; the severity of the pain, especially, being by no means commensurate with the importance of the affected organ. Some parts, such as bone, which in their healthy state possess but slight sensation, become when inflamed most acutely sensitive. Further, in some respects, pain in inflammation is a deceitful guide; sometimes it is altogether absent when its presence might have been fully anticipated; and again, if felt, it is not perhaps at the affected part, but at some distance from it. As a general rule, inflammatory pain is increased by pressure, and is in this way distinguished from the pain of spasm. In some forms of inflammation, such as those of gout, rheumatism, &c., what is called "*Metastasis*" occurs, that is, the action seems to be transferred from one portion of the body to another (see *Rheumatism*). This tendency of inflammation may of course be exerted either for good or evil. Its good the physician tries to imitate, when, by blisters and other means (see *Counter-Irritation—Derivative*), he endeavours to produce inflammation artificially upon the skin, with the view of drawing it off from some more directly vital, and less accessible, organ. The causes of inflammation are very numerous; whatever irritates locally, as familiarly instanced by dust in the eye, will cause it; but it may also originate from causes affecting the constitution, such as cold, or it may arise in the course of constitutional diseases, such as fever.

Such are the principal general points connected with the subject of inflammation, with which it is expedient unprofessional readers should be acquainted; a clear understanding of them will tend greatly to assist the formation of rational and common-sense ideas respecting the nature and progress of disease, and will throw light upon some, at least, of the questions bearing on its rational treatment.

The inflammations which affect the body may be classed as *external* and *internal*.

The *external* inflammatory affections, properly so called, are the various skin diseases, particularly erysipelas, which is, essentially inflammation of the skin; inflammation of the eye, ear, inside of the mouth, &c. The *internal* inflammatory affections are those of the brain,

of the chest and lungs, including laryngitis and croup, which affect the windpipe; and bronchitis, which is situated in the air tubes; also pneumonia and pleurisy, carditis and pericarditis, or inflammation of the heart and its investing membrane.

Of the abdomen, the most important inflammatory diseases are those of the stomach and bowels generally, and of the other viscera, such as the liver and kidneys, and womb. In addition to the above, there are inflammations of the blood-vessels, especially of the veins, inflammation affecting the bones, joints, &c. All these are entered into sufficiently under their separate articles, with exception of inflammation of the lungs—pneumonia and pleurisy—and inflammation of the bowels or alimentary canal, to which reference will now be made.

Inflammation of the Lungs.—The important organs of the lungs and bronchi (see *Lungs*) are liable to three distinct forms of inflammation—bronchitis, or inflammation of the bronchi, or air tubes; pneumonia, or inflammation of the tissue or substance of the lungs; and pleurisy, or inflammation of the pleural, or covering membrane of the lungs (see *Chest*). The subject of bronchitis has been fully entered into in its proper place. Although three distinct inflammations of the lungs are mentioned, it is not to be supposed that they are always distinctly separated practically; frequently they are, but they often coexist. Bronchitis merges into pneumonia, and often accompanies the latter disease, while, on the other hand, pneumonia is often connected with pleurisy.

As might be expected, the inflammatory affections of the lungs have certain symptoms in common. They are all characterised by general symptoms of fever, heat, thirst, and quick pulse, by more or less embarrassment of breathing, and by tendency to cough. In pneumonia and pleurisy there is generally pain in the side, or under the breast more or less severe, but sometimes this symptom is entirely absent. The distinctive characters of bronchitis have been pointed out in the article on the subject. Those of pneumonia are marked by a greater amount of fever, and especially a higher temperature than in the other forms; generally the pain is less acute, but there is more cough than in pleurisy. It is, however, in the expectoration of pneumonia that one marked distinction is found. Shortly after the attack commences, the mucus coughed up, becomes of a remarkably glairy adhesive character, so tenacious as to adhere firmly to the bottom of the spitoon, at first uncoloured, but soon acquiring a yellow tinge, and at length is streaked throughout with blood, which gives it a peculiar rusty or plum juice hue. When, then, in an inflammatory chest affection, the expectoration is characterised as above, and goes through these changes, it may be considered that pneumonia is present. In pleurisy, the pain in the side is frequently severe, of a peculiar, sharp, cutting character (compared often to a stitch), which is aggravated at every respiration, and prevents the proper expansion of the chest; it is, too, aggravated by all attempts to lie on the affected side, and by the cough, which is short and dry.

An attack of pneumonia, or of inflammation of the substance of the lungs, tends to terminate either in the return of the lung to its ordinary healthy condition, in its becoming solidified, or or as medical men call it "hepatised," that is, converted into a mass as solid as a piece of liver, or in the formation of abscess in the lung. In either of the latter cases, the result is, of course, impairment of the functions of a vital organ, which is felt by the whole constitution, and which occasions more or less distress, locally, according to the amount of lung damaged. The condition, moreover, often lays the foundation of future disease. More rarely pneumonia terminates in mortification. An attack of pleurisy tends to terminate in return to health; in the effusion of water or of matter into the cavity of the chest, and in the formation of adhesions between the smooth surfaces of the lungs and those of the chest with which they lie in contact. If the water or matter formed in the chest is of large amount, as it must find room somewhere, it compresses the spongy substance of the lung to so great a degree that no air can possibly enter it, and thus, as may be imagined, causes great distress in breathing. When this occurs, the sharp cutting pain, which was partly the result of the inflamed surfaces rubbing against each other, subsides, for the surfaces are now separated, and the patient, instead of lying on the back, or on the other side, now inclines to the one affected, as, by doing so, he throws the weight of the fluid off the sound lung.

The inflammatory affections of the lungs occur, of course, in every degree of severity, and frequently prove fatal. They are generally the result of cold, but also at times arise from violence or other causes. They are, moreover, diseases which often occur suddenly, and with much severity, in situations at a distance from medical aid. When such is the case, much assistance may be given by the well-directed efforts of the unprofessional. Confinement to bed, low diet, a plentiful supply of diluent drinks to quench the urgent thirst, and hot poultices of bran or other material to the affected side, are the first necessary measures. If the bowels are confined, they should be acted upon moderately, but no good can be derived by strong purging in the diseases in question, and by it the strength of the patient will only be unnecessarily depressed. The propriety of bleeding from the arm in inflammations of the lungs is becoming much questioned, and, except by medical sanction, the operation will be better let alone in unprofessional hands, even if it can be performed. The medicines chiefly to be relied upon are tartar emetic, and

calomel, and opium. In pneumonia, the former should be given in from a fourth to an eighth of a grain doses, every three or four hours; and of the latter, a pill containing a grain and half of calomel and a quarter of a grain of opium should be given every six hours, and continued till either the disease is removed, or till the gums become sore. The antimony may be gone on with till the disease is subdued, unless it acts violently upon the bowels, or unless there is much depression. Should the latter occur, the treatment with ammonia as recommended in article *Bronchitis*, ought to be adopted, and the strength supported by nourishing broths, beef tea, &c. In some cases of inflammation of the lungs, when the pain is severe and the symptoms urgent, leeches, from six to twelve, according to the strength of the patient, may be applied, or cupping practised; but in most cases the hot bran poultice, assiduously used, will obviate the necessity. The mistake of applying moderate sized blisters in the early stages of inflammation is frequently committed, it should never be done; in the latter stages of the attack, however, they are useful. In pleurisy, the chief modification of the above treatment ought to be, the substitution, for the tartar emetic, of moderate doses of some saline, such as nitrate of potash, in ten-grain doses, every four or five hours, and the calomel and opium may be given at rather shorter intervals. It is seldom that an attack of inflammation of the lungs will run its entire course without being visited by a medical man; but should it of *necessity* do so, under unprofessional care, the best procedure will be, when the disease subsides, to do as little as possible in the way of medicine, beyond attending to the action of the bowels, and, if requisite, of the kidneys by some safe diuretic; if cough is troublesome, it may be allayed by a few drops of laudanum, or by paregoric, in some demulcent, such as barley-water. The patient should be nursed gently and cautiously into health.—See *Bronchitis*.

Inflammation of the Bowels or Alimentary Canal.—Inflammation of the bowels, or alimentary canal, may affect any portion of it—the stomach, the large and small bowels, or it may attack its covering membrane, the "peritoneum," or its lining mucous membrane. Inflammation of the peritoneal covering of the bowels (*Peritonitis*—see *Alimentary Canal*) is one of the most formidable and often one of the most painful of the acute diseases; it may be confined to a small portion of the abdomen (see *Abdomen*), or be spread over, not only the peritoneum, which covers the alimentary canal, but that which covers the other contents of the cavity, such as the liver, hence medical men distinguish general and partial peritonitis, the latter being named according to the part affected.

The accession of peritonitis, or inflammation of the covering membrane of the bowels, like that of other inflammatory diseases, is attended with the usual symptoms of fever, languor, depression, shivering, and is followed by heat, thirst, and quick pulse. Either simultaneous with these symptoms, or shortly after, there is usually intense cutting or burning pain in the abdomen, general, or confined to one spot, according to circumstances. *This pain is much increased by pressure*, so much so, indeed, that even the weight of the bed-clothes cannot be borne, and the patient lies on the back with the knees drawn up—an attitude very characteristic of this disease—in order to keep off the weight of the clothes. At this time, the pulse, which is very quick, is usually of a peculiarly hard and wiry character. The symptoms of peritoneal inflammation of the bowels are usually so well marked as to be distinguishable even by an unprofessional person; when they do occur, especially under circumstances to be hereafter pointed out, as likely to occasion them, it need scarcely be said here, that a medical man should be called with the shortest possible delay. The disease is most serious and dangerous, often very rapid in its course, and cannot too soon be submitted to the active treatment which skill and experience alone can venture upon. In the meanwhile, the provisional remedies to be adopted must be, in some degree, regulated by circumstances. If many hours *must* elapse before medical assistance can be obtained, and if the affected person is of strong full habit, leeches may be freely applied over the seat of the pain; a warm bath for half an hour will be useful, and hot fomentations assiduously used for a long time will give much relief, being preferable to the hot poultice, the weight of which, probably, could not be borne, unless made very light. The bowels should be prevented from acting for some days, and then gently relaxed by means of castor oil. If the stomach is unable to retain food, injections of beef tea or nourishing soups, plain or peptonised, repeated from time to time, not only keep the bowels clear, but act as an internal fomentation; they should not amount to more than half a pint at a time, and if the pain is severe, twenty to thirty drops of laudanum may be added. The best medicine is opium, to relieve pain and subdue inflammation. It should be given in doses of one grain every three or four hours until the doctor arrives. The diet must of course be reduced, and nothing but diluents, such as thin gruel, barley and toast water, allowed. In following out the above directions, an unprofessional person, at a distance from medical aid, would be doing the utmost possible to keep the disease in check; the means may, of course, require varying in some degree, but in this, as, indeed, in all such matters, something must be left to the judgment of an intelligent person.

Whenever, with the symptoms enumerated as characteristic of peritoneal inflammation,

there is tenderness on pressure, inflammation may be strongly suspected, sufficiently so, at least, should more active measures not be adopted, to forbid all administration of stimulants, such as is had recourse to in colic and spasmodic pain. Indeed, should the attack turn out to be the latter, all the remedies recommended for peritonitis, except the blood-letting, would be serviceable, especially the warm bath and fomentation. The causes of inflammation of the bowels, apart from surgical operations within the abdomen, are chiefly cold, the abuse of stimuli, or of strong purgative medicines, mechanical violence, constipation, a loaded state of the alimentary canal, and child-birth. The most severe and rapidly fatal case of inflammation of the peritoneal covering of the bowels the author ever witnessed, was traceable solely to the individual rising from a warm bed and standing for some time on a stone floor barefoot. For information respecting inflammation after child-birth, the reader is referred to the article on that subject. It is, however, right in this place to warn that, under this circumstance, a spurious or imitative inflammation is apt to occur, in which bleeding will do the greatest possible mischief; in such cases, therefore, its employment will be most prudently left to the judgment of the medical man. Inflammation of the lining or mucous membrane of the bowels, is generally associated with diarrhœa or dysenteric affection, and to these articles the reader is referred.

Refer to—*Abdomen—Alimentary Canal—Liver.*

INFLUENZA.—This disease was cited under the article *Epidemic*, as the best specimen of an epidemic disease. It is a peculiar feverish attack, accompanied with catarrhal affection of the air-tubes of the lungs, and great prostration of strength. It is not uncommon to call various forms of cold and catarrh, influenza; but the true influenza is a very distinct disease, and seldom occurs but as an epidemic, attacking large numbers at once.

The symptoms of influenza are those of general fever; coming on suddenly, there is shivering, loss of appetite, perhaps vomiting, heat and thirst, with cough, frontal headache, and generally great depression and languor. The feverish symptoms may last from one day to ten, but their general duration is from three to five, or seven days, the cough usually remaining a variable time, after the acute symptoms are gone, according to exposure and circumstances, such as a predisposition to cough, &c.

To the strong and healthy, influenza is but a trifling disease; it certainly prostrates them for a few days, and this is perhaps its most distinctive feature, and leaves them afterwards weak, but it is in almost all cases perfectly devoid of danger—*with ordinary care*—and requires little or no medicine. A few days in bed, according to the severity of the case, with low diet, a gentle aperient, and diluents, putting the feet in hot water, being all that is required. If the catarrhal symptoms are severe, treatment similar to what is recommended for catarrh or cold may be had recourse to.

To the weakly and the aged, influenza is, on the other hand, a comparatively fatal disease, and from the almost universal nature of its attack, carries off more, perhaps, of these classes, than many more apparently severe and more dreaded disorders. The attack of influenza in the description of persons above mentioned, should be the signal for medical attendance, as bronchitis or pneumonia is very apt to supervene. Lowering means especially must not be resorted to; confinement to bed, and the use of diaphoretic remedies, as recommended under articles *Cold* and *Catarrh*, will be required; broth, strong or weak, must be allowed, according to circumstances, and if the strength is deficient, wine may be requisite, and stimulant expectorant medicines, especially in the aged, if the expectoration is abundant, viscid, and difficult to be got up. In such cases the following will be found useful: Take of carbonate of ammonia, thirty to forty grains; tincture of squill one drachm; wine of ipecacuanha forty drops; water or camphor water, sufficient to make an eight-ounce mixture, of which two table-spoonfuls, or one-eighth part, may be given every few hours. If the cough is very irritating and troublesome, two drachms of paregoric may be added to the above, but the opium rather tends to check the free expectoration, which is so desirable. Demulcent drinks, such as barley-water, should not be neglected, and a mustard plaster, or blister, to the chest will do good. In severe forms of the disease, with difficult breathing, if the strength is much reduced and the appetite bad, two doses of decoction of bark may be given during the day.

Persons who generally suffer from delicacy of chest, should beware of allowing the effects of influenza to hang about them; the debility and cough are very apt, if predisposition exists, to lay the foundation of consumption. The strong and healthy may trust to the domestic management of influenza, the weak and aged ought to have proper medical advice, if it is within reach.

The history of the various epidemics of influenza which have visited Europe, and, indeed, the world, at intervals, is a subject of much interest. It has been remarked, that the invasion of the epidemic has been preceded by dense, dark, and in some places it is said offensive fogs.

During the last epidemic of influenza, it was remarked that the barometer was much and usually affected, and that the disease was much more fatal in notoriously unhealthy districts than in others.

Refer to—*Cold—Catarrh—Diaphoretics, &c.*

INFUSION is the submission of sub-

stances to the action of water, hot or cold, for the purpose of extracting from them certain portions soluble in the fluid. The most familiar instance of an infusion is common tea. For the purpose of infusion, a jug, of the form of fig. 133, is the most useful, with both cover and spout with strainer, but, of course, a common jug, with a saucer or plate placed on the top of it, or an earthenware teapot, will and generally does make a good substitute. The object of an infusion is to extract volatile and other substances, which would either be dissipated or injured by exposure to higher heat, such as decoction or boiling; indeed, some infusions, such as that from senna, &c., as noticed in their articles, are better made without heat at all.

The commonest method of forming a hot infusion is, to pour the water boiling upon the substance, cover, and allow the whole to stand near the fire for some time before it is permitted to become cold. If the substance to be infused is thick or tenacious, it ought, of course, either



Fig. 133.

to be cut up, or well bruised before being submitted to the action of water. The chief inconvenience connected with infusions, is their great tendency to spoil; some, such as calumba and dandelion, becoming unfit for use in twenty-four hours in summer. It is said that if the infusion be poured boiling hot into a bottle, filled up to the top, and the bottle immediately well corked, it will keep good a long time. Concentrated infusions are now made by chemists, but many of them contain so much spirit, that they are almost tinctures, and in some cases, therefore, are inadmissible; otherwise they are good preparations. The most useful infusions are:

- Infusion of Bark.
- " Broom.
- " Calumba.
- " Chamomile.
- " Dandelion.
- " Hop.
- " Gentian.
- " Linseed.
- " Quassia.
- " Rhubarb.
- " Rose-leaf.
- " Senna.

INHALATION is the act of inhaling or inspiring vapour into the throat or lungs as a means of medical treatment. The inhalation of ether, chloroform, and nitrous oxide gas for the prevention of pain in surgical operations, is the best-known application of the principle of inspiration, while the inhalation of the vapour of hot water and of medicated sprays, is intended mainly for complaints of the surface of the throat and windpipe.

The steam from water may often be used as a safe domestic inhalation, in cases which require the local application of heat and moisture; indeed, in sore throat, steaming is very commonly had recourse to. It may also be employed with advantage in cases where the breathing is difficult, with tenacious expectoration, especially in old people. In chest affections, such as consumption, with spasmodic cough, the vapour of boiling water, into which has been put a few drops of sulphuric or chloric ether, or ten or a dozen drops of laudanum, will frequently afford much temporary relief. Medicated inhalations, such as those from chlorine, if used at all, must be so under direct medical superintendence. It is probable that the slow, imperceptible, but continual breathing of an atmosphere, impregnated with such medicinal agents as chlorine, iodine, &c., is more likely to be of service than their temporary use in more powerful doses. It has been observed in manufactories in which a chlorine atmosphere prevails, in consequence of the operations, such as bleaching, carried on within them, that men who have entered the works with weak chests or consumptive tendencies, have, in the course of time, become much improved in health. It is, too, not improbable, that part of the benefit, at least, derived from sea-side residence, may be due to the constant imperceptible inhalation of chlorine salts, and other vaporised substances. If, however, the constant inhalation of some agents be beneficial, it is still more certain that the presence of others in the atmosphere breathed is most inimical to health. This subject, however, is sufficiently entered into in other articles, such as *Air—Atmosphere—Ventilation*, &c.

Various methods of inhaling steam are employed: simply holding the mouth over a jug of hot water will answer, but if the throat be the part affected, the vapour is most directly conducted to it by means of a tube of some kind, and by such apparatus as are described in the next article.

INHALERS.—The method of administering remedies of different kinds by means of inhalation, for the cure and, in many cases, for the relief of disease, is now so general that it seems well to give some idea of the way in which this is effected by the instruments used, called inhalers.

These latter are now so numerous that it would be quite endless to describe them all.

The following is a sectional illustration of Dr. Nelson's improved earthenware inhaler, an apparatus for the inhalation of the vapour of hot water, either alone, or impregnated

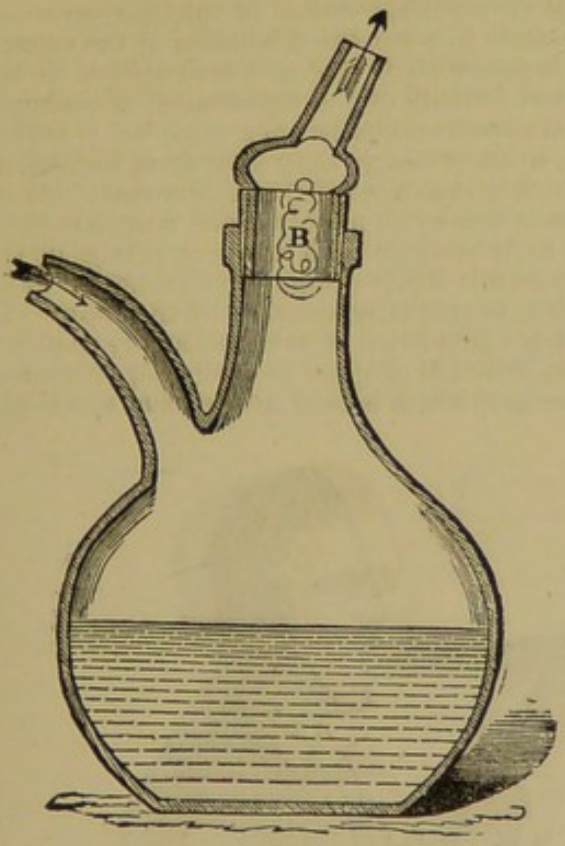


Fig. 134.

with ether, choloroform, henbane, or other medicinal preparations, in affections of the throat and bronchial tubes, asthma, consumptions, &c. (fig. 134).

Directions for use:—Remove the corked stopper, and fill the vessel half full of hot water, then pour the remedy to be employed upon the sponge, contained in the hollow tube at B; and, having replaced the latter, inhale the vapour through the mouth-piece, the exhaled breath passing freely through the tube. For the inhalation of the vapour of hot water only, or hot water medicated, the sponge in the tube need not be displaced.

To obtain the same object, a cheap apparatus called the "poor man's inhaler" has been brought out by Mr. Martindale, and is a good deal used. In this case the inhaler is composed of tin, and is in two parts, the upper chamber being furnished with an earthenware mouth-piece. In the illustration (fig. 135), the inhaler is denuded of a woollen covering which invests it when in use, and which is intended for the double purpose of retaining the heat and preventing the metal from burning the fingers. When required for use, the lower chamber (*f*), which can be readily disconnected from the upper (*d*), is filled with water at a temperature of 140° or 150° Fahr. until the holes *c,c*, establishing communication between the interior and outside channel are about a quarter of an inch below the surface of the liquid. The apparatus is supplied with a thermometer (*a*), to regulate the temperature of the water, which passes through an aperture (*g*) specially made for it.

Instruments may also now be obtained for subdividing fluids into the finest vapour, or spray, either in a hot or cold state, by which means they may be easily brought in contact with the mucous membrane of the throat, nostrils, windpipe, &c., and in this way many valuable and important remedies can be used that were formerly inapplicable to such cases.

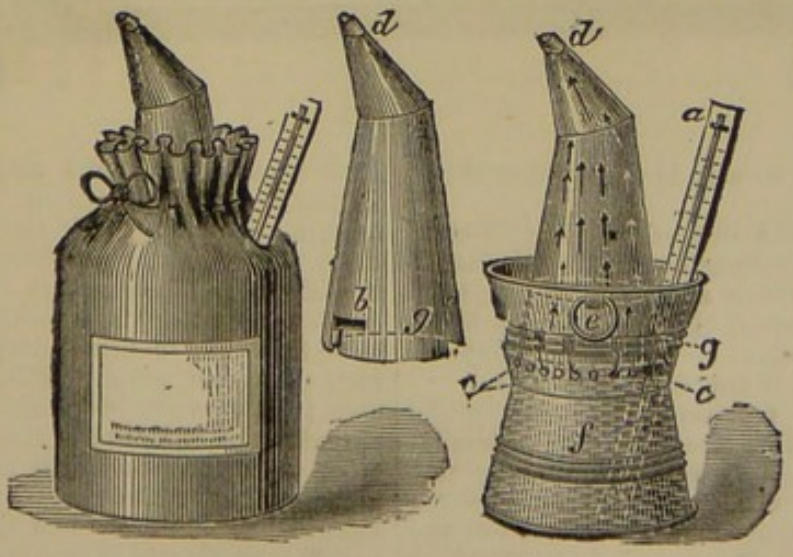


Fig. 135.

Dr. Richardson's ether spray-producer for producing local anæsthesia, figured under article *Cold*, is equally well adapted for inhalation. It will be evident to any one that liquid substances can in this way be brought in contact with parts of the throat and air passages, and

of the gullet and posterior openings of the nostrils. Gargling is a very imperfect and unsatisfactory method of applying such remedies, as it is only possible to reach a very small portion of the throat in that way, but when the above-mentioned instrument is used, the vapour penetrates to all parts in the neighbourhood of the throat, and is equally diffused over them.

The following inhalation will be found useful in cases of foul breath from ulceration at the back of the palate, nostrils, gullet, &c.: Take of carbolic acid one drachm, boiling water, a pint, mix, and inhale the vapour.

Turpentine is sometimes useful, when inhaled, in checking excessive expectoration, especially when there is old standing bronchitis with dilatation of the bronchial tubes. The following formula is recommended: Take of oil of turpentine two ounces, lukewarm water half a pint, mix, and inhale the vapour.

The annexed engraving (fig. 136) represents the action of Siegle's inhaler, frequently referred to in other parts of the present work, as affording an excellent means of inhaling atomised vapours in a condition combining the efficacy of a gargle with that of a fomentation to the internal parts of the throat and air passages. The apparatus consists of a small boiler heated by a spirit lamp; the steam from the boiler, which has also a safety valve attached to it, passes through a minute orifice of a glass tube, at a right angle with a separate tube in the centre of a bottle containing a medicated fluid, which is gradually absorbed by the steam. In using the inhaler, it is customary to employ a funnel either of glass or cardboard to protect the face, which is held in the hand at a slight

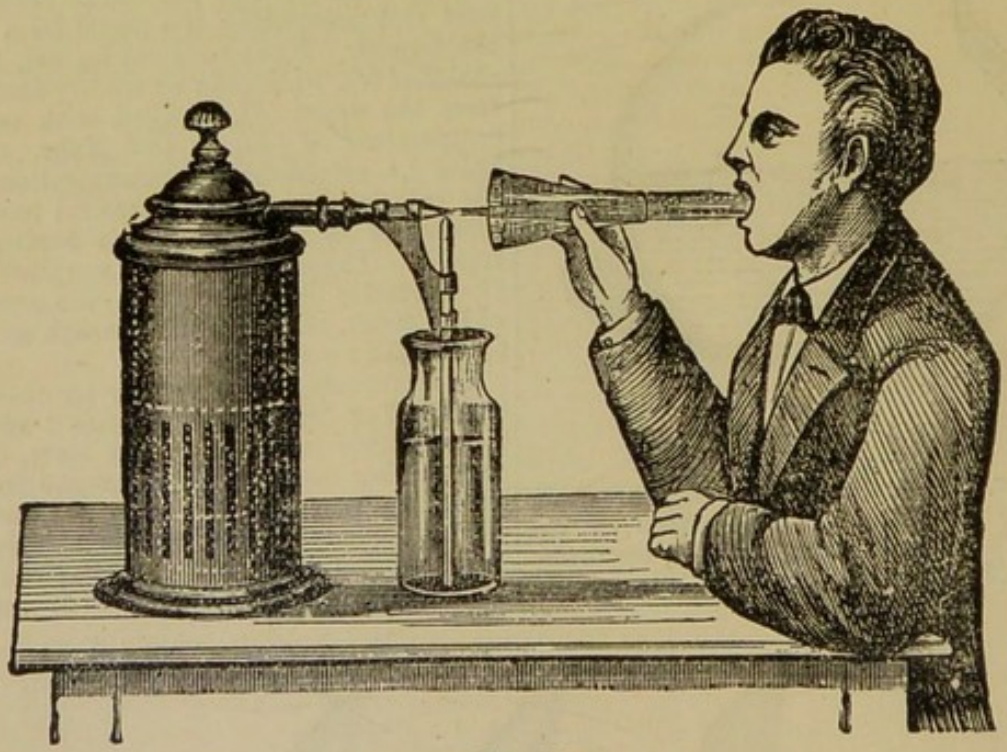


Fig. 136.

distance from the mouth, in the manner shown in the engraving.

On account of the delicate and fragile character of the glass connexions in Siegle's instrument, it is very liable to injury, or to get out of order, and to avoid this inconvenience, the steam draft inhaler of Dr. Lee, composed entirely of metal, is now coming into use.

The following represent the more useful drugs employed with steam inhalers generally. Alum, tannin, and hazeline, in varying proportions from one to twenty grains to the ounce of water, in ulceration of the fauces and upper part of the throat, and in hæmorrhage from the lungs and air passages. Carbolic acid, chlorinated soda or eucalyptus oil, in the proportion of a drachm to the ounce, in cases of offensive expectoration or sloughing of the back parts of the mouth and throat. Opium in the form of tincture or liquid extract, or acetate of morphia, spirits of camphor, tinctures of henbane, hyoscyamus, or belladonna, are all employed in greater or less proportions to allay irritation; and iodine, in the proportions from five to fifteen drops of the tincture to the ounce of water, has been found serviceable in numerous instances in phthisis and chronic bronchitis, but in this, as well as in the other agents mentioned, it is advisable to act under professional advice.

There is, however, one disadvantage connected with the use of many inhalers, and that is, the necessity for steam or spray being inhaled at a comparatively high temperature. This, useful in some cases, is sometimes detrimental in others; and again, cold spray is in

some cases injurious. As a medium, the newly invented inhaler-respirator of Dr. Coghill, of Ventnor, presents many advantages. By its means a great variety of medicated inhalations may be inhaled without fuss or fatigue, and the inhalation continued without difficulty for hours together—an immense gain when it is an object to act with gentle but certain effect upon the air passages, including, if need be, the nostrils.

Refer to—*Respirator.*

INJECTION.—See ENEMA.

INOCULATION is the introduction of a poison into the system by means of a wound. Any poison which will thus affect the part in which it is placed, or the system generally, may be said to be introduced by inoculation. The term is most generally used with reference to the poison of small-pox, to the article on which the reader is referred.

Refer to—*Poisons.*

INQUEST.—The inquiry into the cause of death from violence, or in an unusual, or in an unexpected manner, is of Saxon origin, and ought to be one of those safeguards to human life in this country, which every one should uphold and promote, instead of, as is too often done, throwing impediments in the way of the operation of the law. For this purpose, in cases of unexpected death (see *Death—Drowning*), those who chance first to be at the scene should note carefully whatever may be of service in the inquiry of the coroner and jury. It is a very common opinion that inquests are only called for when there is a *strong* suspicion of crime; if they are to be confined to such cases, they might almost be superseded entirely; their great use is to investigate *unexpected* death, whether suspicion exists or not. In this way only can they be an effectual and dreaded check upon crime. Moreover, the full efficiency of the coroner's office is very greatly impaired, by the anomalous proceeding of generally placing what ought to be a medical inquiry in the hands of a legal functionary. The law of inquest is, or ought to be, in some degree at least, a fixed principle or rule of action; the medical questions which are involved in the majority of inquests are so varied, that they cannot possibly be fully judged of by a non-medical inquirer. Medical men alone are, or ought to be, competent to seize hold of and follow up many clues of inquiry that must and do fail to attract the notice of those whose knowledge—if possessed at all—is necessarily limited on subjects of medical science. While inquests are held, and very properly so, under circumstances of just suspicion, they are far more frequently held and sometimes at great length when the cause of death is as clear as noonday, causing thereby much distress and annoyance to surviving relatives. In cases of sudden death from natural and inevitable causes, a post-mortem examination of the deceased by a competent medical man ought to obviate the necessity of a coroner's inquest.

Refer to—*Death—Drowning—Hanging—Poisons.*

INSANITY, LUNACY, MENTAL ALIENATION, UNSOUNDNESS OF MIND, are all terms for a disorder, of which it has puzzled the most acute to give an accurate, and, at the same time, sufficiently comprehensive definition, although all are aware of the general sense of the terms used to indicate the malady. It is sufficient for our purpose here to mention, that the most general division of the subject is into mania, that is insanity, along with more or less violence in demeanour and action; monomania, in which either the understanding or the will is perverted on one particular point; and dementia, or incoherent thought, verging on imbecility; amentia, or idiocy, has been already adverted to.

The main character of insanity, in a legal point of view, is said to be the existence of delusion, that is, that a person should believe something to exist which does not exist, and that he should act upon this belief. Many persons may labour under harmless delusions, and still be fitted for their social duties; but should these delusions be such as to lead them to injure themselves or others in person or property, then the case is considered to require legal interference,—otherwise not.

The approaches of insanity are variously characterised; sometimes, *to all appearance*, it comes on without warning, a sudden outbreak of violent mania being the first intimation of the disease; even in these cases, however, investigation will generally discover, that there has been some amount of preceding disorder, some sleeplessness, some unusual irritability, or mental excitement, perhaps concealed or controlled by the individual. In other cases, the mental oddities, irritabilities, fluctuations of spirits, &c., have been evident, but too slight to excite apprehension. At the last, the acute attack may be induced by some severe or prolonged mental emotion, or by some physical depression. The onset of the attack itself is frequently preceded by or accompanied with feverish symptoms, which particularly affect the head. In this case, the insanity is, probably at its first onset, accompanied with acute affection of the brain or its membranes, and partakes of the character of delirium properly so called. Where the circumstances, such as hereditary predisposition, or previous warning symptoms, give rise to the suspicion of impending insanity, medical advice must at once be sought, preparatory to the one essential and most merciful step—removal of the patient to an asylum. In the meanwhile, the most perfect quiet, both of body and mind, and the treatment recommended under the head of *Delirium*, will be the most advisable mode of proceeding.

The definition of insanity, as has been

said, is very difficult, and frequently gives rise to much legal controversy. Broadly, it may be viewed as a mental condition which unfits a person for the ordinary business and duties of life. The malady may arise from a congenital deficiency of intellect, as in idiocy and imbecility, or in a perverted condition of the intellect expressed by certain delusions of the understanding; or the intellect may remain intact while the sentiments become depraved. To this latter condition, the term *moral* insanity is sometimes applied, and it comprises the well-known form of the disease called *melancholia*, as well as various aberrations of the moral faculties in which the passions and emotions manifest themselves, sometimes in an exalted, and at other times in an impulsive and incontrollable manner. As often as not, both conditions are combined, and it is barely possible in most cases to draw a rigid line between them; still, for the purpose of classification and analysis, the College of Physicians have recognised in their nomenclature the following classes of mental disorders; (1) mania; (2) melancholia; (3) dementia; (4) paralysis of the insane; (5) idiocy; (6) imbecility.

Mania may be either acute or chronic, and is characterised at first by emotional peculiarities, and afterwards by disordered intellect. The symptoms are ushered in by gloom and despondency, sleeplessness, impatience, and irritability, and often combined with these, the natural functions are disturbed; the skin is hot and dry, the bowels are confined, and there is much aversion to food. The patient, hitherto reasonable and methodical, becomes moody and morose; kindhearted and affectionate, he takes a deep-rooted antipathy to those he was wont to love, or some special form of the malady is manifested by an inordinate craving or exalted propensity. A desire on the part of the patient to take away his own life or the life of another, to which the terms "suicidal" and "homicidal" mania are applied, is not uncommon. Then there is "kleptomania," a desire to appropriate anything belonging to another, "pyromania," a disposition to commit the crime of arson, and "dipsomania," an unconquerable longing for intoxicating liquors. Puerperal mania is that form of insanity which sometimes takes place a few days after child-birth, and is attended at the outset with much fever and delirium. Epileptic mania results from continuous attacks of epilepsy, by which, at length, the mind becomes hopelessly impaired and the memory of past events is lost. The term "climacteric" is affixed to a form of mania which occasionally occurs with women when the menses cease to flow. When the acute stages of these various phases of mental disorders pass away, the victim is very liable to repeated relapses, and chronic mania, which by slow degrees enfeebles all the faculties of the mind, is the sequel.

The term *melancholia* is largely applied to certain cases of mental aberration in which grief and despondency predominate, where life becomes a burden to its possessor, who is too often prompted by a desire to get rid of it. Like mania, it has many phases, sometimes assuming a religious garb, in which most grotesque notions regarding religious doctrines are predominant, or the dread of everlasting punishment is ever before the patient. Sometimes it takes the character of an aggravated form of hypochondriasis, a disease akin to hysteria in the female, and sometimes, especially with emigrants from rural and mountainous districts, it is expressed by a sad longing to return to the home of their birth.

Dementia signifies a more aggravated form of madness than mania or melancholia, although it is often the sequel of both. It is characterised by failure of thought and memory, and may range in its symptoms from a feeble mental condition, simply, to complete fatuity of intellect. In its advanced state persons suffering from the malady often become paralytic, their utterance is affected, and they become perfectly helpless both in body and mind.

What is termed "*general paralysis*" *of the insane* is perhaps the most serious malady of all. The commencement of the complaint is generally very gradual, and is marked by symptoms common to other forms of paralysis, but after a time these are combined with delusions of a very exalted character, in which a sense of the patient's own importance is a distinguishing feature. He asserts his dignity as a prophet or king, and lays down laws for the million in the most incoherent and ridiculous manner. As the disease advances, the paralysis becomes worse, frequently affecting the act of swallowing, while the mind lapses into a condition of complete dementia. The disease is attended with short convulsive attacks of a mixed epileptic and apoplectic character, after one of which death often ensues.

When a person is shown to be insane, there can be little doubt that a lunatic house or asylum is the place best suited for his reception, as the moral management of the insane cannot be satisfactorily carried out so long as they are surrounded by home influences. On the other hand, it is very important that the State should provide safeguards to protect sane persons from the risk of being isolated from interested motives on the part of others. The laws relating to the custody of lunatics are consequently very stringent, and apart from the formalities necessary to be taken before a person can be lodged in a lunatic asylum, the house itself, whether public or private, undergoes periodical inspection by the Commissioners in Lunacy. With regard to their admission, a wide distinction is made between pauper patients, and such as are able to pay for their maintenance in a private asylum. In the former case, all that is needed is to take the lunatic before a magistrate, who, aided by a

medical opinion, has the power to send the person to the county lunatic asylum. Should there be any doubt in the matter, the patient may be retained under observation in the workhouse, until the union medical officer is satisfied of his insanity, when the same formality may be gone through. In private cases, the lunacy commissioners require the certificate of two medical men who have visited the patient at separate times, the certificate being drawn up in a medico-legal form, with the view of indicating the prominent features of the case. Among other less important details, the certificate must refer to facts indicative of insanity, observed by the signer at the time of examination, who must make the examination apart from the other certifying medical man, and in addition, the certifier must refer to facts conveyed to him by others, and must also state whether the person is "a lunatic, idiot, or of unsound mind," and a proper person to be taken charge of, and detained under care and treatment. With the medical certificate, a request for the reception of the patient must be sent by the nearest friend or relative, together with a statement, on a separate form, containing answers to a variety of questions bearing on the antecedents of the lunatic, such as the duration of the present attack, the supposed cause, whether the patient is dangerous to others, and similar matters of detail.

Insanity is a disease, which, when once developed, ought never to be kept under domestic management, or rather mismanagement; the only reasonable hope of cure rests with speedy removal to proper care, and to a state of external circumstances especially adapted to promote recovery. Asylums for the insane are not what they were, and the most attached and affectionate relative need not fear to place the afflicted under the protection of a well-managed establishment.

A very erroneous idea exists, particularly among the ignorant, that if a person be insane, he cannot act or look like a rational being at all, but must be constantly doing things in an insane manner. Consequently, if the individual be simply lunatic or monomaniac, without being actually under the influence of maniacal excitement, or even should he have a "lucid interval," that is, a temporary cessation of mania, and temporary return, either wholly or partly, to his rational condition, those around are apt to be lulled into a false security, the vigilance or attendance is relaxed, and a momentary return of the delusion is attended, perhaps, with the most serious consequences, rendering nugatory hours and days of anxious care.

In addition to the various causes predisposing to, and directly exciting insanity, such as hereditary tendency, political or commercial excitement, grief and disappointment, false or erroneous religious excitement, &c., no fact is more clearly ascertained than the vast amount of insanity caused by drunkenness. The temporary insanity of intoxication cannot be indulged in with impunity; it may be frequently repeated, but at length the mind permanently gives way, and the individual becomes a confirmed lunatic. On this point, an experienced writer remarks: "Intemperance and insanity, the two greatest curses of civilisation, are in their very nature so intimately connected, that any examination of the one would be necessarily incomplete without the other; for both exhibit, as their essential phenomena, perversion or disorder of those mental powers which impart to man his vast superiority over the rest of the creation. Since, then, a single dose of intoxicating substance possesses the power of temporarily disordering the intellect, perverting the moral sentiments, and even wholly suppressing the operations of the mind, it is not wonderful that the continued use of such agents should frequently induce permanent mental derangement." In a table drawn up from the returns of twenty-five asylums in England and Wales, it was found that one-fourth of the cases of insanity admitted were due to intemperance alone, and to it, in conjunction with vice and sensuality, nearly one-third.

Refer to—*Delirium—Delirium Tremens—Dipsomania — Intoxication — Monomania — Stimulants, &c.*

INSPIRATION.—The act of drawing air into the lungs, and the opposite of expiration, which consists of its expulsion; the two together constituting respiration.

INSTRUMENTS.—But few of these mechanical agents used by the surgeon in the treatment of disease can ever be of legitimate use to unprofessional persons living within reach of a medical man; and those who are likely to be placed in circumstances where such assistance is not available, who may wish to be prepared for emergencies, should get themselves practically instructed in the use of the few they may venture to take in hand. The instruments required in such operations as bleeding, cupping, tooth-drawing, &c., are sufficiently described under the articles devoted to the subjects. In addition to them, the dweller (such as a clergyman) in a remote parish, even in this country, might find the following useful:—

A lancet. A silver probe.
A pair of scissors with blunt points.
A caustic holder.
A hypodermic syringe, an enema syringe, or rather two, one on Higginson's principle, and one, the simple elastic bag.
A gum scarificator (see *Childhood*).
A pair of plain forceps. } (See *Forceps*
A pair of spring forceps. } *and Dressing.*)
A vaccinating lancet (see *Vaccination*).

To these the emigrant might add with advantage:—

A tenaculum (see *Tenaculum*).
A tourniquet (see *Tourniquet*).
A shut-up bistoury, or knife.
Two pairs of tooth forceps.

It is perhaps superfluous to add, that these should be got at some respectable surgical cutler's; and it is well to add, that all who provide themselves with them, should endeavour, if possible, to get a little practical instruction in their employment.

INTEMPERANCE.—See STIMULANTS.

INTER-MARRIAGE.—See MARRIAGE.

INTERMENT.—See BURIAL—DEATH, &c.

INTERMITTENT,—a term applied to diseases which, like ague and neuralgia, come on in paroxysms, between which there is an interval of comparative freedom from the symptoms of the disease. The term is also applied to the pulse, when some of its beats are, as it were, omitted.

INTESTINES.—The intestines (see accompanying illustration, fig. 137) occupy the greater part of the abdominal cavity, and comprise that portion of the alimentary canal which, commencing at the pyloric or distal end of the stomach, terminates in the rectum, the last or terminal division of the large intestine. From their relative size, the intestines are divided into small and large; the former (though of less calibre than the latter) are more than three times the length, and are the main channels through which the chyle is conveyed into the circulation. For convenience of description, the small intestine is divided by anatomists into three parts, the *Duodenum*, the *Jejunum*, and the *Ileum*.

The duodenum is from eight to ten inches in length, and is continuous with the pyloric orifice of the stomach; it forms a horse-shoe curve between the liver and the pancreas, and about its middle receives the bile and pancreatic juice by a duct common to both organs. It is in this portion of the alimentary tube that the chyle begins to be formed and also absorbed by the lymphatic vessels of the intestines.

Continuous with the duodenum is the jejunum, so named from the fact of its being usually found empty after death; in other respects it presents characters very similar to those of the first part of the intestine.

The jejunum is continued in the ileum, which forms the third and last part of the small intestine; its calibre is somewhat narrower than the others, and its coils and convolutions are more numerous. The entire length of the small intestine is about twenty feet; its inner surface or mucous membrane is liberally supplied with glands, follicles, and villi, by which the nutritive matters of the food are readily absorbed into the circulation. The ileum terminates in the large intestine or colon in a species of valve or opening called ileo-colic, which opens into the side of the large intestine about three inches above its termination, which forms a pouch or *cul-de-sac* called the cæcum. Attached to the cæcum is a worm-like appendage or tube, about the thickness of a goose quill, and four to six inches in length, the object and uses of which in the animal economy have not been ascertained.

Commencing at the cæcum, the colon ascends upwards on the right side of the abdominal cavity, until it reaches the liver, when it crosses horizontally to the left side, thus forming the second or transverse division; it afterwards passes downwards on the left side, and at its lower part takes the form of the letter S, to which portion the name of "sigmoid flexure" has been applied. The descending colon terminates in a comparatively straight tube, the rectum, through which the undigested matters or fæces are discharged from the bowels. At its extremity, the rectum is furnished with a sphincter muscle or valve, to guard against the too ready passage of the intestinal contents.

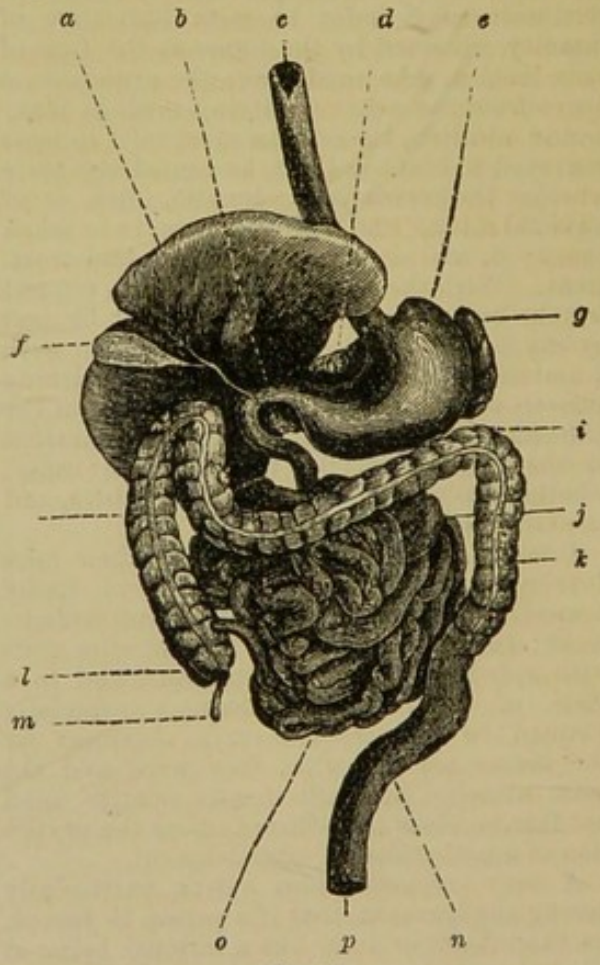


Fig. 137.

a. Liver.
b. Pylorus.
c. Œsophagus.
d. Pancreas.
e. Stomach.
f. Gall-bladder.
g. Spleen.
h. Large Intestine (Ascending Colon).
i. Transverse Colon.
j. Jejunum (Small Intestine).
k. Descending Colon.
l. Cæcum.
m. Vermiform appendix.
n. Sigmoid Flexure of Colon.
o. Ileum (Small Intestine).
p. Rectum.

The intestines, though capable of great mobility, as shown in their continuous peristaltic action, are retained in their position by their serous covering, the peritoneum, which lines the abdominal walls, and especially by that portion of it called the mesentery, which invests the small intestines, and, collecting them into folds, attaches them to the spinal column behind.

The intestines are subject to numerous diseases, the most familiar of which are the two opposite conditions of constipation and diarrhœa, they are also liable to serious obstruction from stricture, tumours, hernia or rupture, and from numerous other causes, likewise to hæmorrhage from ulceration of the internal lining, as in dysentery, enteric fevers, &c. The diseases of the intestines are referred to in separate articles.—See *Abdomen—Alimentary Canal—Constipation—Diarrhœa—Digestion—Villi, &c.*

INTOXICATION means literally what it really is, a condition of poisoning, either by alcohol or by other narcotic agents: the former however being the most frequent cause in this country. Intoxication from the use of opium, Indian hemp, &c., is adverted to in the articles upon these agents. The phenomena of alcoholic intoxication are thus described by an esteemed writer: "The effects which follow the introduction of a large quantity of moderately diluted alcohol into the stomach, are, first, the local excitement of this organ indicated by the sensation of heat in it: this impression is next conveyed to the brain, spinal marrow, and entire nervous system; ideas of unusual brilliancy pass through the mind. As the power of the stimulus increases, all control of the will is suspended; the ideas are then irregular, and instead of being combined in such a manner as to produce even agreeable conceptions, they arise in the most incongruous order; the extent of the excitement becomes apparent in the unusual vivacity of the eye, the swelling of the veins of the neck, and the beating of the arteries: but new symptoms quickly follow, namely, pain in the frontal region, the head drops on the chest, the eyes lose their expression and are half-closed, the physiognomy is altered and vacant, the voluntary muscles cease to act, the arms are pendent, or their movements are irregular, the legs cross one another in the effort to walk, giddiness supervenes, and delirium follows. The exhausting influence of such a state is too great to continue: in a short time collapse, and sleep, resembling that of apoplexy, follow." Probably the influence of alcohol upon the brain, in the first place at least, is partly effected through the nerves of the stomach; but it is very quickly absorbed into the blood, and speedily reaches and acts directly upon the brain itself: this has been proved by experiment and examination after alcohol has been swallowed, and there has been found in the brain after death a considerable quantity of fluid distinctly impregnated with spirit, to such an extent, even, as to burn.

The cases of sudden death—too frequently recorded in the newspapers—from the rapid drinking of a large quantity of spirit, may be quite accounted for by the shock communicated directly to the brain itself, or indirectly by a shock given to the stomach and its nervous connections, with an effect similar to that which ensues from drinking largely of very cold water when the body is over-heated and exhausted, or from a blow on the stomach. Death in the latter stages of intense intoxication is similar to that from some forms of apoplexy. Some indication of the amount of danger to life, existing in a person in a state of intense intoxication, may be gathered from the condition of the pupil (see *Eye*). If this retains its power of contraction, the person will generally recover; if, on the contrary, it remains in a state of extreme dilatation and immobility when a strong light is directed upon it, only a feeble hope of recovery can be entertained. The ordinary duration of fatal cases of intoxication is said to be from twelve to eighteen hours, but on this head there is considerable variation. When death is threatened from the absorption of alcoholic fluid into the system, the individual, after the usual symptoms of intoxication, becomes insensible; the face is flushed and the vessels of the head distended; the pupils are contracted and the skin hot; or, contrasting with violent throbbing action of the heart and arteries, the face is deadly pale, lips blue, pupils dilated, surface cold and covered with clammy sweat; the natural contraction of the muscles is suspended so that the jaw drops; in short, there is every appearance of death, which, indeed, may speedily take place: even from this apparently hopeless state, nevertheless, a patient may be roused by appropriate measures.

The first proceeding which naturally presents itself in the treatment of such cases is to procure the evacuation of any alcoholic fluid which may remain on the stomach. If a medical man is at hand he will probably effect this by the stomach pump, if not, sickness may be excited by the first procurable emetic—except antimony—or by a feather in the throat. After the stomach has been emptied by vomiting, a little sal volatile in water, or hartshorn in water, or vinegar and water should be given; cold water should be used freely to the head: it is most effectual if poured upon it in a regular continued stream for some minutes. If the extremities are cold, heat should be applied to them. Galvanism and electricity frequently rouse the drunkard when other methods fail. The author has found a stimulant injection of an ounce of turpentine in half a pint of gruel, of much service in rousing the depressed system. Mustard plasters may be applied to the pit of the stomach, or between the shoulders. It ought to be remembered,

however, that sensibility may be restored, and the most serious symptoms apparently dispelled, and yet, if the stomach has not been entirely emptied, they may again return and prove fatal, unless the patient is closely watched.

Refer to—*Stimulants.*

INUNCTION.—The rubbing of an ointment upon the skin, for the purpose of promoting the absorption into the system of any medicinal substance contained in the ointment. Ointments which contain mercury or iodine are principally used with this intent.

INVERSION.—The turning inside out of an organ, such as the womb. It is a serious accident, which sometimes occurs under peculiar circumstances, as after labour. The assistance of a medical man is always imperatively called for.

IODINE is a body at present considered as elementary; it is principally obtained from the burnt ash of sea-weed, but is also found in some mineral waters, and in some plants, such as common water-cress. Iodine exists in the form of dark metallic-looking scales; it possesses a strong pungent odour, and stains whatever it may come in contact with of a deep yellow or brown colour. When heated in a flask, iodine rises in the form of a beautiful violet-coloured vapour, and condenses unchanged on the side of the glass. Iodine and its preparations are much used by medical men, but can scarcely fall within the sphere of domestic remedies; the ointment of the combination of iodine with potash is used in bronchocele, or swollen neck (see *Bronchocele*). When combined with iron, potassium, mercury, lead, and sulphur, in what are termed the iodides of these substances, iodine is a remedy of much value in many diseases, especially gout, rheumatism, and scrofula; it is, however, a medicine that should never be taken without medical sanction.

IPECACUANHA—at once one of the most valuable medicines of the practitioner, and one of the safest remedies which can be used domestically—is the root of a pretty little South American plant. It is brought to this country in pieces about the thickness of a goose quill (fig. 138), and about six inches long, brown, wrinkled, and knotty; but its most characteristic feature, and that which serves to distinguish it from spurious roots often attempted to be substituted for it, is its ringed appearance; it seems as if made up of a number of separate pieces, or rings, strung, as it were, upon one central stem.

Ipecacuanha is best known as an emetic, and it is perhaps the most certain, safest, and best of the class we possess. No family medicine chest in the country should be without it. It is also a valuable expectorant and diaphoretic remedy, and facilitates greatly the action of aperients. The powder and the wine of ipecacuanha are the most general forms in which it is used; as an emetic, it should always be given in powder if possible; a great error is often committed in giving children the wine to act emetically, for frequently it fails in action altogether, or so much is required, as to make the amount of wine given a consideration; in cases of febrile disease especially. As an emetic, the dose of ipecacuanha powder is from twenty to thirty grains for an adult, half that to a child of ten years old. For young children, especially when, as in chest affections, the constitutional and expectorant influence of ipecacuanha is as much wanted as its emetic effect, the author prefers giving it in smaller divided doses; for this purpose, from twelve grains to a scruple of ipecacuanha powder may be rubbed up with an ounce and a half of sugar and water, and of this a tea-spoonful is to be given at intervals, according to the effect desired or produced. Quarter-grain doses of ipecacuanha, combined with any of the common aperient pills, seem to facilitate their action, and to

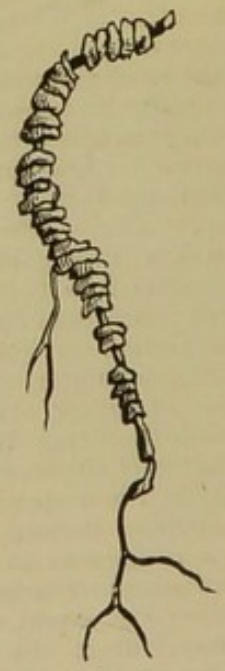


Fig. 138.

leave the bowels with a better tendency to relaxation than before.

When ipecacuanha fails in exerting its emetic influence; and indeed, sometimes when it does cause vomiting, it acts upon the bowels, producing diarrhœa. Its emetic action is slower than that of sulphate of zinc, and the latter is therefore more generally used in cases of poisoning, provided it is at hand. Ipecacuanha enters into the composition of Dover's powder (see *Opium*). Lozenges each containing a grain of ipecacuanha, and others combining morphia along with it, are admitted to the British pharmacopœia. The latter are much used for coughs.

The action of ipecacuanha as an expectorant is improved by combination with an alkali such as soda. Four grains of powder of ipecacuanha and one drachm of carbonate of soda,

with half a pint of water, form an excellent expectorant mixture, to which may be added from half a drachm to a drachm of spirits of chloroform to improve the taste. From twenty to thirty minims of laudanum may be also added to subdue cough; or one or two drachms of tincture of squills, to aid expectoration. Dose two table-spoonfuls.

Ipecacuanha may be kept in the form of powder; but, perhaps, for those who may not be able to renew their stock frequently, it will be preferable to have it in the form of the entire root, as it will thus longer preserve its activity: moreover, the purchaser may then assure himself that he gets the genuine article, which it is impossible for him to do when he buys the drug in powder. The labour of powdering is not very great, and the wine may be made by steeping half an ounce of the well-bruised root in half a pint of sherry for two or three weeks, and then filtering.

Refer to—*Emetics.*

IRIDIN, an oleo-resinous principle derived from *Iris versicolor* or blue flag, much used in America, and chiefly in diseases of the biliary organs. It possesses aperient, alterative, and diuretic properties, and is given in doses from one to five grains.

IRIS.—See EYE.

IRON, the well-known metal, is used as a medicinal agent in a great variety of preparations; it also forms one of the most common ingredients of mineral waters. The tonic and strengthening properties of iron are well known, even popularly, and probably we have no remedy of the kind so generally useful and applicable in cases of debility; at the same time, it is not so much adapted for domestic use as many medicines of less value. The cases in which preparations of iron are most employed are not emergencies, they are usually constitutional affections of some standing, in which medical advice is not only requisite for the general treatment, but also as a guide for the administration of the iron, which, improperly given, may do much mischief. Persons who are habitually costive, who suffer from piles, or from determination of blood to the head, require to be specially careful with respect to the use of medicines containing iron, and should never take them without medical advice. The weak, the pallid, the delicate, may for the most part use them with greater safety, and very generally with benefit.

The tincture of the perchloride of iron, or, as it is called popularly, "tincture of steel," is one of the most generally used and useful preparations; in doses of from ten to thirty drops twice a day, in water, for an adult. It is not disagreeable, and children take it readily; the dose four or five drops to a child of six years of age. This preparation is powerfully astringent, and in relaxation of the throat is extremely useful, applied by means of a camel hair brush. The common sulphate of iron, or green vitriol, is a very cheap and good preparation, in doses of from half a grain to a grain dissolved in water, or made into pill with crumb of bread. The ammonio-tartrate of iron, the citrate, and the citrate of quinine and iron, are all useful preparations; the former is very soluble in water—dose, one, two, or three grains (see *Citrates*). Among other new preparations of iron, we may add the syrup of the phosphate of iron, a very serviceable compound, dose one or two tea-spoonfuls twice or thrice a day; wine of iron, a tea-spoonful to half an ounce, for a dose; the saccharine carbonate, and the arseniate of iron. The citrate of strychnia and iron is also a valuable preparation in atonic dyspepsia and in certain uterine derangements, dose five grains. For children, and, indeed, for some adults, a most excellent form for administering iron is in combination with potash liquor. For this the tartrate of iron is the most suitable. For a child of four years old, one scruple of tartarised iron, one drachm and a half of potash solution, and distilled water to make up to three ounces, forms a very suitable mixture, of which two tea-spoonfuls may be given in a small wine-glassful of milk twice a day. The above may be given even when the tongue is slightly furred; it has no unpleasant taste, and does not constipate.

The principal iron mineral waters, or, as they are usually called, chalybeate springs, in this country, are those of Tunbridge Wells, Harrogate, Isle of Wight, Holywell in Lancashire, Hartfell near Moffat, and Dunblane in Scotland.

When iron is really required by the constitution, it cannot probably be taken in any more beneficial form than that of a mineral water; at the same time, these natural sources of the medicine are open to the same objections and cautions as its artificial preparations, and many persons injure themselves by inconsiderately, and without advice, drinking these waters regularly, merely because they happen to be close to them for the time being. In mineral waters, iron is found in a state of great dilution, and the striking benefit which follows its use in this state in proper cases, justifies the fact that, when given artificially, it is found to be most serviceable in small doses in a considerable quantity of water.

Persons who are taking preparations of iron should pay extra attention to their teeth during the time, to prevent discolouration. The evacuations from the bowels always assume a dark or black colour, during a course of iron, and particular attention is always required to keep the bowels in a perfectly open state during the continuance of the remedy. On this account the sulphate of iron is frequently combined with aloes, and administered in the form of pill.

IRRITABILITY cannot perhaps have a better definition than that of Abernethy,—"excited debility." It is a symptom of many diseases, trying both to patients and to their attendants, but one for which every allowance

and consideration ought to be made. Those who have never suffered from the weakness of disease, especially such as affects or has affected the nervous system, cannot imagine in how many ways, which appear not only trifling, but absurd, to a person in health, the irritability of the invalid may be excited.

The term *irritability* is also used to express that property of muscular fibre, to which it owes its powers of contraction.

IRRITATION may be defined as diseased excitement, not amounting to inflammation. Many of the diseases of children partake more of irritation than inflammation. What is called irritation of an organ may take place at a distance from the source of the irritation; thus, worms and other matters in the intestines may cause convulsive and other affections consequent upon irritation of the nervous system, or the irritation of the gums in teething may also cause convulsions, or spasmodic croup. The irritant action is in these cases in the first place felt by the brain, and thence reflected, so as to affect the muscles which are thrown into spasm.

Refer to—*Convulsion.*

ISINGLASS.—See GELATINE.

ISLE OF WIGHT.—The portion best adapted by shelter and situation for the residence of the invalid, is the Undercliff, of which Sir James Clark observes: "The continuous range of high hills which separates this district from the rest of the island, protects it most effectually from all northerly winds, while numerous short ridges, projecting from the main range towards the sea, break in a considerable measure the violence of the south-west winds.

"The defence afforded by this natural bulwark against northerly winds is, indeed, more perfect than anything of the kind with which I am acquainted in England."

From the elevated position of the Undercliff fogs are rare, and less rain falls than in other parts of the island; and the soil being of sandstone and chalk, the ground speedily dries after rain has fallen. "The mildness and dryness of the climate during winter may be in some degree estimated by the circumstance of myrtles, geraniums, sweet-scented verbena, and various tender and green-house plants usually withstanding the winter in the open flower-borders."

The Isle of Wight is undoubtedly suited to most of those cases where a mild winter residence is indicated.

ISSUE.—An issue is an artificial sore, from which a discharge of matter is kept up by artificial means; it may, therefore, be formed in various ways, such as burning with a red-hot iron, by caustics, by ointments, and a common form in popular use is the pea issue. This is made by pinching up a fold of the skin, and making an incision into it, which will admit the insertion of two or three peas, which are to be secured in the wound by adhesive plasters. In the course of a few days the irritation occasioned by the peas causes discharge of matter; the peas are generally changed every day or two days, as long as the issue is desired to be kept open.

A very good issue may be formed by blistering the skin by means of one of the blistering tissues, and applying daily a piece of the same tissue to the sore, to keep up the irritation.

The seton is only another form of issue, made by passing a skein of silk through a fold in the skin, by means of a seton needle made for the purpose. Two or three threads soaked in blistering fluid and inserted through the skin placed behind the ear, form a convenient issue in cases of eye or ear disease.

The principles on which issues, setons, and other means of counter-irritation are established, is that of producing derivative action, and to the article on that subject the reader is referred; also to *Counter-irritation*, *Blister*, *&c.* The strictest cleanliness must always be observed about an issue or seton, or any other discharging sore. It is perhaps superfluous to add, that an issue should never be made on a portion of the skin which is liable to be exposed.

ITCH, or SCABIES.—This dreaded skin affection consists of an eruption of small pointed vesicles, which show themselves chiefly upon the wrists and between the fingers, but also at the bends of both the upper and lower extremities, the inner parts of the thighs and also upon the breech in children. It is attended with excessive itching, especially when the person affected gets warmer than usual, either in bed or after taking stimulating food or exercise. The itch attacks persons of all ages, of either sex, and is produced by an insect, the *Acarus scabiei* (fig. 139) which burrows under the cuticle where it deposits its eggs.

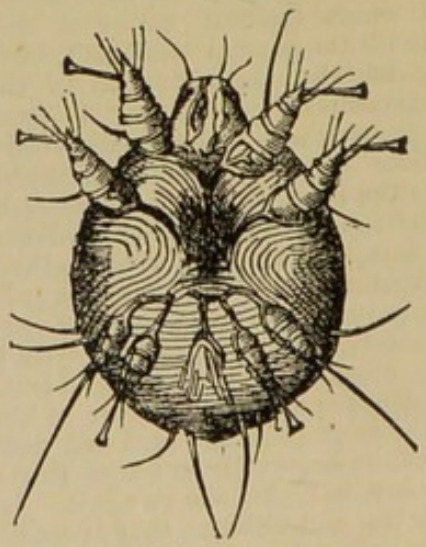


Fig. 139.

Unless caught accidentally by contact with the affected, the disease appears to be mainly the consequence of dirt and uncleanness. It is

frequent among the poor, especially in those of bad constitution, who are also badly nourished and clothed, and it is apt to be mixed up with other eruptions, indicative of the impaired constitutional power.

Fortunately, the cure of this disagreeable affection is in almost all cases certain and quick; sulphur being the agent generally employed in the form of ointment, made by rubbing up one part of the common flowers of sulphur with four parts of lard. Before the application is used, the entire skin should be thoroughly washed with soap and water; the ointment must then be well rubbed in all over the body, and washed off again next morning; the person sleeping in a flannel dress, or between blankets, which in workhouses and hospitals are specially kept for itch cases. This process may be repeated two or three times if requisite. In persons of full habit of body, it is advisable for them to take an active purgative, prior to using the sulphur ointment.

In a disease of so contagious a nature as itch, the utmost care is requisite in the avoidance, not only of contact with the person suffering, but with any article of dress, or otherwise, which he may have made use of; and when the person who has suffered is cured, it is requisite for him to exert equal care with respect to these things himself, until they have been purified, and disinfected. This may be done either by boiling water, by dry heat raised to a temperature of 200° Fahr., or by fumigation with sulphur—bearing in mind the effect of the latter agent in changing or discharging the colour of articles of furniture or dress. If much irritation of the skin exists, it is admissible to employ a smaller amount of sulphur than that indicated above, which is the composition of the Pharmacopœial ointment, and to combine it with sub-carbonate of potash, in the proportion of one drachm of sulphur to half a drachm of the latter, mixed with six ounces of lard. To avoid the dirty inconvenience of a greasy application, recourse is now often had to a lotion composed of sulphurated potash and water, or to a hot bath containing the same. The strength of the lotion should be two drachms of the sulphurate to a pint of water, and four ounces of the sulphurate will be found sufficient for a bath, with thirty gallons of water. The same precautions as to washing the body night and morning, with brown or soft soap and water, require to be observed with this treatment. When sulphur is used for the cure of itch, it may occasion some amount of irritation of the skin, which, being mistaken for the uncured disease, sometimes causes persons to go on rubbing long after the itch is cured, thereby keeping up unnecessary irritation and causing needless trouble and uneasiness. The itch mite, or acarus, as well as its ova, are commonly destroyed after the first or second application of the sulphur, but the eruption caused by its ravages may take a week to heal.

JALAP, so well-known as a purgative, is the root of a species of plant resembling a convolvulus, a native of South America, its name being derived from Jalapa, a town in Mexico, in the neighbourhood of which the drug is produced. Jalap is an active purgative, in dose of from ten to thirty grains, but with some persons it causes great nausea, and others it gripes severely. The best form for its administration is the compound powder, composed of jalap in powder five ounces, cream of tartar nine ounces, and ginger one ounce, well rubbed up together; the dose half a drachm to a drachm. There are purgatives more convenient for domestic use than jalap.

JAMES'S POWDER.—See ANTIMONY.

JAUNDICE is one of the secondary diseases, the result of a primary one. That is, some cause stops the flow of bile from the liver; and jaundice, which consists in the absorption of the bile by the blood, is the effect.

This impediment to the flow of the bile may arise from whatever blocks up the canal of the gall-duct (see *Gall-Bladder*). The obstruction is mostly due to catarrh of the duct, secondary to catarrh of the stomach and duodenum; other causes are thickened bile and gall-stones in the interior of, and pressure by tumours exterior to, the duct. Jaundice has sometimes succeeded violent mental emotions. The presence of bile in the blood is quickly manifested by the colour of the skin, and also more particularly of the white of the eye; the shade of colour varying from the slightest perceptible tinge, to deep golden yellow, or even brown. At the same time, the stools become white and chalky-looking, and the urine—sometimes the perspiration—is deeply tinged with bile, the patient often describing it as like porter; the constitutional symptoms are generally those of disordered digestion, headache, and languor. For many reasons, jaundice is a disease which ought, when possible, to be under proper medical treatment, not so much from the danger of the affection itself, as from its being symptomatic of disorder elsewhere. Should gall-stone or spasm be the cause of jaundice, the case is generally plain (see *Gall-stone*), but should the presence of a tumour, or disease of the liver, be the origin, it requires medical examination for its elucidation.

The treatment of jaundice, which unprofessional persons may adopt in the absence of a medical man, is very simple: from five to eight grains of "grey powder" may be given at bedtime, either alone, or, if there is pain, made into pill with extract of henbane, and followed by a dose of castor oil or senna in the morning. When there is much acidity of the stomach, carbonate of soda may be given. A mild attack of jaundice will generally yield to an aperient like the compound rhubarb pill, taken every night for a few nights in succession. We also now possess most valuable aids in the treatment

of jaundice, in the comparatively recent medicines, euonymin and iridin, which exert a most potent effect upon the liver functions. Moreover, in our native dandelion we have an agent capable of acting slowly but surely in the same direction. The writer has effected a complete cure of a case of jaundice of eighteen months' standing, which had resisted every form of treatment, by the free administration of a strong infusion of dandelion. The diet should be simple, devoid of milk, fat, or saccharine articles, whilst the jaundice exists, and all alcoholic stimulant avoided. Of course, when violent spasmodic pain indicates gall-stones, the measures recommended under the article on the subject must be adopted.

Refer to—*Bile—Gall Bladder—Liver, &c.*

JAWS.—See SKULL.

JEJUNUM—a portion of the small intestines.

JELLY.—See COOKERY—GELATINE.

JELLY-FISH, STINGS OF THE. — The following interesting and instructive remarks of Dr. Greenhow, published in the *British Medical Journal*, may be of use to those who are fond of bathing, and who happen to be in localities infested by jelly-fish :—

"Having formerly passed some years on the sea-coast, it used to happen that I was sometimes consulted by persons who had been stung whilst bathing, by some of the acalephæ, with which the ocean abounds at certain seasons. The immediate effect produced by touching the filaments of one of these creatures is a sensation of stinging, which extends up the affected limb for some distance from the point of contact. Presently the part becomes red, swollen, and tender; and occasionally, especially in young females and children, the entire limb, in the course of an hour or two, becomes much swollen, red, and exceedingly painful. The redness and swelling sometimes terminate in a well-defined border, resembling that of a wheal, but in other respects the ailment does not bear any resemblance to urticaria. These symptoms usually subside spontaneously, if allowed to do so, in the course of three or four days, but meanwhile they often cause considerable suffering, render the affected limb more or less useless, and, as they have a formidable appearance, often produce needless anxiety, especially to persons unacquainted with the nature of the injury. Having previously found spirits of hartshorn, when applied early, a very effectual application for preventing the irritation caused by musquito bites, I was led to try an alkaline and stimulating lotion, consisting of a solution of bicarbonate of potash, sesquicarbonate of ammonia, and spirit of hartshorn, in these cases, with a most satisfactory result. I do not recollect the exact form of the lotion, but believe it consisted of one drachm of each of the salts, and half an ounce of spirits of hartshorn, to six ounces of camphor mixture. This application, if freely used soon after the injury, affords almost immediate relief; and although the benefit is more tardy if it be not applied until the effect of the injury has been thoroughly developed, yet even then its use rarely fails speedily to mitigate the suffering and swelling, and to remove them almost entirely in the course of a few hours."

JESUIT'S BARK.—See BARK.

JOINTS,—also called articulations. The joints, generally, from their mobility and exposed situation, are very liable both to accident and disease; in either case, much care on the part of the attendants, and much patience on that of the patient, is called for, as it need scarcely be remarked that the most perfect rest is, in most cases of disease affecting the joints, *the* essential, for which no other remedial measures will compensate. Serious disease of the bones and the other structures of a joint does not now, under the improvements of modern (and especially of antiseptic) surgery, necessitate the loss of the limb; the joint, such as the elbow, the hip, and the knee—may be excised or resected, and in the course of time, a tolerably useful member remains, a kind of new joint being formed. Apart from disease of the bones, the joints are liable to inflammation of the tissues which invest them, and especially of an important covering called the "synovial" membrane, which secretes a thick glairy fluid to lubricate the joint, as oil is used to make machinery work smoothly. Inflammation of this membrane is termed synovitis, and though common to all the joints it is most met with in the knee, and may arise from injury, cold, rheumatism, and many other causes. Like most membranous inflammations, it is accompanied by great pain, especially in movement, by swelling and tenderness, and sometimes by fever of an aggravated type. When acute, much relief is obtained by the application of leeches to the part, followed by hot fomentations or bran poultices, and perfect rest; while, on the other hand, many surgeons prefer cold being applied to the joint in the form of ice bags, or of evaporating and spirit lotions. This refrigerating treatment is more applicable when the synovitis is due to injury of the joint. Joints are also subject to scrofulous deposits in their tissues, causing pulpy degeneration and white swelling.

Refer to—*Ankle—Dislocation—Hip—Knee—Skeleton*, and the articles on various joints.

JOY.—This powerful and instantaneous mental emotion may act beneficially upon the body, but it may have an opposite effect. There are so many recorded instances, either of overturned reason, or of death resulting from excessive and sudden joy, that too great caution cannot be exerted in arousing it in persons of a nervous temperament, or in those who are debilitated by disease. Epilepsy has resulted from sudden joy.

JUGULAR VEINS are the large veins which convey the blood from the head and

face, back to the heart. They are both external and internal.

Refer to—*Neck—Veins, &c.*

JULEP—an old name for mixtures in common use, such as *Camphor Mixture—Mint Water, &c.*

JUNIPER.—The oil obtained from the fruit or berries of the common juniper, which grows in this country, is used either alone or more frequently in combination with other diuretic medicines for the various forms of dropsy. It is contained in Hollands and gin, which owe their diuretic properties partly to it. A spirit prepared from the oil, and which consists of forty-nine parts of rectified spirit to one part of oil, is introduced into the British pharmacopœia; dose of the spirit, thirty minims to one drachm; of the oil, two to ten minims.

KALI.—Potash.—See Potash.

KAMELA is a red powder scraped from the fruit of the *Rottlera tinctoria*, belonging to the same natural family as the castor oil plant. It is an excellent remedy for tapeworm, being almost, if not quite as efficacious as the oil of male fern, and having this advantage over it, that it is not so nauseous nor so apt to gripe or purge—dose, one drachm of the powder in treacle or orange electuary—taken fasting.

KIDNEY.—The kidneys, or glands whose office is the excretion of the urine from the blood, are situated on either side of the spine (fig. 140—1) in what is usually called the

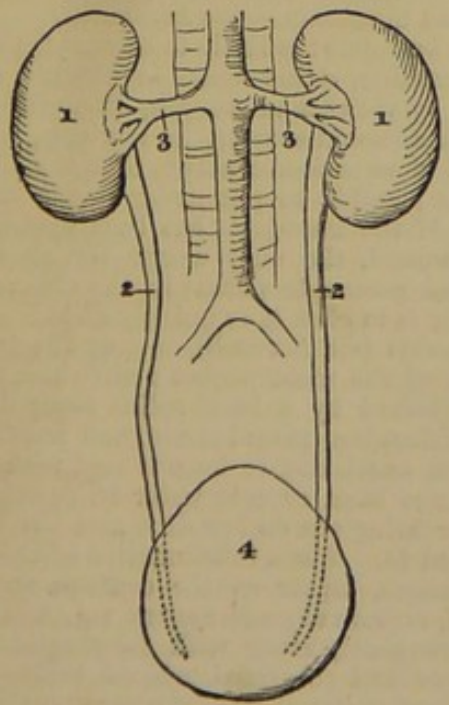


Fig. 140.

"small of the back," where they lie imbedded in fat. Each kidney is supplied with blood, by vessels (3, 3) which proceed direct from the aorta or main blood-vessel (see *Aorta*). From each kidney issues a duct (fig. 140—2, 2; 141—2) the ureter, which conveys the urine into the bladder (fig. 140—4). When cut open (fig. 141) the kidney presents, even to the naked eye, two very different structural arrangements; an outer one, granular looking, the "cortical" substance (fig. 141—5, 5), and an inner or

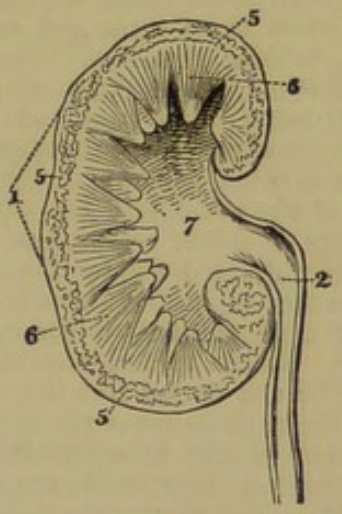


Fig. 141.

"tubular" structure (6), the latter being, as represented, arranged in pyramids or cones, with their bases situated upon the cortical substance and their points or apices, which are free, pointing inwards, and opening into a central cavity (7) the "pelvis" or basin of the kidney, which may be regarded as an expansion of the upper portion of the ureter (2). The entire kidney is enveloped by a sufficiently strong membrane or "capsule," and is lined by a smooth "mucous" membrane, continued into its cavity, by the ureter from the bladder. Those who are curious on the subject, may easily make out these particulars, by examining the kidneys of the sheep, which are about half the size of the human kidneys. When the minute structure of the kidney is microscopically examined, it is found to present a very beautiful arrangement. The tubular portion (6) is seen to consist of numbers of minute tubes about the diameter of a hair, and minute blood-vessels, placed side by side; these tubes, as they proceed towards the bases of the cone, or towards the cortical structure (5), become forked and twisted, and at last end in a minute globular expansion, in which the "capillary" or hair-like branches of the artery of the kidney are spread out in a kind of tuft. It is these globular expansions, each about the one-hundredth of an inch in diameter, which give this portion of the kidney its granular appearance. The minute blood-vessels, which had been spread out in a tuft, are again collected into one vein—and these minute veins are distributed amid the tubular structure, previous to being collected into larger trunks

for the conveyance of the blood out of the kidney. The object of all this elaborate arrangement is this:—the urine is secreted from the blood, which is conveyed into the kidney by its own proper artery, the watery portion of the fluid being strained off, as it were, from the minute tufted vessels, described as being suspended inside the globular expansions, and the other constituents being separated by secreting cells from the blood, after it has been re-collected from these tufts, and as it passes among the tubular structure. The mingled watery and other constituents of the urine (see *Urine*) being thus separated from the blood, and united, pass down the straight tubes in the form of urine, which is discharged from the points of the cones (fig. 141—6) into the central cavity or pelvis (7) whence it is continually being drained off by the ureter (2) into the bladder (4). The ureter is about the diameter of a goose quill, is about eighteen inches long, passes behind the bladder, as represented by the dotted line (fig. 140), and enters that organ at its lower part.

The diseases of the kidneys could not be profitably entered into with unprofessional persons, and, when suspected, should, without delay, be submitted to proper medical care. In the meanwhile, should there be much pain in the back, the application of hot moist bran, or of heat and moisture in some way (see *Heat*) will be of service; a gentle aperient, such as castor oil, should be given, and also warm demulcent drinks and warm injections used. Should there be shivering and signs of fever, with much tenderness over the kidneys, and *no medical advice at hand*, a warm bath may be administered, or a few leeches applied and a dose of opium given. Renal calculus—either in one piece, or in grains—sometimes collects in the cavity (fig. 141—7), and causes pain in the back whilst it remains; when, however, it passes into the ureter (2), it causes extremely violent spasmodic pain, constituting what is usually called a "fit of the gravel."—See *Urine—Bright's Disease, &c.*

KING'S EVIL—a name for scrofula, which originated in the superstition that the disease was cured by the touch of a king. The practice is said to have originated with Edward the Confessor, and it was continued down to the time of Queen Anne.

KING'S YELLOW is a compound of arsenic with sulphur.—See *Arsenic.*

KINO is the concrete juice of a tree, and is brought chiefly from the East Indies; it is an astringent closely resembling catechu, and is used for the same purposes. The tincture of kino is an excellent astringent. The powder of kino with opium contains one grain of opium in twenty of the powder, and is a valuable preparation in certain cases of diarrhœa.—See *Catechu.*

KNEE.—The knee is, perhaps, the most important joint in the body, and is certainly more liable to serious disease and injury than other joints: it is formed of three bones (fig. 142), the extremity of the thigh bone or femur (1), the upper extremity of the larger leg bone

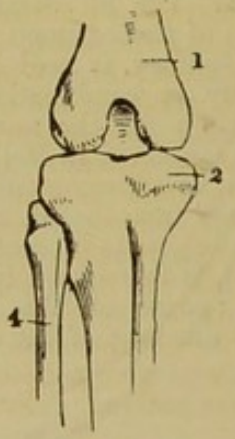


Fig. 142.

or tibia (2), and the knee-cap, or "patella," which lies on the fore part of the joint, but which is not shown in the figure. The small bone of the leg, the fibula (4), does not enter into the construction of the joint. The rounded ends of the thigh-bone rest in shallow excavations in the expanded broad head of the bone of the leg; the knee-cap protects the joint in front and enables the muscles of the thigh to act with more advantage and greater leverage in the movements of the leg; the entire joint being fitted and bound together by means of cartilages and ligaments.—See *Ligaments.*

The knee-joint is liable to become the seat of inflammation, either acute or chronic, caused either by violence or wounds, or as the result of constitutional causes. In any case, the disease is of so serious a nature that it should as soon as possible be put under proper medical care. If the knee-joint has been opened into by a wound, the only course for an unprofessional person to pursue in the absence of a surgeon is to close it as quickly and effectually as possible (see *Wounds*), to put the joint in a state of the most perfect rest (which is best accomplished by a back splint secured by a loop of bandage placed above, and another below the knee), and to keep it cool with spirit lotion, ice bags, or cold water irrigation; the sufferer being put on low diet, and the bowels attended to. When inflammation of the knee-joint arises, either as the consequence of a wound, or from any other cause, very free leeching is requisite, along with fomentations and poultices, and the constitutional treatment of inflammation generally. Blisters near the joint should never be used in an early stage.

White swelling of the knee, so dreaded popularly, consists of increased effusion of fluid into the joint, deposition of scrofulous matter, and degeneration of the joint tissues; this,

however, and other chronic diseases of the knee, require so much educated skill and care that they must be treated by the medical man. Till his aid is procured, the most perfect rest of the limb, the diminution of heat and swelling by cooling applications, the soothing of pain by warm fomentation or poultice, attention to the state of the bowels, and to the diet, is all that should be attempted. White swelling is connected with a weakened and scrofulous state of the constitution, consequently, all debilitating measures are, generally, to be avoided. The knee is sometimes the seat of a very unpleasant affection, termed "loose cartilage," which consists of a rounded gristle-like body lying loose within the joint, and which, from its mobility, is liable to be squeezed between the articulating surfaces of the bones, causes severe sickening pain, and may occasion the person to fall down when walking. The surgeon must be applied to.

The knee-cap, from its exposed situation in front of the joint, is liable to various accidents, to fracture (see *Patella*), also to dislocation, being pushed to one side; it may be replaced, either by the knee being bent by a second individual, or by straightening the knee, and bending the thigh upon the body, so as to relax the muscles on the fore part of the thigh, within the tendons of which the knee-cap is situated. On the fore part of the knee-cap, between it and the skin, is placed a small "bursa" (see *Bursa*) which is liable to become inflamed in persons who have to kneel much on hard substances. The affection is called *Housemaid's Knee*, from its frequent occurrence in that class of servants, who kneel a good deal; it also occurs in thatchers, who press the knee upon the ladder when at work. Matter is liable to form in consequence of the inflammation, and in this case the treatment of abscess generally is requisite. If the disease be taken early, the knee should be rested, and the inflammation subdued by a few leeches and fomentations, &c.; a blister will frequently remove the swelling, or it may be painted over with tincture of iodine, once daily, for some time. Occasionally it remains in spite of treatment, and ultimately disappears of itself.

Refer to *Leg—Patella—Housemaid's Knee.*

KOUMISS—is the product of the natural fermentation of mare's milk, and has been used for ages by the natives of Tartary as an article of fluid food. It has latterly come into much favour in this country, as a nutritive remedy in cases of obstinate vomiting, attended with debility and emaciation. It is now prepared from cow's milk, and is a highly refreshing, agreeable, and valuable beverage.—See *Milk.*

KOUSSO or **CUSSO**—a remedy for tapeworm, is the product of a plant brought from Abyssinia. In two cases—which had resisted all previous treatment—the author found the kousso perfectly successful. At the same time, the oil from the root of the male fern, found so abundantly in this country, is equally successful, and more extensively employed as a worm destroyer.

The preparation of kousso admitted to the British pharmacopœia is the infusion, which is made from the powdered flowers and tops of the plant, in the proportion of quarter of an ounce to four ounces of boiling water, and used without straining. Of the powder half an ounce may be taken on an empty stomach; and from four to eight ounces of the infusion, including the flowers, may be administered in a similar way. It is usually necessary to follow up the action of the kousso, by administering castor oil or other purgative to bring away the worms.

Kousso is now much reduced from the very high price at which it was first sold.

Refer to—*Fern—Worms, &c.*

KREASOTE.—See CREASOTE.

LABOUR.—See CHILD-BIRTH.

LABURNUM.—The seeds, and also the bark of the common laburnum, are highly poisonous, and a few cases have occurred in which children have been seriously affected in consequence of their eating the former. Vomiting, with delirium, stupor, giddiness, pain in the head, pain in the stomach, and collapse are the consequences. Treatment similar to that recommended under *Belladonna* should be resorted to, and medical assistance procured without delay.

LACERATION.—See WOUNDS.

LACTATION.—The secretion of milk.

LACTEAL.—See ABSORBENTS — DIGESTION.

LACTUCA.—See LETTUCE.

LAMB—like other "young meats," is not so desirable for invalids as mutton.

LAMENESS.—See ANKLE—DEFORMITY, &c.

LANCET.—See BLOOD-LETTING.

LANGUOR is a very general symptom of disease, and may be either of a true or false character; it is sufficiently treated of under the head of "*Debility.*"

LARCH, TINCTURE OF, has been prescribed by some in the treatment of hæmorrhage from the lungs. It has also been used in cases of chronic bronchitis. The dose of the tincture is from twenty drops to one drachm three times a day.

LARD.—The fat of the hog, deprived of its connective membrane and purified by heat, besides being employed for culinary purposes, is largely used as a basis for ointments and liniments. From the extensive way in which pork is raised in America, our chief supply of lard is obtained from that country. It is said to be sometimes fraudulently mixed with beef or mutton fat, a fact difficult to determine, but also doubtful, as the cost of the adulteration

would exceed the value of the native product. Some ointments, formerly prepared with lard, are now recommended to be made with glycerine or vaseline.

LARYNGITIS, or inflammation of the lining membrane of the larynx, is caused by exposure to cold and wet, or by inhaling chlorine or other irritating gases. It is also occasioned by misadventure among children, by their attempting to drink boiling water from the spout of a tea kettle. In some respects, the disease resembles croup or diphtheria; but may be distinguished from either of these complaints by the cause which produced it, by the absence of the false membrane at the back of the throat, and by its limitation to the upper part of the windpipe. The symptoms are, great hoarseness and difficulty of breathing (caused by the swollen state of the glottis, amounting to a sense of imminent suffocation), lividity of the lips and pallor of the countenance, combined with an irregular and feeble pulse. In numerous cases, unless relieved by an operation (tracheotomy) which permits breathing to be carried on independent of the larynx, death is liable to ensue. All that the unprofessional can attempt to do in laryngitis is to advise steaming of the throat.

LARYNGOSCOPE.—This is an instrument used, as its name indicates, for the purpose of examining the interior of the larynx. Its introduction has added so much to our knowledge of the diseases of the throat and windpipe, that several new affections of these parts are now described in medical works for the first time. A description of these diseases, and of their recognition and treatment, would be unintelligible and uninteresting to the general reader; at the same time, it is satisfactory to know that many cases of marvellous success are now on record which could neither have been recognised nor treated without the wonderful instrument, which may truly be said to have enabled the "dumb to speak and the deaf to hear." The instrument has been of the greatest service in investigating affections of the voice in speaking and singing, such as morbid growths, cancer, warts, and other complaints of the larynx, as well as all deformities of and injuries to that organ and the throat generally, together with diseases of the nose, mouth, and windpipe. It has also enabled medical men to ascertain the presence of, and to extract foreign bodies, which have accidentally found their way into the larynx, and become lodged there.

The first idea of a laryngoscope seems to have emanated from the mind of our countryman, Dr. Benjamin Babington, as early as the year 1829, for he then submitted to the Hunterian Medical Society "an ingenious instrument for the examination of parts within the fauces, not admitting of inspection by the unaided sight." It consisted of an oblong piece of looking glass, set in silver wire, with a long shank. Directions for the use of the instrument are given, and in the course of his remarks he says: "A strong light is required, and the instrument should be dipped in water so as to have a film of the liquid upon it when used, or the halitus of the breath renders it cloudy." The doctor proposed to call it the "glottiscope."

Afterwards the same idea was more or less carried into practice by several medical men both in this country and on the Continent. For instance, Professor Liston was in the habit of using an instrument of a similar kind to that above mentioned in examining the throat, as was also Dr. Warden, of Edinburgh. The chief merit, however, of introducing the laryngoscope in its present improved form into medical practice belongs to Professors Turck, of Vienna, and Czermak, of Prague; and certainly the highest praise is due to the latter of these gentlemen for the untiring perseverance with which he continued his efforts to perfect the instrument, and to make its use generally known and understood throughout Europe. Dr. Czermak visited this country in 1860, and was kind enough, personally, to instruct his professional brethren in the manipulation of an instrument, to the working of which he had himself devoted so much attention, and which, though still further improved and simplified from the suggestions and experience of others, has since become associated with his name as one of the most valuable aids to medical practitioners in the investigation of disease.

The laryngoscope consists of a little mirror fixed into a long handle. Before it is introduced into the mouth it should be warmed in hot water. Whilst this is employed, the throat is at the same time illuminated by means of a round mirror worn upon the forehead, so as to leave the hands of the examiner free. This is arranged with an elastic band, so that it can be adjusted to any position.

The patient or person to be examined is seated on a chair at one side of a table on which there is a good lamp. If the latter is furnished with a reflector, so much the better, or if good sunlight can be had, nothing does so well. The little mirror (previously warmed) is then introduced to the back of the throat, while a strong light is thrown upon it from the mirror upon the examiner's forehead (fig. 143). In this way, by a medical man, who has through practice acquired facility and dexterity in the use of the instrument, the mechanism of the human voice in health or disease may be studied, while, at the same time, disease, if present, can be readily detected, and the fitting remedy applied. For the latter purpose numerous new instruments have been invented for the removal of growths, and the application of medicaments of one sort and another. Of these it may be said that they are unnecessarily complex, and that the simplest are the best. The drawing shows the manner in which the apparatus is employed.

The above remarks may appear to many quite unsuitable for the general reader; still it may not be uninteresting even to him to know that medical science is every day progressing, and bringing many of its practical applications to the relief of human suffering and disease, and that of late years nothing has thrown more light upon matters hitherto obscure than this new instrument has upon diseases of the throat—a class of diseases, the importance of which can scarcely be exaggerated, when it is remembered that the loss of voice to many involves a loss not only of the enjoyment but of the means of maintaining existence.

As an illustration of the practical advantages to be derived from the use of this instrument, the following case, one among many, may be cited. A young man had suffered for several months from gradual loss of voice, hoarseness, and occasional choking fits at night, so severe as even to threaten his life. His medical adviser attributed all these symptoms to chronic inflammation of the larynx, and treated him accordingly, but without the slightest effect in relieving his sufferings, which grew worse day by day. His general health also was much enfeebled, owing to the severe course of treatment to which he had been subjected. At this time he sought the advice of a gentleman, who examined his throat by means of the laryngoscope, and immediately detected a small polypus, or tumour, hanging by a narrow



Fig. 143.

neck or pedicle in the air-passage, just at the most important point where the mechanism of the voice is situated, or, in medical language, between the vocal cords. This polypus was at once seized with a pair of forceps, and extracted, with immediate relief to all the distressing symptoms of the patient, and the complete restoration of his voice.

Many affections of the voice in females are well known to be dependent entirely upon a hysterical condition, and when a medical man has taken this view of any particular case it is very satisfactory to be able by means of the laryngoscope to confirm his *diagnosis*. A careful examination of the patient's larynx shows him the absence of any morbid condition, and he at once concludes that the symptoms are entirely due to derangement of the nervous power governing the movements of the muscles and vocal cords.

LARYNX.—The organ of voice situated at the top of the windpipe.—See *Lungs*.

LAUDANUM.—Tincture of Opium.—See *Opium*.

LAUGHTER, which arises from an excited condition of the nervous system, though proverbial as a promoter of health, may nevertheless, if excessive and prolonged, give rise to

serious consequences; the fit of laughter might pass into one of convulsions in a predisposed constitution; or in a child. The practice of tickling children, and thus keeping them in a state of laughter for some time, is strongly to be condemned, and may be attended with some mischief.

Refer to—*Convulsion.*

LAUREL.—The common laurel, more particularly its young shoots and leaves, contains a considerable proportion of prussic acid, and a few cases of poisoning have occurred by the use of the water distilled from the leaves. The practice of using laurel leaves in confectionery for the sake of the flavour is not to be recommended.

LAVEMENT.—A clyster.—See *Enema.*

LAXATIVE.—See PURGATIVE.

LEAD.—This metal is of importance in a medical point of view, both on account of its medicinal and of its poisonous properties.

Of its various medicinal preparations, it will be sufficient here to notice three—the acetate, or *sugar of lead;* the solution of an acetate of lead, or Goulard's extract; and the lead plaster. The acetate of lead is used both externally and internally. In the former case, in the proportion of from one to five or six grains to the ounce of distilled, or rain water, it forms one of the best cooling lotions; it may be used slightly warm, either alone or with the addition of one or two drachms of laudanum to the half pint of water. A weaker solution of sugar of lead, one or two grains to the ounce, is often used as an eye-wash, but is not preferable to zinc. Internally, sugar of lead acts powerfully as an astringent, and may be given in doses of from two to four grains, once in eight hours, *in cases of emergency,* by the unprofessional. It is generally made into pill with crumb of bread; often, quarter of a grain of opium is combined with it, and it is advisable to wash the dose down with a draught of weak vinegar and water. The few cases, such as hæmorrhage, in which, in *the absence of all medical assistance,* sugar of lead may be given domestically, are particularly noted when treated of in this work.

The solution of lead, *Liquor plumbi subacetatis,* is used as a lotion in the proportion of one teaspoonful to half a pint of boiled water or milk. It should not be applied to large raw surfaces, on account of the risk of absorption and consequent lead poisoning.

Lead plaster is the most unirritating form of plaster we possess, and as such it is used as the basis for several other kinds, as the mercurial, iron, galbanum, and soap plasters. It is preferable to diachylon on irritable skins: it is also one of the best applications in abrasions and bed-sores. Lead, when conveyed into the system in minute doses for any length of time, occasions serious constitutional effects, the most remarkable being palsy, and obstinate constipation, with colic (see *Colic*). Persons such as painters, type-founders, &c. (see *Artisan*), who work with lead or its preparations, are peculiarly liable to be thus affected by it. The subject is sufficiently entered into in the articles above mentioned. Another very fertile source, however, of the introduction of lead into the system (in individual minute doses, but ultimately, by the accumulation of these, in poisonous quantity), is from the pipes in which water is conveyed for household purposes. This is especially the case when soft waters are conveyed through new leaden cisterns and pipes. Before using water of this character, it is well to empty the pipes of the water which may have remained in them over night.—See *Water.*

The common use of lead or its preparations in the arts, either legitimately or fraudulently, is not an unfrequent cause of disagreeable, sometimes of fatal, attacks of illness, in consequence of the metal finding its way into the body. The use of lead as a glaze to earthenware vessels may prove a source of great injury, being liable to be dissolved off, especially when the vessels are new, either by fatty or acid matters (see *Dripping*). Confectionery is sometimes coloured with the yellow chromate of lead, or with Turner's yellow or chloride of lead; or whitened by the most poisonous preparation of all, the carbonate of lead. Wine when sour has been sweetened by the use of litharge, or oxide of lead, and in consequence of this fraud, a fatal epidemic of colic at one time prevailed in Paris. Wine is also sometimes accidentally impregnated with lead, in consequence of shot, which had been used to clean bottles, having been left in them. Poisoning has occurred from this cause. New rum and cider are both apt to become impregnated with lead in the manufacture. Symptoms of colic have been brought on in persons living much in a room newly painted with lead colours. The white glazed cards are made so by means of lead, and might injure children, who are apt to suck them at times if they come in their way. Many of the hair dyes contain lead, and have caused injury. Putty used by glaziers, and putty powder employed extensively in glass works for the polishing of glass, is a fertile source of lead poisoning.

When lead is introduced into the system in minute quantities, as in the cases above mentioned, the symptoms are generally those described under *Colic;* but when the dose is large, it quickly brings on painful colic, vomiting, and extreme depression. In such cases, the best measures to be pursued until medical assistance can be procured, would be the administration of vinegar in the first place, and in six or eight minutes after, an emetic of half a drachm to a drachm of sulphate of zinc; or some other sulphate, such as Epsom salts or Glauber salts, in quantity proportionate to the lead swallowed. The vinegar in the first place converts the lead into one of its least poisonous salts, and the one most easily decomposed by the sulphates.

The accumulation of lead poison in the system is in most cases denoted by the existence of a bluish line along the margin of the gums, at their junction with the teeth. This symptom should always be looked for when any suspicion exists. Lead paralysis and dropped-wrist originate from the same cause.

Refer to—*Artisan*—*Colic*—*Constipation*—*Litharge*—*Paralysis*—*Water*, &c.

LEAMINGTON.—"The climate of Leamington," says a resident physician, "is more mild and equal than that of the greater part of the inland watering places; it is neither exposed to sudden gusts of wind, nor to the frequent rains which a mountainous neighbourhood so constantly attracts.

"Of the springs, the most used is the Old Well; the following are the constituent ingredients in a pint of the water:—

	Grains.
Hydrochlorate of soda, .	40·770
Sulphate of soda, . .	40·398
Hydrochlorate of lime, .	20·561
Hydrochlorate of magnesia,	3·266
	104·995

	Cubic inches.
Carbonic acid, ...	2·103
Azote, ...	0·537
Oxygen, ...	0·075
	2·715

Being consequently saline, sulphureous, and chalybeate, the mineral springs of Leamington may be recommended for the same complaints as the Cheltenham waters, particularly stomach derangement without inflammatory complication, hepatic obstruction, acne, and other eruptions about the face, as also in chronic gouty cases, especially when constipation of the bowels co-exists."

LEECH.—The general appearance of the leech it is unnecessary to describe, the soft, ringed body being common to all the tribe. Two species only, however, are recognised in this country as fit for medical purposes; these are each distinguished by six greenish-yellow chain-like stripes disposed down the length of the animal on the back and sides, the belly being, in the one, dirty yellow spotted with black, in the other, greenish olive and unspotted. The former of these species of leech, is found sparingly in this country, but occurs throughout northern and central Europe.

Leeches fit for medical purposes abound in India and in many eastern countries. Many of those now used in this country are brought from Hamburg, where they are collected by the merchants from different parts of the Continent. The former of the two species mentioned, that with the spotted belly, and often known as the "brown leech," belongs to northern Europe, the other, unspotted, or the "green leech," is a native of the south of Europe.

The narrower extremity of the leech (fig. 144—1) is the sucking mouth, the broader is simply provided with a sucker (2) by means of which the animal attaches itself to any substance. The mouth is furnished with three "mandibles" (3), the edges of which are set with minute teeth, by means of which the animal perforates the skin by a sawing action, after it has been sucked up. The mandibles also, probably, keep the edges of the wound asunder, and form a sort of tube through which the blood passes. The invaluable properties of the leech as a local abstracter of blood are sufficiently well-known; at the same time, these are often, in a measure, neutralised, by unskilful and ignorant management in application. When leeches are required, it is always better to be provided with more than the number thought requisite, in case, as often occurs, some cannot be made to fasten. When persons can choose their own leeches, the readiest mode of selection is, to take a number up in the hand, and gently to close it upon them, the strongest and most vigorous of the animals will contract themselves into a tolerably firm ball; the same may

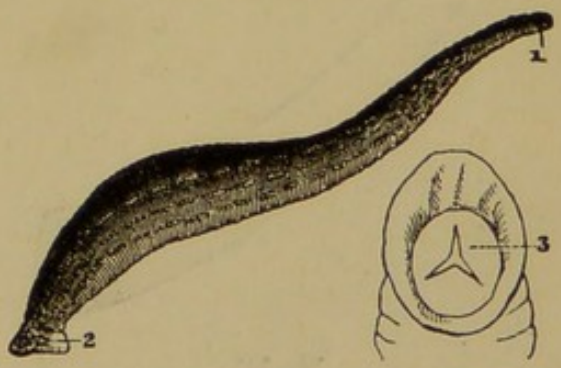


Fig. 144.

be done just previous to application. Some persons recommend leeches to be removed from the water in which they are kept, about an hour before they are wanted, being in the meanwhile laid upon a towel. The part to which leeches are to be applied, must previously be thoroughly cleansed with warm water, and when they are put on by the order of a medical man, it is, in many cases, better to have the space *within which they are to be fixed, marked out with ink.* Many methods of applying leeches are recommended, but none, perhaps, is so generally applicable, as confining them within the proper space, by means of an inverted wine glass; in situations where this cannot be done, they may be put on individually by hand, holding each one by the larger end by means of a piece of cloth, till it has fastened. In some situations, such as the interior of the mouth, a leech glass (fig. 145), made to enclose a single leech, is convenient. When leeches have fastened, they should be allowed to suck perfectly undisturbed, resting on the smooth skin, or some smooth surface; if they

hang down upon hair, or any rough material, they are apt to get fidgetty, and to drop off too soon. After leeches have come off, it is in most cases desirable to encourage further flow of blood, and for this purpose, hot fomentations or poultices of bread or bran are most useful; in situations and circumstances where the moisture is objectionable, pieces of soft linen or calico, made quite hot, will answer very well, applied, folded two or three times, upon the place. In children, and some persons who bleed freely, but little encouragement is required, the difficulty often being to stop the flow of blood.

The possibility of this occurrence should always be kept in mind when leeches are applied to such persons, and, as a rule, they ought always to be *placed if possible over a bone against which pressure can be made*, and never, unless for some very cogent reason, upon such places as the neck or abdomen; most of the

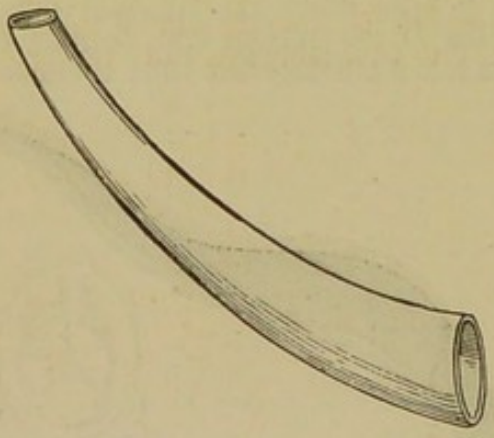


Fig. 145.

cases of fatal bleeding from leech-bites in children have probably occurred from want of attention to the above precautions.

When bleeding from leech-bites continues longer than is thought necessary, it may generally be stopped by introducing a minute piece of cotton wool into the wound, or placing a small pad of folded lint over it, and keeping up pressure with the finger for some time, provided there is the bone underneath to press against, and, if not, the compress may be secured by means of a bandage, and when the bleeding seems to be arrested, the little pad may be kept in its place by one or two strips of adhesive plaster. If the simple pad appears insufficient, it may be soaked in a strong solution of alum. Even should there be no bone underneath against which pressure can be made, the above plan may succeed, but it may not, and in such cases it is often recommended to pass a pointed piece of caustic into the wound; but this is not a very efficient plan, and the pain it causes, by making a child cry, increases the tendency to the flow of blood. In an extreme case, a sewing needle passed through the wound from side to side, and wrapped about with a thread (fig. 146), will stop further loss of blood; at the same time, the author must add that he never found a case resist pressure well and carefully used. Such cases ought, of course, to be attended to by a medical man, if possible; but at a distance in the country, it would be better for a mother to use the remedies stated, than to let her child bleed to death. Any other astringent remedies may, of course, be tried, if they are procurable (see *Astringents* and *Styptics*). A wire or skewer, heated to a white heat, has been employed for the purpose, by being passed into the wound.

It ought further to be remembered, that even after leech-bites have ceased to bleed in children, they may, especially under the influence of warmth, burst out again; and fatal consequences have ensued from children being placed in bed after leeching, and not looked at during the night; they have become completely drained of blood. On this account it is always desirable, when it can be done, that leeches should be *put upon children in the fore part of the day*, and also, that examination should be made from time to time after the operation is over, to see that all is right: if it

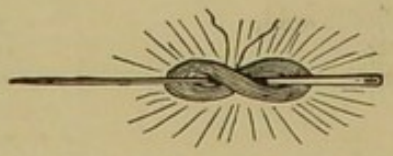


Fig. 146.

is night, a light should be burned in the room. It is not only the immediate consequence of excessive bleeding which is to be dreaded, but the unnecessary loss may make all the difference between a child's struggling through an illness or not.—See *Blood* and *Hæmorrhage*.

In a few individuals, the application of leeches is apt to be followed by inflammatory swelling of the skin, resembling erysipelas; of course this is an obstacle to their use on slight occasions; the swelling may be subdued by the lead lotion, cold or warm, as most agreeable to the feeling of the patient.

There is often considerable difficulty in getting leeches to fix where and when they are wanted; this may arise from various causes, the leeches may be sickly, or torpid from cold, or may have been recently used, or, as they are rather sensitive, the skin may be unclean, either from its own natural excretions, or from applications, such as embrocations, &c., which have been used to it. It is vain to attempt to apply leeches if this is the case; the skin, therefore, must be made thoroughly clean, and if there is hair on the spot, it must be shaved off clean and smooth; as a further inducement, a little cream, sugar and water, or blood, may be put on the skin. If cold is thought to have rendered the leeches inactive, their immersion for a quarter of an hour in water—temperature

70°—will be the best remedy; the addition of a couple of table-spoonfuls of porter to the half-pint of water will not unfrequently make them more lively.

If it is wished to detach a leech before it has finished sucking, it must not be pulled off; a few grains of common salt sprinkled on its head, will cause it to drop off very quickly. When leeches come off, it is the common practice to put them upon a plate of salt, which makes them disgorge the blood they have sucked; this is better done by putting them into a little, not very strong, salt water, which is equally effectual, but does not injure them as the salt in substance is apt to do. After the greater amount of blood has been thrown up under the influence of the salt, the leech should then be "stripped," that is, its tail end being held firmly between the thumb and finger of the left hand, the animal is to be drawn between the thumb and finger of the right, nearly to the head; by this means it is freed from the blood, and is sooner fit for use. Blood which has been drawn by leeches, affords no guide to a medical man like that taken by the lancet; it therefore need not, as is often done, be kept for his inspection. After the leeches have been stripped, they should be put into some fresh water, which will require changing twice a day for the first two or three days, afterwards, only every four or five days.

The great expense of leeches renders it important that the best means of preserving them, and of rendering them, if possible, again quickly ready for use, should be known.

They are best kept in good-sized wide-mouthed jars or bottles, half filled with rain or pure spring water, or, what is better, in small aquaria in which there are river weeds growing, and having at the bottom a little clean sand or gravel on which the creatures can rub themselves, and so clear the skin of the slime which naturally covers it, but which they cannot get quit of in a vessel with smooth surfaces. The temperature of the water in which leeches are kept should never get below 50° Fahr.; if kept in a bottle the water should be changed every ten days or oftener, and the place in which they are kept must be airy and free from strong odours. Of course dead or sickly leeches should be removed at once from the healthy ones.

It has been stated that leeches which have been used, may be rendered in a few days as active and useful as ever, by dissolving a little white sugar in the water, and renewing this solution twice at intervals of twelve hours, and twice afterwards at intervals of a day. Dr. Christison says: "I have tried this plan, and found that the same leeches drew blood three times at intervals of three days, with scarcely any diminution of activity, and without a death among them." Another method recommended is—after stripping—"to put them into a vessel with half an inch of sand at the bottom, and containing water, with two tea-spoonfuls per quart of French white wine; and to change the liquid daily till the fourth day, when pure water is to be substituted." With respect to the choosing of leeches, the following remarks of Dr. Christison are important:—"The gorging of leeches is a more common fraud than the substitution of spurious species. they are known by being less velvety in their coat, less flat when pressed, and by presenting a little tumour when squeezed between the fingers from the head to the tail. Leeches which have been used are often sold for unused, or 'virgin' leeches. These are best known by putting them on a white cloth, and dusting their fore-part with finely-powdered salt. In thirty seconds a little blood will be emitted, but not a particle, if the leech be quite fresh."

The greatest inconvenience connected with leeching, even when well managed, is the uncertainty of the amount of blood taken; but generally it may be calculated, that the application of a good leech should, on the average, including what the animal itself draws, and what flows afterwards, amount to about half an ounce.

To remedy much of the inconvenience connected with the application of leeches, many attempts to make an artificial substitute have been made, but none have as yet been fully successful.

Leeches applied to such places as the nostril, mouth, or ears, occasionally get beyond reach, and find their way into the stomach or bowel. The best remedy, and one which should be used without delay, is the drinking of strong salt water,—this quickly kills the animal. It is an amusing illustration of change in the modern practice of medicine, that the hospital expenses throughout the country for leeches can now be reckoned by pence, where formerly they amounted to pounds.

LEEK, as an article of diet, does not generally agree with persons of weak digestion. It is most wholesome when blanched like celery, and stewed.

The vapour from boiling water poured over leeks is sometimes used as a popular remedy in piles. The leeks are cut up, and put in the pan of a night-chair, or in a chamber utensil, on which the person sits.

LEG, The.—The portion of the inferior extremity between the knee and the ankle,—is formed of two bones (fig. 147). The larger or main bone of the leg (1) is named the tibia; the smaller, or splint bone (2) the fibula. The upper broad portion of the tibia (3) forms part of the knee-joint (see *Knee*), but the fibula does not; at the lower end of the leg, however, both bones are required in the formation of the ankle-joint (see *Ankle*). These bones may be broken together or separately; fracture more generally occurs below their middle than above.

Refer to—*Fracture.*

LEG, Swelled, or white-leg, as it is sometimes named, or *Phlegmasia dolens*, is one of the most troublesome of the disorders which are apt to follow child-birth. It arises from an obstruction to the venous circulation in the limb, brought about by inflammation of a vein or by coagulation of a small portion of blood in it. The symptoms of swelled leg may commence within the first two or three days after delivery, or may be delayed for some weeks. There is more or less fever, and the parts about the groin and thigh feel hot, stiff, and painful, swelling commences, and extends over the whole limb, which sometimes often increases to twice its normal size. The skin assumes a pale white colour, is shining and tense, and does not pit on pressure; at this time the pain

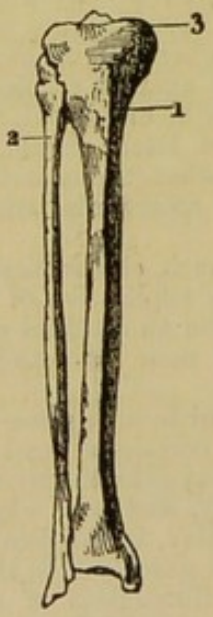


Fig. 147.

is often very severe. After a time, these symptoms are ameliorated; but the limb remains a long time swollen, painful, and comparatively useless.

The above, it need scarcely be remarked, is a disease which requires proper medical assistance as soon as possible; in the meantime absolute rest in bed must be enjoined, as great danger is otherwise liable to follow. Leeches, fomentations, and poultices to the parts about the groin and thigh, will be at once the best and the most soothing treatment, the bowels being regulated either by mild aperients or enemas, and opium given, if the pain becomes severe: for this purpose ten grains of Dover's powder, with two of calomel, may be given at bedtime. Continued friction with simple oil is of much service in aiding the final removal of the swelling. During convalescence, bandaging, friction, the salt water douche, and strengthening remedies and diet will be requisite; but these must be left to the regulation of the medical attendant.

LEMON.—This well-known fruit, and sick-room luxury, is cultivated chiefly in southern France, in Italy, Sicily, Spain, &c. The best lemons are smooth on the skin, and have a thin rind; if packed in newly-slaked lime in closed vessels, lemons may be preserved good for a considerable time. The rind of the lemon, and the agreeable essential oil derived from it, are chiefly used in cookery and confectionery. The juice of the fruit, which owes its acidity to citric acid, is used as the most agreeable medium for the formation of effervescing draughts; the proportionate quantity required to be used with alkaline carbonates will be found under article *Effervescing*. Its use in the formation of lemonade is familiar to all (see *Cookery for the Sick*). The chief direct medicinal use of lemon juice is in the treatment of scurvy (see *Scurvy*), but it has also been introduced by Dr. Owen Rees as a remedy in rheumatic fever, and there are many testimonies to its value in this painful, and often tedious affection. The author has reason, from his own experience, to speak favourably of its remedial power in the above painful disease. Lemon juice is not only a curative medicine in scurvy, but it is also a preventive; and it should, therefore, form part of the "sea-store" of all who are going a long sea voyage. The juice may be procured at a moderate price from confectioners in large towns. The best method of preparing it for keeping, is to add about one-tenth of spirits of wine, and to separate, by straining, the jelly-like matter which coagulates in consequence, and then bottle for use. "Salt of lemon," which is sold for removing the stains of ink or iron, is no preparation of lemon at all, but is a salt of oxalic acid: the name might lead to serious mistakes.

LENS.—Crystal lens.—See *Eye*.

LENTILS belong to the pea tribe, and are used as food. The Egyptian lentil, known, when in the form of meal, as the revalenta, or ervalenta Arabica, is not only nutritious, but possesses aperient properties, which render it, in some cases, a valuable auxiliary to treatment if it agrees with the stomach. Lentil meal made into soup is coming much into use as an article of food. It is very nourishing, and contains, like the meal from the seeds of other leguminous plants, peas, beans, &c., a much larger proportion of albuminoids, or flesh-forming substances, than meal made from the cereals.

LEPROSY.—See Skin, Diseases of.

LETHARGY—an unnatural tendency to sleep, is closely connected, as to cause, with languor and debility, and approaches apoplexy in character. It may arise from the opposite causes of over-fulness of blood, or from deficiency of circulation in the brain, from nervous exhaustion of that organ, or from actual disease in it, such as tumour or abscess. The lethargic state may also arise from an impure or poisoned state of the circulating fluid, such as precedes an attack of British or bilious cholera, or

diarrhœa, or may be a consequence of suppression of urine. It may also, of course, be the result of the action of narcotic drugs, or of alcoholic intoxication. These latter contingencies should be kept in mind in the event of lethargy coming on suddenly; in such a case, the treatment, with precautions, recommended under article *Apoplexy* should be adopted—modified, of course, in some degree, on account of the milder character of the disorder. In the aged, especially, lethargy is always to be regarded with suspicion; but in any case, the *cause* should be investigated by a medical man as soon as may be.

Refer to—*Apoplexy—Biliary Disorder—Debility—Languor—Paralysis, &c.*

LETTUCE.—Two kinds of lettuce are used, the common garden or edible lettuce, and the stronger or medicinal lettuce. The botanical name of lettuce, *lactuca*, from *lac*, milk, is given on account of the milky juice which exudes from the plant when cut: this milky juice turns brown, and dries on exposure to the air, and is then called *lactucarium*, or "lettuce opium," from its narcotic properties, in some degree resembling those of opium. The milkiness of the juice of the lettuce, and its narcotic properties, are not fully developed until the period of flowering approaches; the plant, however, possesses them more or less at all stages of growth.

As an article of diet, lettuce is in very general use, and with most persons, agrees well, though some find it, in common with uncooked vegetables generally, disorder digestion; others find its narcotic properties—even in its mildest condition — inconvenient. Lettuce eaten at night has been had recourse to successfully, among others, by the celebrated anatomist Galen, as an antidote to sleeplessness.

Extract of lettuce, or lactucarium, or lettuce opium, might be used in doses of from ten to fifteen grains, as a substitute for opium, with this advantage, that it does not confine the bowels: it is not, however, so certain in its action, and is now omitted from the pharmacopœia.

LEUCORRHŒA.—See WHITES.

LICE.—See PEDICULI.

LICHEN.—See SKIN, DISEASES OF.

LICHEN ISLANDICUS.—See ICELAND MOSS.

LIFE.—The word, here, is simply taken in its one sense of man's actual material existence in this world: that existence, which, however it may be regarded as but the prelude of another and more perfect state, all persons of healthy mind have an instinctive desire to preserve—instinctive, truly, it may be called at the present day; for the feeling with a large—a very large—class, seems to rise no higher. It seems to protect from immediate, urgent, threatened danger, but beyond that it appears not to go; and life is yearly, daily, hourly sacrificed in this country, by causes which are perfectly under man's own control to prevent—by causes which it is utterly unworthy of intelligent and responsible beings should continue, or be allowed to continue, in operation amongst them. It is sufficient confirmation to reiterate the fact, that fever carries off yearly in Britain a larger number of victims than would fall in the course of a serious campaign; and that one-fourth of the children die before they reach the age of five years. As these tiny victims have been well called "drooping buds," they languish and die in the unwholesome dwellings of city, town, and village. And this need not be; for, fearful as the loss of life now is, it is less considerably than it was a hundred, fifty, or even twenty years ago; and might be much *lessened* still. It is enough to refer the reader to the case of the Dublin lying-in-hospital, mentioned under article *Childhood*, to demonstrate how quickly—how remarkably—the value of life may be increased by a few well-directed and comparatively simple measures. The whole science of medicine, surgery, the efforts of hygiene, sanitary precautions, even the object of such a work as the present, is the preservation and prolongation of human life; and that it is not preserved nor prolonged to a much greater extent than it now is, cannot be for want of knowledge, among all classes. Parliamentary commissions and "blue books," boards of health and sanitary cordons of all kinds, have diffused—or ought to have—information respecting those sources from which the curtailment of life arises; but indifference, self-interest, prejudice, all interfere, and the exertions of those entrusted with the good work are often frustrated by the apathy and even the opposition of those whom it directly concerns. At the same time, it is not the part of the people to wait till these things are wholly done for them; it may be, that the principles of a true political economy render the preservation of every man's life in the state, a duty, and a direct advantage to the community; but the individual must in the matter act for himself as far as lies in his power. The preservation and prolongation of life can never be simply a selfish consideration; man does not live for himself alone. But if none can doubt that the duration and value of life might be extended far beyond what it now is, it is equally certain that it is much greater than it was formerly. A glance at the past in this respect may give hints for the future. One great cause for the short duration of human life among a barbarous or semi-civilised people, is the little value set upon it; hence it is sacrificed for the most trivial reasons—and, from the destruction of the weakly or unwished-for infant, so common, not only amid a savage people, but even among the comparatively civilised Chinese, to the abandonment of the aged parent on the prairie, by the North American Indian, or the destruction of adults in public war or private quarrel, amid

these nations generally—all tend to shorten human life. True, the wars and revolutions of civilised nations even in Europe, cost many useful lives, but their occasional occurrence is not marked like the regular systematic cutting short of life in all its stages, which unceasingly goes on in uncivilised communities.

As a nation rises in civilisation, therefore, the lives of its members are in part prolonged, simply because they are not violently curtailed; other causes at the same time coming into action. Increased comfort of dwellings, and more effectual shelter from the weather, suitable clothing, more regular supplies of wholesome and better prepared food—all reduce the chances of disease and death. Improvements in the practice of medicine and surgery, more quickly and effectually alleviate the former when it does occur, and diminish the probability of the latter; and, lastly, for it comes last, increased—though far from sufficient—attention to hygienic and sanitary precaution counterbalances in some degree those unhealthy influences and combinations of circumstances which inevitably arise during, and advance with, the progress of civilised communities. Hitherto, the increase of the comforts of civilisation, though in one mode it has tended to prolong life, has nevertheless in some degree balanced this advantage by giving rise to other sources of disease. The wandering savages, or natives of thinly-peopled countries, if liable to suffer from privations and exposure, are nevertheless, in great measure, free from the fever-generating drain, and closely-crowded street or habitation; and in this and other similar ways it happens, that although the value or duration of life in a community ought to be a test of its civilisation, the fact has not as yet assumed its full preponderance in the history of national progress. Ignorance of the laws of health, in the first instance, and obstacles to the carrying out of those laws in the next, have hitherto kept the average of life, in this kingdom at least, far below the average it ought to hold. Probably too, indifference as to the means of prolonging human life has partly arisen from the very common error, which supposes that the evil of premature deaths has some compensating advantage in removing a portion of surplus population; whereas, under ordinary circumstances, it is not the surplus, but the valuable portion of life that is thus lost. If a boy dies at some period between ten and sixteen, his existence has been an absolute cost to the community, and he was but just approaching the period when he might have become a productive member of it. If a husband dies in the early years of his married life, he leaves as burdens on the world a widow or children, for whom, under ordinary circumstances, if he had lived, he would have worked: "bearing out the fact, that a parish or country where life is precarious pays more poor-rates—has to support more unproductive members—than its neighbours."

Connected with these remarks, are the facts elicited by the Registrar-General in his numerous reports on the health of the population. As an illustration of the improvement in the health of the people upon that which existed in former times, we may instance the case of the city of London, and compare it with what it is now and what it was formerly. From the bills of mortality we learn that, in the latter half of the 17th century, the mortality was as high as 80 in 1000 living at the period; that in the course of the 18th century, it diminished to 50 deaths annually in 1000; while the more accurate records of the present century give us only 24 in the corresponding number. But London, with its open spaces and complete system of drainage, is one of the healthiest cities in Europe, and ranks next to England, as a whole, including country and town, in its comparatively small death-rate. In Manchester and in Liverpool, two cities which approach most in magnitude to London, the death-rate, as calculated by Dr. Farr for the ten years 1861–70. amounted for males alone in the former city to 35, and in the latter to 40 per 1000 living; while in females it numbered in Manchester 30, and in Liverpool 36 per 1000. In 51 healthy districts, exclusive of towns, the average annual mortality taken over the same period was 17 per 1000 for males, and 16 for females; and ranging over the entire population between these extremes, Dr. Farr presents us with the following table calculated over a period of 34 years (1838–71), which gives the arithmetical mean of the several rates at different epochs of life. The figures of course represent the deaths in 1000 living:—

	Males.	Females.
All ages, . . .	23	21
Under 5 years, . .	72	62
From 5 to 10, . .	8·7	8·5
,, 10 ,, 15, . .	5	5
,, 15 ,, 25, . .	8	8
,, 25 ,, 35, . .	10	10
,, 35 ,, 45, . .	13	12
,, 45 ,, 55, . .	18	15
,, 55 ,, 65, . .	32	28
,, 65 ,, 75, . .	67	58
,, 75 ,, 85, . .	147	134
,, 85 ,, 95, . .	305	279
,, 95 and upwards,	441	430

From this table it may be inferred, that life is at its best between the ages of ten and fifteen, after it has escaped the perils of childhood, and that its prospects darken with increasing years. It also shows unmistakably the advantage which the female possesses over the male with regard to life expectancy, and gives a clue to the reason why so many more male children should be born into the world than females.

The causes which affect life—which influ-

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ence its mortality, are referred to in detail throughout the work, though broadly they may be stated to consist of two factors—(1) such as we cannot control, the effects of growth and decay, and local ailments; and (2) such as are contributed by our surroundings, and which are very much under our power to avoid. To the latter category belong the air, water, and food we consume, the dwellings we inhabit, the clothes we wear, and the occupations we follow. Perhaps no fact is more clearly brought to light in the Registrar's statistics, than the influence of locality combined with density of population in shortening life; healthy districts, whether in town or country, contain but few people to the acreage, and the most unhealthy are crowded with occupants. In the case of London, which is divided by the Registrar into numerous districts, the highest mortality (amounting to 30 per 1000) is to be found in the populous parishes of Whitechapel and St. George's in the East, and the smallest (16) in the less frequented district of Hampstead; and the same principle will be found to obtain in subdivisions of large towns and rural districts throughout the country.

In one of the Registrar-General's Reports, two districts are compared with each other, one of twenty-five towns, another of seven counties. "The number of deaths in the former, from all causes whatever, was 51,492, while in the country districts it was 33,039. Yet out of this smaller number, the deaths from old age amounted to 4699; while out of the much larger amount of deaths in the town districts, the number that had survived causes of premature disease, to die of old age, was only 3525. In round numbers, a seventh part of the country population has thus been allowed to run the natural course of their days, while only a twelfth of the town population have had the same good fortune to avoid the snares which disease and accident have laid for them. The following tables from a Sanitary Report of Mr. Chadwick, show the different values of life in the *different classes* of people in the same districts:—

WHITECHAPEL UNION.

No. of Deaths.		Average Age of Deceased.
37	Gentlemen and persons engaged in the professions, and their families, . .	45 years.
387	Tradesmen and their families,	27 ,,
1762	Mechanics, servants, and labourers, and their families,	22 ,,

STRAND UNION.

86	Gentry and persons engaged in professions, and their families, ...	43 ,,
221	Tradesmen and their families,	33 ,,
674	Mechanics, servants, and labourers, and families, .	24 ,,

KENDAL UNION.

No. of Deaths.		Average Age of Deceased.
52	Gentlemen and persons engaged in professions, and their families, . . .	45 years.
128	Tradesmen and their families,	39 ,,
413	Operatives, servants, labourers, and families, . .	34 ,,

"We here find that in some communities—such as Whitechapel Union—there will be differences so great between the average duration of life in the different classes, that those born in the large house of the professional man, or independent gentleman, live rather more than twice as long as those born in the crowded houses of the small alleys which ramify hither and thither round it. It is a melancholy truth, resting on evidence only too strongly overwhelming, that the lives of the poorer classes, who inhabit the crowded districts of large towns, are liable to be shortened by a variety of causes."

And yet these things need not be; there is no possible reason why the duration of life in a district in which it is low, should not be greatly raised—the amount in some degree of course depending upon the nature of the district. Neither is there any reason why the standard should not be elevated in every district. That such will be the case at some future day there can be little doubt; nor is it unreasonable to suppose, that there is yet a "good time coming," in which the value and duration of life will be extended greatly beyond what it is at present—greatly beyond perhaps what we at present can foresee—when science and a wise legislation have corrected the errors and utilised the experience of an advanced civilisation; when sources of disease from without are removed, and when man has learned that health is better than great riches, and has ceased to sacrifice his own, or that of his dependants, at the shrine of mammon.

LIFE-ASSURANCE.—The security of a sum of money to the family or to the survivors of an individual whose death involves loss or diminution of income to those survivors, may become an important consideration, when the chances of death or recovery in severe illness are nearly balanced—when the tranquillity or disturbance of the mind, may make that balance incline to the one or to the other side. The racking thought of a wife and family left without provision, may drive away *the* sleep that would precede amendment—may give the last jar to the sinking nervous system. In this remedial point of view only, can this important subject be alluded to here, although the necessity of life-assurance on the part of those who have not had the opportunity of making a suitable provision for their families, or who are exposed to much personal risk from

their employment, cannot be too strongly inculcated.

LIFTING CHILDREN is a subject on which a few words are highly requisite. It is really surprising to see in what a cruel and dangerous manner children are often lifted about, not only by their nurses, but by their mothers; and the evil results are very commonly brought before medical men, in the shape of sprains, separations of "epiphyses" (see *Epiphysis*), dislocations, and even fractures. When a heavy child is perhaps seized by the hand or arm, and swung over a gutter, or the like, the wonder is, not when injury results, but that it does not always result, from the practice. Among boys, and even by those who are old enough to know better, there is a trick of lifting children or boys, by the hands placed under the chin and at the back of the head: this is most dangerous—dislocation of the neck, with instant death, has been the result.

LIGAMENTS are white glistening bands

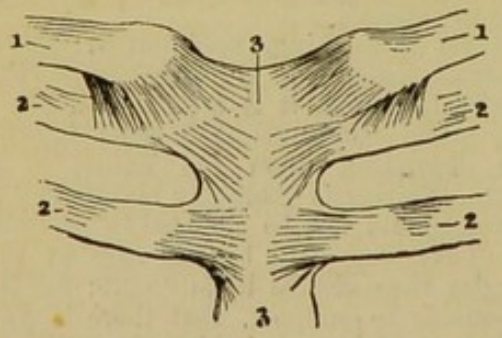


Fig. 148.

of inelastic fibrous tissue, which retain the different bones in position at their points of junction. There is also a yellow fibrous tissue,

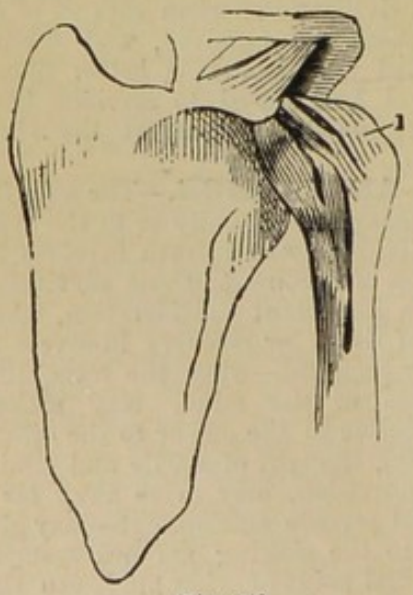


Fig. 149.

which in some places is called a ligament, but which is extremely elastic.

It would answer no good purpose here to enter into a detailed account of the ligaments. The example (fig. 148) which represents the ligaments which bind the collar bones (1, 1) and upper ribs (2, 2) to the breast-bone (3), and the example (fig. 149) which exhibits the "capsular ligament" (1) which invests and connects the bones at the shoulder-joint, will sufficiently illustrate the use and position of these connecting media.

In their ordinary condition, the ligaments are not very sensitive; but when, in consequence of a strain of the joint, or *Sprain*, they are over-stretched, they become acutely so.

LIGHT.—"The prime work of God."—We know that the great source of light is the sun, and that we have sources of artificial light. We know that it is light by which we are enabled to take cognisance of the colour, size, shape, and position of various bodies, we know that this light is subject to laws which it is in our power to trace; but we cannot frame a definition of the agent itself. To enter into a consideration of the optical properties of light would be out of place here; its effects as a stimulant on animal life and development are extremely important. The stimulant action of light not being of such obvious universal necessity to vital action as that of heat; nor its effects and influence so prominently marked, its full power as an excitant upon animal and vegetable life has not been, until lately, sufficiently well recognised, although every day it is becoming more so. The effect of the deprivation of the stimulus of light in producing blanching, or etiolation, in vegetables, has long been practically applied, and the effect of the absence or diminution of the stimulus on animal development and health is now so fully recognised, that in all public buildings, such as hospitals, schools, barracks, &c., a considerable amount of window space is considered absolutely essential on at least two aspects of a building. Dr. Edwards, whose experiments upon the influence of light are well known, has remarked, that persons who live in abodes excluded from the free access of light, are apt to produce deformed children. It has been stated on the best authority, that the cases of disease on the dark side of extensive barracks at St. Petersburg, have been uniformly for many years in the proportion of three to one to those occurring on the side exposed to strong light. Humboldt has attributed the absence of deformity among the Caribs, Mexicans, Peruvians, &c., to constant exposure of the body at large to strong light. It is now, therefore, a received fact, that a free supply of light is almost as necessary to health as fresh air or pure water; it is, too, a fact, which should not be lost sight of with respect to the laying out of dwellings, as dark dwellings are favourable to the growth of scrofula, consumption, and rickets. The powerful stimulant action of light upon the eye is evinced by the fact, that strangers in the Arctic regions are liable to suffer from inflammation of that organ produced by the glare of reflected

light from the snow, and that from the same cause the natives of those regions suffer from snow blindness. A similar inconvenience is felt by Alpine tourists, who provide against it by wearing smoke-tinted spectacles. Light, however, exerts different effects according to its colour; as is well-known, bright white, yellow, or red lights are much more apt to injure the eye than those of a blue or green tinge; when, therefore, persons find exposure to the former coloured lights injure the sight, it is usual to protect the eye by the use of glasses of a bluish or smoke-coloured shade.

Refer to *Amaurosis—Blindness—Eye, &c.*

LIGHTNING.—Injury or death from lightning, appears principally inflicted through the nervous system; although, at the same time, scorching wounds are not unfrequently produced. Persons who are stunned, but not killed, by lightning, generally suffer from temporary blindness and remain in a state of insensibility for some time, the breathing being slow and deep, the muscular system relaxed. In such cases it will be proper to use means for preserving the animal warmth, which has a tendency to become diminished, to keep up artificial respiration, as recommended under article *Drowning*, to use mustard plasters to the spine and pit of the stomach, to administer, from time to time, a little sal volatile in water, if the patient can swallow; if not, to give a warm enema containing half an ounce of turpentine—or to use such other means as are recommended under the articles *Drowning* and *Carbonic Acid*, which may seem best adapted to the case. It is a common idea that persons who have been killed by lightning do not stiffen, and that the blood remains fluid: it is erroneous. It would, considering how often the fact is reiterated, seem almost superfluous to point out the ordinary precautions which those who chance to be exposed to a storm of thunder and lightning ought to adopt; but not a summer passes without lives being lost from sheer ignorance. Harvest labourers and others *will* persist in sheltering under trees, people *will* continue to put up, even iron umbrellas in the midst of a thunder storm, and mowers walk unconcernedly home with their scythes over their shoulders. If an individual is overtaken by a thunder storm in a place where trees abound, he should avoid them as much as possible, and keep to the open field, a thorough soaking will be rather a protection than otherwise. If, on the contrary, the position is on a moor or wide plain, where the body is the highest object, lying down is the safest procedure. In any case, metallic objects, such as agricultural implements, should be laid aside and avoided. Under shelter, the most hazardous position appears to be in a draught or current of air, such as between a door and window, this seeming to exert considerable influence upon the course of the electric fluid

LIME is one of the alkaline earths, formed by the union of oxygen gas with the metal or metallic base calcium; in its various forms of carbonate, such as marble, chalk, limestone rock, &c., it is very widely distributed over the globe. Quicklime is formed by expelling the carbonic acid from one of these carbonates, by means of heat. Its appearance, when freshly burnt, is familiar to all; it quickly, however, changes, if freely exposed to air and moisture, attracting both carbonic acid—for which it has a strong affinity—and water, and being again converted into a carbonate of lime.

Lime is used in medicine in its pure form; it is used as a carbonate in the form of chalk (see *Chalk*), as chloride of lime (see *Chlorine*), &c. Pure lime is given in the form of lime water; this is made by putting some freshly-burned and newly-slaked lime into a bottle, and filling to the top with water, agitating slightly; when the lime subsides, it leaves the water above perfectly transparent, and holding a certain amount of lime in solution. When any of the lime water thus formed is withdrawn for use, all that is necessary is, to fill up quite to the top again with fresh water, giving the bottle a shake, and to *cork tightly*. This may be repeated for a considerable time before the lime requires renewal. Lime water is used as an antacid by some individuals, even habitually. It is taken in doses of from half an ounce to three ounces, generally in, or along with, milk, which it renders lighter, and more likely to agree with the stomach, whilst the milk covers the somewhat acrid taste of the lime. Carrara water, an effervescing beverage, which contains rather more lime than ordinary lime water, is a pleasant form of administering the medicine. Equal parts of lime water and olive or linseed oil form the well-known carron oil, so much used for burns. If lime water is exposed to the atmosphere, a pellicle forms on its surface, and it quickly becomes turbid, from attracting carbonic acid, the carbonate thus formed being less soluble than the lime itself. The same thing will be seen to take place more quickly if an individual blows through some lime water in a glass, by means of a quill, the water at once becomes turbid, demonstrating, at the same time, the presence of carbonic acid in the breath. If, however, the experiment is persisted in for some time longer, the water again becomes transparent, in consequence of the additional amount of carbonic acid redissolving the carbonate of lime, and making it a bicarbonate. Dr. Angus Smith's "ready method" of detecting an excess of carbonic acid in the atmosphere of a room, is by testing it with lime water. Half an ounce of lime water is poured into a dry, wide-mouthed bottle of ten and a half ounces in capacity, and afterwards corked, and the test solution shaken up with the air. Should the carbonic acid be in excess of the healthy standard—that is, should it exceed six parts

in one thousand of air, the lime water will become muddy and precipitate carbonate of lime on standing. In many hard waters, lime exists in solution, in the form of bicarbonate of lime (see *Water*). The property possessed by quicklime of absorbing carbonic acid, renders it valuable in cases where, such as in old wells, this noxious gas exists and requires removal (see *Carbonic acid—Bed-room*). Burns from lime are not uncommon; in such cases the best application is vinegar and water, or some other acid, if vinegar is not at hand—freely applied; the acid in this case converting the caustic lime into a harmless substance. The same treatment is to be pursued in the event of lime getting into the eye, the vinegar or acid being of course more largely diluted than when used to other parts. In any of these cases, the after-consequences, such as ulceration of the skin, or inflammation of the eye, must be treated as recommended in burns generally.—See also *Eye*.

LINCTUS.—Medicine made into a thick syrupy consistence. The form of linctus is not often prescribed in the present day unless in hospitals, where an opiate linctus is generally kept ready made, for ordinary coughs. A good opiate linctus may be made with ten minims of tincture of opium, the same amount of dilute sulphuric acid, six drachms of treacle and two drachms of water. Mix the treacle with the water, then add the acid and tincture. Dose from one to two tea-spoonfuls.

LINIMENT—an embrocation.—See *Embrocation*.

LINSEED, or **LINTSEED.**—The seed of the *Linum usitatissimum*, or common flax, contains a fixed oil, well-known by its name of linseed oil, which is procured from the seeds by pressure; the seeds also yield, when boiled, or infused in boiling water, a thick, almost tasteless, mucilage. Linseed oil was formerly more employed in medicine than it is at present, its chief use now being in the formation of the carron oil, used by some in the treatment of burns. This is made by agitating together equal parts of lime water and linseed oil (see *Burns*). The infusion of linseed, or "linseed tea," may be made in the proportion of half an ounce of the seed to a pint of boiling water. The pharmaceutical instructions are 160 grains of the seed, sixty grains of fresh liquorice sliced, and ten ounces of boiling water (see *Infusion*). It is a cheap and very good demulcent remedy in coughs, and in irritation of the urinary organs. The meal of linseed is made by grinding the seeds, after the oil has been expressed from them; it is chiefly used for poultices.—See *Poultice*.

LINT, formerly made of old linen cloth scraped to give it a soft woolly surface, was afterwards manufactured on purpose, of new material, and of good width and length, instead of the bits and scraps in which it used to be sold. Lint made of cotton is now almost universally used, on account of its cheapness, and is found to be equally serviceable with lint made from flax or old linen (see *Dressing*). Taylor's flax lint is thicker and more spongy than the other sorts, and, therefore, more suited for some purposes; it does not tear well, which is a disadvantage.

LIP.—The lips owe their colour to their extreme vascularity, and to the thinness of the skin by which they are covered, and their sensitiveness to an abundant supply of nerves.

The colour of the lips is closely connected with that of the blood, and also depends upon the vigour of its circulation. When the blood is poor and deficient in red globules (see *Anæmia*), the lips become pale; when, again, from failure of the heart's action, as in fainting, the blood is not circulated properly, the lips also become pale; when, from disease, the blood does not undergo its proper changes, the colour of the lips, instead of being red, inclines more or less to purple. The lips—particularly the lower—are apt to become the seat of cancer in old people; especially, it is said, in those who have smoked much from a *short* pipe. A continued sore upon the lip that will not heal, in an old person, should be examined by a medical man; if it is such as to require removal, this cannot be done too soon.

Refer to—*Hare lip—Skin*.

LIQUORICE and **LIQUORICE ROOT.**—Liquorice root, which is long and creeping, is procured from a plant belonging to the leguminous, or pod-bearing tribe, a native, chiefly of Spain and of southern Europe, but cultivated in England. The extract of the root, known as hard "extract of liquorice," or "black sugar," or "Spanish juice," is used chiefly as a demulcent remedy in coughs and irritation of the throat, in irritation of the stomach and bowels, and of the urinary organs. Many persons take it largely, and find it useful, in heart-burn. It does not disorder the stomach, or cause thirst, like common sugar, even when used in considerable quantity. The extract is also employed to cover the taste of nauseous drugs, such as aloes, &c., and is added to demulcent drinks generally. It also forms the basis for various kinds of lozenge.

A soft extract of liquorice is used by druggists in the composition of pills, and the powder of the root is used for the same purpose.

LIQUORS.—See ALCOHOL—STIMULANTS, &c.

LITHARGE is an oxide of lead, which occurs in the form of reddish-white scales. It is sometimes used to adulterate wine.—See *Lead*.

LITHIA is much used in medicine as a remedy for gout. It is also a good diuretic, promoting the elimination of urate of soda from the blood. In gravel and renal calculus depending on uric acid deposit, its solvent powers are often of great service. The officinal preparations of lithia are the carbonate and the citrate. the dose of the former is from three to

six grains, and of the latter from five to ten grains. There is also an effervescing solution of lithia containing ten grains of the carbonate to a pint of water, with carbonic acid added to it under pressure.

LITHONTRIPTIC—an old term applied to medicines which were supposed to possess the power of dissolving or disintegrating urinary calculi.

Refer to—*Urine.*

LITHOTOMY.—The operation of cutting for the stone.

LIVER.—The liver is the largest gland in the body, weighing, on the average, in man, about four pounds; it occupies the upper part of the abdomen (see *Abdomen*) just beneath the diaphragm or midriff, to which it is attached, or, as it were, slung, by what are called the ligaments of the liver. By anatomists the liver is divided into various "lobes;" but here it is sufficient to point out the general division into a larger, or right lobe (fig. 150—1) and a smaller, or left lobe (2) the former occupying the right *hypochondrium*, the

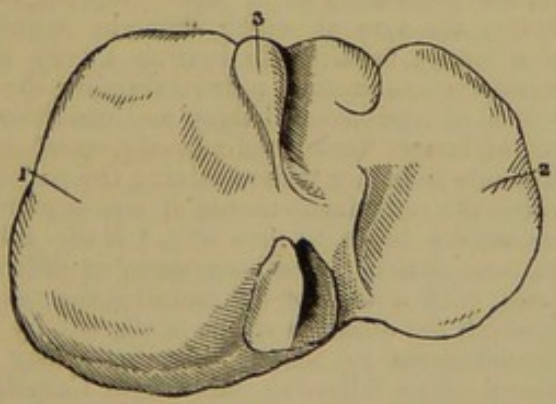


Fig. 150.

latter extending far into the left. The gall-bladder (3) is seen occupying the fore part of the under side of the right lobe of the liver, in which aspect it is represented in the cut. The liver is made up of numbers of minute lobules, about the size of a millet seed, which are composed of the smallest or "capillary" branches of the blood-vessels, of the cells which separate a substance called "glycogen," a kind of liver starch, as well as bile, from the blood, and of the ducts which convey the secreted bile into the larger common ducts; these converge to the one main duct of the liver, through which the bile flows, either into the gall-bladder, or into the digestive canal, direct. The liver starch, which is stored up in the cells, and the bile are manufactured from the blood which has circulated through the organs within the abdomen, and which passes through the liver on its way back to the heart; in this passage these substances are separated from it, thereby elaborating the starchy and saccharine elements of food absorbed by the circulation, and affording a secretion which performs an important part in the processes of digestion, and possibly in the body at large. This intimate connexion, however, of the liver, by means of the blood, with the other organs within the abdomen, and particularly within the stomach, renders it extremely liable to be disordered; and, indeed, there are few cases of disorder of the stomach or bowels in which the liver is not in some degree implicated, either primarily or secondarily. Probably, in no way is the connection between the stomach and liver more strongly manifested, than by the manner in which the latter is affected by the inordinate use of alcoholic liquors; in this case, the spirit being absorbed directly from the stomach by the veins, and conveyed directly to the liver, acts very powerfully upon it, particularly if the form in which the alcohol is taken be that of pure spirit, such as gin or brandy; in this case, if the use of the spirit be persevered in, a low form of inflammation is excited in the substance of the gland, which ends in the formation of what has got the name of the "gin-drinker's liver"—a disease, indeed of which the only traceable cause is the excessive use of spirituous liquors, and which proves fatal to many in this kingdom annually. Its symptoms and treatment could not profitably be laid before unprofessional persons, but its cause should be impressed on all. In its advanced stages, it generally causes dropsical swelling of the lower extremities, and of the abdomen.

Inflammation of the liver is attended by the usual feverish symptoms which accompany inflammation of internal organs generally, and must be managed on the same principles (see *Inflammation*) until proper advice can be obtained. The pain varies considerably in this affection, being usually very acute when the surface of the liver, with its covering membrane, is implicated, but less so, or of a duller character, when the substance of the gland is the part involved. As is the case in liver affections generally, pain is often felt somewhere about the shoulder blades, most frequently in the right, but sometimes in the left, or between them, extending even to the back of the head. Inflammation of the liver is much more frequent in warm climates than it is in this country; and, in the former, is very apt to end in the formation of abscess. The disease, of course, requires the most active treatment of a medical man; but it should be known to those going to a hot climate (see *Climate*) that this, like other liver diseases, is much more likely to attack the free-living than the temperate man. For further information respecting liver-disorder, the reader is referred to articles, *Biliary Disorder*, *Climate*, *Gall-Stone*, *Jaundice*, &c.

LOBELIA, or "LOBELIA INFLATA," is a plant native to, and very commonly found in North America. It was one of the medicines

of the Indians. It has been used by medical men in England as a remedy in asthma, and, in some instances, proves of service; but this is generally the case when its emetic action has been exhibited. It is not a remedy, however, for unprofessional hands; for it may prove a powerful irritant poison. Lobelia has acquired notoriety in consequence of its being the medicine of a set of quacks, in whose hands it has, in more than one instance, produced fatal effects, and been the means of subjecting them to legal proceedings and punishment. The dose of the two preparations of lobelia, the alcoholic, and the ethereal tincture, is from ten to thirty minims. Its action is somewhat similar to that of tobacco.

LOBSTER, like most shell-fish, is unfit for persons of weak digestion.

Refer to—*Fish.*

LOCHIA.—The "cleansings" after delivery.

LOCK JAW is the popular name for a severe disease of almost invariably fatal character, known to medical men as *Tetanus*, in which not only the muscles of the jaws, but the muscles of the body throughout, are, more or less, extensively thrown into violent spasm, so strong indeed, that the teeth or bones are said to have been broken by it. The set of muscles most generally affected, after those of the jaws, are those of the back; the patient, by the spasm, is sometimes bent like an arch, so that often the back of the head and the lower limbs alone touch the bed, occasionally, however, the body is bent forward. Similar convulsions arise from strychnia poisoning. The disease most frequently commences with a sensation of stiffness and soreness of the muscles of the neck and jaws; the latter become fixed, and the spasm extends more or less over the body. It is needless to add, that this extensive cramp is attended with the most severe pain, which is also, in most cases, experienced severely about the pit of the stomach, being dependent, doubtless, on spasm of the diaphragm.

The most usual exciting causes of lockjaw, or tetanus, are punctured wounds, especially of the hands or feet, but the very slightest injury is sufficient to develop the disease. In this climate, however, it is fortunately comparatively rare; in warm climates it is common; it is also liable to prevail among the wounded after battles, if exposed to much vicissitude of weather; indeed, cold will occasionally give rise to lockjaw independent of injury. When lockjaw arises from a wound, it shows itself in from four days to three weeks after the injury. It is a very fatal disease, the greater proportion of those affected by it dying; some, however, recover. Of course, as soon as practicable, a medical man should be called to a case exhibiting even the slightest tendency to lockjaw after an injury; in the meantime, large doses of opium in the *liquid* forms of laudanum, or of sedative solution, may be administered, even by unprofessional persons; they *may* mitigate the sufferings of this dreadful disease. From thirty to sixty drops of laudanum may be given by the mouth, or what is better, morphia may be administered by subcutaneous injection, and repeated at intervals. No definite success has attended the numerous remedies which have been suggested and tried from time to time in tetanus, although much relief to the spasms has been obtained by sedatives and antispasmodics, especially by the inhalation of ether and chloroform at intervals. In addition, the application of ice-bags to the spine has frequently a calmative effect.

It is caused by a bacillus which obtains entrance into the blood through the wound; and an antitoxin has been prepared for subcutaneous injection, the early use of which has been in some cases followed by recovery; if obtainable it should always be used as early as possible, the strength being at the same time maintained by nutrient enemas.

Refer to—*Convulsion—Wounds, &c.*

LOINS.—See LUMBAR.

LONGEVITY.—Prolonged life, it is well-known popularly, is, in some respects, hereditary, the ages at which different members of a family usually die bearing a very near average to one another, notwithstanding the influence of occupation, habits, and condition of life, although these, undoubtedly, exert considerable influence in determining the period at which the component tissues of one or more of the organs begin to give way. Many tables and calculations have been made at different times, with a view of determining the extent to which the duration of life is affected, by the circumstances in which individuals may be placed. The following table from Casper, of Berlin, if it may not exactly apply to this country, shows, at all events, how greatly the average duration of life may vary in different classes:—

Of 100 Theologians, there have attained the age of 70 and upwards,		42
,,	Agriculturists and foresters, .	40
,,	Superintendents, . . .	35
,,	Commercial and industrious men,	35
,,	Military men, . . .	32
,,	Subalterns, ...	32
,,	Advocates, ...	29
,,	Artists, ...	28
,,	Teachers and professors, .	27
,,	Physicians, ...	24

Another table, by a different observer, exhibits the difference of locality, as follows: the observations were taken from a French department:—

	Inhabitants to one death annually.
Mountain parishes, . .	38·3
Sea-side, ...	26·6
Corn districts, . . .	24·6
Stagnant and marsh districts,	20·3

A table of the probabilities of longevity at various ages, applicable to the population of this country, is drawn up by Mr. Neison; from it we gather that the expectation is greater in rural districts than in towns and cities, and less in cities than in towns in the following proportions:—

Age.	Rural.	Town.	City.
10	53·05	50·74	42·63
20	44·99	42·75	34·58
30	37·78	35·03	28·63
40	30·30	27·64	22·64
50	22·89	20·74	17·38
60	16·61	13·12	13·33
70	10·65	9·13	8·76
80	5·65	5·43	4·81
90	3·22	2·76	2·35
100	·50	·50	·50

Refer to—*Age—Old Age—Life, &c.*

LONGING is the term applied to the almost morbid craving for certain articles of diet, with which some females *indulge* themselves during pregnancy; it is probably a phase of hysteria. Under the circumstances, it is only right and humane to yield to those fancies in some measure; but when there is any real or adequate reason for their being debarred, it may be insisted upon, without the risk of the consequences popularly supposed to follow.

LOSS OF BLOOD.—See HÆMORRHAGE.

LOTIONS are liquid applications, principally composed of water, used either to the skin to wounds, or to the mucous surfaces, such as the inside of the mouth or of the nostrils. The variety of lotions, from plain water—which is often a most excellent one—to numerous medicated solutions, is very great. Lotions may be classed as (1) Cooling; (2) Stimulating; (3) Astringent; (4) Soothing; (5) Sedative; and (6) Antiseptic. Of the first, water is an example, either alone, combined with spirit, from half an ounce to an ounce to the half pint, or combined with vinegar. The lead lotion (see *Lead*) is another example of the cooling lotion, but in this case it is astringent at the same time. Water, with one-third or one-half spirit of wine, applied to the skin by means of lint, which is covered to prevent evaporation, is a good example of a stimulating lotion. Very cold water, the lotion of sulphate of zinc or white vitriol, in the proportion of from one to ten grains to the ounce of water, and other astringents in solution (see *Astringents*) form the astringent lotions; the various preparations of opium, decoction of poppies, decoction of hemlock, &c., are soothing lotions; the prussic acid lotion, a sedative one. Antiseptic lotions are composed of solutions of carbolic acid, chlorinated lime or soda, boracic acid, iodine, &c.

The reader is referred to the various articles, such as *Lead, Zinc*, &c.

LOW DIET must necessarily be a comparative term, influenced by the previous habits of the patient, but generally it means the absence of all stimulants and animal food from the allowances, also of eggs, and generally a diminished amount of bread nourishment. Weak tea, bread, diluted milk, cocoa, gruel, arrow-root, sago, and such like preparations, generally constitute the staple of low diet in this country; to these, however, the cooling fruits may frequently be added. Half diet includes the above with the addition of puddings of milk and eggs, of broth, and it may be of a small allowance of meat.—See *Abstinence—Fasting—Hunger—Dietaries.*

LOZENGE—a hard compound of sugar and gum, which contains either simple flavouring, or some medicinal agent. The system of giving medicine in the lozenge form, has come into more general use since various medicated troches or lozenges have been admitted into the British Pharmacopœia. There are ten such preparations, each containing a definite amount of active ingredients, namely, tannic acid, bismuth, catechu, reduced iron, ipecacuanha, morphia, morphia with ipecacuanha, opium, chlorate of potash, and bicarbonate of soda, lozenges. The lozenge form of administration is a useful and agreeable method, particularly in affections of the throat, such as relaxation, when it is desirable to apply the medicinal agent gradually. In children, the lozenge form of medicine is useful, either for the administration of ipecacuanha domestically, or of morphia under medical sanction. The manufacture of medicated lozenges is now almost entirely transferred to the pharmaceutist, who, guided by the directions of the pharmacopœia, has the amount of the ingredients stamped on each lozenge. Lozenges are sometimes adulterated with what is called "mineral white," in other words, plaster of Paris: it cannot be regarded as a harmless addition.

LUMBAGO is rheumatism of the large muscles of the back, and, like rheumatic affections generally, is often extremely painful, the pain being increased by stooping, and again when the person attempts to rise. This peculiar aggravation of the pain by these movements, is generally stated to be the distinction between this disease and painful affections of the kidney. In lumbago, relief is afforded by hot moist applications to the back (see *Heat*) continued from twelve to twenty-four hours at a time, and followed by the soap liniment combined with one-sixth part of turpentine, rubbed well into the back and loins. Ten grains of Dover's powder, with a couple of grains of calomel, given at bedtime, and followed in the morning by a dose of castor oil or infusion of senna, will expedite the cure. Whilst the person is confined to bed, nothing is better than the old women's plan of putting several folds

of flannel over the back and applying a smoothing iron as hot as it can be borne,—"ironing the back,"—and, at the same time, it will be advisable to give warm diluent drinks tolerably freely. In a severe or obstinate case of lumbago, a fly blister is often of service, or a liniment composed of equal parts of chloroform and laudanum rubbed over the loins. In such cases, however, the safest plan is to have medical attendance if possible. Should the urine be scanty or high-coloured, ten grains of carbonate of potash, with a tea-spoonful of sweet nitre, may be taken in a wine-glassful of water twice a day, with advantage. Persons liable to attacks of lumbago, should wear a flannel belt round the loins.

Refer to—*Rheumatism.*

LUMBAR.—Belonging to the loins. The term is frequently used in connection with abscess. In children of weak and scrofulous constitution, abscess in the loins, or "lumbar abscess," is apt to occur, and is often connected with disease of the vertebræ, or bones of the spine. Continued complaint of pain in the back, with any awkwardness in walking, particularly if accompanied with failure of the general health, should awaken suspicion, and give occasion for the child's being examined by a surgeon. Lumbar abscess may also occur in adults and is always a very serious disease.

LUMBRICUS—a worm. Applied to the large round worms which occur in the intestines.—See *Worms.*

LUNACY.—See INSANITY.

LUNAR-CAUSTIC.—NITRATE OF SILVER.—See *Silver.*

LUNCHEON—a kind of intermediate meal, and therefore sometimes an unnecessary one. The English labourer as well as most domestic servants have their "lunch" between breakfast and dinner, generally between ten and eleven oclock A.M.: the English of the higher classes, particularly if their time is not well occupied, are apt to make luncheon a kind of dinner—a meal of animal food and stimulants, which, if superadded to dinner, is certainly unnecessary, and therefore productive of disorder. Either the luncheon should be made a *bonâ fide* dinner at an early hour, or it should be a meal without animal food—provided, of course, that an additional amount of animal nutriment is not considered necessary by a medical man, as a remedial measure. Fruit is generally more wholesome at luncheon than at any other part of the day.

LUNGS.—The organs of respiration. The lungs are two organs, each occupying its own side of the chest (see illustration, fig 151, which represents the left lung and air-tubes of the right), the left being rather the smallest, on account of the greater space taken up by the heart on the left side. The latter organ is situated in the space between the two lungs, which are separated from one another by a middle partition. Air passes into the lungs by means of the windpipe, or trachea, to the top of which is fixed the larynx, or organ of voice; at its lower extremity the trachea divides into two branches, or bronchi, of unequal length, one for each lung; these bronchi on entering the lung subdivide into branches, and these again into still smaller tubes, until after continued division and subdivision, they end in the air-cells. These air-cells are minute membranous cavities, on the membranous walls of which the blood circulates in a network of veins, in such a manner as to be brought into intimate contact with the air which is drawn into the lungs at each

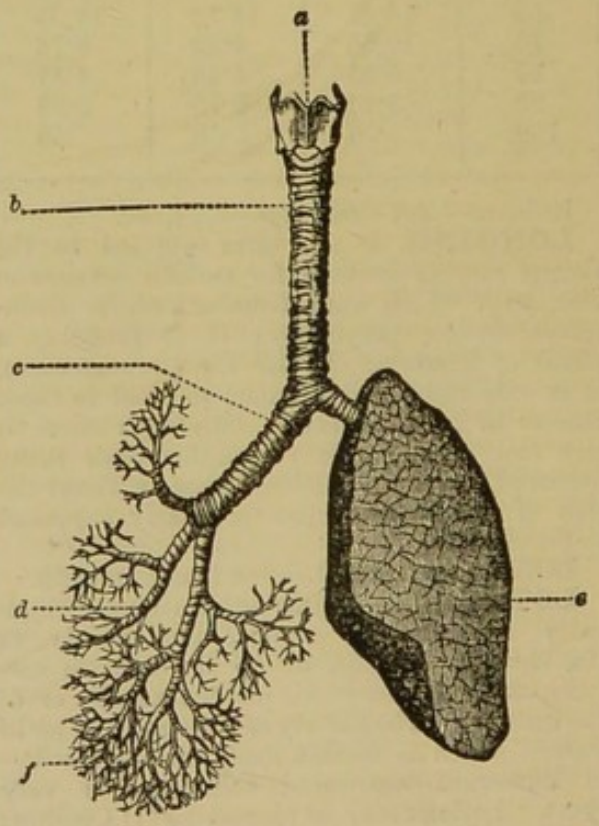


Fig. 151.

a. Larynx.
b. Trachea.
c. Right Bronchus.
d. Bronchial Tube.
e. Left Lung.
f. Ultimate Bronchial Tubes.

inspiration; nothing, indeed, intervening between the blood in the veins and the air-cells, but a membrane so thin that it allows the transpiration of the gases and vapour, which takes place as the blood becomes purified by means of this air contact. In consequence of their structure being adapted for the admission of air into numberless minute cells, the lungs feel spongy when pressed between the fingers. Those who are curious on the point will learn more from five minutes' examination of the lungs and windpipe of a sheep or calf in a butcher's shop, than from any description. In these, however, the mode of death, by bleeding, gives the lungs a much paler colour than their natural one. The tubes, the air-

cells, the blood-vessels, &c., of the lungs are held together by "cellular" tissue, and the entire organ is enveloped by a membrane—the "pleura"—which covers its surface, and is thence "reflected" to cover the inner surface of the walls of the chest; in this way forming a shut pouch, or sac, the inner surfaces of which are in contact, and these being in the healthy state perfectly smooth, and moistened with a lubricating fluid, glide over each other in every movement of the chest and lungs. The trachea, and the bronchi at first, are composed of incomplete "rings" of cartilage, connected together by an elastic tissue; the former tube—the windpipe—as generally known, occupying the fore part of the neck, and lying in front of the gullet.—See *Neck*.

The larynx, or organ of voice, which is placed on the top of the windpipe, extends to the root of the tongue; its situation is often strongly marked in thin men, especially if somewhat advanced in life, when it forms the prominence popularly called "Adam's apple." This prominence is caused by a cartilage which forms a main portion of the body, or box, of the larynx. Into the comformation of this wonderful instrument of articulate and vocal sound, various other cartilages, ligaments, muscles, &c., enter, and the whole is lined by a continuation of the mucous membrane of the mouth, which, after passing through the larynx, lines the trachea, or windpipe, and follows the branchings of the bronchi. The opening of the larynx is divided by a constriction of a triangular form—the glottis—and is protected from injury by a heart-shaped cartilage—the epiglottis—which, especially in the act of swallowing, when the larynx is drawn upwards, completely closes the opening.—See *Throat*.

From the above slight sketch, the general reader may derive some idea of the important organs of respiration. To recapitulate: situated at the root of the tongue, and protected from injury by the cartilage of the epiglottis, is the larynx, constricted in the centre, and ending in the trachea, or windpipe, which, descending in front of the neck into the chest, divides into the right and left bronchi; these entering their respective lungs, divide and subdivide, till the minute branches enter the air-cells, on the thin walls of which the blood circulates in a network of veins, and undergoes purification by absorption of the oxygen of the atmosphere, whilst it frees itself from carbonic acid and watery vapour.

The act of respiration is partly involuntary—that is, goes on, as during sleep, independent of any exercise of the will; it is, however, as all know, capable of being, to a certain extent, controlled by the will; this being, doubtless, a necessary adjunct to the power of the utterance of sound. The process of respiration is essentially effected by means which enlarge the capacity of the chest: these means are the various muscles attached to the ribs, which, by elevating them, increase the diameter of the chest from before backwards (see *Chest*) and also the diaphragm and muscles of the abdomen, which, by their downward and outward motion increase the capacity of the chest from below. The enlargement of the chest by these agencies, either in combined or separate action, has the effect of causing the air to rush in, or to be sucked into the chest, as it is into a pair of bellows. If the cavity was empty, it would rush into *it;* as it is, it rushes into the spongy distensible lungs, and distends *them*, it may be, assisted in some degree by the action of the lungs themselves. The air having been thus drawn into the chest by an active movement, is immediately thereafter expelled by a comparatively passive one; the active muscular movement ceasing, the ribs descend, and regain their position, by their own weight and elasticity. The movements, however, both of inspiration and expiration, may be increased—"forced"—by the will; and in this case other muscles are called into action, and those usually employed in the process are more strongly exerted. It is the necessity for these forced efforts in the asthmatic, which, after frequent repetition, gives the peculiar curve of the shoulders so often observable. The average number of respirations in a minute varies from fifteen to twenty-two in different individuals, and even in the same individual at different times. The object gained by the process of respiration—that is, the change which takes place in the blood, in consequence of its exposure to atmospheric air in the lungs—has been sufficiently entered into in articles *Aeration*, *Blood*, *Circulation*, *&c.;* it is therefore unnecessary to repeat it here.

The passage of the air into and through the lungs, gives rise to certain definite sounds perceptible to the attentive ear applied closely to the outside of the chest. These sounds vary but slightly in healthy individuals; consequently, any deviation from them is indicative of disease, experience furnishing the link which enables the physician to pronounce upon the nature of the disorder, from the character of the sound, or from its entire absence, which latter condition occurs, either when the lung is rendered so solid by diseased action, that air cannot penetrate its tissues, or when it is condensed, pressed together, by the presence of fluid within the chest. Moreover, it is evident that organs like the lungs, which, in their natural healthy state, are distended with air, must, when the side of the cavity within which they are contained is struck, give out a somewhat hollow sound; but that, should the lung become solid, or the cavity more or less filled with water, the sound, instead of being hollow, will be dull or flat. It is further evident that the power of conducting sound must be altered by the various alterations in the structure of the lungs, and that the voice must sound differently to *the ear applied to the chest*, according

to these alterations. These brief observations will, perhaps, convey to the general reader, some idea of the means of judgment, and of the principles on which they depend, which the physician avails himself of, when he goes through the—to the unprofessional—somewhat mysterious-looking process of physical examination of, or "sounding," the chest.

The narrowness of the triangular chink in the larynx, through which the air passes, always renders disease of this organ a matter of anxiety and of danger, for that small opening cannot be obstructed for three or four minutes without death ensuing.

The LARYNX is liable to be obstructed from swelling of its lining membrane, either from inflammation or other cause, from spasmodic contraction of its muscles, or by foreign bodies accidentally introduced into it. It is also liable to ulceration. Acute inflammation of the larynx, or laryngitis, though comparatively an infrequent disease, is a very fatal one when it does occur.—See *Laryngitis.*

Closure of the larynx, or rather of its narrow portion, the glottis, may be the result of swelling, extending to it from the throat; partial chronic swelling, causing permanent, or at least continued, loss of voice, is not an unfrequent and not a dangerous affection, and tubercular ulceration of the larynx, also causing loss of voice, is characteristic of a common form of consumption.

Of the spasmodic affections of the larynx, that mentioned under the spasmodic croup of childhood, is perhaps the most characteristic, but the researches of Dr. Marshall Hall make it evident that in the nervous convulsive diseases, such as epilepsy, spasmodic closure of the larynx takes place, and that in aggravated cases, relief—by proper hands—may be given by the operation of opening the windpipe. When death does occur from any of the causes mentioned, it is by suffocation, or apnœa, just as if the person had been drowned or hanged; it may also take place in consequence of foreign bodies, or food, either getting wedged in the larynx itself, or in the gullet behind it, in which case, if of large size, they act by their mechanical bulk and compression. Foreign bodies are usually drawn into the larynx itself, in consequence of the person, often a child, laughing or crying whilst the substance or fluid is in the mouth. As all know, even the smallest crumb or drop of fluid getting into the larynx, or as it is popularly called, "going the wrong way," immediately (in consequence of the irritation of the extremely sensitive lining membrane of the organ) causes violent cough, and perhaps choking spasm; if the foreign body is large, those symptoms are severe in a corresponding degree, and may by their severity, prove the patient's safety, by expelling the offending substance. Should this not be effected, and if it is too large to pass through the larynx, death inevitably and quickly ensues; sometimes, however, the body passes through the larynx into the bronchi, as happened in the well-known instance of the half-sovereign in Mr. Brunel's case. When this occurs, the more severe suffocative symptoms subside, but irritating cough continues, with the constant risk of driving the foreign body back into the larynx. In such cases, unprofessional persons can do little or nothing, and unless proper surgical assistance is quickly procurable, there is much chance of a fatal termination; it would always be right, however, for some person to pass the forefinger as far back in the throat as possible, in the hope that the obstruction might be within reach; and also to adopt the remedies for choking laid down under article *Gullet.*

The various inflammatory affections of the air tubes, such as *Croup, Bronchitis, Catarrh, Influenza, Laryngitis, &c.*, are treated of under their separate heads; inflammation of the lungs falls under article *Inflammation;* and other diseases of the respiratory organs, such as *Consumption, Asthma, &c.*, are assigned to articles throughout the work.

Refer also to — *Aeration — Blood — Chest— Circulation, &c.*

LUPUS, the Latin name for a wolf, is used to denote a skin disease of an unusually destructive and inveterate type. There are two varieties of lupus, representing respectively the mild and the graver forms of the malady; in the milder form the eruption, which in nearly all cases is confined to the face, and especially to the nose, appears in red patches, raised slightly above the surface, which become encrusted, if left to themselves, with successive layers of scarf skin. The patches are composed of tubercular matter, and if they do not ulcerate, the skin between the patches becomes swollen and exhibits numerous red points. In the worst forms of lupus, sometimes known as "noli me tangere," the tubercles ulcerate, causing deep excoriations and cicatrices. The complaint, which is happily rare, is most likely to be met with among the poor, especially in such as are predisposed to scrofula. The treatment consists in attention to the general health, the administration of cod-liver oil, and tonics, combined with iodine or the arsenical solution. The local applications found most useful in the milder forms of lupus are the tar ointment, and the iodine ointment, or the tincture of iodine may be applied to the patches by means of a hair pencil; while the more serious skin affection must be treated with escharotics and caustics. It is scarcely necessary to add that professional aid should be sought when there is reason to suspect the existence of such a troublesome, and at times formidable, complaint.

LUXATION—a dislocation.—See *Dislocation.*

LYMPH.—The fluid contained within the lymphatic or absorbent vessels (see *Absorbents*)

The term is also applied to limpid exudations from the body, such as vaccine lymph, adhesive lymph, &c.

MACE.—The outer covering, or, in botanical language, the "arillus," of the nutmeg, and one of our pleasantest and most generally used spices, may when taken too largely, produce determination of blood to the head, and intellectual disturbance. The characteristic properties of mace depend upon an essential oil.

Refer to *Nutmeg.*

MADEIRA.—Of this much frequented and most important resort for invalids, Sir James Clark thus speaks:—"Madeira has been long held in high estimation for the mildness and equability of its climate; in which respect it will well bear comparison with the most favoured situations on the Continent of Europe."

Compared with the best of these: "It is warmer during the winter, and cooler during the summer; there is less difference between the temperature of the day and that of the night; between one season and another, and between successive days. It is almost exempt from keen, cold winds, and enjoys a general steadiness of weather to which the Continental climates are strangers. During the summer, the almost constant prevalence of north-easterly winds, especially on the north, and the regular sea and land breezes on the south side of the island, maintain the atmosphere in a temperate state. The sirocco, which occurs two or three times, at most, during the season, and then continues only for a few days (seldom more than three), sometimes raises the temperature in the shade to 90°. With this exception, the summer temperature is remarkably uniform—the thermometer rarely rising above 80°. The summer temperature averages 74° and the winter 64°. In consequence of the regular sea-breezes, the heat is not so oppressive as that of the summer in England often is. Close sultry days are little known in Madeira, and there is neither smoke nor dust to impair the purity of the atmosphere. Such, indeed, is the mildness of the summer at Madeira, that a physician, himself an invalid, who resided for some time on the island on account of his health, doubted whether this season was not more favourable to pulmonary invalids than the winter.

"The spring at Madeira, as at every other place, is the most trying season for the invalid, and will require even there a corresponding degree of caution on his part. In March, winds are frequent; and April and May are showery;" but Sir James adds, "on the whole Continent of Europe there is no place with which I am acquainted, where the pulmonary invalid could reside with so much advantage during the entire year as in Madeira."

MADEIRA WINE is one of the strong dry wines, and contains, according to Hassall, sixteen per cent. of alcohol. It generally contains more acid than either port or sherry.

MADNESS.—See INSANITY.

MAGNESIA, one of the alkaline earths, is largely used in medicine, in the form of the pure or calcined magnesia: also in the form of the carbonate, and of the light carbonate, which latter, being soluble, constitutes the fluid magnesia of the shops. In combination with sulphuric acid, it forms sulphate of magnesia or Epsom salts (see *Epsom Salts*). The compound rhubarb powder is composed of two-thirds magnesia.

The principal use of magnesia is as an antacid in acidity of the stomach and bowels, it at the same time—provided it meets with acid—acts as a gentle aperient; it is often combined with rhubarb, Epsom salts, &c. The dose of magnesia, as an antacid, is from ten to twenty grains; and, as a purgative, from twenty grains to a drachm. The effectual manner in which magnesia neutralises acid in the stomach, and thereby relieves heart-burn and other uneasy sensations, has probably been the reason for its extensive use, and certainly for its abuse among dyspeptics generally, whereby much evil has resulted; for there is no question, that the continued use of magnesia as an antacid greatly impairs the digestive powers. Moreover, if used in the form of calcined magnesia, or of carbonate, should it not encounter sufficient acid in the alimentary canal to convert it into a soluble aperient salt, it is apt to accumulate, and, if taken regularly and largely, to collect into and form concretions in the bowels: on this account, persons who *will* take magnesia habitually, ought to be careful to clear out the bowels thoroughly, at intervals, by means of a dose of castor oil: the same rule being observed with regard to children, if magnesia is given regularly to them. These remarks do not apply to the comparatively pleasant and efficient preparation of the bicarbonate, or fluid magnesia, which has greatly, and with advantage, supplanted the other preparations.

Fluid magnesia, in doses of from half an ounce to two ounces, may be taken either alone, or in milk,—the latter mode being convenient for children,—or it may be given as an effervescing draught, with lemon juice. It has been already observed, that magnesia only acts as an aperient when it meets with acid; the author has found a dose of magnesia, taken after the garden rhubarb used as food, act very well as a gentle aperient.

The citrate of magnesia is an elegant effervescing aperient now much known and used. It has the advantages of being very agreeable to take, and very gentle in its action as a saline laxative, much more gentle than the old Seidlitz powder, which it has largely superseded. The citrate of magnesia is now generally sold in the granular form—that is, made with large grains,

by which it is rendered much less liable to undergo decomposition, but it is also prepared in solution with bicarbonate of potash, in corked and wired bottles.—See *Effervescence*.

The dose of the citrate is one, two, three, or even more tea-spoonfuls, in a moderate quantity of water. It may be taken at any period of the day, but morning is the best time. The dose of the liquor or solution is from five to ten ounces. Much that is sold for citrate of magnesia is a combination of other aperient salts.

Of the solid preparations, Henry's calcined magnesia is the best. Some kinds of magnesia, when kept for a time in mixture with water, are apt to form the whole into a solid mass.

Refer to—*Children—Indigestion—Piles, &c.*

MALARIA.—See AGUE.

MALE FERN.—See FERN.

MALIC ACID.—The peculiar acid of the apple.

MALIGNANT, a term applied medically to various diseases when they assume a fatally severe, or intractable form, such as malignant sore throat, &c.

MALT LIQUOR.—See BEER—PORTER.

MAMMA.—The female breast.—See *Breast.*

MANNA is the saccharine exudation from a species of ash tree, and is chiefly brought from Sicily and Southern Italy. Flake manna is the variety used in this country, but is less used than formerly. It is gently aperient, but as two ounces are requisite for a dose, it is likely to disorder the stomach. As a laxative for young babies, half a small teaspoonful may be mixed with milk in a bottle.

MARASMUS.—WASTING—ATROPHY—See *Atrophy.*

MARMALADE.—The well-known preserve, made from the Seville orange, is by some regarded as a stomachic.

MARRIAGE.—The religious and lawful union of the sexes. Various observations go to confirm the fact, that the married state is conducive both to health and to prolongation of life; thus it has been ascertained, that married women at the age of twenty-five have, on the average, thirty-six years of life before them, whilst unmarried women of the same age have not, on the average, more than between thirty and thirty-one years; that in men, the mortality between the ages of thirty and forty-five, amounts, on the average, to eighteen per cent. in the married, but to twenty-seven per cent., or one-third more, in the unmarried; and, further, that at the age of seventy, whilst there remain alive but eleven bachelors out of every hundred, twenty-seven married men out of the same number may be expected to reach the three score and ten.

It has also been shown from statistical returns, that suicide is very much more frequent among the unmarried than the reverse. On the score, therefore, of physical and mental health, independent of other considerations, marriage is advisable; of course its advisability in individual cases must rest on the relative position of the parties. Certainly, however favourable other matters may be, it is a great evil for parties to enter into the married state too early in life; the female especially, if she commences child-bearing early, that is before the age of two or three and twenty, is liable to suffer in her own constitution, and almost necessarily to entail the acquired debility upon her offspring. In the case of those who have family when advanced in life, the trial is less to their own constitutions, but should the father be aged, the children are not likely to be strong. The reader is further referred to articles *Disease, Hereditary Tendency, &c.*, for information respecting the influence which the health and constitution of the parents exert upon that of the offspring.

As regards physical and mental development, it is an undoubted fact, that the mixture of races, or at least of families totally unconnected with each other, tends greatly to elevate the standard of both. It has been remarked by Humboldt and others, that in South America, the progeny of the negro and of the native Indian, are greatly superior to the progenitors on either side; the superiority of the Caribs to other American Indians has been ascribed to their latitude in intermarriage with the surrounding tribes, and it is well known that the Anglo-Saxon attributes the position of *his* race in the vanguard of progress to the mixture of blood which has taken place, as a necessary consequence of the successive occupation of Great Britain by different races.

MARROW is the fatty matter which fills up the centre of the shafts of the long bones. As an article of diet it possesses the same nutrient properties as the fats generally.

MARSH MALLOW is found on the Continent, and frequently in England, in marshes near the sea; it bears pale bluish-red flowers on an upright stem; the leaves are heart-shaped, cut at the edges, and, like the stem, are covered with soft, hairy down. The whole plant is mucilaginous, but the root is the part chiefly used; four ounces may be put into six pints of water with two ounces of raisins, and the whole reduced one-third by boiling; the mucilaginous decoction obtained is strained through calico before use.

MASSAGE is a term used to denote a mode of treatment by rubbing, stroking, "kneading," and otherwise manipulating the muscles, joints, and other parts. Its object is chiefly to stimulate the circulation, and increase the power of assimilating nourishment. In surgical cases it is applied to stiff joints, &c. The various "movements" of massage must be learned under a skilful operator, as they have, one and all, a definite physiological meaning; but they are easily acquired by any intelligent

person, and a knowledge of them will be found of great use by nurses. Massage combined with systematic rest and excess of diet (mainly milk) constitute the Weir-Mitchell treatment for the cure of neurasthenia and other forms of nervous debility.—See *Shampooing*.

MASTICATION.—The act by which the food is, or ought to be, reduced to a soft mass before swallowing, by the action of the teeth, and by admixture with the saliva. The importance of the proper performance of this act has been pointed out in article *Indigestion*. It has even been suggested, that the average of life at the present time exceeding that of former periods, is partly due to the improvements in dentistry, enabling the aged to masticate their food more perfectly. Mincing machines are to be had for dividing the meat into small morsels, so that it may be more easily masticated.—See also *Digestion*.

MATERIA MEDICA (Medical Materials).—See *Medicines*.

MATICO is the term applied to the leaves of one of the pepper tribe, a native of South America; the drug has been recommended as a powerful astringent in cases of bleeding; the leaves especially being lauded as a certain remedy in obstinate bleeding from leech bites. The drug has also been employed as an aromatic stimulent. The author has not found in his own trials of it that matico possesses any advantage over other astringents, and that which he used came direct from the importers.

MAW-WORM.—See Worms.

MEALS.—See Breakfast—Dinner, &c.

MEASLES is one of the eruptive fevers which most persons go through once in a lifetime, and generally during childhood; the disease usually occurs as an epidemic, and is contagious. The first symptoms of measles are those of a feverish cold; there is shivering, headache, loss of appetite, and perhaps vomiting; the eyes look red, and, as well as the nose, furnish increased watery discharge; there is hoarseness and cough. On the fourth day of the disease, or in from seventy to eighty-four hours after the first symptoms of illness have shown themselves, the peculiar eruption of measles begins to appear, generally first on the neck, then on the forehead and cheeks, afterwards extending to the trunk and extremities; at first the eruption shows only in red points, not unlike flea-bites, but these soon enlarge into rather broad, slightly purplish, spots, grouped in crescentic forms, and just perceptibly elevated above the skin. At this period, the skin is hot, there is a good deal of general fever, with thirst, and much hoarse cough, with quickened breathing. After remaining out about four days, the eruption—first, of course, on the face—begins to decline, and by the seventh day, it has generally disappeared, leaving the skin slightly roughened, followed by separation of the cuticle in small scales.

In all except the mildest attacks of measles, some amount of catarrh of the respiratory organs is generally present. The most common situation of this is the bronchial tubes, giving rise to bronchitis; it may, however, attack the larynx causing subacute laryngitis with hoarse cough and loss of voice; or it may affect the intimate tissue of the lung, setting up acute pneumonia. Different epidemics vary much in their severity, and the same class of lung complications is apt to characterise individual epidemics. Thus in one epidemic severe bronchitis may occur frequently, while in another attacks of pneumonia may be more common. Occasionally very malignant cases occur, where death ensues within two or three days either from the fever itself, or from complications.

Measles is infectious during the whole duration of the disease; to the greatest degree in the early stage before the eruption appears.

In any case of measles, the safest plan is, of course, to have medical attendance; very many parents, however, in the humbler classes, when the prevailing epidemic is mild in character, take the matter in their own hands, and do little more than keep their children in bed for a day or two, if they do even that. There is no question that a mild attack of measles will get well without any treatment; but in even the mildest, ordinary care to guard against cold should be observed, this being, of course, requisite in keeping with the season of the year. If the attack be a smart one, the person should be kept in bed and moderately warm, allowed to drink freely of diluent and especially of demulcent drinks, such as barley-water; the diet should consist of milk and farinaceous matters; stewed prunes and rice, and such like may be allowed, the bowels at the same time being attended to, but not purged. Should the eruption of measles seem tardy in coming out, or the child be affected with drowsiness or other symptoms indicating the undue influence of the fever poison on the nervous system, or should the eruption come out small or insufficiently, or, after having shown itself, should it disappear again suddenly, and before the time of its regular decline, danger must be apprehended; the warm bath is at once the safest and best remedy, the child being kept in the water—temperature 98°—from ten to twenty minutes, according to age; in addition to this, to a child of five years old, a drachm or tea-spoonful of spirit of mindererus should be given in a little sweetened water every two or three hours, and warm drinks freely administered at the same time. A very pernicious practice prevails, especially in the country, among the poor, of giving children stimulants—"to bring out the eruption," and also in the course of the disease; in Scotland whisky is given, in England cowslip wine is the most generally employed stimulant. It is perhaps scarcely necessary to add, that none but the most ignorant and prejudiced could be guilty of so dangerous a practice. In England there seems to be

a popular prejudice in favour of the virtues of the cowslip in measles, and when the wine is not used, it is very common to find the infusion, or tea of the "cowslip pips" or flowers, given; this, of course, is perfectly innocent, and may be permitted. When the feverish symptoms in measles run high, it is commonly in connection with the chest affection; in such cases, from four to six grains of ipecacuanha powder, and half a drachm of carbonate of potash, are to be made into a mixture with three ounces of water, and of this, a dessert-spoonful given to a child of five years of age every four or five hours: in milder cases, ten or fifteen drops of ipecacuanha wine are to be given in the same way. Should, as often happens if the child has been permitted to take cold, symptoms of inflammation within the chest show themselves (see *Inflammation*), they must be treated as directed in the article on the subject, but in all such cases a medical man should be called. It must always be borne in mind, that measles does not bear much lowering treatment, and that blisters are apt to prove dangerous; a bran poultice is always a preferable application. An idea prevails, that persons affected with measles cannot be kept too hot; this is often a source of much mischief: certainly, cold is to be avoided, but free ventilation, with a moderate temperature of about 65° (see *Bed-room*) is always the most advantageous. The room ought to be kept comparatively dark, any glare of light being hurtful to the eyes, and the patient should be debarred from reading in bed, and be confined to one room until the catarrhal symptoms disappear. When measles assumes a malignant or putrid form, the case must be considered as eminently dangerous; in this form the eruption is dusky and purple, or rather, livid, the patient extremely depressed, the tongue dry and black looking; medical assistance as soon as possible is, of course, indispensable, and even then, the hope of saving life is but small; nourishing meat broth, wine, or warm wine whey, must be given frequently, and those measures resorted to which are recommended under typhoid fever.

Convalescence from measles requires much care, if the weather is at all cold, for the disease leaves a susceptibility to inflammatory chest affection for some time. In children of weak constitution, measles, like the other eruptive fevers, is apt to leave a tendency to discharges from the ears, to weakness and redness of the eyes, &c.—See *Rötheln*.

Refer to—*Catarrh—Inflammation, &c.*

MEASURES.—Three kinds of measures are used by the chemist for smaller quantities of fluid, these are the drop or pipette measure, the minim measure and the ounce measure.

The minim measure is, or ought to be cylindrical, as represented (fig. 152). It is graduated or marked with divisions equal to five or ten minims each, and may be made for sixty minims or one fluid drachm only, or for one hundred and twenty minims or two fluid drachms, or for a greater quantity. A minim measure for sixty drops will be sufficient for domestic purposes. A minim, by measure, contains a larger quantity of fluid than a drop; the latter, too, is liable to vary in bulk according to the nature of the fluid, and of the lip of the phial or vessel from which it falls; on these accounts, it would be desirable that the measured minim

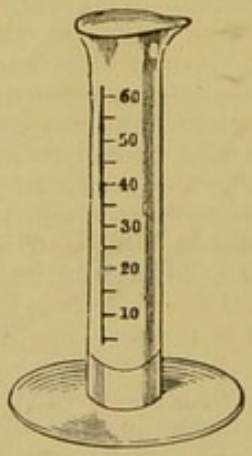


Fig. 152.

only should be used; but, as the measure glass itself must necessarily be frequently wanting, the drop is a more generally applicable mode of division. When the doses of drops of any medicine are measured in a minim glass, one fourth ought to be allowed for the greater bulk of the minim; thus, if the dose is twenty drops of laudanum by drop, by minim measure, it should be only fifteen.

The fluid ounce measure glass is graduated as represented (fig. 153), on the right side of

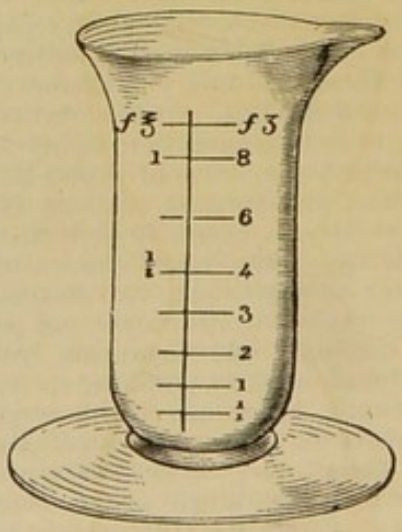


Fig. 153.

the perpendicular line into fluid drachms, on the left side into fluid ounces; it may, of course, be made of any size, from one ounce upwards. Extremely convenient measure glasses in the shape of a small graduated tumbler

and minim measure, packed in a case, are sold by Maw, Son, & Thompson for the use of nurses and others who may require them. The cost of these essential articles for the sick room is from one and sixpence to two shillings.

The other fluid measures used by the chemist and adopted by the British Pharmacopœia, are the pint, which contains twenty fluid ounces, and the gallon, which contains eight pints. The following table of the Apothecaries' fluid measures, also shows the initial letters, by which, for the sake of brevity, these measures are distinguished in prescription:—

Fluid.	Symbol.
One gallon, . .	C = 8 pints.
One pint, . .	O = 20 ounces.
One ounce, . .	℥ = 8 drachms.
One drachm, . .	ʒ = 60 minims.
One minim, . .	mj

Besides these regular measures, there are a variety of less accurate modes of measurement for medicine, used on account of their convenience; these are, the tea-spoon, equal to about one fluid drachm, the dessert-spoon, to double, and the table-spoon, to four times that quantity, or to half an ounce. The wine-glass generally holds about two fluid ounces, a small tea-cup, about four ounces, the breakfast-cup and tumbler, about half a pint each. These irregular modes of measurement, however, are not only inconvenient, but they may, at times, be of serious moment. Spoons and glasses must vary greatly in size; what the poor call a "meat-spoon" and consider a table-spoon, barely equals an ordinary dessert-spoon in calibre: again, one person will fill a spoon till it runs over, another scarcely more than half, so that in one way or other, it is a great

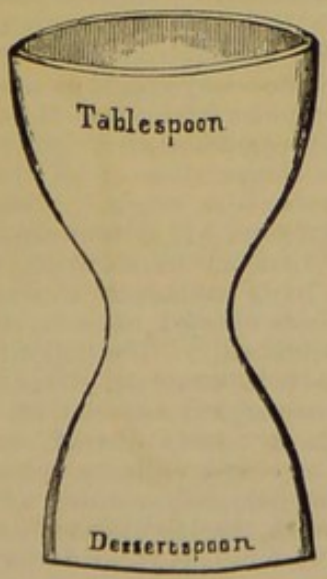


Fig. 154.

chance whether the patient gets the quantity the medical man orders. To remedy these evils, glasses marked in table-spoonfuls, and porcelain measures (fig. 154) made only to hold a certain quantity, have been manufactured, and are certainly convenient when at hand; but by far the most certain method of apportioning the doses of fluid medicine, is by means of the moulded graduated bottles, now largely used; these being marked in fourths, sixths, eighths, &c., and the medicine being prescribed in these proportions, there is no further trouble; no spoon is required, a great saving to silver, which is apt to be stained, and the medicine is poured directly into the cup from whence it is drunk. Bottles of a peculiar shape, and fluted in an unmistakable way, are also made for poisonous medicines which may be prescribed for external application, and may be useful in preventing accidental poisoning. These graduated and fluted bottles are now beautifully made by the York Glass Co. and other firms, and are not higher in price than plain ones. A few of them would be found convenient in most houses.

MEAT.—See Beef—Flesh—Muscle—Mutton, &c.

MECONIUM—the dark olive-green discharge from the bowels of a newly-born infant.

MEDICINE.—The science and practice of medicine is, in its highest and worthiest sense, the practical application of many sciences to the investigation of the numberless diseases and disorders to which the human frame is liable, and to their removal, as a result of that investigation, either by the direct action of medicine, properly so-called, by medicine as supplementary simply to the natural tendency towards health, or by other means which exercise a beneficial influence over the health of the body. To exercise well and truly this noble art, is perhaps the most difficult task in which a man can engage; but it would seem also to be the easiest channel through which the ignorant knave can mislead his fellow men. That it is so, however, cannot be laid to the charge of the science of medicine, but is the consequence of the thorough ignorance respecting the nature and requirements of their own bodies and constitutions, in which people, hitherto, have been for the most part content to rest; an ignorance which, strange to say, has been too often favoured by members of the medical profession, who seem to have laboured under a morbid dread, lest a patient should have, in the least, a rational idea of the nature of his own malady, or of the means, medical and otherwise, requisite for its removal. The effect of this mystery has been, in the eyes of the ignorant, to place the educated physician in many instances on the same level as the charlatan—more particularly in cases requiring long and judicious treatment. In a case admitting of rapid and successful cure, by the well-directed efforts of scientific medicine, even the most ignorant can see, and in some degree appreciate, the educated skill which has afforded the striking result; but should the case prove to be a necessarily tedious one—its

progress slow, perhaps uncertain, ebbing and flowing—the patient, and the patient's friends, unconscious of the nature of the case, and of the difficulties to be overcome, see nothing, perhaps, but mystery in the treatment. Looking upon the curative powers of medicine, as exerted in some undefined curative effect upon the disease; and seeing first one medicine prescribed, and then another, patients probably attribute the changes to the endeavours of the physician to "hit the complaint," whilst he is only making those changes requisite in every case of continued disease to meet the varying and varied symptoms which arise; and when, by the exercise of patient skill, the disease is cured, the last medicine reaps the credit of the whole; and if the patient has been whimsical, very probably the last doctor gets the full credit for that which was really effected by a predecessor in attendance. A patient often remarks: "If you had only given me the last medicine *at first!*" forgetting that the first medicine had to prepare for the last, which seemed to do all the good.

Now, while it is evident that the entire treatment of such cases may have been conducted on the most scientific, rational, and conscientious principles, to an ignorant or prejudiced patient—and there are many such—or to one kept in ignorance, the whole is unintelligible, quite as much so as the quack nostrum, as far as the method of cure goes; and, perhaps, if the physician be a conscientious man, holding out far less brilliant prospects of speedy cure, the quack's promises and lies carry the day against the physician's well-considered, and, perhaps, guarded opinion; for the simple reason, that the patient is without any true rational idea of the structure of his own frame—of the requirements of his own constitution—of the nature and tendencies of his malady, and, lastly, of the objects and intentions which regulate the necessary treatment and direct its aim.

Quackery and deception, in connection with the treatment of disease, never will, and never can be extinguished by legal enactment—they flourish on ignorance alone. It may be said, that the higher and educated classes in this country are the chief supporters of quackery, legal and illegal, patent and secret, and undoubtedly there appears some truth in the indictment; the cause may be traced to their possession of that dangerous modicum of knowledge which arrogates to itself higher aims, and rejects the simple laws which regulate the working of that frame, so fearfully and wonderfully made, in which God has placed them to dwell on earth.

It is a reproach often brought against medical science and practice, that it is so uncertain, so full of doubt, so liable to error: if persons would but reflect for a moment, it would be apparent that this uncertainty must in some degree be inseparable from a science which is *not one of order, but of disorder;* unlike chemistry, astronomy, and the other exact sciences, medicine has to deal with that which is regulated by no fixed laws, but varies with the constitution, the habits, circumstances, and numberless other contingencies connected with the individual, whose constitution, on the other hand, has its own peculiar susceptibilities to the action of remedies. These considerations will show why medicine must be to some degree uncertain; but with this admission, it is contended, that its skilful practice is capable of conferring the most extended benefit on suffering humanity. If the science of medicine is yet uncertain in its nature and results, it is far less so than it has been, and it is daily adding fresh stores of knowledge to its already accumulated experience.

The practice of medicine or treatment of disease may be classed under the two divisions of Empirical and Rational. The former is rather the result of experience and experiment than of reasoning, and administers medicine which is known to remove certain symptoms, or sets of symptoms—constituting a disease—without any rational ground for the administration of the curative agent beyond the fact of its being known from experience to act beneficially in such cases. Rational medicine, on the other hand, looks less at the symptoms than at the causes, and endeavours to ground its treatment upon the observations after death, and upon microscopical, chemical, and other examination. The most efficient practitioner will probably be he who neglects neither method.

Refer to—*Diagnosis—Disease, &c.*

MEDICINES.—Under this head will be included all that would come under the more correct designation of Materia Medica. This term, which literally means medical materials—that is, the various agents used in the practice of medicine—may appear somewhat technical in a popular work, but it is the most conveniently comprehensive, under which to include the enumeration of all those agents, whether medical or surgical, which *may* be used domestically. It is unnecessary here to give more than an enumeration, the agents themselves being sufficiently treated of in the various articles devoted to them, either classified or individually. The following list is meant to include whatever, either in the way of medical or surgical material, an intelligent emigrant, in a remote district, might, with reasonable care and ordinary common sense, safely employ; thus constituting a "domestic" materia medica, in its widest sense. At the same time it must be evident that, however desirable this latitude may be for the circumstances supposed, it is by no means requisite for those who are placed with greater facilities for procuring proper professional assistance; neither is it recommended that they should take advantage of it as a whole, but that each

should select whatever may appear most suited to his own circumstances. The articles in the list to which the asterisk is prefixed, are such as may most readily be dispensed with, in most instances. Of course, the list includes but a portion of the medicinal remedies mentioned throughout the work at large, neither does it include other agents used in medical treatment, such as heat, cold, electricity, &c.

List of most generally useful domestic medicines:—

*ÆTHER—ETHER.—Spirits.—To be kept in a stoppered bottle, tied over with bladder, or with sheet gutta percha.
ALOES.—In the form of the simple drug.
ALUM,—Burnt, in powder.
*AMMONIA.—The carbonate of ammonia, to be kept in a wide-mouthed, stoppered, or well-secured bottle.
AMMONIA.—The aromatic spirit of ammonia, or sal volatile, to be kept in a stoppered bottle.
AMMONIA.—The acetate of ammonia, or spirit of mindererus.
ANTIMONY.—The tartrate of antimony, or tartar emetic.
ANTIMONY.—In the form of James' Powder.
*ARNICA.—The tincture.
*BISMUTH,—Subnitrate of,—called white bismuth.
*BORAX.—In powder.
*CALUMBA.—Root, and powder of root.
*CAMPHOR.—In bottle.
CANTHARIDES—or Spanish blistering fly. In the form of the common blistering-plaster, or in the form of blister tissue, or of blistering fluid.
CARBOLIC ACID.—In coloured stoppered bottle.
CASTOR OIL.
*CATECHU.—The simple drug.
CHALK,—Prepared.
*CHAMOMILE FLOWERS.
CHLORINATED LIME,—which is best kept in solution.
CHLOROFORM.
CHLORODYNE.
CINCHONINE.
COTTON WADDING.—In sheets, or put up in balls or packets for blister dressing.
CREAM OF TARTAR.
CREASOTE.—In stoppered bottle, about two drachms.
COPPER,—Sulphate of,—blue vitriol.
DIACHYLON PLASTER.—Adhesive plaster; but not spread, if going to a warm climate.
DILL-WATER,—For infants.
EXTRACT OF HENBANE.
*GALLS,—whole, or in powder.
GENTIAN ROOT.
GINGER.
GLYCERINE.
*GUM ARABIC.—In mass and in powder.
HYDROCHLORIC ACID,—diluted,—spirit of salt, in stoppered bottle.
IPECACUANHA.—In whole root, and in powder.
*IRON,—Sulphate of,—green vitriol.
IRON—Tincture, perchloride of, "tincture of steel."
*JALAP.—Powder.
LEAD,—Acetate, sugar of.
*LEMON JUICE.—Bottled, if for a sea voyage.
*LINSEED MEAL.
LINT.
MAGNESIA.—Calcined or fluid.
MAGNESIA,—Sulphate of,—Epsom salts.
MERCURY,—Subchloride,—calomel.
MERCURY,—with chalk,—grey powder.
*MERCURY.—Red precipitate.
MUSTARD.—In powder, in close canister, or mustard leaves.
*MYRRH,—Tincture of.
*NITRIC ACID.—Aqua fortis, in stoppered bottle.
*OIL, CAMPHORATED.
OPIUM.—In powder.
OPIUM.—Compound tincture, with camphor—Paregoric.
*OPIUM.—In the form of Battley's solution, a small quantity, or in the form of muriate of morphia.
OPIUM.—In the form of laudanum.
PILLS.—Either in powder, ready mixed for making up, or made up with a small addition of glycerine to keep them soft, and kept in stoppered bottles.
Blue pill in the mass, in a well-covered pot.
PILLS.—Compound colocynth pill.
Compound colocynth pill, with calomel.
Compound colocynth pill, with hyoscyamus.
Compound rhubarb pill.
Compound expectorant pill.—See *Pills.*
POTASH,—Bicarbonate, in powder.
POTASH,—Citrate of.
POTASH,—Nitrate of,—saltpetre, in powder.
*POTASH,—Solution of,—"liquor potassæ," in stoppered bottle.
POWDERS,—Compound.
Compound chalk, with opium.
Compound powder of Ipecacuanha and opium—Dover's powder.
QUININE.
RHUBARB.—In root, and powder of root.
RHUBARB,—Tincture of.
SCAMMONY.—In powder.
*SQUILL.—In tincture.
SENNA—leaves.
SILVER,—Nitrate of, or lunar caustic, in stick mould, in a bottle, or with gutta percha holder.
SODA,—Bicarbonate, in powder.
*SPIRIT OF WINE.
SPIRIT OF SWEET NITRE.
SPIRIT OF CHLOROFORM.
SULPHURIC ACID.—Oil of vitriol, diluted to medicinal strength, and kept in stoppered bottle.
*TARTARIC ACID.
*TURPENTINE,—Spirit of.
VASELINE.
ZINC,—Sulphate of,—white vitriol.

To the above medicines, or such of them as are selected, it will be requisite to add a set of scales with apothecary's weights, a couple, at least, of "graduated" glass-measures, a Dutch tile, a bone spatula, and one or two iron spatulas or palette knives, a filtering funnel or tun-dish, and a moderate-sized mortar and pestle of Wedgewood ware. The above may be said to be the necessary articles of the domestic laboratory, and it is advisable that they and the medicines should be included in a chest or box properly constructed for the purpose. Where expense is not too great an object, strong, glass-stoppered bottles, which are always preferable to corked, will be found quite the best receptacles for the various medicines, wider-mouthed ones being used for the pills and powders, and narrow ones for fluids. In addition to the above requisites, the following will be found convenient additions for all, but especially in the case of emigrants:—A measure graduated for doses, a few bottles of various sizes, from half a pint downwards, *graduated*, that is, marked into parts, such as fourths, sixths, &c., phial corks, filtering or blotting paper, and a few cut papers for powders, a glass rod for stirring.

The above mentioned articles may and ought to be included in a thoroughly furnished medicine chest; and those who would be completely equipped, should also provide the surgical materials mentioned below. All these, however, add to the expense, and as there are many persons, whether emigrants or others,

who either cannot or do not wish to incur the cost of providing so amply, but yet who would desire to keep beside them a stock of the most efficient medicines, and those most likely to be required on emergencies, an emigrant's medicine chest has been manufactured by Mr. Hooper, of Pall Mall, which is calculated to contain, in the most compact form, a stock of selected medicines, with the means of dispensing them, such as scales, measures, &c. The chest is entirely constructed of japanned tin, this material being better calculated to resist the effects of climate, and the attacks of insects, than wood, and at the same time occupying much less space; indeed, the entire chest measures barely eight inches in length, and five in width, and the same in depth, and is to be sold stocked, at a cost of 30s., which will place it in the power of most. A larger form of medicine chest, made of oak, and calculated to contain surgical appliances, as well as medicines, has been constructed after the writer's design by Messrs. Maw & Thompson; and Messrs. Richardson, of Leicester, have stocked a very compact "Colonist's Medicine Chest," which is accompanied by a small "Guide" to the use of the contents, compiled by the writer.

The introduction into pharmacy of drugs in the form of compressed tabloids has increased greatly the portability of many medicines, while, at the same time, the risk of deterioration from the effects of time and climate is much diminished. A very large number of the most useful drugs can now be obtained in this form, the best known manufacturers being the firm of Burroughs, Wellcome & Co., Snow Hill, London, E.C., who supply specially prepared medicine chests for emigrants.

In the case of emigrants especially, the author would advise those who are providing a medicine chest, to make themselves well acquainted, previous to purchasing, with the probable requirements of the climate and situation to which they are removing, or which they are likely to pass through; thus, for instance, quinine would be a much more indispensable article for the settler in some parts of America, where ague prevails, than for the Australian emigrant; or sulphate of zinc, for eye wash, would be an article not to be overlooked in the medicine store of the voyager upon the Nile; or, as another example, persons going to hot climates must not take their adhesive plasters ready spread. By reference to the articles on the individual medicines mentioned in this work, the requisite information on these points will be gained; it is unnecessary, therefore, to detail it here.

To the surgical department belong,—Lint and old linen, oiled silk or oiled calico, or thin sheet gutta percha, vaseline, bandages, scissors; pins, &c. Instruments, properly so called (see *Instruments*), must entirely depend upon the contingent circumstances, present and probable, and upon the inclination of the individual. Indeed, so much depends upon these, that it is impossible to lay down any uniform system of domestic materia medica; but it is trusted that the foregoing enumeration will be some guide in the selection. At the same time, the author would strongly advise parties, either resident in this country, or going abroad, to avail themselves, when possible, of the aid of a medical friend, or adviser, when furnishing the domestic laboratory. They will thus be put in the best way of getting what they want, *good* of its kind: this is essential, for the money had better be kept in the pocket, than wasted upon cheap and worthless drugs; they will, too, have some guarantee when they obtain their stock of medicines from any respectable or well known firm, that the high prices will prove cheapest in the end (see *Drugs*). Further, although there are certain general remedies which none can err in providing, there may be others more especially adapted, either to the constitutional tendencies of the individual, or family, or, in the case of emigrants, to the nature of the climate, and of its peculiar diseases, to which they are about to remove. These are points on which a medical man only can give proper advice; and few are so friendless as not to be able to get it—indeed, the author knows well that none need want advice on these points; the members of the medical profession will always give, and give it freely, under such circumstances. This article is little more than an enumeration of our domestic remedies, the plan of the work rendering it necessary that the information connected with each should be given under the individual heads, and to these the reader is referred in particular, as well as to such articles as *Bed-room*, *Dressing*, *Drugs*, &c. Indeed, the reference may be said to extend to the work at large.

In accordance with the plan laid down at the commencement, whenever doses of medicine are given, they are, unless it is otherwise specified, such as are suitable for an adult; the following table is generally considered a sufficient guide in the apportionment of the doses to the different ages:—

For an adult—

Suppose the dose to be 60 grains or 1 drachm,	. . . . .	℥ i
Under		
1 year the dose will be	$\frac{1}{12}$ = 5 grains, .	gr. v
2 ,,	$\frac{1}{8}$ = 8 grains, .	gr. viii
3 ,,	$\frac{1}{6}$ = 10 grains, .	gr. x
4 ,,	$\frac{1}{4}$ = 15 grains, .	gr. xv
7 ,,	$\frac{1}{3}$ = 1 scruple, .	℈ i
14 ,,	$\frac{1}{2}$ = $\frac{1}{2}$ drachm, .	℥ fs
20 ,,	$\frac{2}{3}$ = 2 scruples, .	℈ ii
21 to 60 years,	1 drachm .	℥ i

Above sixty—that is, in old age, the dose gradually diminishes.

The scruple and drachm weights are discon-

tinued in the British Pharmacopœia, but their long use and convenience prevent them from being abandoned altogether; the former represents 20 grains and the latter 60 grains. The ounce is equivalent to 437·5 grains and the pound to 16 ounces.

Although the above table is, and may be, accepted as an average rule, it must not, by any means, be adopted as an invariable one in practice, without reference to the constitution, state of health, &c., of the individual. A strong child at three years of age may require, and may tolerate better, a much stronger dose than a weaker or weakly one two years older. Moreover, in the case of many aged persons, purgative medicines especially, will often require to be used as actively as in the young. Again, in such a medicine as opium, the proportions given in the table would give rather large doses for children, whilst, on the other hand, in the administration of mercurials, such as calomel or grey powder, they would reduce them too greatly. These observations are made, as qualifications to what some might regard, from its being in the tabular form, as a complete guide in all cases. The variations are of less consequence, as sufficient information respecting dose is always given in the place or article in which it is directly requisite.

As a general rule, women require smaller doses of medicine than men, and at the same time, it is always requisite to keep in view the peculiarities, periodical and otherwise, of their constitutions; and in the case of matrons, the possibility of pregnancy. It is better to avoid the use of strong purgatives, and of astringents, during the healthy menstrual period. In some cases, all relaxing remedies, such as warm bathing of the feet, and diaphoretic medicines, are inadmissible during the same event. Temperament, in all cases, requires to be considered in the administration of medicine.—See *Temperament—Diathesis, &c.*

There is some art—and a good deal depends upon it—in administering medicines properly, not only to children, but to adults. It is a very common popular saying, that "doctors do not give sugar-plums," and verily, unless it be the homœopaths, they do not. At the same time, much may be done to lessen the nauseousness of many drugs; the methods are generally pointed out when the medicines themselves are treated; the following do not occur under any regular head. The aromatic waters, such as peppermint, cinnamon, &c. are as much disliked by some, as they are liked by others; their addition to medicines may, therefore, generally—unless they are given as carminatives—be left to choice; as a rule, they do not render the medicine more palatable. The introduction, however, of glycerine and chloric ether into prescribing, has greatly increased the power of making medicines palatable; alkaline medicines which could not be modified by sugar, are now much improved by a little glycerine for children, or chloric ether for adults, especially when combined with an aromatic such as peppermint water or orange tincture. The same observation generally applies to sugar and syrups; in cough medicines and the like, sweetness may be agreeable, and an advantage, but in the case of a nauseous medicine, sweetening it only renders it more sickly to most patients. From his own experience, the author can testify that the fewer additions made to *the* essential medicine—what physicians call the "basis"—the better. In the case of children, bulk is always an objection to be guarded against, as much as consistent with utility. The fact is, perhaps, not sufficiently realized practically, that one most efficient method of avoiding the taste of nauseous medicine is to blunt for a time the acuteness of the nerves of taste: nothing does this so well and agreeably as the essential oil of orange or lemon peel. A small piece of the rind of either of the above fruits chewed, just before and immediately after swallowing the dose, is very efficacious.

The nature of the medicine and its form should, in some degree, bear a connection with the periods of the twenty-fours hours. Tonic remedies generally are better taken before meals; the time for taking purgatives should, in some measure, depend upon their nature. Unless for some special purpose, liquid purgatives, such as castor oil, senna, salts, &c., which, like liquid *medicines* generally, exhibit their action quickly, should not be taken late in the evening, when their action will probably disturb the night's rest; pills and powders on the other hand, which are slower in their action, may be, and generally are, taken at night. Although medical men order some medicines to be taken upon a full stomach for special purposes, the generality are better taken when the stomach is empty, or nearly so; tonics, purgatives, astringents, &c., particularly. In the first place, they are not so likely to interfere with the process of digestion, and in the second, their proper action is more readily and effectually manifested.

In conclusion, it might be thought by some that more, what medical men call prescriptions, and the public recipes, might have been given in this article, or throughout this work generally; but the author trusts that before this the principle of his system of *safe domestic medicine* has been manifested—that it is not to furnish a set of nostrums, one "good for" this complaint, and another "good for" some other, to be used without reason why or wherefore. Such a concession to a blind *popular craving* is truly mischievous, and antagonistic to the intelligent management of disease, more or less, according to circumstances, and which is based upon a true, even though a superficial, knowledge of the functions and requirements of the human body and constitution, of the disorders, and of the accidents to

which both are liable. Under such a system, no series of nostrums and mixed recipes is requisite; its safety and its efficiency rest, in the first place, upon the correctness and intelligent understanding of the anatomical and physiological knowledge, as far as it goes; upon the clear appreciation of the causes and nature of disease and accident, as far as they can be popularly explained; and lastly, upon the simplicity of the means of alleviation or of cure, which can be legitimately pointed out.

The term *Medicine* is usually given to the substance in its prepared state; in its crude condition it is more generally called a drug.—See *Drugs*.

The prepared forms of medicines are—

Cataplasm, or Poultice.	Mixture.
Confection.	Oils.
Decoction.	Ointment.
Enema, or Clyster.	Pill.
Extract.	Plaster.
Infusion.	Powder.
Juices.	Spirit.
Liniment.	Suppositories.
Liquors.	Syrup.
Lozenges.	Tincture.
Metallic salts.	Wine.

Medicines are also divided according to their actions as follows :—

Anæsthetics.	Epispastics.
Antacids.	Errhines.
Antispasmodics.	Expectorants.
Astringents.	Escharotics.
Demulcents.	Narcotics.
Diaphoretics.	Purgatives.
Diluents.	Refrigerants.
Disinfectants.	Sedatives.
Diuretics.	Sialagogues.
Emetics.	Stimulants.
Emmenagogues.	Tonics.

To these might be added, external forces, heat, cold, and electricity.

For explanation, refer to the articles on the above subjects.

Refer to—articles on medicines individually and classified—*Measures—Filter, &c.*

MEGRIM, or **MIGRAINE**, is a species of nervous headache affecting only one side of, or one defined spot on the head, the forehead and temple, and is generally the result of debility. It is a periodic disease, appearing and disappearing at irregular intervals, and may be induced by the same causes as give rise to hysteria and ague. The immediate attack of megrim headache may be relieved by the application of flannel or sponge, soaked in hot water, or by the continuous application of ice over the part. The affection, which is often a very painful one, is likely to be removed by the improvement of the general health and strength, by good diet, air, and exercise, and by the use of bark, iron, and other tonics. A large dose of quinine, five or six grains, repeated two or three times in the course of twenty-four hours, will generally cut short an attack of megrim.

MELON, the well-known pleasant and highly esteemed watery fruit, much used in warm climates as a food, as well as for quenching thirst and allaying fever. It may be eaten by itself or with the addition of sugar, and sometimes with a condiment such as pepper or ginger.

MEMBRANE, in its purest form, is a thin expanded substance or pellicle, in which no trace of structure can be detected under the highest powers of the microscope; in this state, it is now known as "primary" or "basement" membrane. Membrane, however, may be constituted also, either of flat cells or of interlaced fibres. The surfaces of the serous or mucous membranes are spread over with layers of minute cells, which are concerned in, and adapted to, the functions of the particular membrane they cover; these layers are called the epithelium of the membrane, and resemble, in situation and purpose, the epidermis or cuticle which is spread over the skin.

Refer to—*Skin*.

MEMORY, the mind's record of the past, is, we have every reason to believe, imperishable. The power to recall what has been imprinted on its, to us, mysterious tablets, may not be always at command, but all know that it is more so at one time than another, and medical men not unfrequently meet with cases of disease, in which the memory of long-forgotten knowledge is again opened up; the scenes, the thoughts, and the language and words of the first childhood, pass again through the mind of the second; the thoughts and feelings of later times are unremembered, and the Greek exercise or Latin poem of the schoolroom are once more gone over correctly, by those to whom they have been unknown tongues for years. This resuscitation, as it were, of memory, as the effect of disease, is not less remarkable than its loss; in many instances, under the same influence, one man will remember numerals but forget letters, another the reverse; one can only recall the last syllables of words, a second stops short after repeating the first. Still more remarkable are the cases of double memory or consciousness, several of which are on record. In these, either in consequence of some acute disease, or mental shock, all memory seems to be swept away; the mind is left a perfect blank, and education, even in adults, has to be commenced anew; in such cases the individual has gone on for some time acquiring the simplest rudiments of knowledge, when, all at once, the old memory has returned, and with it all its mental stores, blotting out apparently the new; and this alternation of these two singular states of mind has occurred again and again. Loss of memory, exhibited either with respect to things that have hitherto been well remembered, or in unwonted difficulty in the acquisition of new ideas, must, unless well accounted for by advanced age, be regarded suspiciously, as the possible result of incipient cerebral disorder, it may be, of a tendency to insanity.

MENORRHAGIA. — See MENSTRUATION.

MENSTRUATION.—The monthly periodical discharge, the "catamenia," is one of, if not the most important of the facts connected with female health.

Commencing usually in this country between the ages of thirteen and fifteen, its recurrence in health—except during pregnancy and nursing—is generally extended for a period of thirty years. It needs not to dwell upon the necessity for the maintenance of the regular and sufficient development of this function during those thirty years of life; females are generally sufficiently aware of it, although, sometimes, in carelessness or wilfulness, they neglect the temporary self-restraint it imposes.

It is a foolish error, or neglect, not uncommon with mothers, to omit all mention of the occurrence of this event to their daughters; the consequence is, that the symptoms which usually precede it, are ignorantly unattended to, and it may happen the development of the function is checked by imprudences which a little information might have prevented. Moreover, the unexpected appearance of the period is apt to excite much alarm, and the mental agitation, or other causes, may at once check a natural and healthy proceeding; it need scarcely be said, with how much probable injury to health. Mothers or female guardians should always forewarn those committed to their charge, and put them on their guard against those exposures to cold and fatigue, to mental excitement, or abuse of purgative medicines, which may interfere with the natural relief. There is, of course, considerable variation as regards the amount of the menstrual discharge, and also in the period of its continuance. The one is in this country from four to five ounces, and the other from three to five days, on the average.

Climate, temperament, habits, &c., all exert much influence over the function in different individuals, or even over the same individual at different times; but these variations may all fall within the limits of health, and do not require interference; and, although in the majority of instances the function is established before the sixteenth year, it may, coincidently with perfect health, be delayed two or three years longer. Generally, however, the delay, or non-development of the menstrual function, if not owing to structural deficiency, or to *mechanical obstruction*, is owing to some deep-seated constitutional defect, such as is usually distinguished as *Chlorosis* or *Anæmia* (see *Anæmia*). It may nevertheless be owing to peculiarity, and not to defect of constitutional power. In any case medical advice is requisite to give those proper directions for the improvement of the general health and strength which are necessary, or to investigate the cause, whatever that may be, of so important a deficiency

After the first appearance of menstruation, it is not uncommon for the second to be delayed for a considerable period, without the health in the least suffering; after its full establishment this can scarcely be the case. During the menstrual period, there is almost always some amount of irritation of the system, at least of an increased susceptibility to external impressions, and very often of increased tendency to hysterical affections; these facts always require to be kept in mind in the treatment of disease, and care taken that this does not interfere with the natural discharge, which, often in itself, proves no slight relief; indeed, there exists so strong a prejudice on this point among females themselves, that they will voluntarily stop a course of medicine at the time of their period. As well known, menstruation is generally absent during suckling; its occurrence and recurrence, whilst this is going on, should be a signal for weaning, for not only is the double drain most hurtful to the maternal constitution, but the milk undergoes alteration, becomes more serous and less nutritious.

Menstruation may be interfered with by causes from without, which check its development, and throw it, as it were, back upon the system; or by causes from within, generally incipient disease, such as consumption or general debility. In the former case, the stoppage is of the active, in the latter, of the passive character; in either case, the term *Amenorrhœa* is applied to the condition by medical men.

When menstruation in a healthy female is checked by external causes, such as cold, the whole system exhibits symptoms of oppression; there is probably fever, much headache, torpor, pain in the back, loins, &c.; these symptoms being aggravated, and perhaps mixed up with hysteria, on return of each menstrual period. In such cases, relief is best afforded by those measures which tend to relieve the over-loaded system; free purgation by some of the more active pills, such as compound colocynth, or compound rhubarb, with or without calomel or blue pill, senna, jalap, &c., will be found of service, and effervescing draughts of carbonate of potash and tartaric acid may be tolerably freely taken. If there is much complaint of headache, or of pain in the lower bowels, leeches to the groins, or cupping at the bottom of the back will do good, but these must be used in the interval, not at the return of the period, at which time, immersion of the feet and legs in hot mustard and water, and hot hip baths will be most serviceable, the latter at the full heat of 98°, and repeated nightly for a few times, the patient remaining in for twenty minutes. Until the restoration of the function the diet should be moderate, especially as regards animal food and stimulants, and walking exercise regularly taken for a considerable time every day.

Amenorrhœa.—In Amenorrhœa, or suppressed menstruation from constitutional causes, the reverse of all these measures recommended above will probably be requisite; in such cases, the secretion is not thrown back upon the constitution, but the constitution, from some cause, has not power to bring it forward; it is evident then, that remedial measures must not be so much directed to the inducement of the function, as to the amendment of the debilitated constitution, and improvement of the general health; for these purposes, the plan recommended under article *Anæmia* will be generally applicable, and to that the reader is referred.

In any case of suppressed menstruation, medical attendance should be procured if possible, but especially so in the last mentioned form, when the secretion ceases without any appreciable cause, and the constitutional powers seem to be impaired; in such cases, the threatening of some disease of debility is to be dreaded, which may, if detected early, be nipped in the bud. It is repeated, in such cases a medical examination cannot be too soon submitted to. Moreover, the distinction between suppressed menstruation with over-fulness, and that dependent upon debility, is not always clearly defined; such cases call for the most careful exercise of educated judgment. In cases of suppressed menstruation, the chance of pregnancy is, of course, to be kept in view; many mistakes have been made on this point (see *Pregnancy*). The time of life is, of course, to be considered, and the possibility of the secretion disappearing at an earlier age than common.

In some cases of suppressed menstruation, what is called a vicarious or compensating discharge is sometimes established from the nose, the ears. the lungs, the stomach, &c., sometimes from an open ulcer.

Dysmenorrhœa.—Painful menstruation, dysmenorrhœa, is very common both among married and single, chiefly amongst those of an irritable constitution, and of indolent habits. It causes much suffering; the subjects of it are less likely to become mothers, and often miscarry. As regards the cure of this painful disorder, it is not a matter for the unprofessional, it is generally tedious and difficult, or it may be unattainable, even by the best directed efforts. For the relief of the paroxysms of pain much may be effected. It may be relieved by the use of a hot hip bath for half an hour, after which warm fomentations or a poultice may be applied over the region of the stomach. To prevent the recurrence, everything should be avoided that might act injuriously upon the special organs affected. Thus riding, long walks, or fatigue of any kind must be avoided; especially when the period is expected, and for four days previously, it is useful in many cases to use the warm bath nightly. The bowels should also be kept gently open by means of a saline purgative, the best of which is the ordinary white mixture composed of the sulphate and carbonate of magnesia; indeed careful attention to the digestive organs will in some instances effect a cure. Opiates give relief; five grains of Dover's powder may be given twice or three times in the twenty-four hours, or ten drops of laudanum, or seven or eight of Battley's solution at the same intervals. Anodyne suppositories (see *Suppository*) are often of much service, or small warm injections containing ten or fifteen drops of laudanum; castor oil being used if an aperient is requisite.

In the slighter cases of difficult and painful menstruation, the hot bran poultice may be substituted for the hip bath.

Menorrhagia.—Profuse menstruation, or menorrhagia, like internal hæmorrhages, may be either of an active or passive character. Many varieties of the affection are recognised, but it will be sufficient here to consider it under the above two general heads. Those advanced in life are, as a general rule, most subject to the disorder. Constitutional tendency and the influence of climate both exert so much influence upon the freedom of the menstrual discharge, that they must not be lost sight of in the consideration of cases of menorrhagia; what in one person would be excessive may be only natural in another, and the usual amount in a warm climate would be accounted profuse in a cold one. Profuse menstruation of an active character is most apt to occur in persons of full habit of body; and in such cases, within certain limits, may be considered, and allowed to go on, as a salutary relief. When, however, it becomes so free as to tell distinctly upon the strength, medical assistance should be procured, and in the event of the case being a severe one, blood and clots being passed away in quantity, treatment similar to that recommended under the head of *Abortion* should be resorted to till proper aid can be obtained. Females liable to these attacks of profuse menstruation, if of full habit of body, ought in the interval to submit themselves to medical treatment; animal food must be taken sparingly, stimulants avoided, early rising practised, and active exercise taken during the day, the bowels being attended to by cooling saline aperients; a teaspoonful of Epsom salts, with fifteen drops of dilute sulphuric acid, taken every morning in half a pint of water, will form a most suitable dose. In the recently married the flow is not unfrequently profuse and long continued; the saline purge above recommended, taken till the bowels act frequently, will generally afford relief. Continued and repeated active menorrhagia may end in the passive form.

Passive menorrhagia is most general in persons of debilitated constitution, in whom every drop of blood is of consequence, and in whom the continued weakness resulting from the disorder is very apt to lay the foundation of consumption and other diseases of debility;

such persons ought always to be under the care of a medical man. In the event of a sudden attack, means very similar to those employed in the active form are to be at once resorted to, the strength being supported by strong animal broths,—and, if there is much exhaustion, by stimulants. In such cases, the oxide of silver, as recommended by Sir James Eyre, in one-third and half-grain doses, is extremely useful, but must be given under medical sanction. In extreme cases, the injection of ergotine by the hypodermic syringe, will almost certainly check the flow. Ergotine is the active principle of the ergot of rye, and has to be procured specially prepared. Mr. Hugget of Liverpool, and Messrs. Richardson of Leicester, have both excellent preparations. In the interval, these cases will require a strengthening tonic treatment, animal food and broths freely, wine or malt liquor, bark and mineral acids, or "tincture of steel," in fifteen-drop doses, twice a day. It is repeated, there are so many modifications and varieties both of cause and effect, in cases of menorrhagia, that medical advice cannot be safely dispensed with, and should be resorted to as soon as practicable.

Decline of Menstruation.—The decline of menstruation usually occurs, as already noticed, about thirty years after its first establishment. The period is, and as such is always regarded by females themselves as, a critical era in their lives. With the cessation of menstruation the capability of conception also ceases. Such an important change cannot take place without causing some constitutional disturbance, indeed, women themselves seem to think it a matter of necessity that they must have illness at this period. This is probably going too far, many do get over the change with comparatively trifling indisposition, and much of the disorder that does occur, may be traced to luxurious and artificial modes of life, perhaps also, to privation and over-work. However, disorder at the "change of life" is sufficiently common to make it a matter of expediency in all cases, of necessity in many, that the health should be carefully watched, and any symptoms of disease at once attended to. As might be expected, irritations of the nervous system, hysterical, hypochondriacal, and even symptoms indicating approaching insanity, are apt to occur; still more frequently, disorder, indicative of plethora, or over fulness of blood, such as headaches, or apoplexy, spitting of blood, piles, &c.; or the individual becomes corpulent. Lastly, cancerous diseases not unfrequently show themselves for the first time at the cessation of the menstruation. Moderation in diet, particularly in the use of animal food and stimulants, regular and sufficient exercise, strict attention to the state of the bowels by means of the compound colocynth pill alone, or with blue pill, or by senna, castor oil, or saline purgatives, are means which may safely and with benefit be carried out. A good remedy in this depressed condition will be found in the following mixture:—Carbonate of ammonia, thirty-two grains; treacle and tincture of lavender, of each three drachms; peppermint water, eight ounces; mix. Two table-spoonfuls two or three times a day. On the occurrence of actual disorder or disease, medical aid should be sought at once—any sudden attack being attended to according to its nature, and under the directions given for its management in the proper place.

Refer to—*Abortion* — *Hæmorrhage* — *Pregnancy, &c.*

MERCURY — Quicksilver — the well-known metal, fluid at ordinary temperatures, furnishes some of the most important agents used in medical practice. Of these it will be sufficient to notice its preparations in the form of blue pill, and of grey powder, of calomel and of the red oxide or red precipitate, and of blue ointment. Corrosive sublimate, although a preparation of mercury used by medical men as a medicine, will only be noticed here with reference to its poisonous properties.

Quicksilver itself has been used in medical practice, not as a medicinal, but as a mechanical agent, in obstruction of the bowels; as much as a pound being administered at once under the idea that its mere weight in passing through the bowels would overcome the stoppage. The practice has been long since abandoned.

In the forms of blue pill and of grey powder, mercury, according to some, exists merely in a state of minute division, but is more generally thought to be in a state of low oxidation. The former of these preparations is made by rubbing up metallic mercury in certain definite proportions, with conserve of roses and liquorice-root powder, until the mercury disappears, or, as it is often expressed, is "killed," the entire mass assuming the well-known greyish-blue colour. Grey powder is similarly made by rubbing the mercury with chalk. These two forms are mild, but effective, and most useful preparations; the blue pill for adults, the grey powder for children, or where very gentle action only is required, it being milder than blue pill. It should be remembered in giving grey powder, that if given in preserve or treacle, the acid, meeting with the chalk, gives rise to effervescence.

Calomel is a compound of mercury and chlorine, and is a much more powerful preparation than either of the above; it occurs in lumps, but is generally met with and sold in the form of a heavy white powder. It is often adulterated.

Red precipitate is an oxide of mercury, and should be in the form of brilliant red, somewhat glistening scales. It is often adulterated with red lead, which has a much duller appearance.

Corrosive sublimate, like calomel, is also a compound of mercury with chlorine, but with a larger proportion of the latter; hence, in chemical language, calomel is known as the subchloride of mercury, and corrosive sublimate as the perchloride. These terms are apt to create confusion, and might occasion dangerous mistakes, as the corrosive sublimate, except in minute doses, is a virulent poison. It is better, for medical purposes, to adhere regularly to the old and perfectly distinctive names of calomel and corrosive sublimate.

The medicinal uses of mercurial preparations are, perhaps, more numerous than those of any other single agent in the materia medica; for while, in itself, a mercurial acts as an alterative, as a purgative, as a stimulant, or as a powerful constitutional remedy, according to the mode in which it is given, when conjoined with other remedies, it appears to merge its action in theirs, quickening and strengthening that of the drug to which it is added. With the diuretic it is diuretic, with the diaphoretic it increases the determination to the skin, to the purgative it gives more energetic action. Not the least remarkable and valuable property of mercury is its power of controlling or of subduing some forms of inflammation; in many cases, it is often all that the practitioner can trust to; hour after hour he pushes on the mercurial, in the assurance that if he can get the constitution, however slightly, under its influence, the disease will succumb. This effect of mercury is more particularly manifest in inflammations affecting the serous membranes, or in the eye, as in iritis, in which, as through a glass, the whole process of inflammation is to be witnessed; and it is the curative effect of mercury which he observes in inflammation of the eye, which gives the physician confidence in administering the drug in other inflammatory affections.

The administration of mercury in various diseases being noticed when the diseases themselves are treated of, the reader is referred to the proper articles.

Mercurial Salivation. — The constitutional effect produced by mercury, known as mercurialism, or ptyalism, or salivation, is not a state to be lightly induced, and without good reason, by a medical man; certainly never by an unprofessional person. The first symptoms of the constitution being affected by mercury, or of approaching salivation, is a sense of fulness and tenderness of the gums, the teeth feel as if they were elongated, and the person cannot bite any firm substance, such as a crust, as well as usual; coincident with these symptoms, the breath acquires a peculiar fœtor, which, once observed, cannot be forgotten, and the gums, if examined, are seen to be slightly swollen, and of rather a purple hue. If the medicine be now stopped, or given only in very small quantity, the constitutional indications do not become more developed, nor, indeed, does it serve any good purpose that they should be so; but if the medicine be gone on with as usual, the gums become much more swollen and tender, the tongue and glands around the jaws inflame and swell, and there is continued flow of fœtid saliva from the mouth. At the same time, there is much constitutional irritation—mercurial fever, as it is called—and, altogether, the individual under the action is in a most miserable condition. It is by no means requisite for the good effects of a mercurial course to be developed, that the influence of the medicine should be pushed thus far, neither is it desirable; all that is requisite is, that the gums should give indication of the constitution being affected. At the same time, in some individuals, any constitutional affection by mercury appears to involve this violence of action; indeed, there are some constitutions so susceptible of the action of the medicine, that the smallest dose cannot be taken without its producing free, or even violent salivation. Such cases are among the most vexatious which it falls to the lot of a medical man to encounter. He orders, perhaps, a mild, ordinary dose of some mercurial, and finds it has produced salivation, injuring the patient, and probably entailing days—it may be weeks—of discomfort. It is only experience of the fact which can point out the individuals to which this accident may happen; but, having once occurred, it ought always to be kept in mind, and any person thus liable, having occasion to change his medical attendant, should communicate the fact at the very first interview. Unfortunately, but little can be done to cut short, or even alleviate greatly, a course of mercurial salivation; cold, of course, is to be avoided, the alum wash for the mouth, or tincture of myrrh, or camphorated spirit in water, used to rinse the mouth, afford some relief. A lotion made with two drachms of chloric ether, to eight ounces of water, is also serviceable, and diminishes the fœtor; solutions of chlorinated soda, or of permanganate of potash in the same proportions, will have the same effect. Chlorate of potash lotion, in the proportion of ten grains to an ounce of water, is much used in these cases as a wash for the mouth; and the same salt may be administered internally in fifteen or twenty-grain doses three times a day. Glycerine and tannin applied to the mouth and gums, by means of a hair pencil, is also found very serviceable as an astringent application. Saline aperients, such as Seidlitz powders, or Epsom salts, largely diluted, may also be given with advantage, if the patient can swallow them, and is not in a very reduced state. The excitation of mercurial action must always, as much as possible, be avoided in scrofulous constitutions; in such, mercury seldom acts as beneficially as in others. Mercurial action is not unfrequently induced by persons continuing

to take, inadvertently, aperient pills, which contain small doses of the medicine. When these are prescribed by a medical man for a temporary occasion, warning should always accompany the prescription.

Action of Mercurial Preparations.—When mercurial preparations are given in small doses, they exert an inappreciable—what is called "alterative"—action in improving the quantity and quality of various secretions. For this purpose, a grain of blue pill, or a couple of grains of grey powder, may be given twice in the twenty-four hours. Of all the organs on which mercurials exert their effects, the liver is most obviously affected; small alterative doses stimulate gently the flow of bile, and improve its quality if impaired; larger doses stimulate more actively, and increase the secretions generally through the bowels with a purgative action. This is more obviously the case when the liver has been in an over-loaded condition; then, a dose of mercurial, even a small one, opens, as it were, the flood-gates, and the rapid descent of bile, often in an acrid condition, causes diarrhœa, with severe griping. When mercurials are given with other medicines, not purgatives, it is generally in doses which will not purge, for, should that occur, the desired action is interfered with. When mercurials are given in frequent and not very small doses, either in inflammatory cases, or for the purpose of affecting the constitution, it is usual to combine with them small quantities of opium, a quarter of a grain in each dose, to check the purgative effect, or, as it is expressed, to prevent the mercury from running off by the bowels.

As an alterative, the doses of mercurials are, blue pill one grain, grey powder two grains, calomel half a grain ; as a purgative, blue pill from five to eight grains, grey powder six to ten grains, calomel three to five grains. When mercury is given to act specially upon the liver, it is better given according to the Abernethy plan—that is, uncombined at night, and followed by a dose of liquid purgative, black draught, castor oil, or the like, in the morning. In this way the mercury is able to exert its full effect upon the liver, whereas, if combined with a purgative at first, it is hurried through the bowels too quickly to do this.

In some persons, mercurials produce a state of great nervous irritation; in others, they cause deadly sickness and faintness. Children generally bear mercurial medicines well, in doses which are large when compared with those of adults. It is almost impossible to salivate a child—indeed, in most, it is quite so. The stools occasioned by the purgative action of mercurials, especially in children, are generally of a dark olive green.

Poisoning may be occasioned by any of the preparations of mercury, but corrosive sublimate is the most frequent agent of the class by which it is produced. This substance occurs in the form of a heavy, crystalline powder, and has a strong metallic taste. Three grains would be a dangerous, if not a fatal dose. Corrosive sublimate can scarcely be swallowed without the strong taste being quickly perceived; very shortly, violent pain in the bowels, succeeded by vomiting of stringy phlegm mixed with blood, comes on, the bowels act violently, and if the patient is not relieved, collapse or sinking is followed by death. Of course, in such a case, medical assistance should be obtained with all speed, but, fortunately, the most effectual antidotes are generally within easy reach; these are the white of eggs, given mingled with a little water, or if this cannot be at had at once, thick flour and water, or milk; free vomiting being, at the same time, encouraged by ipecacuanha, if at hand, or by a feather in the throat. The white of egg must not be given too freely; for, if in excess, the good effects of a *sufficient* smaller quantity are neutralised. If the quantity of the poison given be known, the white of one egg may be given for every three grains. Accidental poisoning, even by the mildest of the mercurials, may arise in consequence of violent constitutional affection, owing to peculiar susceptibility. Such cases are most frequent in children, and are usually accompanied with severe affection of the mouth, and mortification of the cheeks, gums, &c.; they generally occur in weak constitutions, and the best antidotes are wine, strong animal broths, bark, or quinine, with two-drop doses of muriatic acid every six or eight hours. Such cases *must* be put under medical superintendence.

Slow poisoning by mercury is apt to occur in those—such as looking glass silverers, furriers and others—who are much in contact with the metal in their daily occupations. They become liable to a peculiar shaking of mercurial palsy of the hands and arms, and sometimes of the whole body, which compels them to abandon their occupations; the same symptoms occur in those employed in quicksilver mines.

Mercurial, or blue ointment, is prepared in a somewhat similar way to blue pill or grey powder.—See *Ointments.*

A sulphurate of mercury constitutes the well-known pigment, vermilion.

The white precipitate, or ammoniated mercury, is only used as an external application in the form of ointment to destroy vermin in the hair. Powders containing grey powder, calomel, &c., and indeed, heavy powders generally, should either be simply placed on the tongue, or given in some thick vehicle; but a teaspoonful of milk answers very well for the administration of grey powder to children. Calomel, in a thin liquid, such as tea, &c., sinks at once to the bottom, and probably is not swallowed.

MESENTERY is a broad fold of the peritoneum, or covering membrane of the bowels, by which the small intestines are connected with the posterior part of the abdomen, and retained in their place. The mesentery contains the mesenteric lymphatic glands, &c. —See *Digestion—Intestines.*

METASTASIS.—The shifting of diseased action from one part of the body to another, the portion deserted being left free from disease. This occurs in rheumatism, in gout, in mumps, &c.

MEZEREON.—The root bark of the *Daphne mezereon*, a shrubby plant found in shady woods, which flowers in February. It is rarely used as a purgative and diaphoretic. The berries are poisonous. The bark is one of the ingredients in the compound decoction of sarsaparilla.

MIASMA.—See AGUE.

MICROSCOPE.—This well-known instrument, which enables us to examine structures far too minute to be even visible to our unassisted vision, has done, and is doing much every day, to render the practical applications of medicine more exact. Many of the conditions of the urine are appreciable only by the aid of this invaluable instrument; the nature of tumours, often a matter of serious import, when their removal by surgical operation is the question, is by it, in many cases, determined in a way that no other means of discrimination could admit of; many other instances might be cited; in fact, a medical practitioner cannot now be considered to avail himself of *every* resource of his calling, unless he uses the microscope. In medico-legal investigation it proves of the highest service; stains which, without the use of the microscope, could only be doubtfully distinguished, are, by it, so exactly discriminated as to afford foundation for sworn evidence. Finally, as a rational and highly instructive means of amusement, every family should possess a microscope.

It may reasonably be doubted if any of the great improvements, or additions to our means of investigating the nature of disease, can take rank with the introduction of the microscope. Many diseases before unknown are now familiar as household words, and many also of which our knowledge was formerly very obscure are now, by its means, thoroughly understood, and capable of being scientifically treated. Perhaps the relation of a few instances will do more than anything else to illustrate the benefit we have derived from the microscope in various ways.

We will suppose an obscure and difficult case, where the patient has repeated attacks of vomiting of blood. A drop of that blood being placed under the microscope is found to contain cancer cells. Now the causes of vomiting of blood are so numerous and complicated, that no one but a medical man can have any idea of the satisfaction afforded to his mind by the certain and positive knowledge thus afforded, as to the exact nature of the disease. Or take the same case in another light. The patient complains of the same symptoms, and the same test is applied. This time, however, to the patient's dismay, it is ascertained beyond the possibility of doubt, that the blood shown is not human blood, but that of some one of the lower animals, and he is at once accused of feigning disease with, perhaps, some object in view. Again, a patient is suffering, perhaps, from indigestion, weakness, with intolerable depression of spirits, and other symptoms, which require to be felt to be described, and which have been treated by ordinary methods in vain. A drop of his urine is placed for examination under the microscope, a new light is immediately thrown upon his case, and the appropriate remedy prescribed, with the result of a speedy restoration to health.

In no way has the microscope proved of more value to medical men than in enabling them to examine with precision and accuracy into the various conditions of the urine and kidneys, which constitute the affection or class of affections called Bright's disease. Indeed, so remarkable is the advantage derived in treating the kidneys, from an examination of the urine, that medical men can tell their condition all through the course of the disease, and can foretell before death almost the exact state in which those organs will be found in fatal cases.

In affections of the stomach, or bowels, the microscope is very valuable in enabling us to ascertain the nature of vomited matter, if there be such. Pus and cancer cells and fibres, on being found, enable us to speak with great comparative confidence as to the nature of the disease. Animal, or vegetable parasites, may be discovered, or merely some functional error, or fault of digestion detected. The examination of the nature of the sputum in lung diseases is of the highest importance. In this way cancer, consumption, simple inflammatory disease, or inflammatory disease connected with some special local irritant, as we find in miners, and many other trades, may be successfully discriminated, and treated accordingly.

After a patient has had to submit to a dangerous and painful operation, it may be for the removal of a tumour, the question is often anxiously asked of the surgeon—Is there no danger of its recurrence? Now this is a question which, by the aid of the microscope in enabling us to examine the tumour, we are in a much better position than formerly to answer with an approach to certainty, and we can thus give much more definite and valuable information to friends and relations as to the probability of other members of the same family being affected by the same disease.

A consideration of these remarks will also show of what importance the microscope may be made in the examination of diseased tissues

after death; in fact, it may be said that it is almost mainly to this method that we look for the means of extending our knowledge of disease upon a scientific basis, and that even now such important discoveries are being made as seem likely to introduce a new era into the practice of medicine and pathology.

Another way in which the use of the microscope may be said to be of value to all classes of people is in the readiness with which, by means of its aid, the fraudulent tricks of dishonest tradesmen, in adulterating food, can be detected. For instance, arrow-root, which, when genuine, is very expensive, is often adulterated with large quantities of potato starch, the grains of which, when viewed under the microscope, present characteristics which at once, and with the greatest ease, distinguish them from those of any other starch. Numerous other instances might be mentioned where

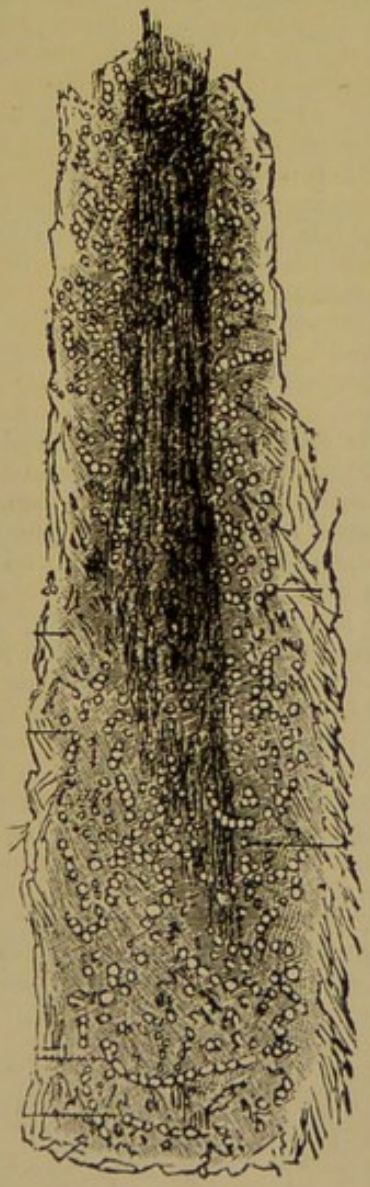


Fig. 155.



Fig. 156.

the tricks of trade are at once exposed by its means. It is comforting also to think that now-a-days, when diseased meat is so common in our markets, many forms of parasitic disease can be discovered even by very low microscopic powers, and in the hands of any tyro; so that sanitary authorities are compelled to do what ought to have been done long ago, viz., provide a proper system of inspection of markets throughout the country.

The discovery of the dependence of several hitherto unknown diseases of the human frame upon the presence of animal, or still more frequently of vegetable parasites, has led to an efficiency of treatment consisting in the destruction of the parasite which is followed by an immediate cure of the distressing symptoms. This alone, had we derived no other benefits from its use, would entitle the workers with the microscope to our lasting gratitude. The accompanying illustration (fig. 155), from Dr.

Aitken's *Practice of Medicine*, shows, as seen under the microscope, a parasitic fungus growing upon, and constituting a well-known disease of the hair and hair bulbs, called *Favus*, or scald head. The next figure (156), also from the same work, represents a hair, as seen microscopically, loaded with diseased parasitic growth. This represents the morbid state of the hair in the disease familiarly known as ringworm of the scalp. From a consideration of the above figures it may easily be conceived how important an agent the microscope may become in determining the nature of a given disease, and in pointing to the remedies necessary to be used for its cure.

MIDRIFF.—The Diaphragm.—See *Diaphragm.*

MILIARY—an eruption, consisting of numerous very minute vesicles, which is apt to appear intermixed with other eruptive diseases, but particularly in cases where persons have been perspiring very much, or kept too hot, in illness. Miliary eruption on the skin, used to be very common in women after childbirth, in times when it was the custom to keep them much too hot, and to stimulate.—See *Skin.*

MILK.—The nutrient fluid secreted by mammiferous animals for the sustenance of their young, through the agency of the peculiar "mammary" glands provided for the purpose, is the only material throughout the range of organisation prepared by nature expressly and solely for food; moreover, it contains within itself all that is requisite in food to maintain in health, and to build up the frame of a living animal. The milk of animals generally is characterised by certain general properties and constituents, although it varies much in the proportions of the latter which it contains. When milk is examined under the microscope, it is found to consist of numberless minute spherical globules (fig. 157), which are suspended or float in a colourless fluid. From these globules, which are of various sizes, milk derives its opaque whiteness; consequently, when it is diluted with water, and the fluid increased in proportion to the globules, the rich whiteness of pure new milk is destroyed, and the liquid assumes a more or less bluish or semi-transparent appearance. These globules principally consist of the oleaginous, fatty, or creamy portion of the milk, but they also contain curd or caseine; this constituent, however, chiefly exists in a state of solution, in the serous or fluid portion of the liquid, along with the sugar and salts, chiefly phosphate of lime with salts of potash and soda, and in less proportion, magnesia and iron.

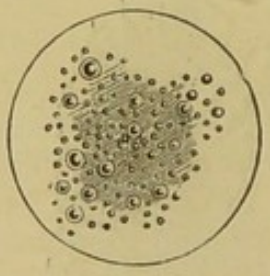


Fig. 157.

Thus we have milk consisting (1) of water which holds the other constituents in solution; (2) of curd or caseine, the nitrogenous or flesh-forming and force-giving element; (3) of sugar and fat, heat and force-producers; and (4) of mineral matters. The following table, from Dr. Edward Smith's analysis, gives the proportions of these ingredients in the milk of various animals:—

	Water.	Caseine.	Sugar.	Fat.	Salts.
Goat,	84·5	3·5	3·7	5·7	0·7
Sheep,	83·2	6·9	3·9	5·1	0·7
Mare,	90·4	3·3	3·2	2·4	0·5
Ass,	89	3·5	5	1 8	0·5
Cow	86·4	5·5	3·8	3·6	0·6
Human Milk,	88·9	3·9	4·3	2·6	0·1

In some countries cow's milk is less used than the milk of other animals. In the north of Europe, in Sweden and Denmark, sheep's milk is preferred; in Switzerland much goat's milk is used by the natives; in Tartary mare's milk (from which a fermented beverage called koumiss is also prepared) is much employed; while in Lapland the milk of the reindeer is generally had recourse to.

Sugar of milk is not present in the milk of carnivorous animals as long as they are fed on flesh solely, but appears if they are made to eat a portion of vegetable food. In the milk of the cow, the proportions of curd, of cream, and of sugar—that is, of the caseous, fatty, and saccharine ingredients—are about equal, the caseine rather predominating; in human milk, the saccharine and caseous constituents are proportionally greater than the fat. This milk is less opaque and thinner in appearance than cow's milk, and is most nearly approached in composition by that of the mare and ass.

Fresh milk is alkaline, has a specific gravity, varying from 1·026 to 1 034, and when good

is at first perfectly homogeneous; after standing, the light oily particles separate and float in greater or less proportion at the top of the fluid, in the well-known form of cream. If the milk be kept some time—more quickly in a warm situation—lactic acid is formed by a process of fermentation, and the curd separates, souring or curdling taking place. Various modes and instruments have been employed for testing the quality of milk as to richness, &c. The addition of a small quantity of carbonate of soda or boracic acid to milk retards its souring and curdling, if it be requisite to keep it longer than usual. When it is not thought advisable to make either of these additions, it is a good plan when the milk is received, to scald it, that is, to heat it in a sauce-pan to a temperature of 212°, but not to boil it.

Milk-dealers have been frequently charged with adding foreign substances to milk, to give



Fig. 158.

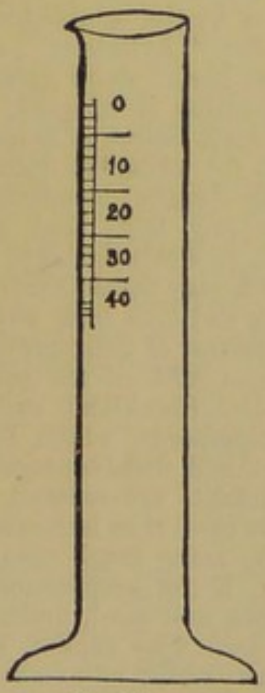


Fig. 159.

colour and consistence to the fluid after fresh milk has been abstracted from it, and water added; but these charges may in the main be dismissed as fanciful and groundless. The only fraudulent addition likely to be made to milk is water, and although the new Adulteration Act has done wonders in improving the quality of the supply of milk to towns, it occasionally happens that milk-dealers are found guilty of evading its provisions, and are punished in consequence. As the chemical analysis of milk is a somewhat formidable operation, and can only be satisfactorily employed by an expert, it is desirable that some ready means of telling the quality should be within the reach of every one, and this desideratum has been supplied by the lactometer for measuring the density of milk, combined with the creamometer for ascertaining the proportion of cream contained in it. These instruments are now universally employed in public institutions where much milk is used, and where it is generally obtained by contract, and may be found useful tests in private households. The lactometer (fig. 158) is an ordinary specific gravity instrument, graduated from 0° to 40° of density, water being represented by the zero standard, and the creamometer (fig. 159), which is used along with it, is a cylindrical glass, marked off in 100 parts, forty of which are shown to give the percentage of cream. As a rule the milk may be considered as good, so long as its specific gravity does not go below 1026°, and after standing in the glass for twelve hours, the cream on the surface marks not less than ten per cent. These intruments are to be had from Mr. Casella, of Holborn Bars, to whom we are indebted for the illustrations. Dr. Parkes gives some practical hints on the specific gravities of milk adulterated with various proportions of water, which are subjoined. Assuming the density to range from 1026° to 1030°:—

9 parts of milk to 1 of water would indicate a specific gravity varying from,	1023 to 1027
8 parts of milk to 2 of water,	1019 ,, 1024
7 ,, ,, 3 ,,	1017 ,, 1021
6 ,, ,, 4 ,,	1016 ,, 1018

Milk may vary much in the quantity of its constituents according to the time of the year, or even at the time of the day at which it is obtained, and still come under the designation of wholesome and pure milk. It may be influenced by the breed of the cow, the conditions under which the animals are kept, and the nature of the food they consume. With dry foods, such as turnips and oil cake, the milk is richer in solids; while cows fed on rich pasture land give a larger amount of cream. Alderney cows are noted for the large amount of cream in comparison with the quantity of milk obtained from them; while other breeds, notably short horned-cattle, give much milk with little cream.

The milk which is first secreted—formed—after the birth of the young, varies from any that succeeds it, particularly in possessing a purgative property which acts beneficially upon the bowels of the offspring. In the cow this first, or "green" milk or "colostrum" is very nutritive, and contains much curd of a peculiar nature, which is coagulable by heat, like the albumen of egg. On this account it is used in the country parts of England, under the name of "beastings," for making a kind of custard pudding. The first milk, or colostrum, of the human female, is thin and serous looking. This first milk, or colostrum, in animals generally, if examined under the microscope, exhibits an intermixture of larger and different globules from those of ordinary milk.

It is perhaps needless to remark, that upon

the health of the being or animal by which milk is afforded, the nutritive properties and wholesomeness of the fluid depend; in the case of mothers, therefore, who are decidedly unhealthy, or the subjects of any disease, scrofulous or otherwise, it is better for their offspring that they should not be nursed by them; and even in the case of the healthy mother, this secretion is so liable to be affected and deteriorated by irregularities in diet, by emotions of the mind, and by medicine taken, that the greatest care, as all mothers well know, is requisite to prevent such causes and effects being accidentally originated (see *Children—Nurse*). Milk has been proved on several occasions to have been the innocent cause of spreading disease, through the vessels containing it having been previously rinsed out with water contaminated with sewage poison. Several outbreaks of typhoid and scarlet fevers have been clearly traced to this cause.

In addition to the modifications which milk undergoes in the hands of the dealer, there are others besides those stated above due to the condition of the animal. The supply of water, and temperature, influence the state of the milk as regards quality and nutritive power; its wholesomeness depends upon the period after calving,—milk not being in good condition for three weeks or a month after this occurrence,—and others depend upon the health of the cow. It was notorious that in many large towns, and in London especially, the mode in which extensive dairies of cows were lodged and fed was most unwholesome for the animals, and for those who use their milk; but these things are now in a great measure rectified by improved sanitary administration.

As an article of diet, milk is for the generality of persons most wholesome, for children especially, of whose food it ought to form in some mode or other a large proportion: less heating than animal food, it is equally nutritious.—See *Childhood*.

Some persons, both children and adults, find new milk too rich, but can take it after the oily cream has been removed by skimming, or if it is diluted with water, or boiled. The addition of from one-third to one-half lime water, will often cause milk to sit more lightly on the stomach. Equal parts of milk and soda water form a nutritious drink which often agrees with people who can take nothing else. Hot milk, slightly sweetened, and soda water makes an admirable night draught for incipient colds, when stronger remedies are unnecessary, or even in addition to them.

When milk is taken largely without other food, there is risk of the formation of a mass of solid indigestible curd in the stomach, which may cause much uneasiness, and at times, in children, even alarming symptoms; its expulsion by vomiting is the usual means of relief. Some persons cannot take milk without suffering from stomach disorder and headache, and others, who suffer from chronic chest affections, find its use aggravate the symptoms. It need scarcely be added that, except in these peculiar cases, milk and milk preparations form one of the most valuable resources in the dietetic treatment of the sick. It is exceedingly useful when mixed with ice, as a cooling drink in fevers, to give strength and allay thirst, and with beef tea forms the staple diet of the fever patient. In giving iced milk, however, some caution is needful, for if swallowed hastily, or in too great quantity, there is the risk of an ice cold coagulum being formed, causing pain and depression, and even risk to life. Many invalids derive much benefit from the use of milk warm from the cow in the early morning; in some cases a small quantity of black pepper, or a tea-spoonful of rum or brandy, is added to the tea-cupful of milk with advantage.

A great step towards ensuring the public of the Metropolis, at all events, with milk of a high standard of quality has been made of late years by the establishment of such companies as the "Aylesbury" and "Collinson Hall's short-horn" dairy companies, in which every precaution is adopted, by testing chemically the milk before it is issued. With the facilities for chemical manipulation afforded by their chemical laboratory, the Aylesbury Milk Company have been able to supply several milk products hitherto difficult to obtain, and which may be had continuously at a reasonable price and free from any objection. The most important of these preparations is the artificial human milk of the company, first suggested by Dr. Frankland and Dr. Playfair, by the employment of which, Dr. Playfair writes, "the risks and disadvantages of the bottle-feeding of infants are reduced to a minimum." He looks upon it as immeasurably superior to asses' milk, being much cheaper; and he considers that, if the preparation were more generally known and used, much illness in the case of children who cannot be brought up at the breast would be avoided. Koumiss, an effervescing beverage obtained by the natural process of fermentation, is another article prepared by the milk company, in which the curd or casein undergoes partial digestion in the process, while the carbonic acid contained in the altered milk has a sedative effect on the irritable stomach. Koumiss has been extensively used, and is highly lauded as a remedy for obstinate vomiting and dyspepsia generally, as well as a remedy for consumption; and there can be no doubt of its being a highly nutritive food. As a means of still further promoting the digestion and absorption of the curd, a peptonised milk has been prepared by adding pancreatic extract to the milk to form a peptone. It is easy to see how a food prepared in this way must prove invaluable to children, and to many invalids whose stomachs would reject pure milk.

The whey, which is the serous portion of the

milk, freed from the curd, and a portion of the cream, is light, nutritious, and aperient, and is perhaps too much neglected as a beverage; the same remark applies to buttermilk, which is freed from the cream, but retains the curd.

Those who desire more information on the subject of the above article, will find much in Dr. Edward Smith's treatise on *Foods*.

Refer to — *Breast* — *Cheese* — *Childhood* — *Cream*—*Food*, *&c.*

MILK, PRESERVED.—Milk can be preserved in a perfectly sweet condition for an indefinite time by the process known as *sterilization*. It is now recognised that decomposition is caused by certain microscopic organisms known as *bacteria*. The bacteria in milk can be destroyed by being subjected for one or two hours to a temperature of about 170° F., or for about ten minutes to the temperature of boiling water, 212° F. The milk is placed in bottles and maintained at a temperature of about 170° F. for the required time, and the bottles are then hermetically sealed. The taste of the milk is practically unaffected by the process. This method is distinctly preferable to the older one of preserving milk by condensing it and adding sugar, the product of which is sold usually as "Swiss milk." Well prepared Swiss milk, however, is a valuable food when fresh or sterilized milk is unattainable, and has the great advantage of being very portable. Professor Church gives the accompanying analysis of milk preserved in the manner indicated, 100 parts of which contain:—

Water, ...	24
Casein, ...	15·2
Milk fat, ...	11·5
Milk sugar, . . .	17·7
Cane sugar, . . .	27·6
Mineral matter, . . .	2·

MILK FEVER, or WEED, as it is sometimes called, is a condition of febrile disturbance, which is liable to supervene a few days after child-birth, and is due to difficulties connected with the secretion of milk. The fever is usually of a slight character, and disappears in a few days when lactation is fully established. To obviate the occurrence, it is advisable to relieve the breasts by putting the child to them as soon as possible, and if this is not enough, to draw off a portion of the milk by the breast pump or other useful contrivance.

MIND—the immaterial part of our existence—exerts so marked, so powerful an influence over the conditions of our bodily health, that it makes the "tone" of the mind a weighty consideration in forming an opinion respecting the ultimate issue of many cases of disease. Under such articles as *Faith*, *Home Sickness*, *Hope*, *Fear*, *&c.*, the subject has been entered into as far as is consistent with our limits.

MINERAL ACIDS.—See ACID.

MINERAL WATER.—See WATER.

MINIM.—See MEASURE.

MINT.—The mints constitute an extensive tribe of plants, well known for their powerful essential oils. Two species of mint are used in medicine — peppermint, and green or spearmint. Of these, the first is at once the most energetic and the most extensively used as a stimulant and carminative, either in the form of its essential oil, of its distilled water, of its spirit or essence, or most generally of all, as a lozenge. Peppermint water is taken in doses of one or two fluid ounces; oil of peppermint, of from two to five drops on sugar; of the essence twenty mimims may be taken at once. A very powerful medicinal peppermint lozenge is made, which is extremely useful where the medicine is required.

Refer to—*Carminatives*.

MISCARRIAGE.—See ABORTION.

MIXTURES are medicinal compounds in the fluid form; they may be simply composed of various liquids mingled together; they may be solutions, or they may contain insoluble powders, as in the case of chalk mixture, iron mixture, &c. In the latter cases, the addition of gum or of gum mucilage is useful to prevent the powder subsiding as rapidly as it otherwise will do; but as it will not prevent this altogether, care should always be taken to shake up the sediment in any liquid medicine. In mixtures which are likely to be kept for some time, especially in warm climates, all saccharine matters should be excluded, to avoid fermentation; if this precaution is neglected, the bottles will certainly be burst. In forming mixtures with light powders especially, such as magnesia, ipecacuanha, &c., and indeed with any powders, it must be done in a mortar, adding at first only a very small proportion of fluid. If much water is used at first, the mixture can never be completely and properly effected.

Refer to—*Medicines*.

MOLES, or, as they are often called, "false conceptions," have not necessarily any connection with an impregnated condition of the womb, and may arise from causes quite apart from this state. The popular idea that these formations are always the results of conception requires correction, for it might lead to most erroneous and distressing aspersions on character.

MOLES ON THE SKIN.—See MOTHER-MARK.

MONKSHOOD.—See ACONITE.

MONOMANIA.—A species of insanity.—Disordered or erroneous persuasions of the mind on one subject. The disease may occur either as acute or chronic, and take any form,—suicidal, homicidal, &c.,—and may lead to incendiarism or theft, to religious melancholy, or to the most absurd ideas and acts.

Refer to—*Insanity*.

MONTHLY DISCHARGE.—See MENSTRUATION.

MORBUS COXARIUS.—See HIP-JOINT DISEASE.

MORPHIA.—See OPIUM.

MORTARS and **PESTLES** are instru-

ments used for triturating, bruising, reducing to powder, &c., the different medicinal substances. They are made of various materials—iron, brass, marble, glass, Wedgwood ware, &c., the last being by far the most generally useful, and quite sufficient for all domestic purposes, at least in this country. In emigrant life an iron mortar might be found useful. The Wedgwood mortar is generally made of the form fig. 160—1, the pestle, 2, its head made of the same material as the mortar, being fitted to a wooden handle. The mortars with which medicine chests are fitted are generally too small, and are only suitable for

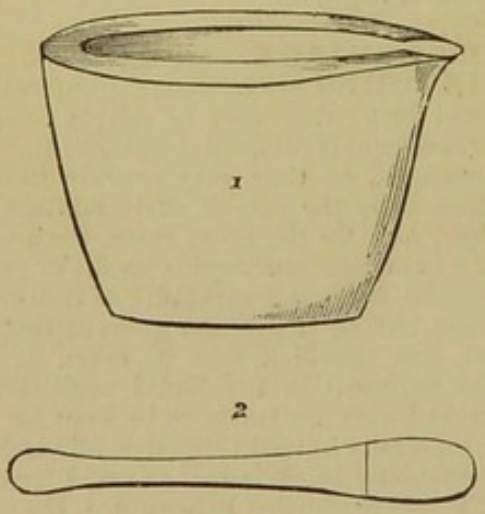


Fig. 160.

mixing powders, &c.; there should therefore be added to the domestic laboratory one of a larger size, one capable of holding about a pint will be most convenient. The great advantage of the Wedgwood mortar is, that whilst much stronger than glass, it is not, like marble or metal, acted upon chemically by different agents. It may, however, be broken, if struck sharply with the pestle. The pestle is used in the mortar sometimes with a beating or hammering action; but more generally it is used to grind or triturate, whilst firmly grasped. For simply mingling powders, a lighter hold by the forefinger and thumb is quite sufficient.

MORTIFICATION, or GANGRENE, or SLOUGHING, is the death of a portion of the living body occurring after violent or peculiar inflammation of the part; the appearance of the mortification varying according to the structure affected. A part in which inflammation is likely to terminate in mortification, is hot, painful, tense, and hard; the colour of the skin, at first dark and angry-looking, becomes mottled, and the surface exhibits blisters filled with dark fluid; at this time the previous heat giving way to a temperature lower than natural, and the pain diminishing; at last the part shrinks, becomes of a dirty grey or ash colour, and exhales a fœtid odour. Coincident with these local symptoms, if the mortification be extensive, or situated in an important part, the constitution exhibits signs of collapse; the face is pinched, cold, moist; the pulse quick and feeble; the tongue brown; the mental faculties depressed or disordered; the natural functions are performed involuntarily; and hiccup is a very frequent accompaniment.

Some parts are more prone to mortification than others, but in all, impeded or deficient circulation of blood is the originator; this may be caused by weakness of the body generally, by weakness of the circulation of a part, such as occurs in paralysis, by impediment to the current of blood through the vessels large or small, by pressure on a main branch, as by a tumour, or on one spot, as occurs on the back, in persons confined by exhausting disease, and by intense cold or heat, which destroy the textures, or by the use of unwholesome grain (see *Ergot of Rye, &c.*). It may also occur from intense inflammation in persons of full habit of body. In the event of an inflamed part showing symptoms of mortification, if a medical man has not been in attendance, he ought to be called without delay; in the meantime, warm poultices may be applied, those made of oatmeal and bran are often useful, or the turpentine liniment may be applied, but the best applications, if procurable, are the carbolic oil, or carbolic acid lotion, or the solution of chlorinated lime; at the same time, the strength must be supported with wine, strong meat broths, &c., and rest procured by means of opium (see *Opium*). When a mortified or sloughing part of the body is separating, its loose and dead portions are usually cut away with scissors, to diminish the fœtor; poultices facilitate the separation, and after it has taken place, simple water dressing will generally be found most suitable. Senile gangrene is the mortification of the toes and feet, which sometimes occurs in the aged, especially among such as have lived too freely. It is caused by the degeneration or disease of the coats of the blood-vessels.—See *Dressing.*

Refer to—*Inflammation, &c.*

MOTHER.—See CHILD-BED—CHILDHOOD—HEREDITARY—NURSE, &c.

MOTHER-MARK.—The term is applied to stains, moles, and other marks, vascular and otherwise, with which a child is born, and for which many fanciful causes are assigned. The most important mother-marks are the vascular nævi.—See *Childhood.*

MOTION and **MOTOR CHANGE.**—Movement in the living body is the result of contraction of the muscles influenced by the nerves, and is either voluntary, dependent on the will, or involuntary, as displayed in the movement of the heart and intestines. The force necessary to supply motion is developed by heat in the oxidation of the food, and, to a certain extent, by the tissues in the process of constant waste and reproduction peculiar to

animal life. The motive force in muscles was for a long time supposed to be due to a metamorphosis of the constituents of the elementary fibres, but recent researches show that the changes are rather the result of oxidation of the carbon of the blood in the tissues, than due to any special waste of the tissues themselves. Dr. Parkes considered (and his opinions are generally accepted) that during exercise the muscles appropriate nitrogen or flesh-forming matter from the blood, while the changes which take place are due to a transformation of the carbo-hydrates, which are consequently the main agents in the production of mechanical force.—See *Animal Heat, Blood—Food, &c.*

MOUTH.—The cavity which contains the tongue and teeth, in which is performed the important process of mastication, and by means of which articulate sound is formed, is inclosed by the lips and cheeks, by the upper and lower jaws, by the soft palate and tonsils, by the "fauces" generally, and by the mucous membrane, stretching from the tongue to the lower jaw; it is further surrounded by the salivary glands, which supply its moisture, and which open by their ducts into various parts of its cavity. The portions of the mouth are liable to different diseases. These, along with other necessary information, are detailed in the individual articles.

Refer to *Aphtha—Palate—Saliva—Throat, &c.*

MOXA—a means of counter-irritation, derived from, and long practised in the East. The true moxa is a soft woolly substance, procured from the leaves of a species of mugwort, which is made into a cylinder, and burnt down upon the skin, causing a deep eschar. The moxa has been superseded by other counter-irritants.

MUCILAGE—a thick semi-fluid formed by the solution of gummy or starchy matters in water; such as mucilage of gum acacia, arrow-root mucilage, &c.—See *Gum, &c.*

MUCOUS MEMBRANE is a membrane which lines certain portions of the body, and which may be regarded as a continuation of the skin, deprived of its cuticle, into the internal passages. It is itself covered on the surface with an "epithelium" of flattened cells, from which is secreted the thick viscid secretion named mucus (see *Mucus*). There are three great systems of mucous membrane, the one which lines the mouth, nose, eyes, throat, bronchi or air tubes, to which the term respiratory is given; the second is continued down the gullet, and through the stomach and bowels to the vent, and is called the alimentary; while the genito-urinary membrane lines the kidneys, bladder, &c.

The affections to which mucous membranes are subject, are sufficiently entered into under such articles as *Catarrh, Diarrhœa*, &c., when the diseases of the parts they line are treated of.

MUCUS is the thick, somewhat viscid, glairy secretion, formed on the surface of mucous membranes; examined under the microscope, it is seen to contain numerous round granular particles or globules, believed to be the product of disintegrated epithelial cells, cast off from the surface of the membrane. When a mucous membrane is inflamed, its secreted mucus becomes thin and acrid, as all know it does in a cold in the head, which is simply inflammation of the mucous membrane lining the nostrils: when the inflammation is more intense, or of a peculiar character, the mucus secretion is apt to be converted into a purulent one.

Refer to—*Pus.*

MUMPS—a contagious epidemic disease, which consists of inflammation of the salivary "parotid" glands, situated on either side of the lower jaw, and is usually confined to children. It commences with more or less fever; shortly, swelling at the angle of the jaw appears, and spreads gradually to the face and neck, in the vicinity of the gland, causing much difficulty and pain when the jaws are attempted to be opened: on the fourth or fifth day the swelling begins to subside. Little treatment is required beyond confinement to the house, and the administration of some simple purgative. The patient is compelled to live on slop diet, from the impossibility of mastication; but if the person be delicate, good broth may be allowed. Hot fomentation and bran poultice to the swelling will give some relief, and if the pain and swelling are very severe, a couple or three leeches may be applied to each side. Pain and swelling in the testicle is not uncommon in boys after an attack of mumps, and ought to be treated by rest and fomentation, if necessary. In girls, the breasts are sometimes, though rarely, affected in a similar manner. Mumps is a disease quite devoid of danger, unless, as has occasionally happened, though rarely, the inflammation becomes suddenly transferred to the brain or testicle.

MURIATIC ACID, or HYDROCHLORIC ACID, or "SPIRIT OF SALT."—See CHLORINE.

MUSCLES and **MUSCULAR FIBRES.**—The muscles, properly so called, are the fleshy portions of the animal frame, by means of which, through the influence of the nerves, the various movements of the body are effected, in fact, *all flesh is muscle* devoted to this purpose. The muscles are composed of bundles of fibres bound together by cellular tissue, and these fibres can be divided and subdivided under the microscope, until the "ultimate fibre" of muscle is arrived at; this ultimate fibre, containing within it other "minute cylindrical particles." These fibrillæ are marked with tranverse lines, and constitute the striated muscular fibre, in contradistinction to the non-striated fibre, which composes the muscular coat of parts, such as the alimentary canal, which are not under the control of the will.

The muscles are attached to bones, &c., for the purposes of movement, by means of tendons; they are largely supplied with nerves (see *Nerves*), and with arterial blood, on the free circulation of which, indeed, the motor change of their elementary constituents, and consequently their power of action, depends. The muscles, like other parts of the body, are subject to disease, pain in a muscle or group of muscles is known as muscular rheumatism, and wasting of muscular substance is the common effect of paralysis and of diseases attended with great exhaustion. Progressive muscular atrophy is the name given to a complaint characterised by much local wasting of muscular substance, associated with a peculiar condition of the spinal cord. Hypertrophy of muscle, when confined to those of voluntary motion, can hardly be recognised as a disease, and is more the consequence of continuous exercise, as may be illustrated in the brawny arms of the blacksmith; on the other hand, hypertrophy or enlargement of the heart, the most important of the involuntary muscles, is a most serious disease.

Refer to — *Beef* — *Flesh* — *Food* — *Motion* — *Tendons*, *&c.*

MUSHROOMS.—The fungus tribe to which mushrooms belong contains a large proportion of poisonous members, and even those which are usually considered edible are not always above suspicion in this country. In France, Russia, &c., many species of fungus are used, commonly, and largely, as food, and are very nourishing, as they contain a large proportion of nitrogenous matter as well as fat. The true value, however, of the alimentary constituents is open to question, and where so much doubt exists as to the character of the different plants, mushrooms as an article of food had better be avoided. Those who gather mushrooms for food should be very certain that they know what *are* mushrooms, and this will be best learned from those who are practically acquainted with the matter; it may be added, that even real mushrooms which grow under trees are generally considered unwholesome, and also those in which the process of decay has commenced. The edible mushrooms grow in dry airy places, usually solitary; have a white or brownish colour; a compact brittle flesh; do not change colour when cut and exposed to the air, have a watery juice, an agreeable odour, and a pleasant taste.

The poisonous plants grow in dark damp places, have a bright green or scarlet colour, acquire a brown, green, or blue tint when cut and exposed to the air; exude a milky acid juice; have a powerful disagreeable odour, and an astringent and bitter taste. After poisonous fungi have been eaten, there is generally giddiness, dimness of sight, and debility, if the symptoms appear quickly; but if they are delayed they are more generally those of irritation, vomiting, purging, and pain. In a case of poisoning by fungi, treatment similar to that recommended for *Belladonna* will be the best, in the absence, or during the delay in the arrival of a medical man.—See *Belladonna*.

MUSSEL.—See Fish, &c.

MUSTARD.—Black and white mustards are plants which grow wild throughout Europe, but are cultivated for use; they are often confounded with the common charlock. Black mustard has smooth seed vessels which grow close up to the stem, and contain reddish-black seeds. White mustard has tough seed vessels, which spread away from the stem, and contain yellow seeds. The seeds of the black mustard are more pungent than those of the white, but the two are very commonly mixed in the manufacture of the common "flour of mustard;" this is formed by crushing and pounding the seeds, and sifting. The sharp, burning acridity of black mustard depends upon a volatile oil, which, however does not pre-exist in the seeds, but is formed on the addition of water. There was perhaps no article in domestic use more largely adulterated than mustard, but since the passing of the Adulteration Act, the samples brought for sale have very much improved in quality. The materials which were used in the adulteration, and which are still occasionally met with, are wheat starch, linseed, plaster of Paris, and cayenne pepper, the latter employed to give piquancy to the flavour.

Mustard, when used in moderation as a stimulating condiment, is wholesome. Its principal use in medical practice is in the well-known mustard plaster, or cataplasm, as a counter-irritant. This application is made in various ways: when speedy energetic action is required, it is best obtained by mixing good *fresh* mustard with *water*, as for the table, and spreading on calico or paper. It is well to interpose a piece of thin gauze or muslin between the mustard and the skin; this does not in any way interfere with the action of the application, and prevents portions of the mustard adhering to the skin, and irritating it, after the removal of the cataplasm. Some persons erroneously mix the mustard with vinegar, thinking to render its action stronger: this is a mistake, as it has the reverse effect. Others mix with one-third or one-half flour, or bread crumb, which modifies the power of the remedy, and is all very well when modified and longer-continued action is desirable, not unless. The usual length of time a mustard plaster can be borne, is from twenty minutes to half an hour, and even in this time it often produces blistering; it always leaves for some time a deep red mark on the skin, a fact not to be forgotten in the case of females. A tablespoonful of mustard added to a child's bath is very serviceable in bronchitis and in promoting the rash of the febrile eruptions among children, should it show signs of receding. Mustard is also beneficially employed in the

same way for common colds when put into the foot bath, and in cases of arrested menstruation it is of service when used in the hip-bath prior to the expected period. When mustard plasters are applied to any one in a state of insensibility from poisoning by opium or alcohol, they should be removed within the half-hour; if allowed to remain, should the person recover, troublesome ulceration may be the result. Mustard papers, or leaves as they are called, are now much employed as substitutes for the poultice, but though convenient for travellers, it is doubtful whether they are equally effective for domestic purposes.

From their familiarity and convenience mustard plasters are apt to be applied somewhat too indiscriminately, both domestically and professionally, and in many cases where a hot bran poultice would be much more soothing and beneficial; they often cause much irritability, and if applied near the spot where inflammation is going on, as in the case of the throat, seem rather to aggravate than to relieve. In the case of a lady under the author's care, the application of a mustard plaster to the lower part of the spine gave rise to effects resembling those produced by the inhalation of laughing gas.

As an internal remedy mustard is a safe and effectual emetic, in doses of one, two, or three tea-spoonfuls in six or eight ounces of water. The seed of the white mustard, swallowed whole in table-spoonful doses, was, some years ago, in much vogue as a stomachic remedy, but is now little used. It probably produced any benefit it effected by its mechanical action upon the alimentary canal.

Refer to—*Counter-irritation.*

MUSTARD LEAVES, referred to above, are prepared according to the Pharmacopœia by mixing one part of the powder of black mustard seeds with two parts of the officinal solution of gutta percha, strips of cartridge paper are passed over this solution, care being taken that only one side of the paper shall receive a thin coating of the mixture. The paper is afterwards exposed to the air to allow the coating to harden, and before being used it should be immersed for a few seconds in tepid water.

MUTTON, when tender, is the meat best adapted for invalids, and persons of weak digestive powers. The best mutton chops are those cut out of the centre of a leg.

Refer to—*Broiling—Cookery—Food, &c.*

MYRRH is a gum resin, the product of a tree native to Arabia, Abyssinia, and the countries bordering the shores of the Red Sea, from which the drug is chiefly brought. Myrrh is a stimulant expectorant, and enters into different medicinal compounds.

The tincture of myrrh forms one of the most agreeable washes in affections of the mouth, in the proportion of half an ounce of tincture to half a pint of water. A few drops of the tincture upon the tooth brush is a most excellent habitual application in cleansing the teeth, especially if the gums are weak or spongy.

NÆVUS, or as it is popularly called, *Mother's mark*, is often very troublesome and obstinate, and it is sometimes a very important and anxious question to settle, whether or not an operation should be had recourse to for its entire removal. There are various methods employed to effect this, should it be thought necessary by the surgeon.

NAILS.—The nails, like the hair, may be regarded as prolongations from the epidermis, or outer skin; they are formed of flattened cells containing horny matter, and spring from a fold or matrix in the true skin, about two lines in depth. At the bottom of this groove or fold, there are numbers of papillæ, or little vascular points, from which the nail is developed, and is continually being pushed forward by the addition of new matter to its root. At first the nail is thin, but it acquires thickness in its progress forwards by the addition of new layers of cells to its under surface, these cells being also formed by papillæ, which likewise serve to retain the nail in its place.

Nails are apt to be cast off after injury, but the principal and most troublesome affection to which they are liable, and particularly the nail of the great toe, is "ingrowing"—that is, ulceration, formed by the edge of the nail, and constantly kept up by the irritation which produced it in the first instance. This, of course, requires to be attended to by a surgeon. To obviate the complaint, care should be taken to direct the growth of the nail, which is best done in the first instance by wearing shoes which give abundance of room for the toes. Next, a small piece of cotton wool, soaked in a solution of potash, should be inserted well into the corner and round the ingrowing part. By this means the nail is softened, and the cause of the pain removed. At the same time, the centre of the nail should be scraped thin, and be kept so for some time. The nail should be allowed to grow square and large, the corners not being rounded off. Should this treatment fail, the nail must be removed, and its subsequent growth attended to. The appearance of the nails is often indicative of constitutional tendency, particularly the long curved or filbert nail of the consumptive.

Refer to—*Skin.*

NAPHTHA.—The term is now applied to the transparent colourless fluid obtained by distillation from petroleum and coal tar.—See *Petroleum.*

NARCOTICS are medicinal agents which diminish the activity of the nervous system, produce sleep, and in most instances relieve pain, but which also are capable, if given in small repeated doses, of exciting the nervous system; by this they are distinguished from the class of medicines named *Sedatives.* The

class of narcotics also includes anodynes. The only narcotics in any way admissible in the domestic materia medica are:—

Camphor.
Chloral.
Hemlock.
Henbane.
Hop.
Lettuce.
Opium.
Stramonium.

Refer to separate articles.

NAUSEA, or the sensation of sickness, or of inclination to vomit, is best known from individual experience of the sensation.

Although the feeling of nausea itself is referred to the stomach, and may be due to causes connected with that organ simply, it also very frequently originates in disorder in other and distant parts of the body, a fact which often constitutes it a valuable symptom. Causes which act directly upon the brain are among the most frequent originators of nausea, and there is every reason to believe that the sensation from which the term is probably derived —sea sickness—is primarily excited in the brain itself. As all know, a blow on the head occasions nausea and vomiting; severe injuries in other parts of the body, such as a dislocation, also occasion sickness by acting indirectly upon the stomach; the nausea of pregnancy is another example of this sympathetic nausea. Disgusting odours are instances of the same thing. The action of drugs of an emetic character must be accounted for by their influence on the nervous system, for they act equally well as nauseants, if injected in solution into the veins, as if they were swallowed. Lastly, the presence of indigestible food, or of bile, &c., in the stomach itself, will also cause nausea, which may also be produced by simple over-distension of the organ by gas or fluid. The instances given of sympathetic nausea, will explain, how it comes to be a valuable guiding symptom in the investigation of disease. Incipient or advanced affection of the brain, gall-stones, stone in the kidney, disease of the womb, pregnancy, and many other conditions of various organs, give rise to the sensation of nausea, or to actual vomiting.

The complete relaxation of the nervous system which occurs in an individual under the influence of nausea, renders its existence favourable to the performance of certain operations upon the body, such as a reduction of a dislocation, or of a rupture. The means of relief in nausea, and its very frequent accompaniment, vomiting, must, of course, depend upon the cause. When dependent upon brain affection, remedial measures are of but little service, but in this, as in other cases, may be resorted to. Effervescing draughts, with lemon juice, or simply aerated water, will often be extremely useful. Spirit of chloroform, in doses of twenty minims, is generally effectual, and is now much used in sea sickness. A tea-spoonful of magnesia in a glass of sherry has been found a good remedy, but one which is inadmissible in head affections; a mustard plaster to the pit of the stomach may be used with advantage. When the nausea is thought to be dependent upon the presence of bile or other matters in the stomach, it is soonest relieved by exciting vomiting, which is easily effected, either by means of luke-warm water alone, infusion of chamomile, or at all events by a small dose of ipecacuanha. After the stomach has been cleared, effervescing draughts will be at once grateful and beneficial. The nausea of pregnancy requires its own treatment.—See *Pregnancy*.

Refer to—*Effervescing*, &c.

NAVEL.—See CHILD-BED—CHILDHOOD, &c.

NECK.—The bond of connexion between the head and the trunk of the body is perhaps the most important region of the frame; certainly it is so in a surgical point of view, on account of the numerous important parts it comprises. The illustration (fig. 161), which represents a

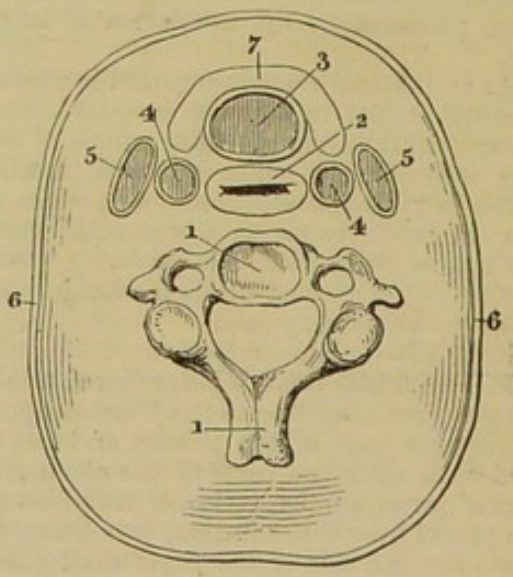


Fig. 161.

transverse section of the neck, will best show the position of the chief vessels, &c.: 1, 1, is one of the vertebræ of the neck, in front of which, somewhat flattened, as at rest, lies the œsophagus or gullet (2); and anterior to this, the windpipe (3); on either side are placed the great vessels of the neck; these are the great or "carotid arteries" (4, 4), and close to them —indeed, included within the same covering or sheath—the internal jugular veins (5, 5). All these parts, besides nerves, glands, the external jugular veins, and the muscles of the neck, are included within the surrounding skin (6, 6). The "thyroid gland" (7), which becomes enlarged in swelled neck, or bronchocele (see *Bronchocele*), lies in front of the windpipe.

Diseases which affect the parts situated about the neck, such as its glands, &c., fall to

be considered under other heads, and need not be enlarged upon here; and under such articles as *Hanging*, *Gullet*, which also includes *Choking*, *Artery*, &c., will be found information concerning the accidents to which this region and its parts are liable. There remains, however, for consideration, the effect of mechanical impediments to the circulation of the blood in the neck, connected either with clothing, or with those muscular movements of which the part under consideration possesses so wide a range. Some persons, particularly those with short necks, or with tendency to apoplexy, epilepsy, &c., are much more liable to be affected than others, by anything which, even for a very short time, checks the free flow of blood through the veins downward from the head; and such persons ought to be especially careful that nothing they wear about the neck becomes in the slighest degree tight, not simply when the face is looking straight forward, but when it is turned from side to side. It has occurred, that a person liable to head attacks, has fallen down insensible, in consequence of the simple act of turning the head rather more to one side than usual, and thus giving a little extra tightness to a shirt collar. It is well known, too, that the tight stock of the soldier was the cause of numerous apoplectic and other affections, in consequence of its effect in compressing the large vessels of the neck. A similar caution is requisite with regard to the clothing of children, which ought always to be loose about the neck. From a similar cause arises the danger which men incur from sleeping without unfastening the usual clothing about the neck; apoplexy may result. But not only may head affection result from tightness around the neck externally, it may, in the predisposed, be the effect of the action of the muscles alone; these, if the head is turned strongly to one side, exert strong pressure upon the veins and impede the flow of blood, damming it up towards the head. On this account, persons who are liable to over-fulness of blood, ought to be on their guard against such sudden movements.

Wry neck is caused by the undue permanent contraction of one or more of the muscles on one side of the neck. It is remediable by surgical operation. A different form of wry neck, or, at least, of an affection closely resembling it, is the result of paralysis of the muscles on one side, permitting those on the other to draw the head towards their own side. Stiff neck is the result of rheumatic affection of the muscles.

NECROSIS.—Death of a portion of bone. —See *Bone.*

NERVES and **NERVOUS SYSTEM.**—The possession of a system of nerve tissue is one chief distinction between the animal and the plant; the latter exhibits no trace of it, and even in some of the lowest tribes of animal life, which are scarcely distinguishable from vegetables, it has hitherto been undetected. Where a nervous system does exist, it is always found to be composed of two parts, one of which is white and opaque in appearance, and when examined under the microscope, presents a tubular or fibrous structure; the other is of a reddish-grey colour, and semi-transparent, and consists of cells or vesicles filled with granular matter. The presence of these two forms of nervous substance seems essential to the working, so to speak, of the apparatus. In the larger nervous masses, such as the brain, the distinction is very palpable, and may be verified by any one who will take the trouble to examine the brain of a sheep. The opaque white nerve matter forms the larger proportion of the brain, spinal marrow, and nerves; the grey is more sparingly distributed, and is evidently the apparatus in which the nerve force is generated, the tubular substance acting the part of the conductor. This is more apparent when the latter is thrown into the form of the nerves, or cords of nervous matter, which are distributed throughout the body. These nerves, at their origin, are connected with the grey substance, with the vesicles of which their fibres are intermingled. Where this intermingling takes place, an enlargement, or as it is named a "ganglion" is formed. In the lower tribes of animals in which the nervous system is simple in a degree corresponding with the simplicity of their structure, these "ganglia," resembling knots upon the nerves, are all they possess in lieu of a brain; but as the scale is ascended towards man, we find the nervous system become much more highly developed, and the nerve substances collected or aggregated into masses, which are carefully protected from all external injury, and from which the nervous cords, or conductors, or as they are usually called "nerves," proceed to all parts of the body, each being enclosed within its own proper sheath, and dividing and subdividing to be distributed to every portion of the frame, although to some, such as the ends of the fingers, lips, &c., their branches are more liberally allotted than to others.

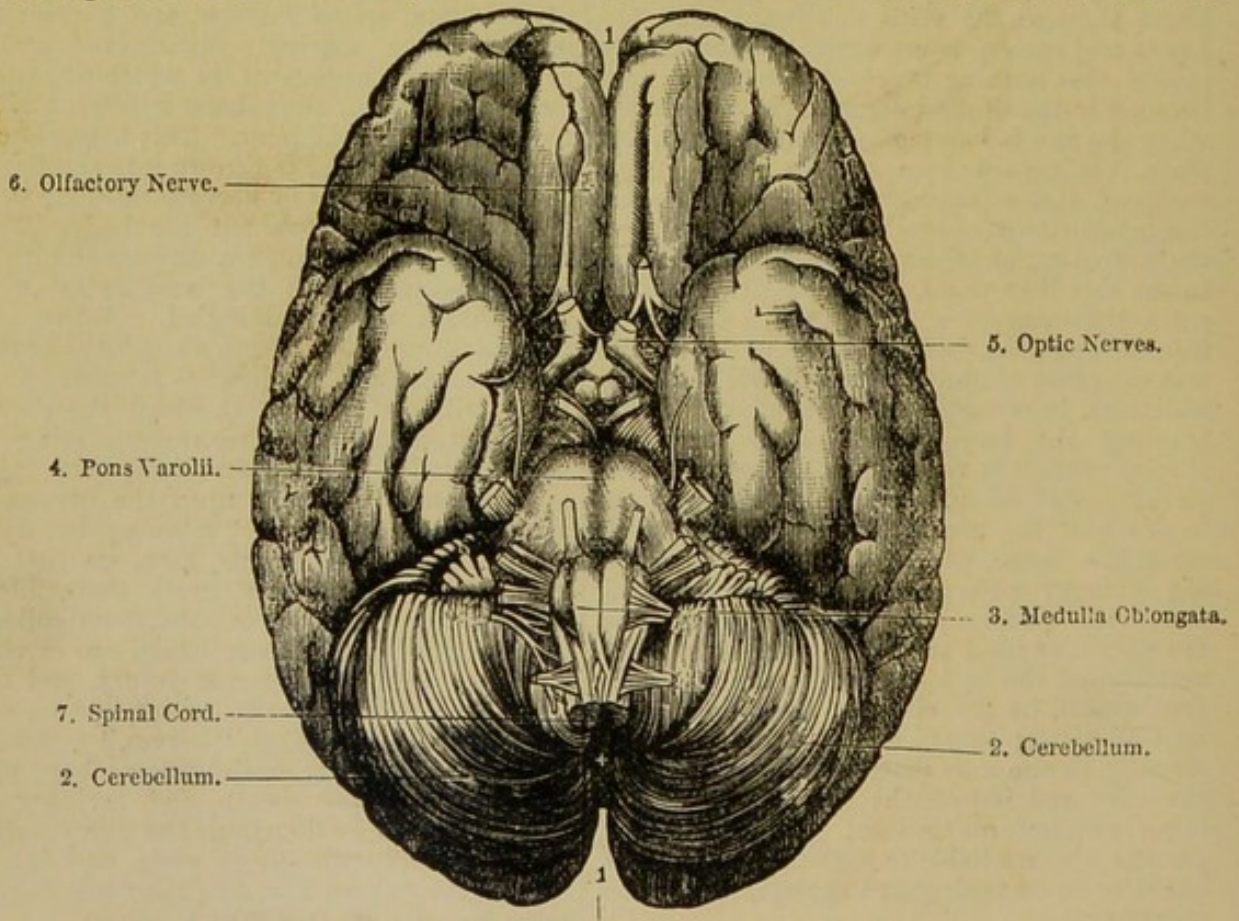
In man the great nerve masses are divided into the brain, or cerebrum (fig. 162, which represents its lower surface, or base), together with the cerebellum, or little brain (2, 2), the medulla oblongata (3), the pons Varolii (4), the origins of the optic (5) and olfactory (6) nerves —the longitudinal fissure (1, 1) dividing the brain into two equal halves or hemispheres. These parts are all contained within, and protected by the hard bony skull. Continued from the medulla oblongata at (3) there is the spinal cord, or marrow (7), which is contained within its own special canal, carried through the bodies of the vertebræ of the spine, and thus most effectually guarded. The brain (see *Brain*), which in man and the higher animals constitutes so large a mass of the nervous system, is itself destitute of sensation, for it may

be, and after accidents often is, cut, without the individual, although perfectly conscious, having the slightest sense of pain. Neither does its presence appear necessary to the continuance of the mere animal life of the body; for if, as has been proved by experiment, the brain of such an animal as a rabbit be gradually and carefully removed, the animal still continues to live, and to perform the various functions of animal life.

The brain is undoubtedly the organ upon which the manifestations of will, intelligence, memory, &c., depend, and by which the conscious mind of man or animal is linked with the processes and actions of the body, by means of other portions of the nervous system.

The cerebellum, or little brain, is believed to be endowed with the function of regulating in unison, and harmonising, the various muscular movements. The medulla oblongata is connected with the processes of respiration, mastication, swallowing, &c., on the due performance of which the preservation of life depends.

The ganglia of the special senses develop the powers of sight, smell, taste, &c., and, lastly, the spinal cord appears to be most essentially connected with animal life, particularly with the powers of locomotion, independently of the conscious mind of the individual, possessing in itself powers of sensation unconnected with the brain. These powers are exhibited in what are called the "reflex" nervous actions; that is to



1, 1. Longitudinal Fissure.

Fig. 162.

say, supposing—as sometimes occurs from injury, or is done for purposes of experiment in animals—the spinal cord is severed at any point, all sensation, all power of the will over the parts of the body below the line of severance is totally lost; but yet, irritation, such as the prick of a pin, to such a part as the foot, will cause the leg to be retracted—evidently showing that the sensation excited by the pin was felt, so to speak, by the spinal cord through one set of nerve fibres, and "reflected" from it again through another, causing contraction of the muscles of the limb—independent either of the sense or will of the individual.

The next illustration (fig. 163) shows the lower surface of the brain with the twelve pairs of cranial nerves proceeding from it, and the spinal cord or marrow from which thirty-one pairs of nerves originate, each nerve possessing two roots, an anterior, or motor, and a posterior, or sensory. These, however, soon coalesce to form single trunks, which, passing out between the vertebræ, subdivide and ramify throughout the system. The cranial nerves, so named from taking their origin within the skull, are partly derived from the brain and partly from the medulla oblongata, the upper part of the spinal cord. They pass out of the skull through nine different apertures, and possess a variety of functions; six pairs are

associated solely with motor power, others, as the nerves of smell, vision, hearing, and taste, are distinctly sensory, while several combine both functions in common. The nerves issuing from the spinal cord are named after the positions they occupy in relation to the spinal column, and in some parts form a plexus or network; this is especially the case in the upper and lower parts, the sites respectively of the brachial and the lumbar plexus. As above stated, the spinal cord is an independent nervous centre; but its main purpose in the animal

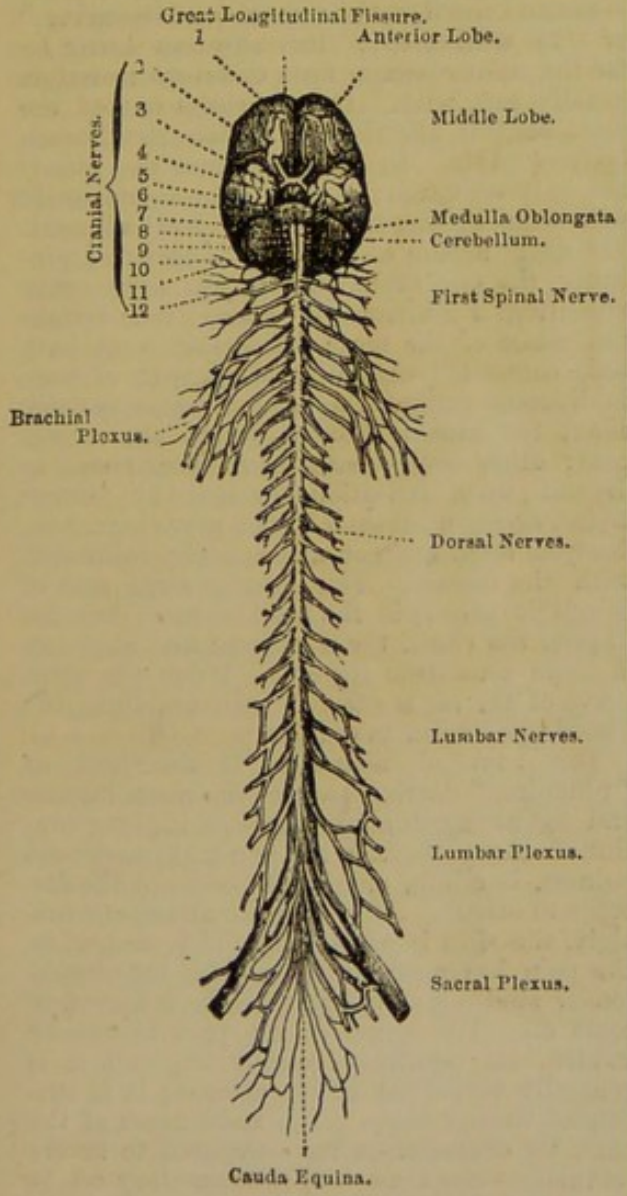


Fig. 163.

economy is to act as the medium of communication between the brain and the rest of the body.

In addition to the nervous system above described, there is the sympathetic, or ganglionic system, situated chiefly on the inside of the spinal column, and characterised by the possession of distinct separate ganglia and nerves, which are connected with the great nervous system on the one hand, and with the viscera of the organic functions, such as that of digestion, &c., on the other.

As the diseases and disorders of the nervous system fall to be treated of under other heads, such as *Paralysis*, *Delirium*, *&c.*, they require no further mention here.

Refer to—*Neuralgia.*

NERVOUS DISEASE, or NERVOUSNESS, is a term usually applied to an indefinite affection—a mixture of mental and bodily disorder and irritability, generally the product of weakness. The active countryman, the hunter, and those who take much exercise in the open air, do not suffer from irritability, or nervousness, which attacks the sedentary—those who exhaust the brain by too great mental exertion, or the body by dissipation. Females are much more liable to nervous disorder than males, independent of hysterical affection, which constitutes one of the most marked phases of the malady, and many of the remarks on which apply to the present subject.

In nervous disorder there is usually great susceptibility to external influences; and at the same time mental emotions, whether of joy or grief, fancied or real, exert much influence over the body and its functions. The heart palpitates, the hand trembles, the face flushes under the most trivial excitement; much of this is undoubtedly due to constitutional timidity; but it is also notably increased in debilitated states of the constitution; and those who have never been what is called "nervous," are apt to become so in some particular conditions of impaired health. The affection, indeed, is very nearly akin to hypochondriasis; it is essentially a disorder of weakness, and is relieved by whatever increases temporarily or permanently the power of the nervous system. The temporary relief to nervous sensations which is afforded by alcoholic stimuli, is very apt to lead those who suffer from them to put too much trust in, and to resort too habitually to, the use of those palliatives—a practice which must be followed by pernicious consequences; sometimes, too, opiates are habitually made use of, and are no less injurious.

Undoubtedly, when properly employed, alcoholic stimuli, and even opium, are valuable in the treatment of nervous disease, but they must never be substituted for more permanent means of invigoration, particularly *regular and sufficient exercise in the open air*, on foot or horseback, good nourishing diet, with a sufficient amount of animal food, and attention to the bowels and the state of the skin. The producing cause, whether excessive mental exertion, sedentary employment, late hours, or excess of any kind, must of course be modified as much as possible. The shower bath is often recommended, and often useful in these affections, but some persons cannot bear the shock; when this is the case, the cold or tepid douche down the back does much good, particularly if there be any tenderness of the spine on pressure, a fact which should always be

investigated; in those who suffer much from nervous disease, it very commonly exists and is overlooked. When the tenderness is at all marked, it will require special treatment, by counter-irritation, &c.; but this, as well as the treatment of aggravated cases of nervous disorder, will be best managed under the care of a medical man. In addition to the regulation of the bowels by the warmer purgatives, or by injection, quinine and the preparations of iron are the most generally useful remedies; tincture of valerian, sal volatile, and stimulant carminatives may be used as palliatives during an aggravated attack, but should be sparingly resorted to.

Refer to—*Hysteria—Indigestion, &c.*

NETTLE.—The common nettle belongs to a tribe of plants which includes the fig, the hop, and others used as food, and is itself eaten when cooked as a wholesome, almost as a medicinal, article of diet, in some parts of the country. It is diuretic. The fresh juice of the nettle has been highly recommended in cases of internal hæmorrhage, particularly from the lungs and womb. The dose, one teaspoonful three times a day. The effect produced by the stinging of some species of nettles, especially those common to India, is painfully severe, and is aggravated by the application of cold water, which appears to increase the irritation from all kinds of stinging nettles.

Refer to—*Hæmorrhage.*

NETTLE-RASH.—Nettle-rash cannot be better described than as an eruption which closely resembles nettle stings, both in appearance and in the sensations it gives rise to. When acute, it is generally accompanied with more or less fever. The nettle-rash, in almost all cases, arises from disorder of the digestive organs, caused either by indigestible food, or in some persons by particular kinds of food. Kernels or seeds, such as almond, peach, &c., which contain prussic acid, seem especially apt to cause nettle-rash, and in some individuals even the pips of an apple have been known to produce the disorder. Fish, particularly shell-fish, also bring it on, or mushroom; also certain medicines, such as turpentine; teething, hurry and agitation of mind in adults, and other irritations, also give rise to nettle-rash. The generally known causes of this affection indicate the remedy—the removal from the alimentary canal of offending matters. If there is tendency to sickness, and if the eruption appears soon after a meal, an emetic is the appropriate remedy, but whether this is given or not, there should be given an aperient. As acid in the bowels often accompanies the condition, a dose of magnesia with rhubarb is very suitable, or some other antacid may be had recourse to, and, afterwards, castor oil. External remedies are comparatively of little service in the acute forms of nettle-rash. A lotion composed of carbonate of ammonia and sugar of lead, of each one drachm, in half a pint of distilled or rose water, will give relief. Dr. Watson recommends flour dusted over the surface. If nettle-rash takes a chronic form, that is, continues, and keeps recurring, after the use of such mild aperients as recommended above, and after regulation of the diet, the case should be seen by a medical man. An ointment composed of ten grains of boracic acid rubbed up with one ounce of vaseline, often gives complete relief.

NEURALGIA—literally pain in a nerve—is also known as "rheumatism of the nerve," or "tic douloureux," this affection being by far the most common form of severe neuralgia usually met with. It is perhaps one of the most painful affections to which the human body is liable. In most instances the pain is the only symptom; in some it is accompanied with marked constitutional or local ailment. The exact nature of neuralgia is obscure; probably, the one effect, pain in the nerve, may arise from a multitude of causes; it is certain that some of the most intractable cases have been connected with diseased growth of bone in different parts of the head or face, especially about the canals through which the nerves pass; other severe cases have been found to depend upon irritation, excited by foreign bodies acting upon some of the nerve branches; decayed teeth are not unfrequently connected with the disease. The most general seat of neuralgic pain is in the head or face; but the fingers, the chest, the abdomen, &c., may any of them constitute its site. When the great nerve of the leg is affected with neuralgia, the disorder is known as sciatica.

The pain of neuralgia is described as "plunging," darting pain of the most intense and agonising kind, but except in long-continued cases, there is no external mark—no redness, swelling, or heat, to indicate the disorder to others. After a severe attack of neuralgia, the skin is often left tender, and when the pain has recurred frequently, exquisitely tender swelling of the part has been known to come on. The access of the pain is usually sudden, its remission equally so, and it is generally periodical in its attacks; it is suspended during sleep. The suddenness of the pain, its character—often compared to severe toothache—the absence of inflammatory symptoms, and its periodical returns, sufficiently mark the disease.

The exciting causes of neuralgia are, especially, damp and cold, or damp alone, if combined with malaria, such as causes ague; exposure to currents of cold air, especially if the individual is heated, frequently originates the disease: in this way, railway travelling has proved a fertile source of neuralgic affection. Debility of constitution renders the individual much more susceptible to those and other exciting causes; neuralgia has often, too, been traced to anxiety of mind. Some sudden attacks

of neuralgic pain in various parts of the body, have been traced to temporary stomach disorders, such as superabundant acid, and have disappeared as soon as the cause has been rectified.

The severe pain which attends neuralgia, quickly drives the sufferer to seek medical advice; and without doubt, the safest plan is to have the exciting cause of the affection detected if possible, and as soon as possible obviated, before the disease has become fixed. If the person is resident in a climate or situation likely to excite it, some change should, if possible, be made; this will probably be most beneficial if the removal be to a dry warm air; but should disease have commenced in a cold dry district, change to a moist, humid, but warm one, will probably offer most advantage. If disorder of the digestion exists, it must of course be rectified (see *Indigestion*) after that, if the disease still continues, quinine, given in large doses of from six to eight grains, every six or eight hours, will most probably be of service. Saccharine carbonate of iron, in from twenty to thirty-grain doses, is a most useful remedy, especially in weak constitutions; but these are constitutional curative measures which will be most safely trusted to medical hands. Blisters behind the ears, or at the back of the neck, are often valuable aids in the treatment of facial neuralgia. The late Sir Charles Bell is said to have found the following most successful in some cases of obstinate neuralgia, probably caused by disorder of the alimentary canal. One to two drops of croton oil are mixed with one drachm of compound colocynth pill, and of this one-twelfth, or five grains, is given at bedtime, along with ten grains of compound galbanum pill. The remedy is more suited to persons of strong habit of body, than to the weakly.

During the paroxysms of agonising pain, anything which will, or is likely to, relieve should be tried, even in the absence of a medical man. A sponge or piece of flannel, dipped in boiling water, and applied as hot as it can be borne over the site of the pain, will often allay its severity, or remove it altogether. A similar good effect is produced by the continued application of ice over the part; or, in extreme cases, chloroform may be inhaled, and will probably continue to give relief after its ordinary anæsthetic effect has passed away. Chloroform, belladonna, aconite, and opium, are all used as external applications in the form of liniment, to relieve the pain; and opium in the form of morphia, is often given by subcutaneous injection, or by the mouth, in pills or draught, for a like purpose. Leeches over the pained part are frequently of service. Lastly, when other remedies fail, great benefit has been derived from the continuous galvanic current from a Leclanché battery administered along the course of the nerve. It is important to bear in mind that as neuralgia is most prone to attack persons whose health is under par, every care should be taken to promote the general health by tonics, and exercise. Cod-liver oil, quinine, iron, and the bitter infusions, act most beneficially. Valerianate of zinc, in three or four-grain doses, in the form of pill, administered two or three times daily, has acquired much reputation in the treatment of hysterical neuralgia. There are, however, two or three modern remedies for neuralgia, which deserve prominence. The one named above, morphia by subcutaneous injection, is at once the most effectual and speedy. The next is phosphorus. It has been said that neuralgia is "the cry of a hungry nerve for phosphorus," and most certainly, the supply of that important constituent of nerve-tissue is one of the most efficient curatives. Given in the form of hypophosphites, it often answers well, but to get its full effect, a solution of pure phosphorus is requisite, and for this, the form given by Ashburton Thompson, excels all others (see *Phosphorus*). Gelsemium is another remedy useful in special cases.

Earache, common in children, is not a true neuralgia, except occasionally as the result of diseased teeth. It is mostly due to catarrhal inflammation of the middle ear.

Refer to—*Nerves—Sciatica, &c.*

NEUTRAL SALTS are compounds of an acid and an alkali, in which the two constituents completely neutralise one another; the resulting compound having neither acid nor alkaline properties.

NIGHT.—The period of darkness consequent upon the absence of the sun's rays, is one which unquestionably exerts considerable influence over the states and health of the human body. The effect of light upon the body, and the injurious consequences of its withdrawal, have already been treated of, and to the article *Light* the reader is referred for information, also to articles, *Early Rising, Breakfast, Sleep, &c.* With the exception of certain animals, fitted by their constitution for nocturnal activity, the majority, including man, are evidently intended by Providence to rest and sleep during the hours of darkness; animals, governed by instinct, do so, uncivilised man for the most part does so; but the member of a civilised community necessarily requires in some degree to modify these things, and is endowed with the capability of doing this, *within certain limits*, without injury to health; if these limits are exceeded, he suffers.

It is often asked: "Is it not the same thing whether I sleep in the day or the night, so that I get enough?" It is not the same thing. Independently of the argument that the natural laws of our constitution can never be infringed with impunity, and that man cannot, without injury to health, spend those hours in sloth and sleep, during which he ought to be active under the sanative influence of diffused daylight, experience has long testified, that during

the night, many sources of disease act more energetically upon those exposed to them. One often recorded experiment sufficiently illustrates the fact. The colonels of two French cavalry regiments had to move their respective corps a considerable distance during hot weather. One, thinking to avoid the heat of the day, moved his regiment during the night only, the other followed the reverse plan; the latter at the end of a week or ten days arrived with his men and horses well, whilst the other had many laid up with sickness.

As, however, in northern countries, in winter, the term of daylight is too considerably curtailed, and the hours of darkness too prolonged, to permit of their all being spent in sleep, it becomes a question which portion of the latter may most advantageously be devoted to wakefulness, under the influence of artificial light. Experience has proved, that to rise early and spend the morning hours by *artificial light*, is not by any means so salutary a custom, as to add to the latter part of the day by the same means. This is probably, in part, due to the greater activity of the nervous system in the after-part of the day, causing the absence of the stimulus of the sun's light to be less felt. While the calm and quietude of night exert, as a rule, a soothing influence on the sick, some diseases are well known to be attended towards evening, with an aggravation of the symptoms. This condition is named nocturnal exacerbation, and is characteristic of rheumatic fever, and other painful affections of the joints as well as of the bones. The night sweats of consumption are among the most exhausting features of the disease.

Refer to—*Sleep.*

NIGHT BLINDNESS is a symptom characteristic of certain forms of inflammation of the retina of the eye. It is occasionally the result of congenital disease; frequently it is epidemic in malarial districts and under insanitary conditions. Congenital cases often end in complete blindness; those of later life are, as a rule, more amenable to treatment. In all cases medical advice should be at once sought.

Refer to—*Amaurosis—Eye.*

NIGHTMARE.—See SLEEP.

NIGHTSHADE.—See BELLADONNA.

NIPPLES.—The nipple of the female breast is chiefly composed of tubes which give passage to the milk. During pregnancy, and at child-birth, it ought to become more prominent and increased in size; but, sometimes, from the pernicious pressure of the stays in early life, it has become so embedded in the breast, that it cannot be developed, consequently, when the time of suckling arrives, it is perfectly impossible for the infant to seize it. This is a state of things which often gives much trouble, causes the individual much pain and suffering, and not unfrequently lays the foundation of abscess of the breast. When this condition of the nipple exists, every *effort should be made, during the time of pregnancy*, to get it into a better and more prominent state, by means of the glasses adapted to the purpose, or by suction exerted by the mouth of an adult: after child-bed, the same means should be assiduously practised. The greatest suffering, however, connected with the nipple during nursing, is in consequence of its becoming excoriated and chapped. This may be greatly prevented, if, during the latter months of pregnancy, trouble be taken to bathe the nipples night and morning, with a mixture of brandy and water, one part of the former to three or four of the latter. When the nipples are inclined to become sore from nursing, which is generally within the first fortnight; the best, and, indeed, almost a certain remedy, is the tincture of catechu (see *Catechu*). Care should be taken to keep the nipples perfectly dry. Various substances, such as cows' teats, prepared nipple shields, &c., have been used to cover the nipple in such cases, but it requires a very strong child to draw the milk through them. Glass shields with elastic tubes attached, are often found serviceable for the protection of sore nipples. If the nipples are harsh and dry on the surface, glycerine will probably be found of more service than catechu, and if they do not heal up under these or similar applications, the child must be kept from sucking for a short period, the breasts being emptied by other means, and the milk thus drawn, given to the child.

The late Sir Astley Cooper's favourite lotion in sore nipples was composed of borax one drachm; spirit of wine half an ounce; and water (soft) sufficient to make up the half pint lotion.

Refer to—*Breast—Child-bed, &c.*

NITRATES are salts, such as nitrate of potash (saltpetre), nitrate of silver (lunar caustic), &c., of which nitric acid is one of the components.

NITRIC ACID, or AQUA-FORTIS, is one of the most powerful of the mineral acids, and is strongly corrosive; it is obtained from saltpetre by distillation with oil of vitriol. Pure nitric acid is composed of nitrogen and oxygen gases, in the proportion of one of the former to five of the latter, and should be colourless; it is usually met with in the shops of a light straw colour, and contains water.

Nitric acid is used externally by surgeons as a caustic, or rather as a corrosive, and is often applied in its diluted state to foul sores in the mouth, and to sloughing patches of mucous membrane. Internally it is employed as a tonic, especially in some forms of dyspepsia and liver disorder, the dose two to eight drops well diluted with water. Diluted nitric acid, composed of one part of the common commercial acid, and four parts of water, is used as more convenient than the strong acid; of this, the dose is from twenty to thirty drops well diluted.

Poisoning by nitric acid or aqua-fortis some-

times occurs, and must be treated in a manner similar to that recommended in poisoning by hydrochloric acid, under article *Chlorine*.

NITROGEN GAS is one of the elementary gases, important from its forming nearly four-fifths of our atmosphere, and from its numerous combinations. — See *Ammonia—Azote—Nitric Acid, &c.*

The existence of nitrogen in animal matters was formerly thought to constitute one great distinctive mark between them and vegetable substances, but this idea is now known to be erroneous. Certainly, the *abundant* presence of nitrogen in the constituents of the animal kingdom, is truly characteristic, compared with its more sparing amount in vegetables; but animals, in the first instance, derive the greater part of their nitrogen from vegetables, which constitute the medium for its conveyance to them from the inorganic kingdom.

Refer to—*Aliment—Blood—Food, &c.*

NITRO-HYDROCHLORIC ACID, or Aqua-Regia,—as it has been called from its power of acting upon gold, is used in medicine as a tonic, and it is a very valuable one. Diluted nitro-hydrochloric acid, is the preparation most used. It is composed of three parts of nitric acid, four of hydrochloric acid, and twenty-five parts of water, and is much used in affections of the liver and skin, and in many cases of indigestion. It is also sometimes employed as a bath for diseases of the skin, especially when the latter are of syphilitic origin. The dose of the mixed acid is from ten to twenty minims, well diluted in water.

NITROUS ETHER, or Sweet Spirit of Nitre, is prepared by the action of nitric acid upon alcohol. When fresh and properly made, it is one of our most valuable diuretics, being also stimulant and diaphoretic, and is much used domestically as a remedy in common colds, &c., and to increase the flow of urine. The dose is from half a drachm to a drachm and a half, given either in water or gruel. When badly made, or too long kept, sweet nitre is apt to contain much acid, which may cause pain at the stomach; the fact may be known by the ether effervescing with carbonate of soda.

NITROUS OXIDE, or Laughing Gas, produced by the action of heat on nitrate of ammonia, is the anæsthetic now principally employed by dentists. It can only be employed for short operations, as its effects on the system are transient, but it is reckoned safer that ether or chloroform.

NOCTURNAL DISCHARGES of seminal fluid, are apt to cause much mental uneasiness and physical debility in those, generally young men, who are the most frequent subjects of them. Unless very excessive, there is no reason that they should be regarded in the almost morbid way they often are. Abundant exercise, cold bathing, either general or local, and where there is not much debility, the disuse of alcoholic stimuli, the avoidance of whatever may tend to excite the secretion in question, and the use of the tincture of perchloride of iron, in twenty or thirty-minim doses twice or thrice a day, will, in most cases, effect a cure. In the bromides now so largely used, we have a most valuable remedy for cases of sexual irritability. A dose consisting of fifteen grains of bromide of ammonia, and the same of bromide of sodium, taken in water at bedtime, will exert great control over the tendencies. It is of great importance, along with these measures, to keep the bowels perfectly open, and for this purpose, gentle salines, senna, castor oil, sulphur and magnesia,—from half a drachm to one drachm of each for a dose, in milk,—or cool injections, are preferable to pills which contain aloes.

In such cases, one caution is of the highest importance: *avoid the advertising quacks* (see *Quacks*). The painfully nervous state of the mind in those who suffer from the above affection, renders them most timidly credulous, and this fact is made use of by designing knaves—first to frighten, by attaching exaggerated importance to every slight symptom, and then to fleece those they have thus deceived. Persons who are affected with the disorder in question, by confiding in some medical man may speedily be relieved.

NODE is a tumour or enlargement of a bone, caused by inflammation of the bone itself, or of its covering "periosteum," and is usually the result of syphilitic disease, though sometimes of scrofula. The shin bone is very liable to the disease, but it may attack any bone, and is frequently noticed on the bones of the skull, on the ribs, and on the collar bone. Whilst active inflammation of the part is present, perfect rest, leeches, fomentations, poultices, are to be used, and other remedies which have a special action on the conditions of the system, such as mercury, iodide of potassium, cod-liver oil, &c. A medical man should be called in.

NOISE IN THE EARS.—See Ear.

NOLI ME TANGERE.—See Lupus.

NOSE.—The organ of smell is so situated above the mouth, that by it the odour of whatever is put into the latter must be perceived in the first instance. The visible portion of the nose is chiefly made up of bone at the upper part or bridge, of cartilage (fig. 164—3) at the expansive nostrils (1). The internal portion of the nose consists of a cavity which communicates with the throat (5), formed in the bones immediately over the hard palate (4), which are expanded in such a manner as to offer a wide extent of the membrane (2) on which the nerves of smell are distributed, to the action of the air bearing the odoriferous particles. The two nostrils are separated from each other by a bony cartilaginous "septum," or division; they are lined by the mucous membrane which secretes the peculiar mucus of the nose. This membrane is continuous

with that of the eyes, through the canal or "lachrymal duct" (see *Eye*), which conveys the superabundant tears into the nostril; it is also continuous with that of the throat. As might be expected, the nose, from its position, is much exposed to accident.

Fracture of the bones is not uncommon, and, like other accidents to the organ, is liable

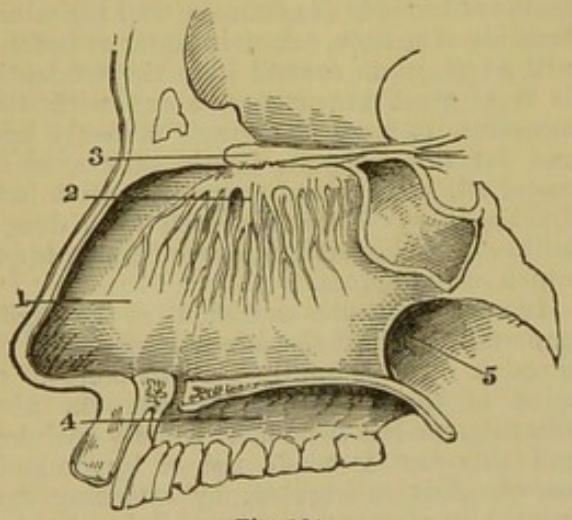


Fig. 164.

to be followed by much bleeding; if the nature of the accident is indicated by the alteration in shape and mobility of the parts, the nose may, if a medical man is not at hand, be restored somewhat to shape, by a bystander, the fingers on the outside being assisted, if requisite, from within, by means of a firm quill, or piece of wood covered with lint, passed up the nostril. After the displacement has been rectified, the person should be kept perfectly quiet, the injured parts covered with cloths dipped in cold water; and if the habit of body is full, a sharp purgative administered, for the possibility of the inflammation excited extending to the brain, must not be forgotten.

Bleeding from the nose (see *Hæmorrhage*). The nose, like the ear, is very liable to be made by children the receptacle for anything that will pass into it; beans, buttons, stones, or the like. A few minutes before commencing this article, the author was called upon to extract a considerable piece of tobacco pipe, which a child had pushed up the nose almost out of sight. When the things introduced swell, by absorption of moisture, there is often considerable difficulty in their extraction; sometimes they have been in the nose, unnoticed, for days or weeks, and are not discovered until inflammation of, and perhaps discharge of matter from, the lining membrane attracts attention, a reason, when such symptoms occur in a child, for always examining the nose for the presence of foreign bodies. The extraction of a foreign body from the nostril is always best done by a surgeon; others are very apt to make the matter worse by pushing the foreign body further in; if, however, circumstances render it desirable to attempt the extraction without waiting, it must be done by

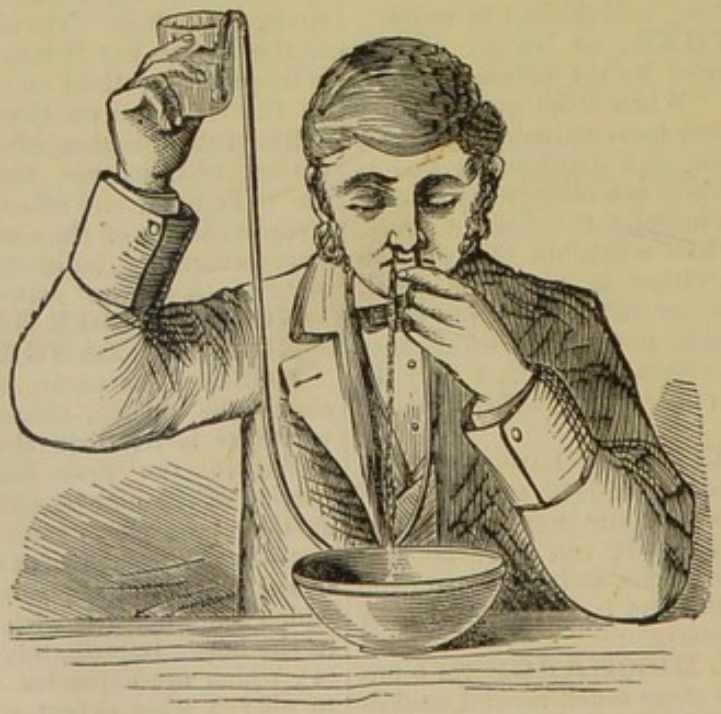


Fig. 165.

means of the flat end of a probe, or of a bodkin, bent about the eighth of an inch, nearly at right angles with the rest of the instrument, which bent end, being carefully passed beyond the body, must be used as a hook to draw it out. Sometimes, when the foreign body is not very far in the one nostril, if that on the opposite side be closed, and the child can be made to blow forcibly through the other, the obstruction will be shot out.

The chief diseases to which the internal parts of the nose are subject are ozæna and polypus. Ozæna is a fœtid discharge from the nostrils, caused by an inflamed or ulcerated condition of the interior mucous membrane, occurring in persons of a scrofulous disposition, or who are suffering from the effects of syphilis. It is a very troublesome and offensive complaint, and, when not checked, may run on to destruction of the cartilages and of the bones, causing great deformity of the nose. The treatment employed for ozæna must, of course, depend on the cause of the malady. Iodide of potassium, cod-liver oil, and other means for altering the constitutional condition, should the disease arise from scrofula, will be indicated. Washing the interior of the nostrils with some antiseptic solution is absolutely necessary to destroy the disgusting odour; carbolic acid, chloride of zinc, Condy's fluid sufficiently diluted may be used, either with a glass syringe, or what is better, by the nasal syphon douche, an apparatus extremely useful in the treatment of this and other affections of the nasal passages.

The illustration (fig. 165) is from Arnold's catalogue, and shows the action of this simple instrument.

Nasal polypus is a growth from the upper and inner part of the mucous membrane in the interior of the nose, which often attains a considerable size, and always interferes more or less with the ordinary passage of the air, and with the sense of smell. The only remedy is removal by the forceps or snare.

NOSOLOGY.—The scientific classification of diseases.

NOSTALGIA.—See HOME-SICKNESS.

NOSTRUM.—See QUACKERY.

NOURISHMENT.—See ALIMENT—DIGESTION—FOOD, &c.

NURSE FOR CHILDREN.—The subject of wet-nursing, and the objections to it, have already been alluded to under article *Childhood*. When a wet-nurse is absolutely necessary and resolved upon, the selection is best left to the medical man, who will endeavour to procure one whose confinement was as nearly as possible at the same time as that of the mother's whose child she is to nurse; he may at the same time avail himself of the aid of the microscope in examining the milk, if *there is much power of choice*. The following characteristics of a good wet-nurse are laid down by M. Devergie: "A good nurse should be from twenty-five to thirty years old, of strong constitution, full-chested, of sanguine lymphatic temperament, brown haired, having white healthy teeth and well-coloured lips. She should have pyriform breasts, with well-formed nipples, and without too much development of veins. The milk drawn into a spoon should be white, with a slight bluish tint, its taste saccharine; it should not be too thick." In scrutinising, however, the physical qualifications of a wet-nurse, it is of the highest importance that the mental ones—disposition, temper, &c.—should not be overlooked; for, independent of the influence which *may* be exerted upon the infant by the psychical qualities of the being from whom it draws its first nourishment, we know that the emotions of the mind always do affect the milk in some peculiar way, and cause injury to the child—nay, death itself—from convulsions, has been the consequence to an infant whose mother had, shortly before nursing it, given way to violent passion. The late Sir Astley Cooper held the opinion, that the anxiety of a mother for her child during teething, by acting on the milk, produced a salutary aperient action on the bowels. Again, all nurses well know how much the quality of their milk is affected either by food or medicine, and this is another reason why a wet-nurse should be selected, if possible, who is likely to have sufficient self-control to regulate her diet. The difficulty in this, is one, at least, of the objections to wet-nurses, especially if kept in the houses of their employers, where they are tempted with unaccustomed and richer food and drink.

The return of menstruation, in a nurse, is always an objection, although perhaps not an absolute one, if merely an occasional occurrence; the child, however, should be withdrawn from the breast during the period, and managed as if nursed by hand (see *Childhood*), the breasts being kept duly emptied by artificial means (see *Child-bed*). In the event of slight indisposition in a nurse, the same plan may be pursued. Perhaps no diet is more suitable for a wet-nurse than one which embraces a large proportion of milk and farinacea, with a moderate proportion of animal food, and much mischief is often done to both nurse and infant, under the idea that an extra allowance of stimulant is required during nursing, from the very first. Strong healthy women require it not, and are better without it; some derive much benefit from a moderate allowance of malt liquor, after the first two or three months, whilst others, who are deficient in vital and digestive power, require it from the very first. Perhaps nothing can show more strongly than these facts, which are well known to every medical man, the folly of laying down any fixed rule respecting the use of alcoholic stimuli by mankind generally. Medicines taken by the nurse may be so directed as to benefit the child, particularly such aperients as castor oil, senna, &c. Saline aperients and acids generally cause griping in the infant.

With respect to nurses who have the charge of children in the nursery, it is sufficient here to remark, that good health, at least, should be insisted upon, particularly if the children sleep with them.

Refer to—*Breast—Child-bed—Childhood—Milk, &c.*

NURSES FOR THE SICK.—In the case of the sick, next to the attendance of the doctor,

the services of the nurse come first in order of precedence. In private life, this duty was in former times usually delegated to the mother or other members of the family circle, and in severe illnesses, to some respectable woman who made nursing her profession, but who probably had no vocation, and had certainly never received any training for the work. The first step towards improving the status of the nurse was taken by Mrs. Fry, the celebrated Quakeress and philanthropist, in 1840, when she established, in the city of London, on a purely unsectarian basis, an association called by the name of the Nursing-sisters, which still flourishes. Mrs. Fry's object was to obtain a respectable class of women to attend the poor at their own homes, as well as others who could pay for their services, and by holding out prospects of an increasing remuneration, and a fair pension after thirty years' services, she thought to secure their permanent interest. By arrangements with a large London hospital, the nurses spent a few months' probation in the wards, which gave them, however, only a partial insight into their work, and it was not till the period of the Crimean War, when the wants of the invalided soldiers became so painfully apparent, that public attention, mainly from the exertions of Miss Nightingale, was fully drawn to the subject. Most of the leading hospitals throughout the country had been endeavouring before this time to improve the position of the nurse; but the establishment of a School of Nursing at St. Thomas' hospital gave an impetus to the movement, and numerous associations were instituted on somewhat similar principles—all having the double object in view, first, of training the nurse by a lengthened period of probation in a public hospital, and secondly, by affording to the public the benefit of her services afterwards, either in private, in district, or in hospital work. Several of these bodies have been organised by religious sisterhoods in connection with the church of England; a much larger number have been founded on non-sectarian principles, while several enterprising institutions have done well as mere commercial speculations, drawing their supply of trained nurses from among those who had been dissatisfied with the parent Association. The cost of a nurse to a private family is usually charged at the rate of £1 1s. a week, and in infectious cases 30s. or £2 2s., which is paid to the Home, the nurse receiving an adequate remuneration from the association, which keeps her when her services are not required. These charges cannot be called exorbitant for a trustworthy trained nurse, though they are far beyond the reach of the poor, who must either be content to do without the nurses' assistance, or be indebted to some charitable organisation to supply their place.

Professional Training of Nurses. — It is essentially necessary, in order that she may cope with the changing aspects of disease and its momentary requirements, that the nurse should have at least one year's experience of hospital work. The training should be as thorough as possible, and should consist of (1) nursing in medical as well as in surgical disease and accidents; (2) in night as well as in day duty; (3) in the preparation of foods most used by the sick; and (4) it ought to be accompanied with some practical lessons in the Laws of Health, especially such as bear on ventilation, warmth, disinfection, and other means for the prevention of disease. Since nursing has become more of a skilled art, many persons of good education have taken to the work for the love of it, as well as for remunerative employment, and facilities are now given at most of the large hospitals to enable gentlewomen and others, on the payment of a certain premium, to obtain a practical acquaintance with nursing, under the direction of the sister, or head nurse, as she is more usually called. It is obvious that an educated intelligence must prove of greater service to the medical attendant than the ordinary nurse, who, for the most part, is on a par with the domestic servant; and that by first going through the ordinary routine-work of nursing, the lady herself becomes better able to fill the office of matron, or superintendent of a ward, or hospital, or any other post to which she may afterwards be called, and where her nursing services may be of use.

The chief points to which the attention of nurses generally may be directed, are the counting the pulse and respiration, the condition of the tongue in health and in disease, the state of the skin, the temperature of the body as indicated by the clinical thermometer, various methods employed in dressing wounds, padding splints, and acting in emergencies. It is important also for a nurse to learn the use of trusses, pessaries, and other appliances used in the sick-room, to administer injections (either by the rectum or skin), electricity, medicine and stimulants in the manner prescribed by the medical attendant. It will also prove of much service, if, in addition, the nurse acquires a knowledge of the action and character of such drugs as are most generally employed, and of the natural functions of the body in health.

It is sufficiently obvious that those whose province it is to wait upon the sick must prepare themselves for many disagreeable duties, entailing loss of rest, confinement, and much mental anxiety; for, although in public institutions these matters are well considered by a mutual division of labour, still, in private life, the nurse is expected in many instances to be constantly at her post, and it is unreasonable to hope that she can retain her faculties intact after days and nights of continuous watching. The nurse ought to have recreation, as well as sleep, and surely there are few cases which will not admit of some member of the family

taking her place at stated intervals. It is not desirable that a woman should engage in nursing until she has arrived at a suitable age, twenty-three or twenty-four, and that she should have at least a month's time to test her aptitude, as well as her liking, for the work. It is a rule in most nurse-training establishments for the nurse to serve this short period without any remuneration, and at its termination, if found eligible, to enter upon a more lengthened period of probation, undertaking at the same time to remain with the association for a term of not less than three years. During the training period she is supplied with suitable uniform, for in and out of door use, with four good meals daily, with washing, with an hour or two for daily recreation, and with pay amounting to about £1 per month. The remuneration is increased during the second and third year to one-third more in amount, and gradually rises with length of service till it reaches £25 a year.

It is oftentimes remarked, that, in hospitals at all events, a greater responsibility lies with the nurse at night than during the day, and if this be so, it is essential that the night nurse should be in no whit inferior to the other. Considering the irksome character of continuous night duty, it is well that it should be alternated with day work, for periods varying from a month to three months at a time, and that in order to obtain uniformity, this arrangement should form a part of the nurse's engagement. So long as sick-nursing is confined to diseases of a non-infectious nature, and consideration is given to the physical requirments of the nurse, it cannot be regarded otherwise than as a healthy employment, though it is the reverse of this when associated with contagious disease. Leaving individual susceptibility out of the question, the liability to contract infection is in relative proportion to the proximity which the attendant stands to the patient, and during epidemics, nurses, catholic priests and doctors are well known to suffer in greater relative numbers than any other classes of the community. We have already said that it is the practice of nursing associations to charge increased fees when their associates are called to attend cases of this character; but it does not appear that the nurses themselves are benefited by the arrangement, and it is usual in fever hospitals to give preference in the selection of nurses to such as have already had fever, and who may be supposed in consequence to enjoy further immunity; but the labourers are few in comparison with the amount of work required of them. The writer has often advocated the desirability of effecting a small insurance on the lives of those so employed, to continue in force so long as they are engaged in the hazardous service, as a measure incumbent on their employers.

It is sufficiently obvious, that those whose duty it is to wait upon the sick, to suffer the necessary confinement, loss of rest and other depressing influences, should themselves have health as good as possible, and be possessed of strength and stature sufficient to enable them to give all requisite aid in lifting, and in manual work, even that of scrubbing the floor, if need be. Activity and order and cleanliness, both in their own persons and about those they wait upon, are indispensable. All bad habits, such as waywardness of temper, forgetfulness, and, of course, addiction to drink, are insuperable objections; likewise the habitual practice of making unusual noises, such as humming, fidgeting and coughing. Neither should nurses be great talkers: some patients are much annoyed with the garrulousness of their attendants. A nurse ought to be a light sleeper, awake to the slightest call or movement, and no snorer; a light mover about a room.

A good and obliging temper is of course highly desirable; equally so, sufficient good judgment in the management of the whims and peevishness of the sick, and to direct any little conversation into proper channels, avoiding all narrations of previous experiences, which are very apt to be indulged in.

In enumerating the qualifications of a good nurse, it is not expected that all these are to be found combined and in perfection in one or every individual, but some approximation, at least, to them should be sought for. Whilst laying down the qualifications for good nurses, one word may be said to those who employ them. If active, cheerful attendance is required, it must not be forgotten, that this is almost physically impossible, if a nurse be kept day after day, and night after night, confined in a close sick-room. Even if averse to it both for her own sake and that of the patient, a nurse ought to be made to walk in the open air at least one hour a day.

The great desideratum is that we should have in this country more training institutions for nurses of all classes—institutions into which no sectarian element should be allowed to enter, and which should have for their object the education of women in the art of attending to, nursing, managing, and cooking for the sick. There are already, in this country, many such institutions, in connexion with some of the London and in several provincial hospitals, and it is very desirable that they should be more numerous, so that the whole country might be supplied with trained and efficient nurses. But this is not all that is wanted, we think it necessary that an attendance for a time, at such an institution, should be considered if not a necessary, at all events, a most desirable part of every woman's education, inasmuch as there are few women in this country who may not be called upon, at some time or other, to play the part of nurse to a sick parent, brother, husband, or

child; and every medical man has witnessed the regret exhibited by women in such positions, when, too late, they have become painfully aware how unable they are properly to fulfil those duties in which a little practice and training would soon have made them proficient. The objects, then, of a Nurses' Training Institution, should clearly be—1st, to educate a sufficient number of nurses to supply our hospitals and public institutions, as well as private families, with professional nurses, whose services can be obtained for hire; and 2nd, to afford private individuals, of all classes, an opportunity of becoming practically acquainted with the details of nursing, which lose much of whatever is disagreeable about them, even in the most trying cases, when the duty is performed in an orderly and efficient manner.

It is much to be regretted that in our large manufacturing towns, owing to the comparatively high price which female labour can command, it is oftentimes difficult to get women to undertake what they imagine to be a repulsive, and what is at all times a responsible and difficult office; but it may be confidently hoped that when such institutions as those mentioned above, are known to be well managed, and to turn out nurses whose services are properly appreciated, there will not be felt the difficulty which at present exists.

It will be seen, too, at a glance, that should cottage hospitals become more general throughout this country, as is very probable from the success which has already attended their introduction, an immense advantage would accrue to the inhabitants of and around the villages in which they are established. For it might very easily be made a part of the system of these hospitals, to train and instruct one or two nurses, who should work under the direction of the female head of the hospital, be she styled "sister," "matron," "lady superintendent," or "head nurse," provided she herself has been properly educated at some such institution as described above. In this way a number of good nurses would be distributed over the country, whose services must prove of inestimable value to the sick, and who in their turn might be made useful in teaching others.

Rules and Hints for Nurses.—It is quite out of the scope of an article like this to enter into and detail the various duties of a nurse; suffice it to say, that there are several general rules which will admit of useful application by all. In the first place, then, a nurse ought not to stand too much upon the supposed dignity of her office, and refuse to do what are called menial offices, on the ground that it is not her "place," or her "business," so to do; she ought to remember that it is her duty to do the greatest amount of good to the sick person or persons intrusted to her care, and although it is not recommended that as a rule nurses should do the work of cleansing, scrubbing, &c., that is expected of domestic servants, still, a nurse that refuses to perform these offices when the good of her patient requires it, is, in no sense of the word, a nurse.

There is no more difficult subject upon which to enlighten the mind of nurses than ventilation. They are very apt either to suffocate the patient, or, running to the other extreme, expose him to a draught, by means of which he gets some new disease, or aggravates the one he already is suffering from. All that is required is a little management and common sense in the opening of the windows of the sick-room; that is to say, when to open them, how much to open them, and how long to keep them open, according to the state of the atmosphere, wind, &c. It may be stated once for all, and the nurse will do well to remember it, that *we have as yet discovered no effectual means of ventilating either a sick-room or ward, but by means of open windows.* At the same time, these require careful and constant management, otherwise the patient in many cases will assuredly suffer. In connexion with the subject of ventilation, so far as it concerns the nurse, let it be laid down as an absolute rule, that no bed-room utensil should be emptied or cleansed in the bed-room, but should be at once removed to a suitable place for this purpose. Nothing is so irritating and offensive to the patient, and nothing is more prejudicial to his health, the effluvia given off during the process being most detrimental.

Another rule:—Never air the bedding or clothing, or do any cooking in the sick-room, if it can be helped. It is most annoying, injurious to the patient, and, it may be added, dangerous. The writer was once alarmed by the cries of a patient, and on rushing to the sick-room, which had been left by a careless nurse, was horrified to find some clothes which had been put out to air, in flames.

It is to be desired that nurses would study to acquire a pleasing and agreeable modulation of voice, since nothing is so annoying to a patient as a discordant tone in speaking, "out of tune and harsh," while nothing has a more marvellously soothing effect than a low soft voice—"that marvellous thing in woman." Cheerfulness is essential, and "Job's comforters" should be banished from every sick-room, and never allowed admittance under any pretext whatever.

A nurse who, either from stupidity or officiousness, or from a desire to make herself appear wise and important, either adds to or detracts from the orders of the medical adviser, under whose care the patient is, is worse than useless.

It is well to know that there are numerous cases in which the recovery may depend upon the *regularity* with which food and stimulants are administered, as ordered. This is a point upon which medical men have found great difficulty with inferior nurses, rendering it highly desirable that some supervision should be exercised upon them, to see that their orders

are punctually and constantly, and perseveringly carried out.

A popular writer, in one of our periodicals, thus feelingly expresses himself on the subject of nursing:—

"Nursing is a faculty, not a science. It is a gift, not an acquirement. There are some worthy, tender-hearted, highly estimable people, who can never make decent nurses. You love them, you are charmed with them in society; you wish them all imaginable prosperity, but would as soon think of introducing a French horn and a dancing bear round about your sick-bed, as of surrendering yourself to their best intentions. Let such people read every manual ever printed; let them walk the hospitals day and night, they would be no better for the experience. Nature forgot the pinch of kaolin which makes good nursing, when she mixed up the clay of which they are formed; and art cannot always bolster up that which nature has left imperfect. Not that I would undervalue the scientific teaching of nursing. Given improvable conditions, it helps towards perfection in the art; and that means one of the ineffable, inexhaustible, immeasureable blessings of humanity. But nothing comes out of nothing, and if nature had laid no foundation, how can art or science, or anything else, build up a superstructure? Pyramids are not raised downwards."

This humourous and withal sensible writer classifies nurses under the following heads:—

"The good-natured, unscientific nurse, whose shibboleth is feeding, and who thinks that nothing can go well where there is not cheerful conversation and a busy kitchen; the muff, a precious creature for healthy homes, a tender, clinging, loving soul, whom everyone declares must make one of the best nurses imaginable, whose theory of nursing is comprised in incessant personal attention and incessant personal caresses; but who must be given up at the end of a week, if you do not wish to give up the ghost.

"Then there is the conscientious nurse, hard and practical; the grimbones who cannot judge for herself, but must act up to orders, to the letter, whatever may have taken place in the meantime. There is also the watching nurse, whose eye is never off you, and who wants to know every five minutes what you will take now. And who does not know the gruesome nurse, with small, cold, stone-coloured eyes, with chiselled crisp curls, thin light lips, and long lined, granite-coloured countenance! And last of all, and best of all, there is the dear fairy nurse, who is never in the way at the wrong time, and never out of the way at the right time; who, when you wish for her, presently appears at your side; and when you want anything, never keeps you waiting. Who is always cheerful and kind, but never fussy; and owns the rare faculty of seeming fresher after sitting up with you all night, than the rest of the household with their seven hours' bed."

Such a nurse is more easily described than found; but it is not too much to expect that a good attendant upon the sick should be gentle, and watchful, and firm; and whilst carrying a cheerful countenance, take care to avoid all fuss of manner, all hurried movements, all ill-considered talk to her charge; be quiet alike of foot and speech, wearing gowns that never rustle (cotton prints of a light colour are the best), and shoes that do not creak. She should keep everything daintily clean; all things in their proper place, so that in an instant her hand can be upon what is required. She should pay the strictest attention to the doctor's orders respecting the temperature of the sick-room, and regulate the lights with equal care; whilst every article of food she offers to the invalid should be most carefully prepared, and presented in the most inviting manner possible. This is our model nurse; but most active women, with good common sense, who are able and willing to learn, may soon, by judicious teaching and hospital experience, be made good nurses, and may be of more service than many whose training has served no better purpose than to make them conceited and troublesome.—See *Childhood—Cookery—Hospital, &c.*

NUTMEGS are the produce of a tree resembling the pear tree, which is a native of the islands of the Indian Archipelago generally, but its cultivation has been much circumscribed by the narrow policy of the Dutch. The nutmeg is the kernel of the fruit, which is about the size of a peach, and is inclosed in a shell, over which is spread the arillus, which is the mace of commerce (see *Mace*). The properties of the nutmeg depend upon a fragrant essential oil which it contains. This is sometimes partially extracted by heat, and the nuts afterwards sold as fresh ones, being covered with powdered lime. This covering with lime, however, is also sometimes resorted to simply to prevent the attacks of insects. The oil, as well as a spirit prepared from it, are used in medicine as aromatics and slight stimulants, but nutmegs are mainly employed for flavouring in cooking.

As articles of diet, they possess the advantages and disadvantages of spices generally.

Refer to—*Mace—Spices, &c.*

NUTS.—See CHESTNUTS—FILBERTS, &c.

NUX VOMICA is the seed of a tree—the *Strychnos nux vomica*, a native of India and the neighbouring countries. Its active principle is strychnia, one of the most energetic poisons known, though a valuable remedy in proper hands.

Strychnia is now much used for destroying vermin, and occasionally proves fatal to the human subject by design or accident. The symptoms produced in poisoning, either by nux vomica or by strychnia, come on quickly,

in the form of violent spasms, affecting the entire muscular system, and death ensues from spasm of the muscles of the chest producing suffocation. The stomach pump, if it is available, if not, an emetic; chloroform inhalation, animal charcoal, fat, butter, or oil, and artificial respiration may be used in such cases, and, if available, chloral hydrate as an antidote. Medical assistance is urgently called for.

As a medicine nux vomica, either in the form of tincture or extract, or in its active principle, strychnia, is now largely used, as a nerve stimulant, as a general tonic, especially in some forms of nausea and vomiting, and it need scarcely be added that caution is required in its use. The extract is frequently added to ordinary aperient pills, such as compound colocynth, and compound rhubarb; when it is required to overcome habitual constipation. From one-fourth to one-third of a grain may be given thus for many nights in succession. As a tonic, five minims of the tincture may be given twice a day in water, and for obstinate sickness, one minim every hour in a tea-spoonful of water.

OAK BARK is a powerful astringent, and may be used for the same purposes as others of the class. For domestic use, it has the advantage of generally being easily procurable. It is used in the form of decoction, made by putting from an ounce to an ounce and a half of oak bark into a quart of boiling water, and boiling down one half. In relaxed sore throat it is a useful gargle.

Refer to—*Galls.*

OATS as an article of diet, are generally ranked next after wheat as regards nutritive power, the latter holding the first place, in consequence of its containing a larger amount of gluten; in some respects, however, the oat is the superior grain, especially as it is on the whole much richer in flesh-formers (see *Grains*). The oat is most largely used in Scotland; the seed is there "kiln dried, stripped of its husk and delicate outer skin, and then coarsely ground," in which state it constitutes "Scotch oatmeal." It may be thought that the cheapness of the oat might prevent its meal being adulterated; but it was found, at one time, that much of the oatmeal sold in London, was adulterated with barley-flour, a much less nutritious article of diet. In England, oatmeal is chiefly used for making gruel (see *Cookery*); but the meal, or rather oat flour, prepared in England, is of very inferior quality to the Scotch, and even when meal is made professedly in imitation of the Scotch preparation, it is a very poor substitute. In Scotland, oatmeal is most largely employed in the form of oatcakes and for the well-known "porridge," which constitutes the breakfast of a great proportion of the population, and almost universally of the children of all classes, and except, perhaps, for a few persons, a more wholesome one could not be found. In a few individuals, the use of oatmeal causes heart-burn, and occasionally sickness, and, of course, must then be abandoned. One of the most beneficial properties of the oat, especially in the form of the Scotch meal, is its aperient power; in many children, the use of oatmeal porridge for breakfast will entirely correct a tendency to constipation. The proper method of making oatmeal porridge is, to have the requisite quantity of water boiling *upon the fire*, and to sprinkle the meal into it from the hand, stirring constantly, not only at the time, but during the twenty minutes that the mixture should be boiled. Sufficient salt for seasoning is to be added during the process. In Scotland the stirrer is generally made of wood, and is known in every household by the name of the porridge stick. When the mixture is boiled sufficiently, it must be poured into a saucer or soup plate, till it is sufficiently cool. It is generally eaten with milk, but butter-milk, treacle, or beer are also used. A pint of water, and a tea-saucerful of oatmeal, will make a good soup-plateful of porridge. When oatmeal, coarsely prepared, is too largely used, especially in a dry state, it may cause concretions in the bowels (see *Concretions*); but this effect never follows its proper moderate employment.

Refer to—*Grains—Groats—Poultice, &c.*

OBESITY.—See FAT.

OBSTETRICS.—The art of midwifery.—See *Child-bed.*

OCCIPUT.—The back part of the head.

OCCUPATION.—See ARTIZAN.

ŒDEMA is the term applied to the swelling caused by the effusion of serum into the cellular tissue beneath the skin.—See *Dropsy.*

ŒSOPHAGUS.—See GULLET.

OIL—from *Oleum*, derived from the name of the olive which yields the well-known oil.

Oils used in medicine are the products of either the vegetable or animal kingdom; they are divided into fixed oils—which also include the fats—and volatile oils. Oils are also divided into drying and non-drying, according to their power of solidification by absorption of oxygen from the air.

Fixed oils vary from the most limpid fluid to the hardest suet, according to the amount of solid or fluid fatty matter in their composition; all fixed oils, and animal fats, being separable into two, and often three, different principles; one named oleine, remains fluid at the lowest temperature, the next, margarine, has a higher melting point, and the third, stearine, the highest of all. The separation—under the influence of cold—into oleine and margarine may often be witnessed in olive oil in winter. Fixed oils are further distinguished by their leaving a greasy stain on paper, which is not dispelled by heat, and by their power of forming soaps with the caustic alkalies.

Volatile oils are of great variety, the odoriferous properties of the vegetable kingdom depending on their presence. These oils are generally limpid, should be colourless, but are for the most part slightly yellow; their taste is usually pungent. Like the fixed oils, the volatile oils cause a greasy stain upon paper, which, however, *entirely* evaporates under the influence of heat, thus affording an easy test of adulteration with a fixed oil, which is sometimes practised.

Some volatile oils, such as turpentine, oil of lemons, juniper, &c., are composed simply of carbon and hydrogen. Others, such as lavender, peppermint, &c., also contain oxygen in addition—camphor belongs to this division—and a third section, those of garlic, mustard, &c., have sulphur added.

The principal fixed oils used in medicine are—

Almond oil.	Croton oil.
Cajeput oil.	Linseed oil.
Castor oil.	Olive oil.
Cod-liver oil.	

They all possess more or less aperient properties. Almond oil is chiefly used as an external application. The reader is referred to the separate articles for further information.

Volatile oils are used chiefly for their pleasant flavour, and for their stimulant carminative and antispasmodic properties. They form a long list:—amber, aniseed, caraway, chamomile, cinnamon, cloves, copaiba, coriander, cubebs, dill, juniper, lavender, lemon, nutmeg, peppermint, pimento, rosemary, rue, savin, spearmint, theobroma, and turpentine, are all entered in the British Pharmacopœia; and now we have Eucalyptus and others.

OINTMENTS are greasy or unctuous preparations, about the consistence of firm butter; they are much less used as dressings in modern practice than they formerly were, and their number might be reduced with much advantage; they have been supplanted by the more elegant, cleanly, and in every way superior, water-dressing and lotions. Occasionally a greasy application is requisite, and then nothing answers better than perfectly fresh lard, or sweet olive oil, or when fresh, a simple ointment, containing spermaceti or wax to give additional firmness. The form of ointment for purposes of counter-irritation, inunction, &c., is sometimes convenient, but even this, as in the case of tartar emetic, might be often avoided.

The ointments most likely to be useful for domestic practice are, antimonial ointment, gall ointment, iodine and iodide of potash ointments, mercurial and red precipitate ointments, simple and spermaceti ointments, sulphur ointment, and zinc ointment.

The composition of these is given under the head of the active ingredient they contain. Simple spermaceti ointment is made by melting together spermaceti five ounces, white wax two ounces, olive or almond oil twenty ounces, stirring continually till the mass is perfectly cold.

One of the great objections against ointments is, that so many of them, if kept, become rancid, and thus form a most irritating application; but this objection bids fair to be obviated by the substitution of vaseline as a basis for ointments.

Refer to—*Dressing.*

OLD AGE.—Although the powers of life may have previously shown symptoms of decline, the period of incipient old age is usually fixed in women about the fifty-third, in men about the sixtieth year; after this, it generally becomes evident that the vigour of prime is giving way, and that the powers of the constitution are no longer able to recruit themselves, or to sustain exertion with the same ease as formerly; diseases, too, peculiar to this stage of life, begin to show their symptoms of approach,—symptoms which can scarcely be too soon detected, or too carefully watched. As time goes on, the individual becomes more dependent upon the affectionate care, and, equally important, the intelligent supervision of those around. The subject of the treatment of the aged has been a neglected one. A valuable work, by Dr. Day, has supplied the want of a special treatise upon it. Old age increases the liability to such hereditary diseases as gout, gravel, rheumatism, apoplexy, and paralysis; and in women, especially, to cancer. Now the effects of excesses and of dissipation in early life, which may have been unfelt during the vigour of manhood, too often add to the natural infirmities. Whatever may have been the previous modes of living, it is always a dangerous experiment to make any material or sudden change in them after age has begun to tell upon the constitution,—it should not be done but for important reasons, and under direct medical control. The natural sensations will gradually guide the individual to those modifications of previous habits, which accord with the altered structures and diminished powers; and this more particularly in the case of active or violent exertions, which the hardening and ossification of the various tissues, but more particularly of the coats of the arteries, render hazardous. The weakened digestion of advanced life should be considered in the food, which, while it is nutritious, ought at the same time to be lightly cooked, and every thing like hardening avoided. Where the teeth are deficient, meat should be well divided, either by mincing before cooking, or by the knife after. The table mincer is of immense assistance when mastication is defective. The meals light, not at too long intervals. If the dinner be early, as it ought to be for the aged, who are not obliged to hurry off to business, supper, but a light one, should always be taken. The skin of old people is

often most shamefully and disgustingly neglected, and no point in their management is more closely connected with their comfort and health; it should frequently be sponged with tepid water, and well rubbed afterwards with a rough towel to promote reaction. It ought at the same time to be carefully protected by woollen clothing; old people are most injuriously susceptible of the changes of external temperature, particularly cold; indeed, a fall of a few degrees in the thermometer, may be the immediate cause of death in very advanced life, and the average number of old people affected by apoplectic or paralytic seizures, is apt to be notably increased at the setting in of frost. Exercise by the old should be continued as long as they are able to take it, but never should it extend to fatigue. Sleeplessness, so frequently and loudly complained of by aged people, is, in some respects, natural; as life advances, nature would seem to require less of the soft restorer. It is not well to endeavour to overcome it by narcotic medicines. If possible the time of sleep should, by habit, be kept to the early hours of the night, and, in summer especially, the tedium of the early morning may be relieved by reading, knitting, sewing, or some other light employment, even in bed. In advanced life, the urinary organs require the greatest care, the call to relieve them should never on any account be delayed; on the slightest symptoms of derangement, proper medical advice ought to be taken at once, it may prevent evils which too often render the latter years miserable. It is most important for old people to give themselves time to empty the bladder thoroughly; they do this with more difficulty than the young. The medicines prescribed for the aged should be, whenever it is possible, of a warm character, to counteract the tendency to flatulent distention: large doses of mercurials, neutral salts, strong purgatives, are all to be avoided. Alkalies, even when given to counteract a tendency to the acid of gout or gravel, must be carefully watched, and not too long continued; they may produce the opposite state from that which they are intended to correct—a much greater evil. Pills, especially if at all hard, are apt to pass through the bowels unchanged. When an aperient is required by an old person, none is more suitable than a moderate dose of infusion of senna, to which a little ginger, or a tea-spoonful of bark, or of gentian is added. Six to eight drachms of the compound decoction of aloes answers well, if there is no great tendency to piles. When the bowels are habitually constipated, an injection of a pint to a pint and a half of warm soap water, must be given occasionally as required; this counteracts the great tendency to fæcal accumulation. The doses of medicine ought always to be diminished after the period of incipient old age.—See *Age—Childhood—Life, &c.*

OLIVES,—the product of the *Olea Europæa*, or olive tree, though used in the form of preserved olives, is better known as the source of the well-known—

Olive, or Salad, Oil, which is procured by crushing from the perfectly ripe fruit. Good olive oil is of a pale yellow colour, and should be almost free from either smell or taste. It is often adulterated with the inferior fixed oils. As an article of diet, olive oil agrees well with many, and some persons find it useful as an aperient, but it is very weak in action. In pregnancy, however, with irritable and yet confined bowels, it occasionally answers better than the usual castor oil. Olive oil is most used in medicine as an external application, both as an addition to ointments, and as a liniment.—See *Ammonia—Camphor, &c.*

OMENTUM, or Caul, a membrane, more or less covered with fat, which is spread over the intestines. It probably acts as a protection against cold. The great loading of the omentum with fat, is one of the chief causes of the protuberance of the abdomen in very corpulent persons.

ONANISM.—The crime of Onan—self-pollution—requires no further notice here, than to put parents upon their guard respecting their children, in connexion with this ruinous vice, acquired at school, and indulged in, in ignorance either of its sin or evil consequences. Some of the most lamentable instances of youthful decrepitude, nervous affections, amaurotic blindness, and mental debility and fatuity in early life, which come before medical men, are traceable to this wretched practice. Whenever young people, about the age of puberty, exhibit unaccountable symptoms of debility, particularly about the lower limbs, with listlessness and love of solitude, look dark under the eyes, &c., the possibility of vicious practices being at the root of the symptoms, should not entirely be lost sight of.

ONION and **GARLIC.**—The former of these well-known vegetables may be considered either as a condiment, or as an article of real nourishment. In its raw state especially, the onion, by virtue of the volatile oil it contains, is a powerful stimulant, but one only to be used with advantage and impunity by the owners of strong stomachs, who intend for the time being to eschew civilised society; under this proviso, the onion may really, at times, prove, and has proved, of much value as a stimulant. By boiling, the onion is deprived of its pungent volatile oil, and becomes an agreeable, mild, and nutritious vegetable; it is less wholesome either fried or roasted, a portion of the volatile oil being retained, and empyreumatised, and thus rendered very irritating to the stomach. The onion possesses diuretic properties. A roasted onion, cut in half, and the centre scooped out, is a frequent domestic remedy applied to boils, with a view of hastening their breaking.

Garlic is a more powerful stimulant than onion; when applied to the skin, either fresh or in a pulp, it acts like a mustard cataplasm. Garlic is diuretic, and possesses other properties, but its abominable smell is quite sufficient to exclude it from use, when so many more efficient and agreeable substitutes are obtainable.

ONYCHIA is an inflammation of the root or matrix of the nail of either a finger or toe, usually resulting in abscess, and occasionally in loss of the nail. It is often very painful, and the pain may extend up the arm or leg. The local irritation is to be treated with poultices and fomentations, and if the imprisoned matter nears the surface, it should be allowed to escape by a slight incision made through the skin; if the nail becomes detached it should be removed, and an antiseptic ointment applied. The repeated occurrence of onychia is usually an indication of depressed health.

OPHTHALMIA.—See EYE.

OPINION, MEDICAL. — A medical opinion on a case of disease includes, first, the *Diagnosis* or conclusion arrived at respecting the nature of the disease; second, the conclusion as to the appropriate treatment; third, the *Prognosis* or opinion respecting the ultimate termination of the case. Under articles *Diagnosis*, *Medicine*, *Science of*, and *Prognosis*, these points are sufficiently entered into.

OPIUM is the milky juice, dried, of the seed vessels of the common garden poppy; it is, perhaps, the most useful remedy in the entire list of medical agents used by man, and has probably given more relief to human suffering, than any physical means we are acquainted with.

Opium may be procured from other species of poppy, but that above named is its regular source. The drug is chiefly collected in Asia Minor, in Egypt, and in Hindostan, but has been prepared in Britain. It is procured by making oblique incisions about half through the external wall of the unripe poppy capsule or seed vessel, and allowing the milky juice to become partially dry, when it assumes a brown colour, and tenacious consistence; at this stage, the opium is generally gathered by scraping it off the capsule by means of a stick or some other instrument, by which it is transferred to the receiving vessel—a cocoa-nut shell or the like; it is then further dried, after which it is, in some places, packed in leaves, in masses of various size, or, as in Egypt, made into rolls, or small flat cakes. Opium, when bought as imported, is apt to contain much impurity; by far the best condition, therefore, in which to purchase it for direct use, is the properly prepared powder, which must be kept in a well-closed bottle. The preparations of opium used by medical men are very numerous; the most useful of these only will be referred to in this article.

Opium is most familiarly known in its action upon the human body, first, by its power of compelling sleep—its sedative, soporific, or narcotic property; and second, by its power of relieving pain, its anodyne property; these actions, however, are much varied, and others are developed in accordance with the influence of circumstances, either permanent or accidental, such as the dose, and mode of administration; the state of the person taking it at the time, whether physical or mental, his temperament, previous habits, &c. It is well known, that among the Orientals opium is employed rather as a stimulant, as we use wine, than as a sedative, and its use for this purpose has very widely extended of late years in this country. When taken with the above view, the dose requires to be small—that is comparatively so according to the habits of the individual—and if sleep approaches, it requires to be resisted; after this state, if it occurs, in those who are stimulated by opium, a state of unusual physical, and especially of mental, activity is excited, accompanied with exalted brilliancy of ideas, which after some hours subsides, leaving drowsiness, inactivity, and low spirits.

If, however, the dose of opium has been a large one, or if the individual gives way to the inclination to sleep which follows even a moderate dose, heavy slumber is the result, varying in duration according to the dose of the drug and other contingent circumstances. Such is the more ordinary medicinal effect of opium; but whether the effect produced be one of excited or sedative action, pain is either modified or wholly subdued for the time being. When the effects of an ordinary dose of opium are passing off, most persons experience some amount of uncomfortable sensation: dryness of the mouth, headache, low spirits, and sickness; this latter symptom, especially, is sometimes so distressing, as almost to debar the use of opium in certain individuals.

Sometimes opium produces neither sleep nor the pleasing excitement so valued by its votaries, but gives rise to feverish restlessness, headache, thirst, &c. This may arise from constitutional peculiarity, from a state of previous feverish excitement, from the drug having been swallowed too soon after a meal, or from other causes.

In whatever way it is conveyed into the system, whether by the stomach, by the skin, by hypodermic injection, or by external application, opium seems to exert its peculiar effects upon the brain and nervous system; it further modifies the secretions, particularly those of the mucous membranes; it checks the flow of bile, and powerfully constipates the bowels; but it determines to the skin and causes sweating. The constipating action of opium is sometimes one of its chief inconveniences; but in those who consume it regularly, this effect generally soon passes off.

The action of opium upon the system is in the first place greatly modified by custom; persons who habitually take it for purposes of intoxication, find it necessary gradually to increase their dose, if they wish to experience what to them is its agreeable influence; such persons, when consulting a medical man, ought always to inform him of their habit, otherwise, when ordering what would be only a suitable dose for the generality of persons, he may be prescribing little more than a tithe of the ordinary amount consumed by his patient. It is, perhaps, needless to point out that serious consequences might result. Again, the existence of certain diseases, particularly of a spasmodic or painful character, very greatly modifies the power of opium over the system; this is peculiarly exemplified in such diseases as lockjaw, &c. Persons, even, who are ordinarily very susceptible to the action of opium, when suffering severe pain, can often take it in considerable quantity without experiencing its usual effects, or, indeed, any effect beyond relief to pain. Age is another circumstance, which, affecting the power of action of all medicinal agents, seems peculiarly to do so in the case of opium, its influence augmenting in a rapidly increasing proportion as the earliest epoch of life is approached; indeed, during the first two or three years of life, it is impossible to exercise too great caution in the administration of opium; many accidents are known to ensue from its careless, or ignorant, or criminal use, and doubtless many more there are which never come to light. A single drop of laudanum has been known to prove fatal to a young infant. Even in infancy, habit, nevertheless, enables comparatively large doses of opium to be given, but the most lamentable results accrue to the constitution, and, ultimately, death itself may be the consequence. No one should be tempted to give opium in any form to a child, unless under medical sanction, or under the pressure of some of such circumstances as are pointed out in various parts of this work (see *Childhood*), and when it must be given, it should be in the form of laudanum, in the most cautiously graduated dose. To an infant under two months old, one-quarter to one-third of a drop only should be given at once, and repeated at intervals of an hour, if required; and even in this way, no unprofessional person should venture to exceed the amount of one single drop of laudanum to an infant under six weeks old.

Poisoning by opium, either by accident or design, is a very common occurrence. The symptoms generally set in from half an hour to an hour after the drug has been swallowed, but this circumstance depends partly upon the form in which the poison is taken, being delayed longer when solid opium has been employed, instead of, as more usually happens, its fluid preparation, laudanum. The symptoms are, giddiness and drowsiness, from which the person may be roused by noises, shaking, &c.; but this quickly passes into apoplectic stupor and coma, with slow, "stertorous" breathing; and, ultimately, if the case proves fatal, into death, with or without convulsions: these being most common in children. In addition to the above symptoms, the face is pale and ghastly-looking, the surface cold, but may be covered with perspiration; the urine is suppressed; the pupils of the eye are generally contracted; the odour of opium may possibly be detected in the breath.

The treatment of a case of poisoning by opium must, in the first place, be to procure the evacuation of the poison from the stomach. For this purpose a medical man may use the stomach-pump; but others must attempt it by emetics (see *Emetics*). If sulphate of zinc (white vitriol) be procurable, half a drachm should at once be given, dissolved in water; or five grains of sulphate of copper (blue vitriol), in the same way; or mustard or salt may be tried if neither of the above is at hand; or ipecacuanha combined with a stimulant—a couple of tea-spoonfuls of sal volatile or of brandy; or the throat may be irritated with a feather. In some cases vomiting and even diarrhœa occur spontaneously, and certainly diminish the danger. When the stomach has been cleared, *but not before*, vegetable acids—lemon juice, vinegar, cream of tartar, may be given freely; or strong coffee, without either milk or sugar (see *Coffee*). At the same time, every means must be used to keep the patient from lapsing into lethargy; cold, or alternate cold and hot, water, may be dashed over the body; mustard plasters used between the shoulders, and continual movement kept up. This is usually, and very properly, done by keeping the patient in continual motion for many hours between two assistants. Lastly, galvanism or electricity may be used, and artificial respiration kept up. Perseverance in one or more of these measures is almost certain to resuscitate what would appear to the ignorant an almost hopeless case of opium-poisoning, and no efforts should be spared in impressing this fact on friends or relatives.

Tannin, the active principle of oak bark, has been recommended in opium-poisoning. It is perhaps not much to be depended on, but in the absence of other remedies, a strong decoction of the bark might be used. It must be remembered that in poisoning by opium, partial consciousness may be restored, and yet the patient, if unattended to, may relapse and die. It has been suggested that many of the symptoms of poisoning by opium are the result of the dryness of the lining membrane of the air tubes—which is one of the variable consequences—preventing the due oxygenation or purification of the blood; the fact should not be lost sight of, especially as it may be remedied by making the patient inhale steam freely.

The quantity of opium required to destroy life may probably be stated at from four to five grains of solid opium as a dangerous dose to an adult, and from a drachm and a half to two drachms of laudanum, and upwards. The average time in which death ensues, in consequence of poisoning by opium, is twelve hours; but it may occur considerably earlier.

Opium as a medicine is useful in a great variety of diseases, but as its employment is mentioned under the separate articles, it is unnecessary to repeat the information here. The most useful preparations of opium are:—

Opium powder.—To be kept in a well-stoppered bottle. Average dose for an adult, one grain.

Tincture of opium, or laudanum,—which contains one grain of solid opium in fifteen minims. Average dose for an adult, fifteen to twenty minims, or about twenty-five to thirty drops.

Of all the preparations of opium, this is the most generally useful and valuable, and the safest. Its dose may be regulated to the minutest proportion, and when properly made, it keeps well.

Tincture of opium with camphor, now called compound tincture of camphor, or paregoric,—which contains one grain of solid opium to the half ounce. Average dose for an adult, one drachm to three drachms.

Compound opium powder with ipecacuanha, or Dover's powder,—which contains one grain of solid opium in ten.—See *Dover's powder.*

Compound opium powder with chalk,—which contains one grain of opium in forty. Average dose, twenty to forty grains.

As external applications, the opium liniment, and the opium plaster, are both useful.

There are many other preparations of opium used, but the above would be ample for the best stored emigrant chest; and therefore for any home use. Persons generally, will find it more advantageous to purchase the preparations ready made, but in some cases it may be requisite to make laudanum themselves.

To make Laudanum.—Take of opium in coarse powder one and a half ounces, proof spirit one pint, macerate for seven days in a closed vessel, with occasional shaking; then strain, press and filter, and add sufficient proof spirit to make one pint. This solution contains thirty-three grains of opium in one fluid ounce. Of course a much smaller quantity may be made at once, observing the same proportions.

Laudanum and paregoric are best administered in water, Dover's powder in the form of pill, and the compound chalk powder in some thick substance, such as gruel. When solid opium is given, it is best in the form of pill, without admixture. Laudanum is sometimes used as an external application, being put into poultices, &c.; it is also used to rub on the gums in toothache. It must not be forgotten, that in any of these ways, if employed incautiously, or in excessive quantity, it may affect the system, and even prove dangerous. For the use of laudanum in injections, the reader is referred to articles *Enema* and *Hypodermy.*

In addition to the preparations of opium above mentioned, two others require notice, one of these, the valuable, though secret, Battley's sedative solution, will be found noticed under its special article; the other, morphia, is the special sedative or narcotic principle of opium. Opium is a very compound body, and includes other principles, on some of which its stimulant and other powers more particularly depend; morphia, therefore, being separated from these, is more purely sedative, and is not found so frequently to occasion the disagreeable after-effects which often follow the use of opium; in other respects, its action and applications are the same.

Morphia, on account of its insolubility, is generally prescribed in the form of the more soluble acetate or hydrochlorate of morphia. The latter is the best and more certain preparation: dose, from twenty to forty minims of the solution, which contains half a grain of the salt in each fluid drachm. The *graduated* morphia lozenge is a most effectual and comparatively agreeable remedy in irritable cough; ten or fifteen of the lozenges may be taken in the course of the same number of hours. Each lozenge contains the thirty-sixth part of a grain of morphia.

Refer to—*Poppy*—*Dalby's Carminative*—*Godfrey's Cordial*, &c.

OPODELDOC is an old name, seldom used now by medical men, applied to external stimulating embrocations. The camphorated soap liniment is the form most usually indicated by the term, popularly.

OPTICAL DELUSIONS or **ILLUSIONS**—the result of diseased or of disordered action—are not uncommon. Under the term may be included the more obvious disorders of vision, such as those in which one-half of an object, or one-half of a word only, are perceived. From this state, up to that in which figures of persons, either known or unknown, are seen, either constantly or periodically, every form of optical delusion is met with. Such cases are generally connected with disorder in the head, either in the form of disease of the brain itself, or are occasioned by sympathy with disordered function in other parts of the body, more particularly the stomach.—See *Blindness.*

ORANGE.—This well-known and wholesome fruit is imported chiefly from the countries bordering the Mediterranean. The two varieties—the bitter or Seville orange, and the sweet orange, are too well known to require description. The perfume of the orange flower is highly valued, and the distilled water is used on the Continent as an antispasmodic and anodyne; it is recommended as extremely useful in hysteria, in doses of one or two ounces.

In this country, the chief direct medicinal use of the orange is derived from the rind, which yields an agreeable, aromatic, stimulant bitter; the rind of the bitter orange is usually ordered, but that of the sweet may also be used, though it is less powerful. An infusion, a compound infusion, a syrup, and a tincture of orange peel as well as orange wine and orange water, are all used. A very good infusion may be made, simply, from an ounce of the dry bitter orange-peel, twenty ounces of boiling water being poured over, the whole allowed to stand for twenty minutes, and then strained; the addition of a quarter of an ounce of lemon peel to the above quantity may be made with advantage. The dose, as a stomachic, is a wine-glassful twice a day. Of the sweet variety of the orange, the China, the Maltese, and St. Michael's are best known in this country; the finest descriptions of the fruit have a smooth, thin, dark rind. The juice of the sweet orange contains principally mucilage, sugar, and citric acid, and is one of the most wholesome vegetable juices we possess, particularly in the chamber of sickness; the cellular pulp of the orange, however, in which the juice is contained, is very indigestible, and when swallowed, as it often is by children, is apt to produce disorder, passing through the bowels unchanged. It is a good plan, in the case of young children, to give the orange juice squeezed into a glass.

ORBIT.—The cavity in the skull in which the eye is placed.

OSMAZOME is the animal principle on which the peculiar and agreeable flavour of cooked meat depends. It is most manifestly developed in decoctions of meat, such as soups and beef tea, but as the term is now found to have no special signification, it has been abandoned in favour of aroma or flavour.

OSSIFICATION.—The formation of bone. "The first development of bone," according to Carpenter, "is commonly preceded by the formation of a cartilaginous (gristly) structure, which occupies the place the bone is afterwards to take; and it has been commonly considered, that the bone is formed by the ossification of the cartilage (gristle)." This, however, does not appear to be the case, for none of the peculiar substance of the cartilage—chondrine—can be found in perfect bone. The process of true bone formation always commences in the immediate neighbourhood of blood-vessels, which pass down into canals excavated in the substance of the cartilage; the spots where these vascular canals are especially developed, are termed centres of ossification. We usually find one of these in the centre of the shaft of a long bone, and one at each end; in the flat bones, there is generally one in the middle of the surface, and one in each of the principal projections. Up to the period when a bone attains its full dimensions, the parts which contain distinct centres, are not connected by osseous (bony) union, but only by cartilage, so that they fall apart when this decomposes; the purpose of this is to allow an increase in the size of the bone by the growth of cartilage between its detached portions. which cartilage may give place to bony structure, when there is no further need of increase.—See *Epiphysis.*

After the formation of bone has been completed, the changes which take place in its component particles appear to go on slowly; but should injury be inflicted, either in the form of fracture, or as a consequence of disease, by which a portion of bone is destroyed, the formation of new bone is often extremely rapid, and in the course of time, extremely perfect; the new structure in every way resembling the old. The reunion of fractures by the formation of new bone has already been alluded to under article *Fracture.*

As all are aware, the bones of young animals are much more cartilaginous than those of older ones; they contain much more animal matter, which, as life advances, diminishes, and gives place to a larger proportion of mineral ingredient. It is not, however, in the bones alone that this tendency to increase of mineral deposit—ossification—is observed; the body, generally, in old age, becomes more rigid, and bony deposit is found in structures that do not ordinarily contain it. Some structures are, however, much more obnoxious to this than others. It is matter of popular information, that the heart is very liable to be the seat of ossification, or more correctly speaking, of earthy degeneration in advanced life; this occurs more especially in the structure of its valves, and in connexion with them (see *Heart*), also in the coats of the coronary arteries which supply its own muscular substance; a change which is often found to have been associated with symptoms of "angina pectoris." This tendency, however, to the deposit of calcareous matter about the arteries of the heart, extends throughout the arterial system generally, causing these otherwise elastic tubes to become rigid, and thus impairing the important power they possess in health, and in early life, of assisting to propel each wave of blood which the heart-contraction commences through the body. The arteries, when in this condition, impart a tense wiry feeling to the fingers, and can be readily felt under the skin, and the pulse at the wrist, as well as the superficial veins, become more visible than they should be (see *Circulation*). This change in, and enfeeblement of, the power of the arteries, is one great and originating cause of many of the diseases of old age. Other parts, such as those connected with the larynx, &c., are liable to undergo this bony transformation, as life advances. The subject could not profitably be pursued further here.

Refer to—*Bone—Cartilage—Fractures, &c.*

OVARIOTOMY is the term applied to the operation of removing a cyst or tumour of large size formed in the ovary. Since the in-

troduction of chloroform, and more recently by the employment of antiseptic dressings, this operation, formerly considered very formidable and dangerous, is now attended with a large amount of success.

OVARIUM, or **OVARY**, is the receptacle in which are contained, either in plant or animal, the germs of the future seed or egg. The ovary in the human female is liable to a variety of diseases, such as inflammation, irritation, dropsy, and tumour. Irritation of one or both ovaries often gives rise to many obscure symptoms in organs apparently quite disconnected with those which are the primary seat of the irritation. Dropsy of the ovary is one of the most general affections of the organ, and arises from an enlargement of one of the small vesicles of the organ, which fills with fluid until it frequently occupies the cavity of the abdomen. Tapping, or other operations, may be required for its relief.

OVERCROWDING.—The death-returns of the Registrar-General show conclusively, that wherever human beings are crowded together, the death-rate asserts a higher proportion to the population, than in houses and districts sparsely populated. The people living in densely-populated neighbourhoods do not alone suffer, for when epidemic or infectious disease occurs among them, as it is too prone to do, it more often than not extends to their immediate zone, the occupants of which may be living in comparative luxury. Dr. Gairdner has given us a table, showing how the death-rate increases, with mathematical precision, in proportion to the density of population. The first column represents the number of persons located in one square mile, in separate districts in England, while the second column gives the deaths per 1000 living, for each year:—

56, ...	15
106, ...	16
144, ...	17
149, ...	18
182, ...	19
202, ...	20
220, ...	21
324, ...	22
485, ...	23
1216, ...	24
1262, ...	25
2864, ...	26
2900, ...	27 and upwards.

All experience shows the detrimental effect of limited area on the health of the population, and the legislature has wisely enacted that in buildings under their control, such as factories, workhouses, schools, barracks, and hospitals, a given amount of space consistent with health, and efficiently ventilated, should be allowed to each individual, but the main difficulty felt is in dealing with the poor in their own homes, especially in the crowded courts and alleys of great cities. Considerable powers are now invested in municipal bodies, Boards of Works, and Sanitary Authorities, to purchase and pull down habitations unfit for human dwellings, and to build others; but, as was anticipated, the vast expense attending the carrying out of the provisions of the "Improvement in Dwellings Act," has been a great bar to its working. The success connected with the erection of model lodging-houses, the Peabody gift, and other philanthropic agencies, proves how much private enterprise, aided by a wise charity organisation, can effect in the way of improving the dwellings of the poor. Perhaps no stronger illustration of the effect of airy dwellings can be found, than in the case of the nomad race of gypsies, who live for the most part either in the open air or under canvas, and, notwithstanding many privations, enjoy much better health than the denizens of the rookeries which exist so plentifully in all large cities.

OVUM literally, means an egg. The term is generally applied to the germ of the future being, after it has been fertilised by the male; previous to that, the term ovule is used. After fertilisation, the ovule of the plant becomes the seed; that of the animal, the egg, in which and from which the future animal is formed, either out of or within the body of the mother. —See *Egg*.

OXALIC ACID is one of what are called the vegetable acids, being found ready formed —in combination with potash—in various plants, such as the common wood sorrels, the common sorrel, the garden rhubarb, &c. It is also formed in some disordered states within the animal body, and is excreted in the urine, in combination with lime (see *Oxaluria*). Oxalic acid may also be formed by the action of nitric acid on sugar or starch, to which bodies it approaches, nearly, in composition, beng formed of carbon, oxygen and hydrogen, in certain definite proportions, or in other words, of carbon and oxygen, along with the elements of water. Oxalic acid is generally met with in the form of small white crystals. Oxalic acid is not now used medicinally; formerly, it was so, in the form of the wood sorrel, which was employed for the purpose of making febrifuge acid drinks, whey, &c.; but there are many substitutes, such as lemon juice, better adapted for the purpose, and less suspicious.

What is known in the shops under the name of "essential salt of lemons," or salt of sorrel, is a compound of oxalic acid with potash, and was formerly obtained from the wood sorrel.

Oxalic acid derives its chief importance here, from its frequent effect as a poison, either by accident or design. The accidents have generally arisen, in consequence of oxalic acid having been sold or taken in mistake for Epsom salts, the crystals of the two closely resembling one another; the precaution of tasting a single crystal would be sufficient to detect the difference.

The symptoms produced by poisoning by oxalic acid vary considerably. When a large

dose has been swallowed, the chief effect is complete prostration of strength, in fact, a state of collapse, accompanied with stupor, in which the patient dies, often within thirty minutes after taking the poison. Severe pain at the stomach usually comes on soon after the poison has been swallowed, but this, and vomiting which also generally occurs, and continues with great severity, may be absent. The vomited matters are strongly acid, and dark in colour. The rapidity with which death often ensues after a poisonous dose of oxalic acid has been swallowed, renders it almost impossible, in many cases, to procure medical assistance in time; it is, therefore, highly desirable that the most prompt measures should be adopted by those around. The principle of treatment is based on the fact, that the very soluble oxalic acid itself, forms, with lime especially, and with magnesia, insoluble and, therefore, comparatively less hurtful compounds. Chalk or whiting, the carbonate of lime, mixed up with water, is the best possible antidote, and should be given freely; if this is not at hand on the emergency, a portion of old mortar should be taken as a substitute, rubbed up with milk and water, and given as quickly as possible, or instead of it, magnesia. If none of these remedies can be procured, very copious draughts of water should be given to promote vomiting, which in any case should be excited, if it has not been already occasioned by the poison. There was formerly a prejudice against giving water largely in oxalic acid poisoning, from the fear that it might favour the solution, and passage of the salt into the blood; the practice has, however, been found advantageous, provided free vomiting is encouraged. Of course, whilst these measures are in progress, medical aid should be sought. Should the patient survive the poisoning, symptoms of irritation of the stomach and alimentary canal must be expected, which will require the most soothing treatment, chiefly by demulcent medicines and diet, and it may be by leeches to the pit of the stomach.

OXALURIA AND OXALIC ACID DIATHESIS are distinguished by the presence of crystals of oxalate of lime in the urine, which may either exist naturally after partaking of certain vegetables, as rhubarb, or wines, or malt liquors containing much carbonic acid, or the salt may be excreted as a morbid product from the kidneys, the result of disintegration of the tissues. The latter condition is associated with some forms of dyspepsia and often with hypochondriasis; occasionally, the salt gives rise to a concretion in the bladder or kidney, characterised by its rough uneven surface, to which the term mulberry calculus is given. The treatment in such cases consists in avoiding all articles containing oxalic acid, as well as sweet effervescing beverages, and the employment of the dilute nitro-hydrochloric acid, in doses of twenty drops, in some bitter infusion.

OX-GALL.—The gall or bile of the ox has been much lauded as a remedy in habitual constipation. A few years ago, it was extensively tried, and undoubtedly proved, and does prove, serviceable in certain cases, but, perhaps, having been over-praised, it seems to have become again almost too much neglected. In some cases of constipation in pregnancy it answers extremely well, and is very safe. Its preparation for medicinal purposes is simple, all that is required being, to place a quantity of fresh ox-gall in a flat dish, in a sufficiently warm situation—such as an oven—and permit evaporation to go on, till the gall becomes sufficiently firm to make it into pills, of which from five to ten grains weight may be taken once or twice a day. Besides acting as an aperient, ox-gall has been said to assist digestion; this may be, either from its bitter giving tone to the stomach, or from its giving its own chemical aid to the solution of certain constituents of the food. Ox-gall in its purified state is admitted into the Pharmacopœia; it is given in doses of five or ten grains in the form of pills, or in gelatine capsules.

OXYDE OF BISMUTH.—See BISMUTH.

OXYGEN GAS is one of the elementary bodies, and if one is more important than another, it, perhaps, is entitled to the first place. Its name, derived from two Greek words, was given in consequence of the erroneous idea that it was the sole cause of acid properties in bodies; it has also been named "empyreal air," "dephlogisticated air," &c. Oxygen gas, in mechanical mixture with nitrogen, constitutes the air of the atmosphere which surrounds our Globe (see *Air*), and on its presence in due proportion, depends the continuance of animal existence, the phenomena of combustion, &c. Whether the nitrogen gas with which oxygen is mingled in the atmosphere fulfils other objects or not, it certainly does the important one of diluting it, and of tempering its potent agency, which, were it not for this dilution, would act with such chemical energy, as must quickly prove destructive to organised life upon our Globe, as at present constituted.

Oxygen, in combination, forms what are called *basic oxides*. These are bodies such as potash, soda, oxide of iron, &c., which tend to unite with its next class of compounds, the *acids*. Besides these, oxygen forms compounds which do not exhibit aptness for entering into combination.

Further, oxygen, by uniting in different proportions with the same body—such as nitrogen—may give rise to a variety of very different compounds. Oxygen has never been separated in a palpable form; it is known by its effects. The important part which oxygen plays in the various fulfilments of animal life and existence has rendered the foregoing notice necessary. Under such articles as *Animal Heat*, *Air*, *Blood*, *Digestion*, *Motion*, *Respiration*,

&c., the reader will find those fulfilments and effects sufficiently entered into. Oxygen (compressed into iron cylinders) taken by inhalation has been found to be a remedy of much value in some diseases. It has been found especially useful in cases where the breathing powers are impaired, adding to the comfort of the sufferer, and influencing favourably the general condition. From a series of experiments made recently by Mr. Hayem, and communicated to the Academy of Sciences, he has shown that when oxygen is inhaled in certain proportions with common air, it has the remarkable power of stimulating the nutritive functions, increasing the amount of red corpuscles in the blood, quickening the appetite, and adding ultimately to the weight of the body. It was found that the suspension of the inhalation checked these changes, but so long as they were continued, there was a decided improvement in the condition of the patients. The advantages of the inhalation were especially serviceable in persons suffering from anæmia and chlorosis; and in cases of dyspepsia accompanied with vomiting, it had the power of checking the vomiting, while in cancer of the stomach, and in phthisis, the vomiting was rendered less frequent.

OXYGEN WATER.—This water owes its medicinal properties to the fact that it contains a large amount of free oxygen gas in solution. The amount of gas contained in the water, which was manufactured and sold at one time by a public company, was said to be about 13·5 cubic inches to each imperial pint, equal to 4·6 grains of gaseous oxygen by weight. Chlorate of potash is a remedy frequently prescribed by medical men, with the view of supplying oxygen to the blood. Now one pint bottle of this oxygen water contains as much of the gas as would be obtained from a dose of chlorate of potash equal to 21·4 grains.

Oxygenated water is a very pure, wholesome, and useful beverage, and is found to be a gentle stimulant to the functional action of the stomach, and the secretory organs generally. It is given in cases of indigestion, with loss of tone, feebleness, and irritability of the stomach, with tendency to nausea and sickness. It is also of value in cases of pulmonary consumption, and of diseases of the lungs and respiratory system, connected, or accompanied, with deficient æration of the blood.

OXYMEL—a mixture of honey and vinegar. Simple oxymel is made in the proportion of forty ounces of honey to five ounces of acetic acid and five ounces of water.

Oxymel of squill is made by mixing five ounces of squill vinegar with half a pound of honey.

The above are pleasant and useful preparations in some forms of catarrh and cough, and may either be used alone, or combined with other medicines.

OXYMURIATIC ACID.—The old name for chlorine.

OYSTERS.—Respecting the wholesomeness of this well-known shell-fish, difference of opinion exists among medical men; nutritious, especially when uncooked, they certainly are, but their digestibility in all probability depends greatly upon the person by whom they are eaten. Some, whose stomachs generally require much consideration, can eat oysters in moderation with impunity: Dr. Paris condemns them for invalids, but most authorities agree in considering that in their raw state they are admirably suited for weak stomachs. Oysters have been known, like other shell fish, to cause symptoms of irritant poisoning.

OZONE is a substance of penetrating odour, which, according to M. Schönbein, who paid much attention to the subject, is constantly liberated in greater or less quantity in the atmosphere, according to the development of electricity. It is a substance which has a powerful effect in decomposing foul organic matters in the atmosphere, and its oxidising properties on metals are greater than those of oxygen. It is found in greatest abundance on land near the sea, and during snow and thunder storms, and its presence may be detected by its action upon paper moistened with iodide of potassium, which it renders brown by liberating the free iodine. It was thought at one time that ozone might be the cause of epidemic catarrh, on account of its energetic action on the air passages, but this theory was soon abandoned. Scientific men have speculated curiously as to the influence of ozone upon the health of mankind, and many ingenious instruments, called ozonometers, have been devised to determine the quantity of it present in the atmosphere which we breathe, under various conditions. It may, however, be truly said that, as yet, we know nothing definite with regard to it, although the most careful investigations have been conducted with a view to determine, if possible, its relation, if any, to the health of our large towns; or whether having any, and if so, what influence in favouring or producing the occurrence of the different epidemic diseases by which we are from time to time assailed. Ozone is believed, by the best observers, to be oxygen in a concentrated form, or, to express it in chemical language, an allotropic form of oxygen, just as the diamond and plumbago may be said to be allotropic forms of carbon. It derives its name from the Greek word, signifying a smell. It has been recommended to be given in medical practice in combination with other remedies, as, for instance, with cod-liver oil, and in the form of ozonised water, but the continued experience of medical men has not endorsed the high opinion that was once entertained of its curative properties. Ozone is made artificially, and is much used for bleach-

ing purposes, and its well-known activity in decomposing foul organic matter in the atmosphere, points to the probability of its uses being further taken advantage of in this way.

PAIN.—The sense of pain, like other sensations, originates in the nerves, and very generally *appears* to be located in the parts where their ultimate branches terminate; the perception of pain, however, by the sentient being, must depend upon the brain, the sense of it being conveyed to that organ by the nerves. This we know, certainly, to be the case, for if the nervous communications with the brain are cut off, as by injury to the spinal cord (see *Nerves*) or if that organ itself is oppressed, as in stupor, there is no sensation, and consequently no pain. There may be the appearance of sensation, and of pain being felt, in consequence of reflex action, as explained under the article *Nerves*, but it is appearance only. If any portion, almost, of the healthy body, is injured, pain is felt, because the universally-distributed nerve branches are injured in the process, and, as might be expected, the sensation is referred to the seat of the injury; but pain being felt in a particular part, or as if in a particular part, is not necessarily indicative of injury at the place where it is felt; it may arise from irritation of the nerve cord which supplies the part, at almost any part of its course. This is most strikingly exemplified in the cases of persons who have suffered amputation of a limb, and who often experience the sensation of pain, as if in the member they had lost. Similar, in some degree, to the above, are the sympathetic pains observed in some cases of disease; such, for instance, as the pain at the point of the shoulder from affection of the liver, the pain in the knee which is so general an accompaniment of hip-disease, or the pain in the legs which may result from acid in the stomach. Pain, therefore, although a most valuable guide in the investigation of disease, is by no means an unerring one, and must not be too implicitly trusted.

The faculty or power of feeling pain—the sensibility of the various parts of the animal body, when in a healthy condition—varies greatly, depending in a great measure upon the supply of nerves they receive; thus, such parts as bones, tendons, ligaments, &c., are generally but little sensitive; when, however, they become inflamed, they are acutely so. Further, it would seem that certain affections of the central parts of the nervous system greatly increase the sensibility to pain, as well as diminish it, more particularly affections of the spinal cord. Such is the case in hydrophobia, lockjaw, &c., in which every portion of the surface of the body becomes painfully sensitive.

Lastly, in functional disorder, or irritability of the nervous system, such as occurs in hysteria, there is often intense susceptibility to pain, as well as to other outward impressions; but this evidently depends on very different causes, and requires very different treatment from the cases above mentioned (see *Hysteria*). Pain is not at all times referred to the terminations of the nerve, in neuralgia either of the head or face, or affecting the great nerve of the thigh and leg,—sciatica,—the pain is often complained of in the site of the main cord of the nerve itself.

Pain varies greatly in kind, as all know; it is dull and aching, sharp and cutting, throbbing, tingling, smarting, burning, &c., these differences depending in some measure upon the part affected. Inflammation of the skin is generally accompanied with pain of a burning, tingling, or smarting character; that of a "serous membrane," such as lines the chest, causes pain that is sharp and cutting, which is the case in pleurisy; the pain of toothache is dull, aching, and throbbing; the pain of spasm is sharp, but distinguished from that of inflammation by not being aggravated by pressure.

It is probable—and cases of hysteria justify the supposition—that some persons are much more acutely sensible of pain than others; it is certain that some bear it much better, both physically and mentally, than others. It is sometimes of importance to ascertain this; it may be done at times, by remarking, when it is necessary to apply a blister, how far the irritability, either mental or physical, is excited by it.

Pain is not an unmitigated evil; were it not for its warning, we should be liable, unwittingly, to inflict all manner of injuries upon our bodies. We see this in cases in which the sensibility to pain is impaired or destroyed, in consequence of disease of the brain, or of paralysis of the nerves of sensation. In the former case more especially, as has already been alluded to in this work, serious results may follow forgetfulness of this fact; the feet, either of an adult or of a child, may be parboiled, or a mustard plaster may be kept on the skin, till the most severe effects are produced, simply because the warning symptom of pain is, for the time being, in abeyance. This is no imaginary possibility, and it is one, the occurrence of which should deservedly bring down the censure of gross carelessness upon any one under whose management it might happen.

The absence of sensibility to pain, in connexion with cases of apoplectic stupor, &c., is what we may expect; it sometimes, however, occurs whilst the mental faculties remain active; this, when it does happen, is generally after some severe accident, such as an extensive burn or the like, which seems to overwhelm the nervous system; in such cases, the severest operations may be undergone without suffering,

but the symptom is one of the most fatal import.

The presence or absence of pain, or its alleviation, is by no means a light consideration in the treatment of disease; the mere sensation of it exerts a great call upon the system, and it is quite possible for a person to die from severe pain alone; hence the inestimable value of these modern discoveries, the anæsthetic, or pain-relieving powers, of chloroform and ether, which, by saving a patient the exhausting shock of the pain of a severe surgical operation, place him in a much more favourable condition for recovery than he would be without their aid—a consideration, which far outbalances the few and far between fatal accidents which have undeniably followed the use of the above agents. It is the fact of the exhausting tendency of pain, which renders opium so valuable a medicine, and one, the existence of which so abundantly testifies to the beneficence of our Creator, who, in conferring upon man the liability to suffer from the warning pang of pain as a necessary adjunct to his present being, has also given the means of its alleviation.

Although, however, it may be advisable in most cases to alleviate or annul pain, and, when it is very severe, imperative to do so, it is possible to sacrifice too much to the one object. Generally speaking, it is not difficult, for a time, at least, to overwhelm the sensations of pain by powerful doses of anodynes; and although, as far as can be done, consistent with other means of treatment, suffering should be relieved, it may not be desirable totally to annihilate what is, in many cases, an index of the progress of a disorder; neither can it be advisable to sacrifice to the one object—the alleviation of pain—other considerations of more vital and lasting import. In other words, it would not be right to give, for instance, a large dose of opium to annul a present pain, with the risk or certainty of interfering with some of the secretions or excretions of the body, such as that of the bronchial membrane, the due performance of which must be absolutely necessary to the ultimate wellbeing of the patient. This point is dwelt upon, because it is one on which the public requires a little enlightenment. To unprofessional persons, the man who most quickly relieves that which every patient thinks the most prominent symptom of his case—pain—naturally, perhaps, appears to be a practitioner superior to one who does so more slowly; but yet, the latter may be following by far the safer, and one may add, more conscientious practice, and be much more likely to conduct his case, in the end, to a successful issue, than if he had sunk other considerations before the one—the relief of the present pain. The relief of pain by anodynes (see *Anodyne*) has been chiefly alluded to in the foregoing remarks, these being the remedies which are most likely, from their remarkable power of subduing pain, to be resorted to, to the exclusion of other really more important indications and methods of treatment. There are, however, other means of alleviation, which cannot strictly be called anodynes, but which may, in many cases, be used with much advantage, without being open to the objections which hold good against opium and the like. Of these, heat, especially when combined with moisture, is at once the most useful and generally applicable, as with a poultice or hot fomentation; cold may answer the same purpose in some cases, but not generally, except in pain affecting the head, where an ice-bag or evaporating lotion can be applied. The position of the body, or of a limb, the temporary loosening of a bandage, the mechanical support of a painful part, either to relieve its natural weight, or to take pressure off the site of the pain, and throw it on some sound texture, the friction of a pained part by the hand, the abstraction of blood by leeches, scarifications—as shown in the case of the gums, which, by relieving the swelling and tension, also relieves the pressure upon the extreme nerve branches—and many other remedies applicable to the relief of pain, are to be kept in mind. Lastly, the kind word and the gentle tone are anodynes, which, though they may not relieve real pain, will yet, either in rich or poor, make it more bearable, and whilst incapable of harming, give the double blessing on them that bestow and on them that receive.

Refer to—*Nerves—Opium.*

PAINTER'S COLIC.—See COLIC—LEAD.

PAINTER'S PARALYSIS.—See LEAD—PALSY—DROPPED WRIST.

PAINTS and **PAINTING.**—The injurious effects exerted upon the health of those who occupy newly-painted houses or rooms, is a circumstance too frequently overlooked. That living in, and especially sleeping in, rooms which have been newly painted with "oil colours," does occasion uneasy feelings, such as headache, &c., most can testify; but that the effect produced is more than transient uneasiness, is evident from the fatal influence the same circumstances exert upon birds. Children often upset their stomachs by sucking paints and paint brushes, as well as toys, the colouring matters of which become easily detached. Most green paints contain arsenic.

PALATES.—The palates are divided into hard and soft. The former is the ridged roof of the mouth, which, commencing behind the upper teeth, extends backwards, and merges into the soft palate, which is a fold or curtain of the mucous membrane lining the mouth, and from the centre of which depends the uvula, a small rounded projection which any one may see by examining his own throat in a glass. From each side of the uvula proceed two arched "pillars" or folds of membrane, an anterior and a posterior, between which, on each side, is placed the tonsil (see *Tonsil*).

The soft palate, during the act of swallowing, prevents the regurgitation of food into the nose, whilst, at the same time, the arched pillars above described, by closing over the root of the tongue, keep the morsel from passing back into the mouth. The membrane within the mouth, which covers the hard palate, is liable to be the seat of small blisters, particularly in those who suffer from some forms of indigestion; in such cases, of course, the cause, and not the effect, requires treatment (see *Indigestion*). The hard palate is occasionally deficient at birth, and to so great an extent, as to require the introduction of a metallic plate to fill up the gap. In such cases, the fissure often extends through the soft palate, dividing the uvula into two parts. These "congenital" affections are usually associated with hare lip, and, like it, require the operative aid of the surgeon for their reparation. Fortunately, improvements in the mode of operating, particularly those introduced by the late Professor Ferguson, of King's College, have rendered the measures resorted to much more generally successful than formerly.

Refer to—*Nose—Throat—Tonsils—Uvula, &c.*

PALLIATIVES are remedial agents which aim rather at relieving urgent symptoms, than at curing or removing the disease which these symptoms indicate. Too often it happens, that the palliative is all that is left for even the highest skill to administer; and if that skill cannot hinder the breaking of the "golden bowl," or the snapping of the "silver cord" which binds the living man to life in this world, it is much to be thankful for, that there are means and remedies which mitigate the pangs of fatal disease. There are diseases which baffle the most searching investigation, not only in the living body but in the dead, and there are others which, although recognised, are so only—*in the present state of our knowledge*—to tell that they are beyond the reach of human aid to cure; in such, the palliative only remains, and if this be the case with educated skill, how often, rather how generally, must it be so with the limited knowledge of the unprofessional! On this account, in a work like the present, addressed to the latter, palliative treatment occupies a large space amid the remedial measures recommended as being most safely usable by those who are put in possession of the information.

Refer to—*Pain.*

PALM-OIL, obtained from the seeds of the oil palm, is of a bright orange-yellow colour, and is brought to this country as a substance the consistence of butter. It is used as an external application for similar purposes to the olive and other oils, but is in no way superior.

PALPITATION OF THE HEART is unusual action of that organ, of which the patient is sensible; it may take the form either of a fluttering sensation about the region of the heart, perhaps extending into the throat, or it may amount to violent beating, either regular or irregular.

The liability of the heart's action to be increased by exciting emotions of the mind, almost of any kind, whether of fear or of joy, renders palpitation a very common affection, and when it occurs only under occasional circumstances like the above, it cannot be considered otherwise than a perfectly natural occurrence. When, however, palpitation arises on every trivial occasion, either of mental emotion or of physical exertion, or without occasion at all, as it often does, even during rest in bed, then it requires attention, not solely on account of the discomfort it gives rise to, but because it may lay the foundation of disease of the organ which is so constantly subject to over-excitement. It has already been stated in this work, that heart affections have been observed to become more common after seasons of much public excitement of any kind, an effect traceable only to the frequent disturbance of the organ by the passions or emotions.

Palpitation of the heart, independent of disease, is most liable, indeed is very liable, to occur in the young of both sexes, and in females particularly, soon after the age of puberty, in the latter, being very generally associated with hysterical tendencies; in such cases, it is met with in its most aggravated forms, and often of such violence as to prove truly alarming. In any case, the tendency to palpitation is more common in the nervous temperament, and is increased by whatever gives undue predominance to that temperament, such as indolence, luxurious habits and the indulgence of feelings and imagination artificially excited; and, having once begun, it is kept up and aggravated by the continued attention with which the mind is apt to dwell upon the ailment; the individuals subject to it easily imagine themselves the subjects of heart disease, watch every motion almost of the heart, and thus, under the influence of their own imaginary fears, produce the very symptoms they dread. This nervous condition—for it is generally nothing else—is only to be got rid of by those measures which give a more vigorous and healthy tone both to mind and body; the false excitement of imaginative literature—if it has been indulged in—must be exchanged for a more healthy mental aliment—something which calls for some healthy mental interest. This must, of course, be regulated in some measure by the habits and tendencies of the person, but where it can be adopted, the pursuit of some branch of natural history, botany, geology, or any other out-door occupation, such as gardening or sketching from nature, are the best pursuits; they occupy the mind, and draw away from its own morbid fancies, even in the time of exercise, which is

rendered doubly invigorating by the mental excitement which accompanies it. Along with these means, a system of diet (see *Food*), adapted to give good blood nourishment, should be adopted; heated and ill-ventilated rooms above all things are to be avoided, early hours observed, and if a feather bed has been habitually lain upon, a firm hair or wool mattress is to be substituted. One article of diet requires especial mention as being peculiarly injurious in such cases—tea of any kind is better avoided, but green tea is absolute poison; coffee is scarcely allowable, and cocoa or milk should invariably be substituted for either of the above more stimulant beverages. Wine or malt liquor may be injurious, or the reverse, according to the previous habits of the patient and the nature of the case: if depression or debility follows their withdrawal, the tendency to palpitation is certain to be increased. Smoking to excess often affects the nervous system to an extent to produce palpitation, and where there is this liability it ought to be forbidden. In addition to these measures, regulation of the bowels, the use of the shower bath, or, better, of the douche down the spine, and occasional mustard plasters on the chest or between the shoulders, are all useful, especially if, as frequently happens in cases of aggravated palpitation, any tenderness of the spine is found to exist. In cases of nervous palpitation, medicine is not much called for, unless to remedy other disorders, such as indigestion. Some patients derive much benefit from a tea-spoonful of the ammoniated tincture of valerian, taken twice or three times a day in water, to which, if there is much nervous irritability, ten drops of tincture of henbane may be added; sal volatile in tea-spoonful doses is often useful, especially if there is much flatulence: or ether, either sulphuric or chloric, may be taken in ten or fifteen-drop doses, either alone or with the above-mentioned remedies. The ethers, however, are more generally serviceable as remedies during an attack of palpitation, than when taken regularly. Night palpitations may be frequently relieved by a draught, taken at bedtime, composed of bromide of ammonia, bromide of sodium, fifteen grains each, and ten mimins of tincture of digitalis, in an ounce and a half of water. When palpitation is habitual and severe, a medical man should be consulted, especially if the mind is at all uneasy; his examination will detect the real nature of the affection, and his advice will be most likely to indicate with certainty the remedies which will most quickly relieve that which, though but a functional disorder, may, if neglected, become an organic disease. With respect to palpitation dependent on disease of the heart, enough has been said in the article devoted to the subject of heart disease in general.

PALSY.—See PARALYSIS.

PANACEA—a remedy capable of curing all diseases; it is, perhaps, needless to add, an imaginary one—a "myth."

PANADA—a food for children and invalids, best made by boiling for a length of time in water, or milk and water, thin slices of bread previously well dried in the oven.

Refer to—*Childhood.*

PANCAKES.—The well-known article of food; they are unsuitable for invalids.

PANCREAS.—The pancreas (fig. 166—1) is a narrow gland from six to seven inches in length, which is situated behind the lower portion of the stomach (2). It is sometimes compared in shape to a dog's tongue. It secretes a fluid, somewhat resembling the saliva, which is poured into the duodenum (3) through a duct, which enters the bowel by the same opening as that which conveys the bile,

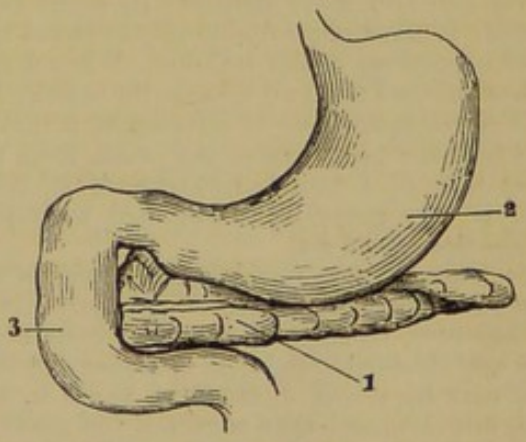


Fig. 166.

the two fluids mingling with the digested food pulp, or the chyme, at the same time, and neutralising its acid properties. The pancreatic juice (as the secretion from the gland is usually named), is the main agent in saponifying or minutely subdividing the fatty particles of the food, and converting them into a condition in which they are readily absorbed by the vessels of the intestines.

Refer to—*Alimentary Canal—Digestion.*

PAPILLA is a small eminence upon the surface of an organised body. The minute points visible upon the tongue are called the papillæ.

PAPULE.—Papules or pimples occur as elevations from the surface of the skin, and are characteristic of some of its affections. The eruption of small-pox commences with minute pimples, which are afterwards converted into pustules. As a rule, however, papules do not contain any fluid, and disappear after a time in the form of scurf.

PARALYSIS is loss of sensation, or of the power of motion, in parts naturally possessed of those endowments: the affection varies considerably in kind and degree. There may be loss of sensation, merely, either of a part, or of the whole body, without the power of motion being impaired, but this is comparatively rare;

generally, it is the power of motion which is lost or diminished, that of sensation being often not affected at all, and when it is, only slightly so. Paralysis of motion may be confined to a single finger, to part of a limb, or to the whole of one; it may extend only to the lower extremities, whilst the upper portion of the body is functionally unaffected; or one entire side of the body may be totally or partially deprived of the power of motion. In a few cases it occurs, that general paralysis of all the muscles of voluntary motion has taken place, life being carried on for some time by the involuntary functions solely.—See *Nerves*.

Palsy or paralysis of one side of the body, what medical men call *Hemiplegia*, is much more common than the other forms of the disease, and may occur at any age, even from infancy upward, but is most general after middle life, and more frequent in males than females; it takes place under very opposite and varied conditions of the system. When a person has suffered from an apoplectic attack, the result of congestion or of effusion of serum or blood into the substance of the brain, from the giving way of a vessel, recovery, if it takes place, is very generally trammelled with paralysis.—See *Apoplexy*

The rupture of a vessel in the brain is one common originating cause of paralysis; it is one, however, which may occur without there being any decided apoplectic symptoms at all; there may be slight effusion of blood in the brain, but not more than causes at the moment transient faintness and confusion; if the attack occurs during sleep there may not be even that; but either with or without it, paralysis is found to have occurred, either total or partial, and remaining partial, or gradually increasing for some time after its first appearance. Another form of paralysis is that arising from a more decided state of general debility, in which the brain partakes, and in which the structure itself gives way. It is often the disease of overworked literary men, or men of business, and is apt to end quickly, in a softened state of the brain, with mental imbecility, and perhaps general paralysis. Palsy may, of course, arise from other causes which act upon and injure the structure of the brain, such as tumours, violence to the head, &c., but the above are the most common, and are sufficient to notice here.

Whatever the cause, it is always found that when the brain proper is the seat of the disorder, the paralysis of the body takes place on the side *opposite* to that portion or "hemisphere" of the brain which is affected.

The symptoms which precede an attack of paralysis, are so very similar to those which have been described as being the forerunners of apoplexy, that it is needless again to go over them. The most frequent, however, is the complaint of numbness and prickling sensation throughout a whole limb, or affecting only a portion of it, such as a single finger. Such symptoms in old persons, or in the predisposed, should never be neglected.

When a person has suffered from a "stroke of palsy," or a "paralytic seizure" (by which is generally understood the paralysis of motion on one side of the body), the loss of power may be complete, the arm and leg lie perfectly inert as far as the will is concerned, and the face is generally more or less affected in a severe case, the side on which the paralysis exists having a rather relaxed appearance, whilst the features are drawn towards the other, in consequence of the muscles of the sound side still continuing active, and being unresisted by those on the paralysed side. This is much more visible under any of the mental emotions which usually affect the features, such as laughing, the muscles on the sound side only acting, whilst the paralysed side of the face remains perfectly unmoved. Under this condition of circumstances, the speech is affected, articulation is thick, in consequence of one side of the tongue being also paralysed, so that when this organ is protruded, it is drawn to one side; swallowing is, at the same time, in some degree imperfectly performed.

These are the symptoms of a severe attack of paralysis, but they are often developed in much less intensity; the leg alone may be affected, or the leg and arm, leaving the face and head intact, and the mind perfectly clear. In a great number of cases, the paralytic symptoms after reaching a certain point go no farther, remain stationary for some time, and then begin to amend, the arm and leg recover power, the features regain their wonted expression, and the speech is well articulated. This amendment may go on to complete recovery, but, generally it stops short of this, and the person, though comparatively well, is not fully restored; the leg is not lifted as formerly in walking, but drags a little, the hand and arm do not regain their former skill and accuracy in executing accustomed acts, such as writing, even though the face, if it has been "drawn," is perfectly restored. In this state of partial recovery numbers continue for years, capable not only of enjoying life, but of executing many or most of its duties. It is a state, undoubtedly, which requires care, in diet, in exertion, whether physical or mental, and which involves many restrictions and self-denials, but none perhaps, to which a well-regulated mind will not cheerfully submit; indeed, it does happen that individuals who, previous to an attack of paralysis, have been dyspeptics, or invalids, under a lax system of living, finding after its occurrence the vital necessity of greater carefulness, absolutely enjoy better general health than previously.

When a portion of the body, such as the arm, remains permanently paralysed, it usually, after a time, diminishes in muscular bulk, partly owing to the want of exercise which necessarily occurs, but partly also to the diminished power

of blood circulation through it, which certainly takes place. The difference in the power of the pulse in a sound and in a paralytic arm is very perceptible, and experiment has demonstrated that in the latter the animal temperature is habitually lower. In connection with these conditions of paralysed limbs, it should be borne in mind that they have less power of *resisting differences in heat or cold;* a variation in temperature which would not affect a sound limb being apt to injure a paralytic one, water which would not be too hot for the former producing a scald in the latter. In addition to the local effects of paralysis, there are general ones which often accompany the condition, these are usually connected with the excretions; the bowels particularly are apt to be very costive, and to require much care.

The mind may not be much affected at first, not perhaps for years, but the temper is apt to become irritable, a point which ought to be remembered with indulgence by others; as age, however, advances, in most cases the memory fails, and the mind, even the most powerful, becomes gradually weakened. It is enough to recall to the recollection the touching accounts of the last days of some of our great men, such as Sir Walter Scott, who have suffered from paralysis, to illustrate this fact.

Such are the best marked symptoms which accompany and follow that very common disease, a paralytic stroke. Many of the warning symptoms of paralysis have been detailed under the head of apoplexy, and the precautionary measures pointed out; in the same article, too, the means recommended to be adopted in the different forms of apoplexy, either threatened or actual, will apply to the severer cases of paralysis. When a person becomes affected with paralysis without apoplexy being developed, when debility, faintness, and loss of power are the most prominent symptoms, it is not often that very active treatment is required; the cause of the disease is probably beyond the reach of art to remove, and the object must be to place the system in a state which will in no way favour a return or increase of the attack, but which will give every chance of recovery by the natural powers of the system. If the attack of paralysis has occurred in a person of very full habit, the chances are, that apoplexy has accompanied it, and if so, depleting measures will probably be requisite, these of course should be, if possible, under medical direction; but if this is unattainable at the time, they may be carried out as recommended, and under the precautions enjoined in the case of apoplexy.

When the attack of paralysis is accompanied with faintness and only partial loss of consciousness, in the absence of medical assistance, a tea-spoonful of sal volatile in a little water will be as suitable a remedy as any other, and may be repeated once or twice in the course of the first hour or two. If the depression continues, the individual should be placed in bed with head and shoulders tolerably well elevated, and kept perfectly quiet; if the bowels are confined, a gentle aperient of castor oil, or of rhubarb and magnesia, should be given, and light nourishment, tea, gruel, and the like. The warmth of the feet, and particularly of the affected side, must be strictly attended to. If, either at the time of the seizure, or afterwards, there is much pain in the head, flushing of the face and appearance of fulness, leeches, from six to eighteen, may be applied, or half a pint of blood taken from the back of the neck by cupping; but in these cases, much caution is always required in the abstraction of blood. In such a case as the last, more active purging will be admissible. Mustard plasters to the calves of the legs may in some cases be advantageous. The great essential, however, is the most perfect quietude; with this, time will be the best restorative, the diet being kept light and free from stimulants, and the bowels attended to. If the urine become scanty in quantity, cream of tartar drink—imperial—will be of service, or five grains of carbonate of potash, with five grains of nitrate of potash, may be given twice a day in a wine-glassful of water. Moderate friction with the hand to the affected side is not only soothing and comforting in most cases, but probably expedites the returning strength. Exertion of any kind must be very slowly and gradually resumed; but all this will be regulated by a medical attendant, under whose care the case must be placed. In some cases of severe paralysis the natural functions are performed involuntarily, and much trouble is required to preserve cleanliness.

The case in which the lower limbs are paralysed, the upper portions of the body being unaffected, is named *Paraplegia;* it is generally produced by disease or injury to the spinal cord or its membranes, or as a reflex symptom from affections of the urinary and generative organs. If arising from the former, it is generally a very hopeless disease. When the result of injury, the symptoms are of course developed at once, and, indeed, are so in some cases of disease; but generally they come on gradually, with weakness of the lower limbs or starting in them, very often with a sensation as if insects were crawling over the skin. Such cases always imperatively call for proper medical assistance; unprofessional persons can do but little beyond attending to their comfort in position, to cleanliness, which is apt to be much interfered with, and to the prevention of bed-sores, &c., which are very apt to form.—See *Bed—Bed-sore.*

Cases of local palsy are not uncommon; of these, the disease, amaurosis, already treated of, which is a palsy of the nerve of sight, is an example. One hand is not uncommonly affected with paralysis in the course of a single night; the affection is generally attributed to

pressure having been in some way exerted upon the nerves during the time of sleep; a blister on the forearm will very often remove the symptom at once; it is better, however, to apply to a medical man for advice, for the attack may depend on other causes. Paralysis of one side of the face, depending upon injury to the nerves, and sometimes resulting from exposure to cold, when it occurs, is apt to excite more than needful alarm. When the result of cold, one or two doses of calomel and colocynth, or calomel and compound rhubarb pill; a blister behind the ear and a grain of quinine, three times a day, are the best remedies.

Paralysis of the nerves of special sense is not uncommon, and besides that of sight already referred to, we have loss of hearing, taste and smell either permanently or temporarily affected by organic or functional derangement of the special nerves. The power of articulation, or of swallowing, or both, is sometimes lost by the deprivation of the motor force of the nervous supply to the lips, tongue, and other organs within the mouth, and loss of voice, or aphonia, is not an uncommon symptom of hysteria, depending on a depraved condition of the nerve supplying the larynx.

Lead palsy usually occurs in those who have been long exposed to the influence of the poison, and the majority of those attacked have suffered from lead colic. The attack is preceded by lassitude and feeling of numbness, and of stiffness of the parts about to be affected, the loss of power gradually coming on. In a few cases, loss of sensation is also observed. Lead palsy is not confined to the hand and arm, but affects other portions of the body, although the former is its most frequent site. The most dangerous form of this disease affects the muscles of respiration which move the ribs, and proves quickly fatal. No treatment likely to be effectual could be undertaken by unprofessional persons, and the disease is not one likely to occur apart from medical aid. It is well here to reiterate the caution to those who are employed amid lead or its preparations, that they observe the utmost cleanliness, especially at meals, for there is good reason to believe that the poison often finds its way into the system from carelessness on this point.—See *Colic—Lead, &c.*

Shaking palsy, in one form, is generally the result of old age, in another it is more traceable to direct disease of the brain, and is very apt to occur in those who have drunk freely. It comes on very insidiously, and even under the best care is a very hopeless affection as regards cure. This is a different affection from the "mercurial tremor" with which those who work in mercury, such as gilders, are liable to be attacked.

Refer to—*Apoplexy—Nerves—Brain, &c.*

PARALYSIS, INFANTILE, or Children's Paralysis, is a subject which, of late years, has occupied the attention of physicians, and has been very ably described in a memoir by Dr. Kennedy, published in the *Dublin Quarterly Journal* for November, 1861, and read before the Obstetrical Society of Dublin. Paralysis in children may proceed from the same causes which are responsible for the disease in adult life, although degenerative changes of the tissue of the brain are very rare in childhood. It may also be the result of convulsions due to irritation of the digestive system, or may follow upon an attack of St. Vitus' dance. In cases where the arm or leg of a child becomes suddenly paralysed, the possibility of the arrest of movement being due simply to pain caused by rheumatism or strains must always be kept in view. Such cases are common and often excite needless alarm. Tenderness on pressure, especially on the joints, some appearance of swelling, and complaint of pain, or, in young children, crying when passive movements are made, will serve to distinguish this type of disease. In such cases a dose of some active purge, with a little alterative medicine, will generally suffice to alter the state of the bowels, and the paralysis quickly yields to simple means, as the cold douche, with rubbing, and, perhaps, the application of gentle galvanism. On the other hand, there are many cases of children's paralysis of a very chronic and obstinate character, and which resist most attempts to benefit. In such the disease affects the lower extremities, and is more often than otherwise confined to one limb, which, in course of time, becomes wasted and deformed and comparatively useless. By far the best remedy in these cases, is the continuous current of electricity competently administered; but all such ought at once to be put under the care of a medical man, the fact being borne in mind that cases of infantile paralysis do occur as well as cases of St. Vitus' dance, and of convulsions, the cause of which is to be sought for in some external or internal source. Amongst the different causes of this form of infantile paralysis that have been enumerated, we may mention cold—from the child sitting or lying upon damp grass, local inflammation of any kind, the irritation of teething, the presence of worms, or of concretions in the bowels, violent cough, as in hooping cough, to which we must add congenital deficiency, &c.

It is well to bear in mind that palsy, of a limb or limbs, may arise from the above mentioned causes, as it has not unfrequently happened that it has been ascribed to a fall or blow, and the nurse, although quite innocent in this respect, has been accused of culpable carelessness.

The presence of tubercles on the brain or its membranes, and diseases of the spine, give rise to forms of paralysis which, if not incurable, are of the most serious import, and altogether different from the maladies described above.

PARAPLEGIA.—Palsy of the lower portions of the body.—See *Paralysis.*

PAREGORIC, or PAREGORIC ELIXIR—an anodyne. English paregoric is also called camphorated tincture of opium, or the officinal compound tincture of camphor; of this half an ounce contains one grain of opium. Scotch paregoric, also called "ammoniated tincture of opium," is more than double the above strength, containing two and a half grains of opium in every half ounce. These preparations should be purchased ready made.

Refer to—*Opium.*

PAREIRA is the dried root of the *Cissampelos pareira,* or velvet leaf, a plant which grows in South America and the West Indies.

The root is brown and wrinkled externally, and yellowish-grey internally. It has a sweetish taste, with a bitter after-taste. There are three preparations in the British Pharmacopœia,—decoction, and liquid and solid extracts of Pareira. The dose of the decoction is half an ounce to two ounces, and of the liquid extract from half a drachm to two drachms. It is a bitter tonic, but being in no way superior to other well-known bitter tonics, it is seldom or never used for this purpose. Its main use in medicine has been in chronic inflammation, or catarrh of the bladder, in which it has been thought to be of decided service, prescribed either alone, or in combination with acids or alkalis, according to the state of the urine. Chronic inflammation of the mucous lining of the bladder is a disease so difficult to overcome, especially in old people, or in those who have lived freely, and are exposed to cold weather, that the patient is generally willing to try anything which will relieve the irritation, and diminish the mucous discharge, but the case should, if possible, be put in the hands of a medical man, who alone, from an examination of the urine, is able to prescribe the proper remedies and watch their effect.

PARENT.— See HEREDITARY — MARRIAGE—IDIOCY, &c.

PARIETAL BONE.—See SKULL.

PAROTID GLAND is one of the glands which secrete the saliva. It is situated a little below, and in front of the ear, and fills up the space beneath the angle of the lower jaw. Its duct, which conveys the saliva into the mouth, opens between the gum and the cheek opposite the second double tooth. It is this gland which becomes swollen, inflamed, and painful, in the disease called the mumps.

PAROXYSM.—A periodical accession or aggravation of certain symptoms of a disease; an attack of toothache may be called a paroxysm; there are paroxysms of ague, of mania, &c.

PARSNIPS contain a considerable proportion of flesh-forming as well as saccharine matter, and are nutritious, but often disagree with weak stomachs. They form a substitute for the potato when the latter cannot be had, but they are not so digestible.

PARTURITION.—See CHILD-BED.

PASSION.—It is sufficient here to allude to the serious effects which may follow the indulgence of violent passion. Those who give way to it are often themselves sensible, either during the paroxysm or at its close, of unusual sensations about the region of the heart. There can be no question that this important organ is much influenced by these violent mental emotions, one of which may lay the foundation of that disease which another may ripen into sudden death. And what a death!

PASSION ILIAC, or ILEUS.—See COLIC.

PASTILLES are used as an incense, and for destroying bad smells. They are composed of the aromatic gum resins, such as benzoin, with sweet-smelling woods and barks, as sandal wood or cinnamon, reduced to powder, and afterwards made into paste with charcoal and some of the essential oils, combined with a little gum arabic. They are then formed into small cones and burned, and may be used to diffuse a pleasant odour in a sick-room, or to dissipate a bad smell. Pilules composed of similar matter, but without the charcoal, are sold by chemists for perfuming the breath. A small quantity of cascarilla bark burned over some hot cinders on a shovel, is the readiest way to cloak an offensive smell, but it should be kept in mind that pastilles, although deodorants, are not antiseptics, and consequently have no power in destroying infection.

PASTRY.—See CONFECTIONERY.

PATELLA, the knee-cap, or knee-pan, is the small, somewhat oval, or heart-shaped bone (fig. 167) which is contained within the



Fig. 167.

tendon of the "extensor" muscles of the lower extremity, serving at once to protect the important joint which it covers, and to give proper direction to the muscular power on the fore part of the limb. The knee-cap is very liable to be fractured, or rather torn across, in falls where the individual, in the endeavour to save himself, violently exerts the muscles of the limb; a painful shock, as from a blow, is felt, and the power of extending or advancing the limb is instantly lost; when examined, the deficiency occasioned by the absence of the upper half of the knee-cap, is at once apparent, this being drawn more or less up the forepart of the thigh by the action of the muscles. When the knee-cap is broken, as it

sometimes is by direct violence, the displacement is not so great, but the accident is generally more serious, owing to the violence injuring the knee-joint generally. The treatment of the transverse fracture of the knee-cap, might, with care, be managed by an unprofessional person in the absence of a medical man. The principal object in the treatment of this accident is, to remedy the displacement or drawing upwards of the upper fragment of the bone, which takes place, in consequence of the muscles of the thigh with which it is connected, being set free from the counteracting power of their attachment to the upper part of the bone of the leg, their common tendon, in which the knee-cap is imbedded, being torn through, as well as the bone.

It must be evident to any one, that by placing the limb as represented (fig. 168), by which the aforesaid parts are rendered lax, not only will their tendency to draw up the upper fragment, be obviated, but the position will

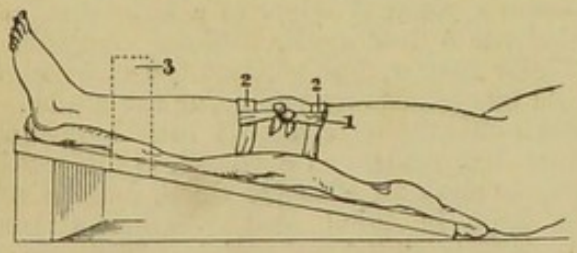


Fig 168.

permit of the bone being again brought down to its proper place; accordingly, the first part of the treatment of this accident is to place the entire lower limb, as represented, on an inclined plane made of any convenient material, and cushioned of course; this being done, and the displaced fragment drawn as nearly as possible into its natural position, and in contact with the lower fragment which does not undergo displacement, some additional means must be employed to keep the parts steady; for this purpose, many different kinds of apparatus have been used; probably the most easily managed, will be the simple one represented in the cut. This is formed by laying a strip of stout bandage, longitudinally, on each side of the injured bone (fig. 168—1) these strips are then secured by a few turns of two circular bandages (2,2) passed, one round the lower part of the thigh, the other round the upper part of the leg, close above and below the fractured bone; the ends of the longitudinal bandages (1) being then tied, the apparatus is complete. It will be advisable to add to the inclined plane some additional protection, as represented by the dotted line (3), to obviate the chance of the limb slipping off the apparatus. It has been observed, that those who have suffered fracture of one knee-cap, are more liable than others to suffer from a similar accident on the other leg. This is probably accounted for by the fact that, in a large proportion of cases, the two fragments of the fractured bone, are not brought into close union, and that the person is, therefore, more liable to suffer a fall similar to that which produced the first accident. Some individuals, moreover, are more liable to suffer from rupture of the tendons and accidents of this nature than others. The knee-cap sometimes suffers displacement.—See *Knee.*

PATENT MEDICINE.—See QUACKERY.

PATHOLOGY.—The science of the nature of disease.

PEA.—The common garden pea, in its fresh or green state, and when eaten young, is wholesome and digestible, but when it has advanced towards ripening, the outer skin becomes very tough and indigestible, and passes through the bowels unacted upon by the digestive organs. In this condition it is very liable to lodge in the folds, or "sacculi," of the colon, or large bowel. If old peas are eaten regularly, and the bowels are at all torpid, a large accumulation of these pea-skins may take place, and at length give rise to troublesome irritation and diarrhœa. A dose of compound colocynth pill, or of castor oil, is the best remedy (see *Diarrhœa*). Peas in their young state contain a considerable amount of saccharine matter, but when ripe and dry, they, like others of the leguminous, or pulse tribes, contain much vegetable caseine—analogous to the curd of milk; indeed, so largely is this the case, that the Chinese make from peas a kind of cheese, which can scarcely be distinguished from that made from milk curd. Dried peas can, of course, only be used as human food with advantage when reduced to softness, and after being deprived of their outer covering by machinery, when they are employed under the name of split peas, for making pea soup and pease pudding. The dried peas, when ground into flour, make an excellent pottage as well as bread; and when thus rendered digestible, they contain more real nutriment, that is, plastic matter, adapted to building up the animal frame, that even wheat or oats. It is calculated that in 100 parts of pease meal there are 23 parts of caseine to 60 parts of starchy and saccharine matter, so that, chemically speaking, the pea is commercially the cheapest food product we possess.

Refer to—*Diarrhœa—Grains, &c.*

PEACH, the well-known fruit, is, when ripe, sufficiently digestible if eaten in moderation. The peach tribe derive their chief interest in a medical point of view, from the hydrocyanic, or prussic acid, which is obtained from various parts of the plants by distillation. Peach kernels yield it largely, also the blossoms and the young leaves; preparations from these, therefore, must be employed with great caution. An infusion of the dried leaves of the peach has been used in cases of worms.

PEARL ASH is the name applied to the potash of commerce.

PEARL-BARLEY.—See BARLEY.

PEARS are apt to disagree with many persons.

PEDICULI.—Ticks or lice, generally the result of filth, may show themselves upon the head or body during sickness, notwithstanding the most scrupulous care, and some kinds of skin disease and sores are with great difficulty freed from them. Cleanliness is the great preventive, but carbolic oil should be used to destroy the insects, and it will also render their nits or eggs abortive.

PELVIS, literally means a basin, the term having been given to the particular region of the body from its fancied resemblance to that utensil. The pelvis (fig. 169) is the

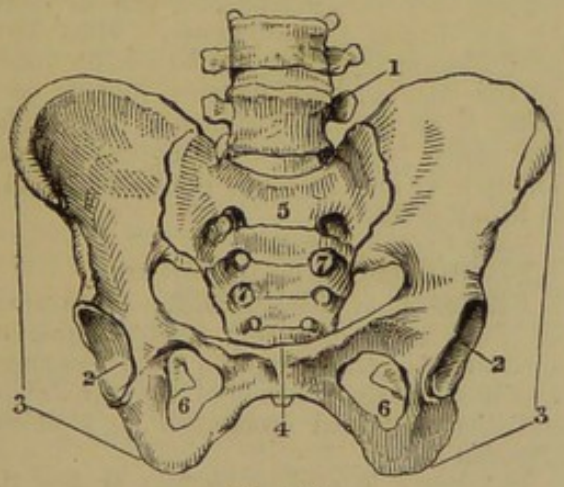


Fig. 169.

irregular structure of bone which supports the spine (1) and which rests upon the thigh bones, the round "heads" of which are fitted into the cups, or cavities (2, 2; see *Hip*). The pelvis is composed essentially of three different bone masses; two of these, the *ossa innominata* (3, 3), form together, the sides and forepart of the pelvic cavity, being united in front (4). The back part of the pelvis is formed by the *os sacrum* (5), a triangular bone, which fits like the wedge or key-stone of an arch between the two side bones of the structure. On the top of this bone, which appears, and may be regarded to be a number of vertebræ, or spine bones, cemented together, the spine is placed; its central canal, or cavity, which incloses the spinal marrow, being continued down the centre of the sacrum in which the holes (7, 7) give passage to small nerves. The side bones (3, 3), although in the adult they are united into one piece, are not so in early life, but are in three divisions; for the sake of convenience in describing, &c., anatomists retain these distinctions even in the adult bone. A little consideration will show any one how much strength is imparted to the important bony construction above described, which is, moreover, so placed, or balanced, with respect to other portions of the body, as to throw the weight on those portions of itself best calculated to sustain it, and the whole upon the thigh bones in the most advantageous manner possible. Further, the whole structure of the pelvis is made as light as can be compatible with strength. The sacrum bone (5) is the lightest bone of the body for its size; and in the arrangements of these pelvic bones generally, wherever ligament can be substituted for bone, we find it is so; thus, for instance, the two holes (6, 6), instead of being filled up with bone, have merely a thin, light ligament stretched across.

There is considerable difference in shape between the male and female pelvis; the latter being more broad, ample, and expanded than the former, in every way—a matter of necessity in child-bearing particularly, so as to afford sufficient room for the passage of the infant, the head of which is for the most part adapted to pass through the pelvic cavity by a series of turns. The near adaptation, in most cases, of the infant head to the passage through the almost unyielding pelvic bones, must obviously make it a matter of the highest importance, that in the female these bones should attain their full expansion and development; this they do in the majority of instances, but in some cases, particularly in consequence of disease, the room afforded in the pelvis becomes seriously diminished, so as to make ordinary child-birth impossible. In such instances, the life of the infant is almost certain to be sacrificed, and that of the mother to be put in great hazard; in either case, a contingency which none should incur knowingly. If, therefore, either in consequence of disease in early life, such as rickets, or of natural deformity, or accident, there is reason to suspect deformity of the bones of the pelvis, the female who is the subject of it, should not enter into the bonds of marriage, without its first being ascertained that child-bearing is possible without danger to life. This can be ascertained by medical examination. Instruments called *Pelvimeters* are used by medical men for the purpose. If, after marriage, causes previously undiscovered, or which have come into action afterwards, should render ordinary child-birth hazardous from contraction of the pelvis, there yet remains the possibility of a living child being preserved by the induction of premature labour; it is, however, a question, how far it may be right to enter into marriage under such a proviso. The cavity of the pelvis is inferior to, but continuous with, that of the abdomen; the contents, or "viscera," of the two being continuous (see *Abdomen*). Fracture of the bones of the pelvis occasionally occurs in consequence of accident; it is always a serious mishap from the circumstance, that the violence which is capable of fracturing these strong bones must, in all probability, injure some of the important parts—the bladder especially—

which they naturally surround and guard. The accident is not likely to be detected by an unprofessional person; if suspected, soothing measures to the painful parts, hot fomentations, poultices, and leeches would be advisable; the body being placed in the most easy position, and perhaps a bandage a foot broad sewed round the hips, surgical assistance being procured without delay.

Refer to—*Abdomen—Bladder—Hip—Spine, &c.*

PEMMICAN is a preparation of dried meats, divested of fat and reduced to powder or paste. As it is very portable and easily preserved, besides containing a large amount of nutriment in small bulk, it is useful for travellers, and has been supplied to troops as well as to the numerous Arctic expeditions.

PENNY-ROYAL is one of the mint tribe, found in wet places in England, and in Europe generally; it was formerly much more esteemed than it is now. It possesses the same properties as the mints generally. It is said to have the power of driving away fleas.

PEPPER.—Four species of the peppers are used by man—two dietetically and partly medicinally, the black and long peppers; two strictly medicinally, the cubeb pepper, and the matico (see *Cubebs—Matico*). Long pepper occurs in the form of cylinders, from an inch to an inch and a half in length, these being made up of numerous little pepper-corns, or berries, compacted together; it is often used as a substitute for the next species, the black pepper, both being brought from the East Indies and from the neighbouring islands.

Black pepper is the fruit of a trailing plant, the berries being produced on spikes or stalks to which they closely adhere. When half ripe, they are red, and in this state are gathered; in drying they become black and shrivelled, assuming the form of the common black pepper-corns. When allowed to ripen, they are divested of their husks, and then form white pepper, which is milder than the black. Its properties depend on an acrid resin, and on an acrid volatile oil more pungent in the black than in the white specimens. The aromatic stimulant, and carminative properties of pepper are too well known to require description, they may often be conveniently taken advantage of when stimulants are required; ten to twenty grains of ground black pepper may be given at once, if given in milk. Black pepper has been used as a remedy in ague, and might be tried in the absence of other more certain medicines. A confection of black pepper is used in tea-spoonful doses as a remedy in piles. When steeped in alcohol and applied to the skin, pepper acts as a rubefacient, and might be found useful in the absence of mustard. Peppers, even when whole, are liable to adulteration, still more when ground. In the investigations of the *Lancet* Sanitary Commission, it is stated: "Some years since it was not uncommon to meet with artificial pepper-corns." "This spurious pepper was made of oil cake, common clay, and a portion of cayenne pepper, formed into a mass, and granulated by being first pressed through a sieve, and then rolled in a cask." Of course the adulterations of ground pepper are more easily effected. In the report of the above investigations, an extract from Mitchell's *Treatise on the Falsification of Food*, states: "In the state of powder, pepper is nearly always adulterated, substances being sold for the express purpose. It is often mixed with the powdered husks of mustard, which are openly sold for this purpose, as are also the sweepings of the pepper warehouses, under the name of 'P. D.' or pepper dust." In addition to the above, linseed meal, white flour, pea flour, and sago meal, are also used to adulterate ground pepper, and were detected in various samples by the *Lancet* Commissioner. Most of the adulterations of pepper can be readily detected by the microscope. Jamaica pepper, or all-spice, is an agreeable aromatic, applicable to the same purposes as aromatics generally. The powder may be given in doses of from ten to thirty grains.

Refer to—*Capsicum.*

PEPPERMINT.—See MINTS.

PEPSIN, or PEPSINE.—There are two or three kinds of pepsin used at present by medical men, that prepared from the mucous membrane of the stomach of the calf or sheep, and that obtained from the pig's stomach (*Pepsina porci*).

The latter is said to be four or five times stronger than the former, and is prepared according to a very good process by Mr. Bullock, and now adopted by the British Pharmacopœia. In recent years a great variety of pepsin preparations of various chemists have been introduced, such as "Lacto-peptine" "Pepsine Pancreatine." The dose of it is from two to five grains given with a meal. The powder, which is grayish-white, and possessed of an odour somewhat resembling baked flour, may be given between two thin slices of bread and butter, or in any other way agreeable to the taste of the patient. It may be dissolved in a glass of sherry wine, if preferred, and recommended to be taken in that way. Pepsine wine is to be had at all the principal chemists. The pepsin derived from the calf's stomach is not so highly coloured as the other, and is not so strong. Its dose, therefore, may be said to be about fifteen grains, and it may be given in the same way as recommended above. It has rather an acid and disagreeable taste and odour. Both kinds of pepsin are very valuable remedies in cases of indigestion, connected with loss of power and tone of the stomach, and have proved of peculiar service in cases of pulmonary consumption where sickness and want of digestive power were the prevailing symptoms. Pepsin acts more efficiently

in conjunction with dilute hydrochloric acid, and may also be given with iron in anæmia and chlorosis, when the functions of the stomach are disturbed as they frequently are in these diseases. Pepsin may also be given where there is imperfect digestion from organic disease of the stomach, but this, of course, would be only under the direction of medical advice.

The method of preparing pepsin is as follows:—The stomach of the calf, or pig, is well washed with cold water, and the cleansed mucous membrane scraped with a blunt knife, and the viscid pulp, thus obtained, is spread out on a piece of flat glass or porcelain, and dried at a temperature not exceeding 100°. The dried residue, reduced to powder, is to be preserved in a stoppered bottle. Boudault's process of preparing pepsin, by means of lead, is less employed.

It is not very easy to explain the undoubtedly wonderful digestive power of pepsin, seeing that *out of the stomach* it is only able to dissolve a comparatively small amount of matters used as food. We must conclude that *in the stomach* it acts in some way as a ferment; that it has, to use scientific language, catalytic powers, that is, the power or property of resolving other bodies into new compounds, and so rendering them more easy of digestion and assimilation.

PERCUSSION, in medicine, is the process of eliciting sounds from any portion of the body, by striking upon it, or some interposed medium, by means of the fingers, or by an instrument adapted for the purpose. The object of eliciting those sounds, and the mode in which, to the educated ear, they give information of the condition of the parts beneath, has been sufficiently explained in article *Lung*.

PERFORATION.—The term in medicine is chiefly used to express the formation of an aperture in some portion of the coats of the alimentary canal, which allows the escape of a portion of the contents of the stomach or bowels, into the cavity or sac of the "Peritoneum," thereby causing agonising pain, severe inflammation, and in almost every instance death. As the escape of a small portion of the contents of the canal is sufficient to occasion these severe symptoms and fatal consequences, a very small opening may be the occasion of death. The most common sites of the perforation are the stomach, or the small bowel near its junction with the large, in the latter case, usually occurring in the progress of fever, and being occasioned by ulceration.—See *Fever, Enteric.* The occurrence of perforation in the stomach is often for some time preceded by dyspeptic symptoms, pain, especially after food, and perhaps vomiting. Females, especially those of a weak, lymphatic, or scrofulous constitution, are more liable to it than males; but it may happen in all constitutions, and without previous symptoms. When perforation occurs, and the contents of some part of the canal escape, there is sudden, intense, agonising, burning pain, perhaps vomiting, and there is extreme depression or collapse of the system generally. In such a case, the hope of saving life is very faint, even under the most skilful treatment, and of course a medical man should at once be procured. All that unprofessional persons can do is to mitigate the intense agony, which opium alone can relieve. Full doses of whichever of its preparations are most easily procurable may be given, and repeated at short intervals, until some relief is obtained. Heat to the bowels may afford some comfort. If there is much vomiting, the opium will, as in all similar cases, probably be best retained if given solid, in the form of pills—of one grain each; in such a case opiate injections, containing each thirty to forty drops of laudanum, may be serviceable. When there is great depression, if the person survives some time, stimulants, wine or brandy, are given.

Refer to—*Inflammation.*

PERICARDIUM.—The bag in which the heart is inclosed.—See *Heart—Carditis, &c.*

PERICRANIUM.—The membrane which invests and adheres to the bones of the skull; in other bones the corresponding membrane is named the periosteum.

PERINEUM.—The space at the fork of the lower limbs, between the fundament and the generative organs.

At this spot the operation of cutting for the stone, in males, is usually performed. Falls, with the legs astride any body sufficiently narrow to allow it to bruise the perineum, are apt to be followed by serious consequences, bloody urine, or complete stoppage. For the same reason, the practice of "hoisting," carrying an individual astride upon a piece of wood, either in the way of practical joke or punishment, is seriously to be condemned.

PERIODICITY.—The recurrence at regular intervals of marked phenomena in the progress of vegetable, or of animal life, is at once one of the most interesting, one of the most certain, but at the same time—as to cause—one of the most obscure facts in the range of scientific inquiry. Among plants, a daily periodicity is so well marked, both as regards their opening and their closing, that it is familiar to all, even the children know when the daisies and the clover "go to sleep"; and the famous Linnæus constructed, or rather arranged, what he called the floral clock, from the times of the opening and shutting of certain plants. It is sufficient to allude to the different, but regular times of leafing and flowering of tree and plant, to the certain returns of seedtime and harvest, to confirm that what holds good in the revolution of the twenty-four hours, does so throughout the year. In the animal kingdom, periodicity is equally well marked, each kind carries its young a certain time; with slight variation, the changes from the cradle to the grave in

man progress in well-marked periodical order. What is observed in health is seen also in disease. The regular return of the paroxysm in the quotidian, the tertian, the quartan ague; the regularity with which the eruptions of scarlet fever, small-pox, or measles, appear and decline, all tell of the same thing, the nightly hectic of the consumptive patient does so also. These are well-marked instances, so much so, that they cannot fail to attract attention, but there are doubtless numberless others in the progress of disease, equally interesting and important, but unobserved. The causes of periodical changes are generally very obscure; some, unquestionably, such as the lunar influences upon the tides, the effect of prolonged heat and light, as from the sun, in stimulating vegetation, we can readily distinguish and appreciate, but the majority are beyond our ken. Some may be connected with the hidden springs of life, others are more than probably linked with the barometric and electric changes, which are continually going on in the diurnal revolution of the twenty-four hours. The following table, drawn up some years since by Dr. Laycock, of Edinburgh, in some degree indicates the nature and connexion of periodical changes :—

Table of the Meteoric and Physiological Events occurring at the Barometric hours, during a solar day of twenty-four hours.

4 to 5 o'clock A.M.

Barometer at its minimum height.
Minimum of electric tension, nearly.
Intermediate minimum variation east of magnetic needle.
Minimum of temperature.
Hour at which several flowers bloom.
Certain moths escape from the chrysalis.
Minimum consumption of oxygen.
Onset of cholera, epidemic diarrhœa, Egyptian ophthalmia, and quotidian ague.
Period of increased excitement in the insane commences.
Hours of alleviation of symptoms and of sleep in hectic and infantile fever.

4 to 5 o'clock P.M.

Barometer at its minimum height.
Minimum of electric tension.
Minimum variation east of magnetic needle.
Certain moths escape from the chrysalis.
Termination of a paroxysm of quotidian ague.
Onset of a quartan ague.
Exacerbation of fevers; accession of hectic fever.
Period of increased excitement in the insane begins.

8 to 10 o'clock A.M.

Barometer at its maximum height.
Maximum of electric tension.
Maximum variation east of magnetic needle.
Maximum excitability of the circulation.
Maximum of muscular power.
Period of increased excitement in the insane ends.

8 to 10 o'clock P.M.

Barometer at its maximum height.
Maximum of electric tension.
Maximum variation east of magnetic needle.
Meteoric lightning and thunder storms appear.
Certain insects escape from the chrysalis.
Consumption of oxygen at its minimum.
Minimum of muscular power.
Minimum excitability of the circulation.
Hour of natural sleep.
Period of increased excitement in the insane ends.
Paroxysm of quartan ague ends.

In connexion with the above, Dr. Laycock remarks: "What effect have barometric variations on animal life, and especially on the phenomena of epidemics?" Huxham specially refers to the phenomena of intermittent fevers as being probably influenced by barometric variations, through the varying pressure of the atmosphere on the veins. More recently, Sir D. Barry took up both the pathological and physiological views of Huxham, and in the same spirit observes: "1st, It being now evident that the blood in the veins is placed under the influence of atmospheric pressure, it would be curious to trace the connexion which appears to exist between diseases generally,—intermittent fever, for example,—and the daily atmospheric variations." The reader will see at once that facts countenance these speculations. 2nd, Has the electricity of the air, or the magnetism of the earth, any influence on vital phenomena? If any, we may infer, *à priori*, that the results would be seen in the nervous system. Now, according to the table, the period of increased excitement in the insane commences when the electric tension of the air, and the variation east of the magnetic needle, are at a minimum, and *vice versâ*. The unpleasant influence of thunder storms is well known to persons of nervous temperament, and to those predisposed to disease of the nervous system; and as these occur most usually in the evening, we should look for nervous attacks at that time.

The whole subject of periodical changes has hitherto been too little attended to, when its importance, and the magnitude of the scale on which these changes take place, are considered. Under article *Influenza* it was stated, that during the occurrence of that epidemic remarkable barometric changes were observed.

PERIOSTEUM.—The membrane which closely adheres to, and invests the bones, except at their articular or joint-forming surfaces. —See *Bone—Node, &c.*

PERISTALTIC.—The contractile, worm-like movements of the intestines.

PERITONEUM.—The peritoneum is the serous membrane which lines the abdomen,

covering both its walls and its contents—the viscera. The peritoneum is what is called a shut sac,—in its interior it contains simply the serous fluid which it secretes, and which facilitates the movements of its interior surfaces, and, consequently, the various movements of the bowels and other organs upon each other; the parts which the peritoneum covers all lie exterior to its cavity, the outer sides of the sac being folded over them. In dropsy of the belly the water is effused into the cavity of the sac. Wounds which open into the peritoneum have within the last few years been regarded as much less dangerous than formerly, especially since the introduction of antiseptic surgery. Operations, such as ovariotomy, and opening into the peritoneum, are now performed with comparative safety. Peritoneal inflammation (*Peritonitis*) arises from other causes, such as prolonged parturition and the like.—See *Inflammation*.

PERMANGANATE OF POTASH, or CONDY'S FLUID, is much used as a deodorant and antiseptic. It has a remarkable power of oxidising organic matters, but it cannot be regarded as an aerial disinfectant.—See *Disinfectants—Potash, &c.*

PERSONS FOUND DEAD.—See DEATH—DROWNING—HANGING—INQUEST.

PERSPIRATION is one of the functions of the skin, which is concerned mainly in the maintenance of the body at a uniform temperature. The skin contains innumerable sweat glands, the orifices of which open on the surface, and from these exudes, generally invisibly, sometimes quite visibly, a constant flow of fluid or watery vapour containing some salts in solution. When the body becomes warmer the flow increases, and the temperature is reduced both by the amount of watery fluid exuded and by the active evaporation which goes on from the surface. The induction of perspiration by means of drugs, such as spirit of Mindererus, spirit of nitrous ether, and antimony, is the most usual method of reducing temperature in the early stages of fever. As a rule, perspiration, even when excessive, is without odour, but in some diseases it becomes offensive, and frequent sponging with warm water containing some disinfectant, such as Condy's fluid or carbolic acid, may be necessary for the comfort of the patient and the sanitation of the apartment. A troublesome form of offensive perspiration is frequent in the feet of young people, more especially young women engaged in domestic service, who have to stand a good deal. The stockings and the soles of the shoes become quickly saturated with the offensive secretion, producing much annoyance both to themselves and to those near them. The most satisfactory treatment is bathing the feet morning and evening with a saturated solution of boracic acid, or with a lotion made of one part of Condy's fluid to twenty parts of water, and after drying them carefully, dusting with a powder composed of equal parts of boracic acid, oxide of zinc, and starch. The stockings should be changed frequently and soaked in boracic acid solution after being taken off; and removable cork soles should be placed in the shoes, to be taken out when necessary and placed in boracic acid solution. Perseverance in these measures will generally effect a satisfactory cure.

Refer to—*Skin—Diaphoretics.*

PERUVIAN BARK.—See BARK.

PESSARY.—An instrument used to support the womb when displaced.—See *Womb.*

PESTILENCE.—See EPIDEMIC

PETECHIÆ are spots which appear upon the skin in certain forms of fever. They often resemble and are mistaken for flea-bites. Petechiæ frequently assume different colours and forms, differences which have lately been assumed as one of the distinctive marks between the typhus and typhoid forms of fever.

PETROLEUM, literally "rock-oil," a liquid bituminous substance which flows from the cleft of the rocks in some countries, and from the soil, or from deep wells in the oil regions of North America. It is now the general opinion of geologists that the oil is the result of decomposition, both of animal and vegetable matters, and it has been found in the rocks of nearly all epochs. Vaseline, a product of petroleum, is coming into general use as a basis for ointments. It may be prepared as a pure jelly, very soft and pleasant to the skin, and does not become rancid, so that it is likely to supersede lard and oil in the manufacture of numerous ointments and liniments, especially when employed for diseases of the skin. Like other oils, however, its origin is in the first instance vegetable. In Trinidad it occurs in beds or lakes. Petroleum has been recommended as an external application in rheumatism and in skin diseases.

PHAGEDENIC,—a term applied to a form of ulcer, which, from its rapid extension, gives the idea of the tissues being eaten away. Sloughing phagedæna is most common in persons of weak unhealthy constitution, who may be suffering from scrofula or syphilis, and is often the result of crowding together a large number of persons with open wounds. It occurs in the malignant sore throat of scarlet fever, and was at one time common in hospitals, where proper attention had not been paid to the sanitary condition of the inmates. It has also been known, under the name of hospital gangrene, to spread among the wounded after severe campaigns, in the camp hospitals erected for the combatants. The introduction of carbolic acid and other antiseptic dressing has, in a great measure, banished the disease from hospitals, and from military practice.

PHARMACOPŒIA is a book or system which includes the medicinal agents, their

preparations, and mode of preparation, authorised by the principal, legally-constituted medical authorities of the kingdom; also the measures and weights which are to be employed in dispensing the medicines. The inconvenience, confusion, and, indeed, danger of having three different Pharmacopœias for England, Scotland, and Ireland had long been felt by medical men, as well as by many of the general public, and it had for many years been thought desirable that they should be amalgamated into one, the use of which, and of which alone, should be rendered compulsory in Great Britain and Ireland.

Accordingly, in 1864, after many tedious delays, the British Pharmacopœia was published, under the direction of the General Council of Medical Education and Registration of the United Kingdom, pursuant to the Medical Act of 1858. The preparation of such a manual was no light task, and it was hardly to be expected that the changes in the nomenclature, and other novelties which the work necessarily involved, should meet with universal approval, consequently, another edition was called for, which was issued by the council in 1867, containing among other improvements the doses of all the more important remedies. Reprints of the original edition, with an appendix containing the more recent drugs introduced, have been made from time to time since 1867. The more important articles mentioned in the Pharmacopœia will be found under their respective headings in the *Dictionary*.—See *Weights*.

PHARMACY—the art of preparing medicines.

PHARYNX.—See THROAT.

PHENACETINE is the safest of a series of chemical preparations from coal tar which have been found very useful in relieving pain and reducing the temperature of fever. Other drugs of similar character are antipyrin, exalgine, and antifebrin.

Phenacetine is largely employed in doses of about ten grains for the relief of headaches, especially those of neuralgic or rheumatic origin; and in almost all forms of rheumatism it affords some relief. Not more than twenty grains should be taken within four hours, and it is not a drug to be used frequently, as its continued action is very depressing. Its remedial effect is greater if the sufferer rests quietly on a couch, with a warm covering, for at least an hour after taking the medicine. It is obtainable in compressed tabloids of five grains each, two of which should be crushed into a powder before being taken as a dose.

Refer to *Headaches*.

PHLEBITIS.—Inflammation of the veins.—See *Veins*.

PHLEBOTOMY.—The cutting or opening of a vein for the purposes of blood-letting.—See *Blood-letting*.

PHLEGM.—MUCUS.—See MUCUS.

PHLEGMASIA DOLENS.—See LEG, SWELLED.

PHLEGMON.—The term is generally used in connection with inflammation, as in erysipelas which affects the cellular tissue beneath the skin.

PHOSPHATES.—Compounds of phosphoric acid.—See *Phosphorus—Soda, Phosphate of*, &c.

PHOSPHORUS, classed among the elementary bodies of matter, is interesting in this work, less for its medicinal properties or preparations, than for the share it takes in the composition of animal bodies, and for its extensive economic uses.

When pure, phosphorus at an ordinary temperature looks and cuts like darkish-coloured wax; it is very inflammable, and when cut or handled should be kept under water.

Phosphorus in the form of its salts, that is, phosphates of lime, magnesia, potash, &c., exists in the soil, whence it is, in this compound state, absorbed by vegetables, and is afterwards consumed by the animal creation; in the seeds of the grains, especially, phosphorus exists in comparatively large proportion.

In the animal body phosphorus is an essential constituent of the albuminous (see *Albumen*) and fibrinous compounds; it enters into the composition of the substance of the brain and nerves in considerable proportion, and largely into that of the bones, to which the phosphatic earthy salts give much of their solid firmness. As phosphorus is contained in the various tissues of the body, it of course exists in the blood, and in the milk, which is suited to be the sole nutrient of the living animal; it also exists in the excretions, as stated above, in the urine, and also in the discharges from the bowels.

Phosphorus in its pure state is used in medicine in minute doses in the forms of diluted phosphoric acid and the phosphorus pill of the Pharmacopœia, the pill mass being made up largely of tolu balsam and yellow wax, so that each pill of five grains should not contain more than an eighteenth of a grain of phosphorus. Of late years phosphorus and its salts have been much used as remedial agents. The phosphates, under various forms, such as Parrish's Chemical Food, &c., have been most generally employed, but the hypophosphites of soda and lime now rank not only as most valuable remedial agents in pulmonary consumption, but as nerve restoratives generally; three grains of either of the above given thrice daily, in solution either simply or combined, is quite a sufficient dose. Free phosphorus is much more energetic in its action, and requires much care in its administration, it is moreover exceedingly difficult to procure in a dependable form for administration. There are many forms of phosphorus pill, but the writer has found them either slow or uncertain in action, and much prefers the liquid/

forms. These, too, it is difficult to obtain satisfactory, but a form propounded by Mr. Ashburton Thompson thoroughly fulfils every requirement as to certainty of dose, and keeping unchanged. In some forms of neuralgia this preparation is invaluable in giving rapid relief.

Phosphates of Soda, Lime, Iron, and Ammonia (see respective articles). The large use made of phosphorus in match manufactories invests it with great interest, and the peculiar manner in which under careless management, it has been found to affect the health of a few of the work-people, demands attention from its hygienic importance. Some persons who have been employed for a length of time in a lucifer-match factory, become affected with disease of the lower jaw, portions of the jaw-bone become "necrosed" or die, cause abscesses in their vicinity, and are either cast off by the natural processes, or require to be removed by the surgeon. In some cases, nearly the entire jaw has thus been lost, and the ingenuity of modern surgery has done much to remedy this deformity. Probably, constitutional predisposition has something to do with the liability to this phosphorus disease, but, at the same time, there is no question that, in other manufactures, free ventilation of the places in which the processes are going on, and strict attention to cleanliness on the part of the work-people must prove great preventives. It is said that saucers filled with turpentine, distributed about the workrooms, by absorbing the phosphoric vapours, are a safeguard. These accidents are now, however, comparatively rare in consequence of phosphorus being used in its amorphous condition in match manufactures. The following account of the amorphous phosphorus is at once very interesting, and well illustrates one of the most curious points in chemistry, the existence of the *same* body in most opposite conditions, and possessing most opposite qualities. The extract is taken from a paper read by the late Dr. George Wilson, before the Royal Scottish Society of Arts, in April, 1852:—

"Phosphorus, also, is well known to act as a poison when swallowed in the solid form, and as it occurs in this condition in lucifer matches, fatal accidents have more than once occurred from children sucking them. The red or amorphous phosphorus is much less combustible than ordinary phosphorus, and not at all poisonous. To prepare the new substance, ordinary phosphorus is melted in a peculiarly constructed retort, and kept for some hours at a temperature of about 5° Fahr. A very singular change is the result of this heating, during which the phosphorus combines with caloric, and renders it latent, but does not otherwise undergo any chemical alteration. The original phosphorus was a pale yellow, or white transparent body, so combustible that it must be kept under cold water, and when brought into the air grows luminous even at the freezing point, and enters into full blaze at a temperature of about 150° Fahr. By the prolonged heating it becomes a soft opaque mass, which is easily pulverised, and then forms an uncrystalline powder of a scarlet, crimson, purple-brown, or brown-black colour, so incombustible that it may be exposed in summer in the open air and handled with impunity; nor does it grow luminous till it is about to enter into full combustion at the temperature of 482° Fahr." The following are stated as some of the advantages connected with the use of this form of phosphorus, that—(1) "It involved much less risk of destruction of life and property by fire; (2) It was more suitable for matches intended for warm climates; (3) It was not poisonous in the solid form, so that matches made with it would be comparatively harmless if sucked or chewed; (4) It gave off no vapour at ordinary temperature, so that it could not occasion disease in the matchmakers." The symptoms of direct poisoning by phosphorus, happily of rare occurrence, are inflammation of the stomach and intestines, and the best means of neutralising the poison are to be found in the free administration of milk, magnesia, and mucilaginous drinks, to prevent the formation of the acid and to envelop the crude phosphorus.

PHRENITIS.—Inflammation of the brain. —See *Brain*.

PHTHISIS.—Pulmonalis—Pulmonary Consumption.—See Consumption.

PHYSIC (see *Physician*).—Among the lower orders, in some places, the term physic is applied solely to purgative medicines.

PHYSICIAN, "M.D.," or "Doctor of Medicine."—These titles are rightfully assumed by those only who have undergone successfully the examination instituted by Colleges or Universities, legally chartered to grant such titles or degrees. The conventional meaning of the term physician is, one who treats internal diseases of the body alone, in contradistinction to surgeon, one whose province is the treatment of external disorders, and the performance of operations, and to accoucheur, one who devotes himself solely to the diseases of women, and particularly to the management of child-birth. To those may be added what was formerly the apothecary, and is now the "general practitioner." These divisions into physician, surgeon, accoucheur, and apothecary, arose at a time when the science and practice of the healing art was very different from what it is at present. The physician was the only educated man, as Chaucer says—

> "In all this world ne was ther non him like
> To speke of phisike and of surgerie."

He probably practised the higher departments of surgery, as well as medicine strictly so called. The ordinary surgeon added to his

emoluments by the trade of the barber, and the apothecary was the mere vendor of drugs; the separate department of the accoucheur is comparatively of recent date. Time, and the tendencies and requirements of the age, have abundantly changed these old distinctions, chiefly with respect to the position and standing of the general practitioner; the physician and surgeon have been advancing in scientific requirements, but the general practitioner has approached them so closely, that all seem likely before long to merge in one profession in name, as they now, in great measure, do in practice. The surgeon cannot be a good surgeon, in the proper sense of the word,—not meant to designate a mere operator,—unless he is also a good physician; and the physician, if he does not handle the knife, must be a good anatomist to practise his profession properly. In large towns, and in certain districts, the distinction into pure physician and into pure surgeon is maintained, and, as at present, with advantage, at least when age, experience, or peculiar talent have fortified the titles; but the great mass of medical men must be "general practitioners," highly educated, and fitted for every duty of the healing art. With such a class the kingdom is rapidly filling, and many of its members, whatever their title, stand, and will stand, among the foremost in their profession, and must be the "consulting men" of future years, when time and experience, combined with talent and industry, have given them a claim to the honour; the high education of all medical men is now levelling every distinction. As long as the education of the physician was so infinitely superior to that of the medical profession at large, the prestige which attached to the title was its just due; it still is its just due as the tribute to the mark of high attainment, but it is not just, when paid to the exclusion of the profession generally, the members of which, as a body, whatever their title, must now be all as nearly on a level as the difference between man and man permits. Nay, more, the medical profession, as the education of its members is now conducted, must become the most highly intellectual body of men in the kingdom. The studies of a medical man *must* embrace the widest possible range, from the simplest truths of mathematics and of natural science, to the latest developments of practical psychology, and within this range their knowledge is *real, true* knowledge, the knowledge of the manifestations of God in His works; and their deductions from that knowledge must be the alleviation of the physical, and many of the mental, evils of fallen man, and higher still, their prevention. *It must ever be to the honour of the medical men of the present age, that though their bread may be said to be got through the misfortune of their fellow men, they have been ever the foremost to point out how these misfortunes are to be avoided, they have been the first rousers, and the chief leaders of the sanitary movement everywhere.* In large cities, and in the metropolis especially, there always will be, probably in an increasing degree—and it is expedient there should—a division of labour among medical men; one will take the skin, another the eye, another the chest, and so on, as his particular department, and will attain such acquirements in connexion with his own special province, as will give him an extra claim to confidence when that is concerned, especially in obscure or difficult cases. But this cannot be with the kingdom at large; and in the provinces the great mass of disease must continue to be the care of the general practitioners, whose experienced leading members must, under the present system of education, become what the physician has been.

The above remarks may appear to some irrelevant to the present work, but the public generally require some enlightenment as to the present constitution of the profession, and on the bearing of its different members to one another.

Refer to—*Medicine—Practitioner, General—Surgeon.*

PHYSIOGNOMY.—See COUNTENANCE.

PHYSIOLOGY.—The science of the functions of living bodies, generally and specially, hence embracing Biology and Institutes of Medicine, by which names the science is sometimes called.

PICKLES.—Vegetable substances preserved in vinegar. Even when well prepared they are not always digestible, and many of what are purchased are deleterious on another account—the more or less amount of copper which they contain, this poisonous addition being made to impart the fresh green colour so generally desired by the purchasers and consumers of these articles, and also by the action of the vinegar on copper vessels used in preparing them. The investigations of the *Lancet* Sanitary Commission on this subject, disclosed the fact, that all the pickles examined contained more or less copper; in some it existed in poisonous quantity. The slightest impregnation with this poison cannot be too strongly condemned, but it is probably used, at times, in ignorance, for even some cookery books openly advised its employment to "green" pickles. Fortunately, the detection of this adulteration, even in a small proportion, is easy. If a perfectly clear and bright piece of iron—wire will do—be immersed for a few hours in the vinegar of the pickle, if copper is present the metal will be deposited in a perceptible, though thin, crust upon the iron. "Another very simple and efficient method of detecting the presence of copper in pickles, is the following:—Put three or four drops of the suspected vinegar on the blade of a knife; add one drop of sulphuric acid, and heat the under surface of the knife over the flame of a candle; the vinegar, in evaporating, will deposit the copper upon the iron, if any be present." In the investigations of

the *Lancet*, it was ascertained "that the pickles which contain the largest quantity of copper, are those which consist entirely of green vegetables, as ghirkins and beans."

When properly made, pickles form a wholesome and agreeable addition to the table, and are aids both to appetite and digestion. They are prepared from a great variety of vegetables, the most popular of which are red cabbage, beet-root, unripe walnuts and mushrooms. The hotter descriptions of pickles are made by the addition of spices and peppers in varying proportions, such as capsicum pods, pepper corns, mace, ginger, and cloves.

Sulphuric acid, which is detected in pickles, comes more under the head of vinegar adulterations.—See *Vinegar*.

PILES, or HÆMORRHOIDS, are tumours which form at the verge of the anus or fundament, and may be situated either within or without the bowel; they are either what are called "blind," or they are bleeding piles. Piles are often induced by an enlargement or "varicose" condition of the veins situated about this part, this enlargement being caused by whatever tends to obstruct the return of the blood through the veins of the abdomen generally; thus, affections of the liver, constipation, with overloaded bowels, pregnancy, &c., are all frequent causes of this form of piles, in which the swellings are generally smooth, and of the colour of the surrounding skin. Generally, the tumours vary in size, according to the operation of the acting obstruction; if they have occurred in consequence of pregnancy, they diminish or disappear after child-birth; if loaded bowels have been the cause, a dose of suitable aperient medicine relieves the effect. Sometimes the enlarged veins become filled with a fibrinous deposit from the blood, and then the tumours are permanent. Another form of pile is more of the character of a morbid growth, in it the tumours are more generally internal, and are red, florid, and uneven on the surface, and often very painful. From the causes of piles already stated, it may be imagined that the sedentary, those who are most liable to suffer from constipation and liver disorder, are also most likely to be the subjects of piles; the same may be expected to be the case with women who have borne large families. If the causes which first produced the disease do not continue in active operation, or are guarded against, the hæmorrhoidal tumours may continue long quiescent, and give little trouble; but if from any cause, whether neglect of the bowels, cold, the abuse of purgative medicine, &c., they become inflamed, much suffering is induced; the state is then called a "fit of the piles," which lays the individual up from active exertion. In other cases, instead of inflammation, bleeding may occur, and every time the bowels are relieved a considerable amount of blood may be lost by stool.

The preventive treatment of piles is of the first importance, and the causes of the disease pointed out will at once suggest the remedies, which are, chiefly, a sufficient amount of exercise, and proper regulation of the bowels, with avoidance of food of too heating and stimulating a nature. If the liver is apt to get too loaded, it must be regulated (see *Biliary Disorders*), but in doing this, and also in regulating the bowels, it is of some importance what aperient medicines are employed; preparations of aloes, from their power of acting upon the rectum or lower bowel, are often said, when taken too constantly, to produce piles, but their effects in this way have perhaps been somewhat over-rated. Certainly, if taken habitually in quantity to irritate, they will both cause piles and aggravate them when existing; but, on the other hand, the effect of aloes, in thoroughly unloading the lower bowels, and in stimulating the liver, renders the medicine a very efficient remover of the cause of piles. The moderate use of aloes, therefore, when an aperient is often required, need not be entirely eschewed by those who suffer from piles, unless they find by experience that the affection is aggravated by the use of the drug. The other aperients most useful in piles are, when active effect is required, castor oil, or senna infusion; when a milder action is required, rhubarb and magnesia, in the form of Gregory's powder, the confection of senna, or the saline medicines, such as Epsom salts, in small doses largely diluted, will be found useful. Sulphur, combined either with an equal part of cream of tartar, or of calcined magnesia, forms one of the best of the mild aperients in piles; of either mixture a tea-spoonful may be taken for a dose, the first in treacle, the second in milk. It must be remembered, that except for unavoidable purposes, purging is to be avoided in those subject to piles, and that mild easy action of the bowels is to be encouraged; above all, such a state of bowels as permits the fæcal mass to become so hard as that it irritates or scratches the piles in passing, must be avoided. This is apt to occur if the bowels have been constipated for a day or two, in which case it is advisable to use a *small* enema of warm water, so as to soften the contents of the bowel previous to evacuation; indeed in those subject to piles, injections—*if care be taken not to irritate with the pipe of the instrument*—form a most valuable adjunct to other means of prevention or of treatment.—See *Enema*.

When from any cause, inflammation, or a "fit of the piles," is induced, the first essential is rest in the horizontal posture, so as to give every facility for the return of the blood from the affected parts; the diet should be reduced, made as cooling as possible, and the bowels kept lax by some of the means pointed out above. If the inflammation is severe, four or

five leeches may be required; if not, warm fomentations and steaming will often give relief; at other times, the cooling lead lotion, or an ointment made with half a drachm of goulard extract, rubbed up in an ounce of lard, or the gall and opium ointment of the Pharmacopœia, will be most serviceable. When piles show a tendency to bleed, and indeed in any case, when they are decidedly developed, a medical man should be consulted; not solely on account of the pain and inconvenience resulting from the presence of the tumours themselves, but because of the constitutional tendencies they exhibit. The treatment of bleeding piles is often a delicate matter. If the loss is so great as to be manifestly weakening a patient, there can be but little doubt that it must be stopped, and it may be with safety; but at other times it is a safety-valve which cannot without hazard be closed, as long as the cause, which first opened it, continues. That is to say, instead of stopping the loss of blood from the piles by direct applications, it must be done by constitutional remedies, adapted to diminish the plethora, either local or general, which originated the disorder; in this case, the preventive treatment of piles generally, as already stated, must be resorted to. Apoplexy and other diseases have followed upon the unwary closure of bleeding piles. After constitutional treatment, however, piles may continue to bleed merely from local causes; in this case, the drain is injurious, and must be stopped. Many remedies for the stoppage of bleeding piles are used. Common pitch, rolled into three-grain pills, and two of these taken twice a day, is sometimes very efficient. Cream of tartar alone, in tea-spoonful doses, taken stirred in water, answers well in some cases. Astringent lotions composed of sulphate of alum, zinc, or copper, have been found very useful in restraining hæmorrhage from piles, and may even be employed in a diluted form in the proportion of one grain to two ounces of water in the form of injection. Hazeline, the active ingredient of the American witch hazel, is strongly recommended as a local application in cases of piles. It should be mixed with water and applied to the parts three or four times a day, and a piece of lint dipped in the solution should be retained at the anus during the intervals. Equal parts of hazeline and water (one to two table-spoonfuls of each) may be, with great advantage, injected into and retained in the lower bowel; and in very severe cases of bleeding piles, thirty minims of hazeline should be taken in water twice or thrice daily. When inward piles are protruded at the evacuation of the bowels, it is very important that they should be returned to their proper site as soon as possible, otherwise they are very liable to inflammation and strangulation. A piece of linen, well oiled, is the best medium for exerting the pressure requisite for this operation. When piles reach a certain point they may require a surgical operation for their removal.

Refer to—*Rectum—Leeks—Veins, &c.*

PILL.—This well-known and convenient form for the administration of medicine is a mass of medicinal substance, of such consistence as to permit of its retaining the globular form into which it is made. Pills may be made simply of the active ingredients they contain, with the addition of a little syrup, gum mucilage, or treacle, to give coherence; but when the active ingredients, as, for instance, calomel, are not sufficient, either as regards bulk or consistence, to form a pill in this way, then some additional substances must be used; the most common are bread crumb, hard or Castile soap, soft extract of liquorice, or conserve of roses. Of the above, the pills made with conserve of roses, or with treacle, retain their softness for the greatest length of time; pills made with bread crumb especially, soon become very hard; it is, however, very convenient for the extempore preparation of some pills, such as those of calomel, and quinine. When used, the bread, which must be stale, is crumbed in the mortar with the fingers; it is then rubbed well up with the active ingredient; and, lastly, formed into an adherent mass by the addition of a few drops of gum mucilage, or of syrup. When hard soap is used to form pills, it must first be scraped into thin shavings before it is mingled with the other substances. The soap may be in sufficient quantity to form a mass without other addition, or a little mucilage, or syrup, or glycerine may be required. Soft extract of liquorice, or conserve of roses, generally require to be simply rubbed up with active ingredients. Glycerine has recently been used as an addition, in small quantities, to pill masses, for the purpose of keeping them moist, and answers very well for the purpose. A little fixed oil of any kind will also preserve softness.—See *Glycerine.*

After the composition of the pill, its size and consistence are important considerations. Pills are frequently made too large, that is to say, five grains in weight. Not only is a pill of this dimension uncomfortable to most to swallow, but there is some chance that the whole does not become dissolved in the stomach. A pill of three grains in weight will generally be found the most convenient and effective size. A pill must neither be too soft nor too hard, but in the matter of consistence, something must depend upon the length of time it is to be kept; pills that will be used in the course of a few days or a week, may be made with less attention to this object, than those which are to be kept an indefinite period. When the latter is the case, conserve of red roses may be employed, or spirit of wine added to pills, such as the compound colocynth, which contains resinous matters, or as stated above, a few drops of glycerine may be added to the pill mass before rolling. It is not likely

that for domestic purposes a "pill machine" would be procured; the best method, therefore, of dividing a mass into separate pills will be, to weigh out twenty-four grains of the pill mass at once, and to divide this as nearly as possible into eight equal parts, or pills, rolling each between the finger and thumb, and when they are put together, adding a little flour, magnesia, or liquorice powder, to prevent their adherence. Pills which are likely to be kept for some time before use, should be preserved in a well-stopped or corked bottle, *but never in a box;* in the latter, they often get so hard as to be completely useless, and, in the aged especially, are apt to pass through the bowels perfectly unchanged. For domestic use, either in this country or in emigrant life, it is the most desirable plan to purchase compound pills, either in the mass, or ready rolled; as, however, it may prove useful, the composition of some of the most generally serviceable pills will be here given.

Within the last few years the manufacture of pills of all kinds has become a separate business. If procured from respectable houses, they are quite to be depended on both for efficiency and keeping, especially if coated.

The most useful purgative pills for domestic store are:—

The Compound Rhubarb Pill.—Mild aperient.

The Compound Colocynth Pill.—Active aperient.

The Compound Gamboge Pill.—Very active aperient.

Blue Pill.—Best procured and kept in mass.

The Colocynth and Hyoscyamus Pill.—Mild aperient.

The Aloes and Iron Pill.—Tonic alterative and aperient.

Expectorant, or Cough Pill.—See *Influenza.*

Many other forms of pill are ordered, and used, but it would serve no good purpose to burden either the memory or the medicine chest with them, especially as their composition is given when they are recommended in this work. Those above enumerated will be ample store, others may be made up as required.

The Compound Rhubarb Pill, one of the best, mildest, and safest aperients, is thus made:—

Take of

Rhubarb, in powder,	3 drachms.
Aloes, in powder,	2 dr. 15 gr.
Myrrh, in powder, } each,	1½ drachms.
Hard soap, scraped, }	
Treacle,	4 drachms.
Oil of peppermint,	11 drops.

Mix the powders with the oil, then add the treacle, and beat the whole into a uniform mass.

The dose of the compound rhubarb pill is from three to twelve grains. It may be kept either in powder to be made up with treacle (or syrup or gum mucilage) when required, or it may be kept in a soft mass, wrapped in oiled silk, or ready rolled. Persons going to warm climates would find the form of powder the best in which to keep this pill, preserving in a well-stopped bottle.

The compound rhubarb pill may be taken alone, or, in some cases, combined with one-third either of blue pill or calomel, especially in cases of biliary disorder.

The Compound Colocynth Pill is, perhaps, more extensively used in this country than any other purgative of the kind. It is considerably more active than the compound rhubarb. The compound colocynth pill is thus best made:—

Take of

Aloes, in powder.—See *Aloes.*	
Scammony, in powder, of each,	2 drachms.
Colocynth, in powder,	1 drachm.
Sulphate of Potash,	15 grains.
Oil of Cloves,	15 drops.

Water sufficient to beat the whole, when mixed, into a mass.

As the remarks, both as to combination, keeping, &c., which have been made on the compound rhubarb pill, apply exactly to the compound colocynth, it is unnecessary to repeat them. A very good addition to the compound colocynth pill is that of a drachm of ipecacuanha powder to the quantities given above.

The Compound Gamboge Pill is of less moment, as a store pill, than the above, but it is valuable for very strong individuals, who require powerful medicine, and where economy is an object: it is thus made:—

Take of

Gamboge in powder, }	
Aloes, ,, }	
Compound powder of } of each,	1 drachm,
Cinnamon, }	
Hard soap in powder,	2 drachms,
Syrup, a sufficiency,	

and beat into a mass to form pills. The dose is from three to twelve grains.

The Colocynth and Hyoscyamus Pill is used when it is desirable to prevent griping, which often occurs with the compound colocynth pill. It is made from the

Compound colocynth pill mass,	2 parts,
Extract of hyoscyamus,	1 part,

and beat into a uniform mass. Dose, five to ten grains.

The Pill composed of Iron and Aloes is prepared in the following way:—

Take of

Sulphate of iron,	1½ drachms.
Aloes in powder,	2 ,,
Compound powder of cinnamon,	3 ,,
Confection of roses,	4 ,,

Reduce the sulphate of iron to powder before mixing it with the other ingredients, then add the confection, and make the whole into a uniform mass.

In cases of Obstinate Constipation the following pill is strongly recommended :—

Extract of nux vomica,	.	6 grains.
Watery extract of aloes,	.	24 ,,
Compound rhubarb pill mass,		30 ,,

Mix and divide into 12 pills, two to be taken every evening if required.

Expectorant, or Cough Pill, as given under article *Influenza*, is thus made :—

Take of

Opium, in powder,	. .	25 grains.
Squill, ,,	. .	80 ,,
Ipecacuanha, ,,	. .	60 ,,
Camphor, ,, (see *Camphor Powder*),	. . .	90 ,,
Gum Ammoniac, in powder,		120 ,,
Rhubarb, ,,		60 ,,

The above pill will keep well, either in powder or rolled, and will be found the most useful and convenient form of cough or expectorant medicine, either in emigrant life or elsewhere, particularly in chronic cough.

Many other combinations of pill might be enumerated, but the above, along with the information scattered throughout the present work, ought to be guide sufficient to any one of moderate intelligence. Pills may be made, either in a mortar, or if the substance used is in small quantity, on a slab or Dutch tile, by means of a spatula.

Refer to—*Medicines, &c.*

PIMENTO.—Allspice.—See *Pepper.*

PIMPLES.—See Skin—Sebaceous.

PINE-APPLE, the well-known fruit, is rather hazardous for those of weak digestive powers.

PINS and **NEEDLES** occasionally get fixed in the throat from the careless and reprehensible practice of holding them in the mouth (see *Gullet*). When swallowed they generally work their way to, and show themselves at, some distant part of the body. Very recently the author extracted a good-sized sewing needle from the thigh of a child about two years old. The needle could only have entered the body by being swallowed, and, indeed, its course into the thigh could in some measure be traced by symptoms which had been exhibited sometime before its appearance at the surface.

PITCH.—See Tar.

PLACENTA. — The after-birth. — See *After-birth.*

PLAGUE.—This disease, so well known to all by name, and, happily, by name only in this country, belongs to the class of malignant fevers. Its contagiousness has been disputed, but is testified by the best authorities who have had practical acquaintance with the subject. The last time the plague visited this country was in 1665, the period of the Great Plague of London; since then, however, it has appeared in, and ravaged various parts of Europe, as in Marseilles in 1720, Moscow in 1771, and Malta so late as 1816. Egypt, Asia Minor, Turkey, and India are the countries now chiefly liable to the visitations of this fearful scourge ; and, whatever other influences may be at work to foster its germs—the bacilli which produce it—there cannot be the smallest doubt, that the total neglect and ignorance of the simplest laws of health materially add to the evil.

The symptoms of plague are thus described by Dr. Gregory :—"A feeling of great languor and lassitude ushers in the attack of plague, which for the most part happens towards evening. There is always a cold stage, though it is seldom of long duration. Heat of skin, headache, and giddiness succeed. The pain of the head is referred to the temples and eyebrows ; the eye appears heavy, dull, and muddy. The expression of countenance changes in a remarkable manner. Sometimes there is a wild and furious look ; sometimes a look claiming commiseration, with a sunk eye, and contracted feature. The most striking of all the early symptoms of plague is the *staggering*, and the sudden extreme prostration of strength. A strong tendency to void the urine is generally noticed. The stomach is very irritable, and rejects almost everything presented to it. The tongue is white and moist. The bowels are sometimes torpid, and at other times loose, the evacuations being always highly offensive. The speech falters. The pulse is at first small, hard, and quick ; but after the appearance of buboes it often becomes fuller and softer. It is sometimes intermittent ; in point of frequency its average may be stated at 100. The heat of the skin is seldom very intense. The head is occasionally perfectly clear and collected ; at other times, stupor occurs immediately after the formation of the hot fit. Some cases of the disease are ushered in by a violent fit of mania ; the greatest indifference with regard to recovery prevails, and is always reckoned a most unfavourable symptom.

"After one, two, or at the furthest three days, pains in the groin and arm-pits announce the formation of *buboes*. Those pains are often highly acute, and unless speedily followed by the swelling of the gland, the patient dies delirious. In women, the arm-pit, in men the groins, are chiefly affected. Carbuncles appear at the same time, but indifferently on all parts of the body. Petechiæ and vibices are much more frequent than carbuncles, which, it appears, do not occur above once in twenty cases. The fatal termination is sometimes preceded by violent hæmorrhages from the mouth, nose, or intestines.

"The duration of the disease is very various. A few cases are on record where the patient died within a few hours from the invasion. To many it proves fatal during the first paroxysm or period, which includes the time from the evening of the attack to the close of the following night. The third and fifth days are, how-

ever, upon the whole, those of the greatest danger. The former is the usual period of the appearance of bubo; the latter, of the abatement of the febrile symptoms. If the patient survives the fifth day, and the bubo is fully formed, he may be considered as nearly out of danger. The convalescence, indeed, is always very tedious, from the extreme debility which the disease leaves; and the patient's life is not unfrequently again put into imminent hazard from the occurrence of gangrene in the extremities.

"In the malignant form of plague every variety of treatment has been tried, but with so little effect, that it may be considered as a disease nearly beyond the reach of medicine. The violent headache which occurs during the first twenty-four hours seems to point out the propriety of blood-letting, and it is recommended by the general custom of Turkish practitioners; but in the hands of English surgeons it proved of no avail. In the cases in which it was tried it did not appear, however, to make matters worse. Where mercury can be brought to affect the mouth, it appears to be of some service, but it is seldom that sufficient time is afforded for this specific effect of the remedy. Ether and laudanum are valuable medicines in allaying the irritability of the stomach. Wine and opium are of no use during the violence of the disease, and bark can seldom be retained. This is much to be regretted, for whenever it can be made to stay on the stomach, even in those severe cases where carbuncles and vibices appear, its good effects are conspicuous. Camphor, bark, and wine are given with much advantage during the period of convalescence. Emetics, purgatives, and the cold affusion have been tried, but it does not appear that they are of any service."

"The latest period of the contagion of plague, or that between communication with an affected individual and the appearance, is extremely short, and liable to very little variation. It is scarcely ever less than three days, and it seldom exceeds six. Instances indeed are recorded of the disease not appearing until the tenth day, but these cases are rare.

"The contagion spreads to a very small distance only from the body of the patient. The consequence of which is, that the disease is seldom, if ever, communicated, except by actual *contact*.

"The contagion of plague is readily imparted to *fomites*, in which it may lurk for a very long time, more particularly if excluded from the air."

It is now universally understood, that even so formidable a disease as plague can be prevented by the adoption of habits of cleanliness, free ventilation, moderate living, and freedom from communication with those attacked.

The terrible outbreak in Bombay (1897) has proved that local conditions of filth and overcrowding are far more answerable for propagating the disease than direct infection. A lymph has recently been discovered which is said to be a "prophylactic" against the plague-bacillus, but it is too early as yet to pronounce definitely on its real merits.

Refer to—*Fomites*.

PLASTER OF PARIS—Sulphate of Lime, Gypsum—has been noticed in various parts of this work as an occasional adulteration in confectionery, &c. It is often used in the treatment of fractures, for diseased joints where perfect rest is required, and in the formation of the jacket-splint for persons suffering from spinal curvature.

PLASTERS are compounds of adhesive tenacious substances. Many are, principally, compounds of an oxide of lead and oil, others of wax and resin. "Plasters should not adhere to the hand when cold; they should be easily spread when heated; and should remain tenacious and pliant after they are spread; but should not be so soft as to run when heated by the skin. All plasters become too consistent and brittle when long kept; but in this case, those which are unctuous may be re-melted by a gentle heat, and some oil added to them." Plasters are not so commonly used as mere external applications as they were at one time, but among the poorer classes they are still very favourite and much-trusted remedies, and in some cases are unquestionably serviceable.

Plasters may be either simply adhesive, such as the common diachylon or the isinglass plaster; they may be protective, such as the lead; warm, like the galbanum, and strengthening.

The most useful plasters are—

Adhesive, resinous, or diachylon plaster.		
Belladonna,	.	Anodyne.
Cantharides,	.	Blistering.
Galbanum,	.	Warm and stimulant.
Iron or chalybeate,		Strengthening.
Lead,	. .	Protective.
Mercurial,	.	Absorbent.
Opium,	. .	Anodyne.
Pitch,	. .	Warm and stimulant.
Soap,	. .	Adhesive.

Refer to separate articles.

The above plasters may be employed for the purposes indicated, and should always, if possible, be procured ready spread. As a general "strengthening" plaster, the chalybeate or iron plaster is perhaps the best, and undoubtedly gives much comfort and support in many cases, especially those in which there is much weakness of the back. In such cases it cannot be used in better form than that spread on brown holland or glazed calico, which is now sold as prepared by machinery. It may, however, be spread on leather. Either the pitch (Burgundy) or galbanum plasters may be used for the same purposes, and be prepared in the same way, but they are more stimulant, and sometimes produce uncomfortable or unbearable irritation on delicate skins; indeed,

any plaster will cause this with some people; lead is least liable to do so. To avoid the irritation which doubtless arises from the imprisoned perspiration, it is well to remove the plaster every few days and carefully cleanse the part.

Lead plaster, spread on soft leather, calico, or best of all, felt, is one of the best protectives in the tendency to, or formation of bed-sores. If kept long after it is spread, however, it becomes brittle, cracks off, and is useless; it is therefore better kept in roll, and spread when wanted. With the exception of the adhesive plasters, required in the treatment of wounds, &c., all the others are but occasionally required, and may for the most part be dispensed with. The most useful adhesive plasters are, the common diachylon, and the soap plaster. These may be bought beautifully spread by machinery, and in this country this will always be the most advantageous mode of procuring them; travellers, such as emigrants, proceeding to warmer climates, should never get them thus prepared, otherwise when they come to unfold their plaster for use, they will find it one adherent mass, and perfectly useless; they should take the plaster with them in roll, as it is sold; it can then, when required, be spread on any material, such as calico, or even paper, by means of a heated knife, or flat piece of iron, if no better instrument is at hand. The common plaster iron (fig. 170) is neither expensive nor cumbersome, and might very well be added to an emigrant's outfit. When used, it should be heated sufficiently to melt the plaster, when the flat surface (fig. 170—1) is applied to the end of the roll; the melted plaster being allowed to drop on the material on which it is to be spread. When sufficient has been melted, it is then to be spread evenly and thinly by means of the edge of the instrument.



Fig. 170.

When spread plasters are warmed for application, the unspread side should always be held to the heat. When plasters are to be removed from the skin, they should always be well warmed through by warm water.

It is a common popular error to suppose that the plasters used in the treatment of wounds exert some healing influence; whereas, they are only used to keep the severed parts in as close apposition as possible, in order that the *natural* healing power may be exerted. It is requisite to notice the error, for it might in some cases interfere with the use of substances, such as gums, &c., as plasters, which might be advantageously used as such. It is no uncommon thing to see wounds which, had they been left to themselves, would have healed kindly, kept open by means of sticking plaster.

Refer to—*Blister—Dressing—Wounds, &c.*

PLEASURE.—The cheerful excitement of the mind by what is called pleasure, is rather a preservative of health, than a remedy in real sickness, when the less stimulant but cheering tonic of hope is the better adapted mental remedy. Pleasurable relaxation there must be, both for mind and body, and especially for the young; and they act unwisely, who, instead of directing the mind to sources of, and leading it to find its happiness in innocent, cheerful, well-directed relaxation and pleasure, would make this world one never-closing workshop, or have it a perpetual valley of tears.

Refer to—*Dancing.*

PLETHORA—Fulness—is the term applied to that condition of system in which the blood is superabundant, both in quantity and quality, over what the requirements of the body call for. It is a condition not uncommon among the well-fed and indolent, in whom the digestive organs continue in full vigour. Individuals of the sanguine temperament, whilst leading a life of mental activity and anxiety, have greater powers of activity than most others, but they, in many instances, border upon plethora, and if they become so placed that their former activity is either uncalled for or interfered with, provided there is not much mental anxiety, they quickly become plethoric; the vessels are over-loaded with rich blood, and instead of the former power of exertion, oppressive languor and inactivity succeed; in fact, the whole of the functions, and the brain and nervous system especially, are weighed down and clogged; there is mental sluggishness, heavy sleep, and inaptitude for exertion. This last symptom is too often mistaken for weakness; the person labouring under the mistake resorts to additional food and stimulants, it need scarcely be added, only to increase the evil. An individual in this condition, it may be said, is ripe for inflammation; if cold be taken, it is very likely to light up inflammatory action somewhere, and once lighted up, the action is very liable to be of the severest kind.

Should febrile disease of any kind, as for instance small-pox, or erysipelas, or rheumatic fever, be excited in the constitution, the symptoms run high, and the case is very likely to become one of danger. For similar reasons, accidents are not well borne—at least their after-effects are often such as to put life in danger.

Persons who are in a plethoric condition, not unfrequently get relieved by some natural effort: piles show themselves and bleed, or the nose bleeds, or spontaneous diarrhœa comes on, and instead of the individual being weakened, he feels stronger and lighter than before—a true indication of the real state of matters. The evil results of mistaking a state of oppression from plethora, or false debility (see *Debility*), for one of weakness, must be evident to all. Even the pulse is liable to deceive, and, in these states of oppression, to seem low and weak, but

it is essentially different from the pulse of debility. The latter, if the finger is pressed even slightly upon it, is extinguished at once; but the pulse of oppression seems rather to resist the pressure, to become stronger, and to beat up against the finger, rather than to give way. As might be expected, plethoric individuals are often the subjects of apoplexy, and in a less degree of affections of the heart, lungs, liver, and kidneys. A state of plethora must always be one, if not of danger, at least of hazard, and ought to be guarded against; its well-known causes naturally direct the attention to the best modes of prevention.

If a person suffering from plethora is threatened with an immediate attack, such as apoplexy, the condition cannot be too soon or too actively removed. Bleeding in some way, free purging, and low diet are the immediate remedies; but in the absence of any threatened attack, it is not advisable to invoke the aid of these powerful agents; the condition should be reduced gradually and steadily, by the formation of, and perseverance in, modes of living suited to counteract the tendency. When a man, suffering from the effect of plethora, gets rid of his unpleasant symptoms by a *coup*, such as the loss of a basinful of blood, by a few calomel pills and black draughts, he is probably highly pleased to be so easily rid of his enemy, and by means which involve no self-restraint, or giving up of indulgences; so, trusting to the repetition of the same remedial measures, he puts no check upon himself, and when the plethora again reaches a certain height, he again bleeds and purges, and this goes on till he is overtaken some day with an apoplectic attack, or till he becomes the subject of organic disease. It is a false and most precarious security.

Persons who have a tendency to plethora must have exercise, they must use up their blood and muscle in active motion; but in doing this, especially at first, they must beware of overdoing it; it will not do for a plethoric man to commence a new system of *living for health*, with violent exertion, otherwise he may precipitate the very evil he dreads; some over-loaded vessel may yield under the increased tension caused by the muscular exertion and excited circulation. Plethora, to be reduced, must be so, steadily, but gradually; active exercise, increased as the ability to take it increases, must be balanced with aliment proportioned to the amount taken, stimulants being rarely if ever permissible, or required, and animal food in very moderate proportion. Early hours, and curtailment of the time devoted to sleep, is desirable. In most cases, tepid bathing is preferable to either hot or cold, and either by it or by sponging, the skin must be kept active. The bowels require especial attention, and are better rather lax than otherwise; any slight tendency to plethoric oppression being counteracted by acting upon them by the compound colocynth, or compound colocynth and blue pill, or by small, largely diluted, doses of Epsom salts, or by Seidlitz powders. If the kidneys are inactive, the infusion of broom, or of dandelion, carbonate of potash, or the nitrate of potash (saltpetre) may be taken, or the acid-tartrate of potash (cream of tartar) used in the form of imperial, as a common drink.

Refer to—*Apoplexy—Debility—Fat, &c.*

PLEURA. — The "serous" membrane which lines the chest and covers the lungs. Each lung is separately invested, and like other serous coverings, the membrane is double, one layer lining the cavity of the chest, and the other the lung; the inner surfaces of each being lubricated with serous exudation, which enables the lungs to contract and expand smoothly. When the serous fluid is largely poured out (as in pleurisy), water in the chest, or hydro-thorax, takes place; and when matter is formed in consequence of inflammation of the membrane, the disease is termed empyema.—See *Lungs.*

PLEURISY is the name given to inflammation of the pleural covering of the lungs. It is not an uncommon disease, is distinguished by sharp catching pain confined to one part of the chest, and is usually attended with a dry cough.—See *Lungs—Inflammation.*

PLEURODYNIA is a rheumatic or neuralgic affection of the muscles between the ribs, characterised by acute pain, occurring sometimes in paroxysms, but sometimes continuous. When continuous, it is more probably due to circumscribed pleurisy, and to old adhesions of the pleura to the chest wall, in which case it will yield to the application of a few leeches, or to some slight counter-irritation. When the pain is periodic, a liniment, containing chloroform and opium, applied two or three times daily, and the administration of quinine, will probably give relief. A sheet of cotton-wool worn next the chest will also prove very useful; but the most speedy and effectual remedy is a small dose of morphia introduced by the hypodermic needle.

PLICA, or PLICA POLONICA.—A peculiar disease of the hair which occurs in Poland and the adjacent countries.—See *Hair.*

PLUMMER'S PILL, also called compound calomel pill, is one of the most useful alterative and gently diaphoretic pills or remedies in general use; it rarely acts on the bowels, and may be taken for a considerable time without affecting the system. Besides calomel, it contains sulphurate of antimony, and is made into a mass with guaiacum resin and castor oil. The dose is from three to ten grains.

Refer to—*Mercury—Pill, &c.*

PNEUMONIA. — Inflammation of the substance of the lungs.—See *Lungs.*

PODOPHYLLIN is a pale greenish-brown resinous powder obtained from the *Podophyllum peltatum*, or American May apple, which is

well known in the United States, where it is sometimes called Mandrake.

The dose of podophyliin is from one-sixth of a grain to half a grain, given in pill, either alone, or in combination with other remedies, such as the compound colocynth pill mass, henbane, or some other corrective, to prevent the troublesome griping pain which sometimes accompanies its use. It acts somewhat like jalap, as a drastic purgative, and is thought to be of peculiar service in cases of congestion of the liver, or in cases where that organ is overloaded with bile. It may be combined with calomel, in order to produce smart purging, with a gentle flow of bile; or with cream of tartar, or bicarbonate of potash, in cases of dropsy.

Upon its first introduction to medical practice, it was thought that it would supersede all other ordinary purgatives, but it has not in any way realised the expectations that were formed in its favour, being somewhat uncertain and capricious in its actions, and above all, causing in some persons intolerable, griping pain.

Podophyllin is sometimes given along with ox-gall, in cases where it is desired to promote the flow of bile, and to increase the action of the liver and bowels. The following prescription is recommended for use in such cases, and will probably be found of benefit:—Take of purified ox-gall two grains; podophyllin half a grain; compound rhubarb pill mass, or powdered rhubarb, two grains. Mix. Pill, to be taken at bedtime, occasionally. *N.B.*—For some persons the dose of podophyllin would require to be much smaller, perhaps one-fourth to one-sixth of a grain.

Podophyllin is now greatly superseded by euonymin and iridin, either of which drugs acts quite as energetically on the liver without the unpleasant griping and teasing action of podophyllin.

POISON.—Considerable difficulty has been experienced in giving such a definition of the word poison as shall, whilst sufficiently inclusive, be sufficiently precise. Some substances, such as strychnine, corrosive sublimate, &c., can never be considered otherwise than as poisons, in every sense of the word, but when cayenne or common pepper, cream of tartar, even common salt, and other substances not unusually used in food, have been found in large doses to act as poisons, it becomes very difficult to frame a correct definition of the term. Dr. Taylor, in his *Manual of Jurisprudence*, says:—"Perhaps the most comprehensive definition which can be suggested is this: 'A poison is a substance which, when taken internally, is capable of destroying life without acting mechanically on the system.'" Some substances, however, act as poisons through the skin, such as those of infectious diseases, others, probably, through the lungs. Poisons are usually classed under the three heads of irritant, narcotic, and narcotic acrid poisons. Of the first, arsenic and the mineral acids are examples; of the second, opium and henbane; of the third, alcohol and strychnine.

As a general rule, it may be acted upon in cases of poisoning, that the sooner the ejection of the poisonous agent from the stomach can be procured the better. In the majority of instances, perhaps, nature effects this in a more or less perfect manner before any remedy can be employed; indeed, the occurrence of vomiting is often the first symptom of the action of the poison.

These natural efforts, however, must not be alone trusted to, even if they take place, and, in almost every case, the best thing that can be done is to excite full, free vomiting. This may be brought about by any of the emetic substances so often mentioned, but sulphate of zinc, or white vitriol, *when it can be procured*, is the agent generally preferred for the purpose. In its absence, salt or mustard may be used, and are almost always procurable; indeed, any other emetic at hand should be resorted to,—an infusion of the root of the sweet violet, in the absence of others, or chamomile tea, or warm water in abundance; the action of vomiting being also excited by irritating the throat with the finger, or with a feather.

Next to the evacuation of the poisonous substance, its neutralisation is important; indeed, in the case of such poisons as the mineral acids, it is to be the first object. It is unnecessary to repeat here the proper remedies which more especially neutralise the effects of different poisons, as they are given in their proper places, but, as a general rule, milk, oleaginous substances, and demulcent fluids, such as linseed tea or barley-water, or hasty pudding, will be useful, if given freely, in protecting the coats of the stomach from the contact of the poison, and by interfering with the absorption of the latter into the system.

Lastly, it must be an object to counteract the effects of the poison upon the system at large; as in the case of opium, the narcotic influence is combated by forced exertion, by strong coffee, &c., or in poisoning by prussic acid, by stimulants and cold affusion.

When poisoning is known or suspected to have occurred, the first thing is to procure proper medical assistance as quickly as possible; *nothing must stand in the way of that:* the next is to ascertain the nature of the poison, if possible, and the amount taken, the remedial measures which may be known, either by reference to such works as the present, or from other sources of information, being adopted as quickly as possible. All vomited and other matters—such as evacuations from the bowels—which may contain trace of, or afford clue to the poison, must be reserved for the inspection of the medical man. Sometimes individuals, from throwing away, in the excitement of the moment, the poisoned food, or whatever has

been taken, have found themselves unpleasantly situated, and objects of suspicion. If there is any idea that there has been criminal proceeding connected with the poisoning, some responsible person should secure whatever may guide in the investigation of the truth, and place all under lock and key, *and seal*, till the arrival of the authorities; food and vomited matters should be sealed in suitable vessels.

The symptoms which would give rise to the suspicion of poisoning having taken place, are those of sudden illness shortly after taking food or medicine, the individual having previously been in good health, or at least free from the peculiar, and generally violent, symptoms developed, particularly those indicative of irritation of the stomach and bowels, or of narcotic or irritant influence upon the nervous system. When poisons are either given or taken for criminal purposes, the symptoms usually show themselves quickly and severely, on account of the dose of the deleterious substance being generally large. At the same time it is to be remarked, that the presence of much food on the stomach, sleep, and intoxication, have all been known to retard the development of symptoms from even large doses of poison. If a number of persons who have partaken of the same dish are seized shortly after with symptoms of illness, the suspicion of poison is, of course, greatly strengthened.

It is perhaps necessary, however, to caution all, against a too hasty assumption of the fact of poisoning, at least as far as the criminal implication of others is concerned; if there is suspicion, it will in any case be better to take such measures as may be thought requisite, as quietly as possible, until the bearings of the case have been examined by competent persons.

This caution is necessary, for there are diseases, such as British cholera, which not unfrequently first break out shortly after a meal, and spasms of the stomach are not uncommon with some after food; perhaps the disease which has most frequently given rise to suspicion of poisoning—doubtless on account of its all but universal fatality—is *Perforation*, alluded to a few pages back.

In connexion with the above remarks, the following from Taylor's *Medical Jurisprudence* is important:—"It seems highly probable, that the mere fact of a person eating a full meal after *long* fasting will give rise to symptoms resembling those of irritant poisoning." "Mr. Holland, of Manchester, has communicated two cases of this description. In one, the symptoms were very violent and the patient nearly died, in fact was laid out for dead: the other patient suffered from severe gastralgia —nervous pain in the stomach—for several weeks. Poisoning was at first strongly suspected, but the suspicion was removed by the fact, that others in health had partaken of the same food, principally potatoes mixed with gravy, without any injury, and there was no reason to suppose that any irritant poison could have been mixed with the food. The two who suffered were extremely weak and exhausted from long fasting, and were observed to eat their food, which was quite wholesome, voraciously." Further, it must be remembered, that although symptoms of poisoning may be distinctly traceable to the effects of a meal recently eaten, it by no means follows that the poisoning has been the consequence of something added, either intentionally or accidentally, to the food; it may be the consequence of changes which have taken place in the food itself: many casualties from this cause are recorded. In Germany, numerous deaths have occurred in consequence of sausages prepared in that part of Europe undergoing a peculiar kind of putrefactive fermentation, which renders them highly deleterious. In this country the flesh of animals which have died from disease has not unfrequently been known to give rise to symptoms of poisoning. Fat or oily food, when in a state of decay, seems peculiarly injurious; salmon, bacon, &c., having in this state been found poisonous. At a festival held in the Canton of Zurich some years ago, at which about 600 persons were present, nearly two-thirds of the number were affected with symptoms of poisoning, in consequence of partaking of meat which had become slightly tainted, and of hams—probably the injurious article—which had been badly cured; —some of the number affected died. Shellfish, it is well known, will, in some persons, produce symptoms of poisoning at any time, and in certain states are probably deleterious for all (see *Mussel—Oyster—Copper*, &c.). A recently noticed source of poisoning requires mention. It is that which might ensue from the flesh of game birds—partridges especially—which have been destroyed by feeding on grain steeped in arsenic and scattered about for the purpose of destroying other birds. It is said that partridges thus destroyed are not found lying on their sides like dead birds generally, but are found sitting as if in life. It is to be feared that birds found thus, fresh, and in good condition, might, by unscrupulous or ignorant persons, be sold as other game.

It has been mentioned that the common garden rhubarb contains oxalic acid,—not in sufficient quantity to injure in the moderate use; but when used largely, especially in some constitutions, it may give rise to unpleasant symptoms connected with the kidneys.

Liebig records a singular mode of fatal poisoning, which occurs in Germany, "from the drinking of what is called the feather-white wine." This poisonous wine is wine still in a state of fermentation, which is increased by the heat of the stomach. The carbonic acid gas which is disengaged penetrates through the coats of the stomach, through the diaphragm, and through all the

intervening membranes, into the air cells of the lungs, out of which it displaces the atmospheric air. The patient dies with all the symptoms of suffocation caused by an irrespirable gas. The best antidote in this form of poisoning is the inhalation of ammonia. The development or formation of poison within the body itself is a subject which has been but little investigated. The characteristic ingredient of the urine, urea, if retained in the circulation, acts as a narcotic poison. Oxalic acid is certainly formed within the body; perhaps prussic acid. When the fæcal contents of the alimentary canal, especially of the large bowel, are long retained, and reabsorbed into the circulation, as they undoubtedly are, they exert effects somewhat akin to poisoning, and the author believes he has traced extreme temporary depression of the system to this cause alone.

Although the antidotes to be immediately adopted in cases of poisoning by various substances are given under separate headings, it may be convenient to tabulate the principal in this place. The data are taken from Dr. Garrod's work on *Materia Medica*.

Poisons.	Antidotes.
Acids,	Magnesia, chalk, and diluted solutions of alkaline carbonates.
Alkalies,	Vinegar and water; oil.
Alkaloids,	Finely divided animal charcoal.
Antimony,	Decoction of bark and other preparations, containing tannin in solution.
Arsenic,	None; but charcoal may be given, or magnesia and hydrated peroxide of iron.
Carbolic acid,	Olive oil freely, emetics, followed by stimulants.
Chlorine,	Ammonia, magnesia.
Iodine,	Starch.
Lead salts,	Sulphate of soda or magnesia.
Mercurial salts,	White of egg.
Nitrate of silver,	Common salt and other Chlorides.
Opium,	Animal charcoal, which absorbs morphia.
Oxalic acid,	Chalk and water copiously.

In connexion with poisons, the fact—more than once alluded to in this work—must not be lost sight of, that it is possible for the long-continued daily reception of even minute doses of certain poisonous substances, at last, by "accumulation" to exert pernicious effects upon the system (see *Mercury—Lead, &c.*). This must not be confounded with the criminal, secret, slow poisoning, so often recorded as the practice in ages gone by, a crime which has been occasionally imitated in the present day, specially by long-continued administration of small doses of tartar emetic, but which can hardly be practised without detection.

Before leaving the subject of poisoning, it is requisite to advert to the influence which habit exerts over the effects exercised by poisons on the human subject. All know how largely the habitual consumers of opium can increase their doses, and that the same is observed with respect to other drugs, chiefly of the narcotics; but the most remarkable instance of this power of habit, is in the case of the "arsenic eaters" of Styria and adjacent provinces, of whom it is an ascertained fact, that they habitually consume large and poisonous doses of solid arsenic, not only without injury, but with, it is alleged, apparent benefit to health.—See *Wounds, Poisoned*, and the various articles on poisonous agents.

POLYPUS is a tumour, usually pear-shaped, the result of the morbidly excessive growth of the mucous membrane lining a cavity. It is most frequently met with in the nose and in the womb, but also occurs in the ear, the rectum, and in the larynx. Polypi vary much in texture, in some cases being easily torn, and bleeding after the least injury, at others being firm and almost cartilaginous; their colour is usually grey or yellowish, and they possess but little sensibility; they are generally attached to the surface whence they spring by a narrow neck. The chief inconvenience which results from polypus in the nose, is the interruption to breathing through the nostril, at night especially; the affected person can only lie with the mouth open, which therefore becomes most uncomfortably parched. When polypus, however, in this situation, increases to a large size, it necessarily displaces the adjacent parts, such as the soft palate, or distends the nostrils. In any case, polypus is so uncomfortable a companion, that its removal is generally sought. This must, in all cases, be effected by the surgeon, by means of ligatures, scissors, or forceps, and, therefore, proper surgical advice should be resorted to. Occasionally, polypus in the nose will yield to the persevering use of astringent powders, such as that of burnt alum, or it may be regularly touched twice a day with tincture of steel, by means of a camel hair brush. Polypus of the womb cannot possibly fall under the cognizance of unprofessional persons.

POMEGRANATE. — This anciently known tree—a native of Asia and Africa, is cultivated in warm countries generally. The flowers, the rind of the fruit, and the bark of the root, have been used in medicines as astringents, but the most general remedial use in modern medicine, has been that of the root bark, as a remedy in tapeworm; for this purpose it is extensively used in India. Dr. Christian says, "it seems scarcely ever to fail if properly used." The original mode of administering it is to steep two ounces of the *fresh* bark in two pints of water for twelve

hours, then to boil the whole down to one pint, and to give a wine-glassful of the strained decoction every two hours, till the whole is taken. "Sometimes joints of the worm begin to come away in less than an hour after the last dose; but often the doses must be repeated several successive mornings before they take effect; and it is right to repeat them occasionally for four or five days after joints have ceased to come away." Laxatives should be administered from time to time. The remedy sometimes causes nausea and vomiting. The fresh root is most efficacious, but as it is almost impossible to obtain it in its fresh condition in this country, its employment as a worm destroyer has been almost entirely superseded by the more active kousso and the root of the male fern. Still it is possible that in many situations abroad, fresh pomegranate root may be procured, where the other remedies cannot be had. When given in powder, the dose of pomegranate root is twenty grains.

POOR.—Whilst poverty is so great an aggravation of the evils of sickness, it is, unfortunately, too often one of its most general causes. It is a perfectly well-ascertained fact, that physical deprivation and physical disease are to one another as cause and effect, and, however sad the reflection, that the insufficiently fed and clothed, and hard-worked labourer, has much less chance of prolonged health and life than those more fortunately placed. The following extracts from Dr. Combe's *Physiology of Digestion* put this in a strong light:—

"If over-feeding be the prevailing error among the middle and higher classes of the community, the opposite condition is as unquestionably that of a large proportion of the labouring poor. Pressed upon all sides by the powerful competition both of constantly improving machinery, and of a superabundant population, the manual labourer is compelled to undergo an amount of ever-recurring bodily exertion, which far exceeds the natural powers of his constitution, even when supported by the fullest supply of nourishment; and when, as often happens, along with this excess of labour, his food, from inadequate wages, the size of his family, or his own injudicious management, is defective in quantity or in quality, the consequences to his health and happiness are disastrous in the highest degree.

"To those who have never reflected on the subject, it may seem like exaggeration to say, that, as a general fact, at least nine-tenths of the lower orders suffer physically, morally, and intellectually from being over-worked and under-fed; and yet I am convinced, that the more the subject shall be investigated, the more deeply shall we become impressed with the truth and importance of the statement. It is true that very few persons die from actual want of food; but it is not less certain, that thousands upon thousands are annually cut off, whose lives have been greatly shortened by excess of labour and deficiency of nourishment. It is a rare thing for a hard-working artizan to arrive at a good old age. They almost all become prematurely old, and die off long before the natural term of life. It is in this way that, as remarked by Dr. Southwood Smith, the mortality of a country may be considered as an accurate indication of the misery of its inhabitants. According to Villermé, the rate of mortality among the poor is sometimes double that among the rich. Thus it is found, he says, that in a poor district in France, one hundred die, while in a rich department only fifty are carried off; and that, on taking into account the whole population of France, a child born to parents in easy circumstances has the chance of living forty-two and a-half years, while one born of poor parents can look for no more than thirty.

"These are striking facts, and their truth is confirmed by every day's experience in Britain as well as in France. Many causes concur to produce this melancholy result, but among the principal is, unquestionably, the disproportion so generally existing between toil and nutrition. During epidemics, too, the poor, from their impaired stamina, almost invariably become victims in a proportion far exceeding that of the more wealthy classes. This is, no doubt, partly owing to their greater intemperance and want of cleanliness; but even these vices often derive their origin from the same root—the want of adequate repose and comfortable sustenance.

"The bad consequences of defective nourishment are not confined in their operation to the bodily constitution of the labouring poor. *Their minds also are deteriorated.* The pressure of poverty is unfavourable to the growth of refinement and morality, and crime and turbulence are never so much to be dreaded as during times of scarcity, and manufacturing or agricultural distress.

"Among the poorer classes the children as well as the parents suffer both physically and morally from insufficient food. Their diet, being chiefly of a vegetable nature, and consisting of porridge, potatoes, and soups, with very little butcher meat, proves far from adequate to carry on vigorous growth in the one, or repair waste in the other; hence arise in the young an imperfect development of the bodily organisation, a corresponding deficiency of mental power, and a diminished capability of resisting the causes of disease. In workhouses, and other charitable institutions, ample evidence of these deficiencies obtrudes itself upon our notice, in the weak and stunted forms and very moderate capacities of the children."

Happily, recent changes and improvements with respect to the working of the poor law have modified in some degree the force of the above observations, but they still hold good in too many instances. The fact of the connexion

between deficient nourishment, clothing, &c., and the production of disease, ought ever to be kept in mind by those who have the management of their inferiors in intellect, or in worldly means.

Many of the evils attendant on poverty are, unquestionably, out of the power of the poor themselves to rectify, but many others, connected with the subject of ventilation, cleanliness, and attention to natural laws, which do so much to ward off the incursions of disease, are in most instances in their own hands.

Those who are taken, either by the calls of duty, or by the dictates of benevolence, to visit the poor in sickness, have many prejudices, theoretical and practical, to encounter. It is marvellous the dread of fresh air or of cold water, the faith in quack nostrums and old women's recipes, the constant anxiety that food should be taken and stimulants administered, and the perverse disobedience to the directions of a medical attendant. All these, and many others which are met with, ought to be special objects for good advice, for kind and rational explanation. The more leisurely visits of a clergyman, or of others who visit the poor, may well be in part devoted to instruction on these points, if the power of imparting the information is possessed, as it ought to be, by every educated person.

Refer to—*Bed-room—Drainage—Houses—Water, &c.*

POPLITEAL SPACE.—The hollow of the ham behind the knee.

POPPY, *Papaver somniferum*, or opium poppy, is the common cultivated poppy of the gardens, of various hues, varying from red or purple to white. Its principal produce, opium, has already been treated of. The capsules or seed vessels of the poppy, when dried, are used for their narcotic properties, owing to the opium which they contain. In order to have the dried capsule in the most efficient state, that is, containing the largest amount of opium, it should be cut green before it is fully ripe. When the seeds have been matured, the seed vessel is much exhausted. Poppy capsules are principally used in the form of decoction for purposes of fomentation. To make the decoction, rather more than an ounce of the capsules, *well broken up*, is to be added to each pint of water, and the whole boiled for a quarter of an hour. This preparation often proves soothing and relieves pain.

Syrup of poppy is made from the poppy capsule, but is a preparation which should be absolutely abandoned as dangerous. There is always considerable variation in the amount of opium contained in the capsules, and this variation is necessarily entailed upon the syrup prepared from them, a most dangerous contingency in a preparation of opium,—for such it is,—the use of which is in a great measure confined to children: half a tea-spoonful has proved fatal to a child six months old, and yet larger doses are often given. The calculation of the proper strength of syrup of poppies is about one grain of opium to the ounce. If an opiate syrup is to be employed, it ought to be made with as definite proportions as any other preparation of the drug.

Although the poppy seed vessel possesses such powerful narcotic properties, it is remarkable that the seeds are entirely free from them, and are mild and pleasant in flavour. They contain a fixed oil, and in some parts of Asia are converted into bread or cakes.

Refer to—*Opium.*

PORK.—The flesh of the hog is generally and justly considered the most indigestible animal food in common use. In Dr. Beaumont's table, showing the average time required for the digestion of different articles of food, pork, fat and lean together, is shown to require about five hours for digestion. There is no doubt that much of the indigestibility of pork is due, not only to the fat, ostensibly existing as such, but to the large amount of fatty matter mixed with the muscular fibres; at the same time, pork more than other meat seems to exert marked injurious effects. In some few cases even symptoms of poisoning have followed the use of pork as food, but, in these, there probably must have existed some peculiar "idiosyncracy," or the meat must have been diseased. It is by no means unfrequent, however, for severe diarrhœa to be the result of a pork diet, continued for two or three days in succession. This often occurs in the families of the poor. The parasite which sometimes infests pork is called the *Trichina spiralis*, it produces the disease known as trichinosis.—See *Trichina.*

Refer to—*Bacon.*

PORRIGO—a disease of the scalp.—See *Skin—Scalp.*

PORTER, the well-known beverage, is brewed from malt highly dried. Dr. Paris says:—"Much has been said upon the fraudulent adulteration of this article, but we are inclined to believe these statements have been exaggerated." Mr. Donovan, however, affirms that, until the interference of the legislature, porter was liable to every species of adulteration. In a medical periodical the following observations occur in connexion with this subject:—"If we are to believe the assertions of previous writers, supported by the evidence adduced in connexion with numerous excise prosecutions, during the last few years, the adulteration of malt liquors has been practised to a very considerable extent, both by the brewers and the publicans. The following is a summary, exhibiting a list of the substances said to have been thus employed, together with the effects they are intended to produce:—

Quassia, gentian, wormwood, broom tops, nux vomica, and strychnine, *to impart bitterness.* in lieu of hops; capsicums and grains of

paradise (in concentrated tinctures), ginger, corianders, orange-peel, and caraway seeds, to give *pungency* and *flavour;* opium, cocculus indicus, nux vomica, tobacco, extract of poppies, and the tincture and juice of henbane, to communicate *intoxicating properties* or "*strength*"; molasses, colouring, sugar, burnt sugar, and corianders, as *substitutes for malt;* sulphuric acid (oil of vitriol), alum, green vitriol, and common salt, to impart *an appearance of age;* and "foots," pearl-ash, Scotch soda, and some of the articles before named as "*heading,*" or to give the beer the *property of bearing its head, or froth.*

The following list of articles, said to have been seized at different breweries and brewers' druggists' laboratories, is copied from the "*Votes and Proceedings of the House of Commons,*" published some years since. In many cases heavy penalties were inflicted on the offending parties:—Cocculus indicus, multum (an extract of cocculus), colouring, honey, hartshorn shavings, Spanish juice, orange powder, ginger, grains of paradise, quassia, liquorice (root), caraway seeds, copperas, capsicums, and mixed drugs (various)."

Some of the articles in the above lists are virulent poisons. Such are opium, nux vomica, henbane, tobacco, cocculus indicus, and extract of poppies. We have reasons for stating, that the three latter are those only which we may suspect meeting with in beer at the present day. The use of cocculus indicus has been recommended by several writers on brewing. One of these conscientious gentlemen (?) states that "it is impossible with pure malt and hops alone to produce a *strong-bodied porter,* and then directs the employment of cocculus indicus, grains of paradise, and nux vomica for that purpose." Another author, equally base and ignorant, orders "three pounds of cocculus to be used for every ten quarters of malt;" and adds: "it gives an inebriating quality which passes for strength of liquor; it prevents second fermentation, and consequently the bursting of the bottles in warm climates." The latter assertions are utterly unfounded, and are mere excuses for adulteration. Another author informs his readers, that "six pounds of roast sugar and one pound of corianders are equal in strength and intoxicating qualities to a bushel of malt." In a work published many years since, it is stated that "cocculus indicus is commonly smuggled out of the hands of the druggist into those of the brewer, in common soda barrels, with three or four inches of Scotch soda at the top and bottom of each;" and also, that "it forms the principal ingredient in B.E., or black extract, which is ostensibly prepared for tanners, but its real destination is the beer cask."

Of course, the fact that fraud and adulteration may render such an article of human consumption, as porter, most deleterious, does not in any way afford an argument against its use when properly and truly manufactured, and there are few medical men who will not testify to the highly beneficial effects which follow the use of good porter in many cases; it is, in fact, a most admirable tonic, superior to any other form of malt liquor, and especially so, because it is less likely to disagree and to become acid on the stomach than the other varieties of malt beverage; neither is it so likely to give rise to gravelly deposits in the urine in the predisposed. Dr. Prout recommended the use of porter in diabetes, not only for its tonic properties, but as less likely to prove injurious in many cases of that disease than any other drink.

In convalescence from acute disease, porter is a strengthening medium, most grateful to the patient. In order to prove of service, porter must not be flat; it is, therefore, better for invalids, at least, to drink it bottled.

PORT WINE belongs to the class of "dry and strong" wines, being put down in Brande's tables, as containing an average of 22·96 per cent. of alcohol. The colour of port is due to the colouring matter of the grape husk, which is pressed out in the preparation, along with a considerable amount of astringency and extractive matter, from which the white wines are free. The large percentage of spirit contained in port wine is, of course, not the result of the natural fermentation, but is added on account of the depraved taste, which has rendered it necessary for foreigners to add spirit to the genuine wine, to render it marketable in Britain; spirit, too, which for the most part must remain in the wine in an uncombined condition. Probably, no wine imported into this country, or in many cases professed to be imported, is liable to the same extent of adulteration as port wine, an immense amount of deleterious stuff being sold under the name, especially when retailed in small quantities, or direct from the wood. In such cases the poor often suffer; probably, after illness, they may be able, or enabled to purchase, it may be one, or perhaps a couple of bottles of port; the liquor being frequently drawn from the cask and put into their own bottles, it need scarcely be added, that it is often worse than useless. There are few, medical men at least, who will decry the virtues of port wine, as a remedy, either in some stages of acute illness, or in periods of convalescence, but if it is to be of any service it must be genuine; those, therefore, who charitably interest themselves in the wants of their poorer brethren, should keep this in mind, and, if inclined to aid with the often most welcome gift of a little wine, send it from their own cellar, instead of giving money for its purchase. Good port wine is often one of the most valuable remedial agents in the hand of the physician: it is beneficial in the low stages of fever, in diseases of debility generally, and in convalescence from most of the exhausting diseases. Gargling with port

wine in relaxed sore throat is a good, but perhaps somewhat unnecessarily expensive, remedy. Owing to the high value of genuine port wine, it has been largely supplanted in this country by a cheaper class of red wines from the south of France and from Spain. The most generally approved of these substitutes is the wine known as Tarragona, grown on the east coast of Spain; it at all events possesses the virtue of purity combined with cheapness, which is more that can be said of the numerous so called port wines which are foisted on the market.

POSITION.—The position, either of the whole body, or of the affected part, in those suffering under illness, or from the effects of accident, is one of the most important considerations connected with treatment; it is, moreover, one frequently overlooked, particularly by unprofessional persons. Although the structural arrangements and vital activities of the living body counterbalance the influence of gravity under ordinary circumstances, the latter force is apt, more or less, to exert its power when weakness and long constraint in one posture diminish the powers of its counteragents. It is undoubted that the muscular movements, which are continually going on with most persons in health, tend greatly to assist in regulating and equalising the distribution of the blood and other fluids; even in the healthy the temporary want of this assisting power is shown in the liability of the feet or legs to become slightly swollen, in consequence of long sitting or standing in one posture.

In regulating position, it has for the most part to be done, either with reference to the relaxation of the muscles, to facilitate the flow of the blood or other fluids within the body, or to obviate pressure on any portion of the body.

The regulation of position with reference to the relaxation of certain muscles, or sets of muscles, is most generally required after fractures; and the principles on which this relaxation is to be adopted have been sufficiently alluded to under the article (*Fractures*) itself. This muscular relaxation may also be an object in the treatment of wounds which run transverse to the fibres of the muscle directly underneath, such as transverse wounds of the thigh.—See *Wounds.*

The regulation of position with reference to the flow of the blood or other fluids is often of immense importance, and too often neglected. The blood may have a tendency to gravitate towards the most dependent parts of the body, either from general or from local causes.

In some diseases, accompanied with great exhaustion, and, indeed, in many aged people, independent of disease, it would appear as if the forces which circulate the blood lost the power of counteracting the force of gravity, even in the horizontal posture, consequently, the blood is apt to accumulate in the most dependent parts. In the lungs especially this is the case, and there is every reason to believe that congestion or accumulation of blood in these organs in the first place, giving rise to a kind of inflammation in the second, may be the consequence of long continuance in one position, as on the back. In such cases, care ought to be taken, when practicable, to change the position. Stagnation or congestion of blood occurs in the majority of instances, from some obstruction to the circulation, either at its centre, the heart, or in consequence of mechanical impediment acting upon the veins of the part or parts involved, such as happens from the pressure of tumours, or of the pregnant womb, upon the large veins of the abdomen, &c.

Again, at all times, in the healthy body, when in the erect posture, there is the force of gravity to be overcome in the return of the blood from the parts lower than the heart to the heart, and for this, special provision is made, most remarkably in the numerous valves with which the veins of the lower extremities are provided; any deficiency in these valves (see *Veins*) favours the gravitation of blood. In all the above named instances, position is of the very highest importance, not only as regards the comfort of the patient, and the treatment of the disease, but sometimes as a matter of safety.—See *Veins.*

Whilst position is to be considered and taken advantage of as a means of facilitating the flow of blood through the veins, it is also a useful auxiliary in regulating its passage through the arteries, for it makes a very considerable difference whether the propulsion of the blood by the heart and arteries is exerted against the force of gravity or not. This is well shown when there exists from any cause a tendency to fainting. This condition, as pointed out in the article on the subject, depends upon diminished circulation of blood through the brain; it must, therefore, be evident to all, that in the erect posture, when the blood has to be driven *upwards* to the head, against the force of gravity, a much greater exertion of power is required, than if it had merely to be sent in a horizontal direction as it is when an individual is lying down, and, consequently, that in fainting, in which the action of the heart is much enfeebled, the usual treatment of laying a person *almost* flat is the most rational plan which can be adopted; it, moreover, illustrates well the influence of position. In a tendency to apoplexy, or to overfulness about the head, on the other hand, it is a matter of safety that all positions, such as stooping when awake, or sleeping with the head low, which favour the arterial flow to, or impede the venous flow from, the head, are to be avoided. On precisely similar grounds to the above, position is highly important in wounds involving severance of vessels. It must be evident to all, that in the case of an artery being wounded,

the most rational mode of preventing,—which it will do entirely sometimes,—or at least of impeding, the effusion of blood, must be to place the wounded part in such a position that the force of gravity must act as strongly as possible against the force of the circulation; in other words, that if an artery of the hand is wounded, less blood will be lost by holding the hand and arm straight upwards, than in any other position (see *Artery*), and that, in this position, less pressure will be required to arrest the hæmorrhage. It might also seem as if common sense alone would be sufficient to teach persons generally such simple facts, but it is not so. It is on record (and similar cases are constantly occurring) that a woman nearly lost her life, in consequence of the giving way of one of the veins of the leg from ulceration,—she almost bled to death,—because not one of those around had knowledge sufficient to lay her flat down, to elevate the bleeding leg above the level of the rest of the body, or to check the flow of blood with the thumb (see *Emergencies*). The regulation of position, with reference to the escape of fluids, such as matter from any part of the body, requires attention: surgeons generally take care that it is properly seen to, but it might escape the notice of unprofessional persons. As a general rule, parts should always be placed so that any discharge from them may have as free escape as possible. It is this fact, in cases of abscess, which often makes the artificial opening of the surgeon preferable to the natural one of the disease; he chooses the point for his incision where the matter can have the readiest escape; that is, the lowest portion of the abscess, in the natural and unconstrained position of the portion of the body in which it is situated.

Position, with reference to pressure upon different parts of the body, particularly in persons long confined to bed, requires much attention; it has been already alluded to under articles *Bed*, *Bedsores*, &c.

The position, or in medical language the decubitus of disease, is of great interest to the physician, as in fact the posture assumed by the patient in certain affections is often quite characteristic, and speaks a plain and intelligible language to the medical attendant. Thus for instance, a patient suffering from abdominal disease with pain, lies on his back *with the legs drawn up*. One with heart disease, and difficulty of breathing, sits up in bed, and refuses to lie down. One with water in the chest lies on the affected side, to give the sound side room to move freely, and *cannot* perhaps lie on the sound side. A patient with rheumatic fever lies on his back utterly helpless and immovable, &c.

There are many other points connected with the important subject of position, but the foregoing remarks—directed rather to principles that to details—will probably serve to attract a little more attention than is often given to considerations so closely linked, not only with the comfort, but with the safety and well-being of the sick and infirm.

POSSET—an old form of domestic preparation for the sick, made with milk curdled by means of treacle, beer, &c.

POTASH, or Potassa, or Potashes, or Vegetable Alkali.—One of the fixed alkalies and a compound of the metal potassium with oxygen, is very widely distributed throughout nature; in the soil, in vegetable and animal bodies, it is an almost constant ingredient.

Many preparations of potash are used in medicine; the most generally useful are:—

Potash, in its pure forms of caustic potash, especially in its solution the liquor potassæ.
Carbonate and bicarbonate of potash.
Acetate of potash.
Bitartrate, or acid tartrate of potash, or cream of tartar.
Chlorate of potash.
Nitrate of potash.
Iodide of potassium.
Citrate of potash.
Bromide of potassium.
Permanganate of potash.

Potash derives its name from its source and mode of manufacture. It is procured by "lixiviating," that is, mixing and steeping vegetable ashes in water, and evaporating the solution or "ley" which results. From this solution, potash in the form of a carbonate is obtained, but the process being very roughly carried out, yields, of course, a very impure material, the "pot-ashes" of commerce, which are brought chiefly from Russia and North America. The rough potash is purified in various ways, either in the country of its manufacture, or after importation. When imported in a purified state it is sold as "pearl-ash," and after purification in this country, as purified pearl-ash, or carbonate of potash. This must not be confounded with the bicarbonate of potash, which is the most generally used medicinal preparation. There is great variation in the amount of carbonate of potash obtained from various vegetables, but weeds yield it most abundantly, after burning. For example, whilst oak-wood yields but 1·53, and beech-wood 1·45, in every thousand parts, the fern yields 6·26, thistles 35·7, wormwood 73·0, and the common fumitory 79·0, in every thousand. Pure carbonate of potash is sold in the form of a white, granular salt, which is very deliquescent; that is, becomes moist or partly dissolved, in consequence of attracting moisture from the atmosphere.

Bicarbonate of potash occurs in crystals, but is more generally sold in the form of a white powder. It is, whilst applicable to the same purposes, a much milder preparation than the carbonate.

Liquor potassæ or the solution of pure potash, is very similar in its medicinal action to the

above preparations; in its undiluted condition it is caustic, and a violent poison.

All the above preparations of potash are antacid, diuretic, and cooling; the simple carbonate, however, is but little used as a medicinal agent. The bicarbonate, in doses of from ten to twenty grains, dissolved in a couple of ounces of water, may be given when its antacid action is required; for diuretic purposes, the doses must be at least double the above. The dose of the "liquor potassæ," or potash solution, is from ten to twenty drops, diluted in the same way. The bicarbonate of potash is often used, along with an acid in forming effervescing draughts, in febrile diseases; for the amount of acid requisite see article *Effervescence*. In some disorders of the liver, and where there is a tendency to the formation of red gravel in the urine, potash, especially the liquor potassæ, is one of our most useful remedies. A very good combination is fifteen drops of the solution in a tea-spoonful of dandelion tea: this may be taken at least twice a day. A very good preparation of potash, "Brandreth's Solution," is used by some in preference to the common potash solution. It is requisite that those who regularly, or for any length of time, take these preparations of potash on account of red gravel, or other diseases, should be on their guard, lest too long-continued a use of the remedy may induce other disorders, as bad, or probably worse than the existing one. The author could, in one case, trace a sudden break up of the nervous system, with alkaline and phosphatic urine, to no other cause than the long and incautious use of potash to obviate a tendency to red gravel. As mentioned under article *Fat*, the use of potash solution tends to diminish that constituent of the body. Potash is preferable to soda, as an antacid, in gout, from its forming a more soluble compound with the peculiar acid of that disease.—See *Gout*.

Caustic Potash is usually moulded into white sticks or pencils, to be available for medical purposes. It is only used for external application, as a caustic for sloughs and warty growths. It has also been made into a paste to decompose cancerous and other tumours.

Poisoning by potash solution has sometimes occurred; in this case, vinegar, lemon juice, milk, demulcent drinks, or oil, will be the best remedies.

The acetate of potash, a compound of acetic acid and potash, is chiefly used as a diuretic, and as a remedy in skin diseases,—the dose from thirty grains to sixty, well diluted in water: it may act upon the bowels.

Chlorate of potash is generally sold in the form of flat, white crystals; it is cooling, diuretic, and a good saline remedy in inflammatory fever; it is most valuable, however, as a remedy in thrush or "aphtha" (see *Aphtha*), and in cases of sore mouth generally,—the dose five to fifteen grains, dissolved in water, for an adult. Chlorate of potash lozenges contain each five grains of the salt, and can be highly recommended in various affections of the throat and mouth. There are also compressed tablets of the chlorate, and a combination in glycerine jujubes, which some find the most agreeable form.

Bitartrate of potash, or cream of tartar, is a compound of potash with tartaric acid. In its impure state, in which it forms a grey or brown concretion, it is known by the name of argol or winestone, and is formed inside the casks in which new wine is kept. The coloured, impure, crude tartar is purified, dissolved, and the solution gradually evaporated; in this process crusts form on the surface of the solution, which are successively skimmed off, whence the name "cream of tartar" is given to the purified preparation; this is generally sold in the form of white powder, which feels gritty in the mouth, and gives a pleasant acid taste. Cream of tartar is used to form the cooling pleasant drink, *imperial*, which, by most persons, may be taken freely. In doses of from sixty to one hundred grains of the salt, *stirred* into half a tumblerful of water,—it will not readily dissolve,—it is one of the best diuretics we have; in doses of two or three drachms it acts as a powerful purgative (see *Jalap*). Some persons cannot take cream of tartar in any form without suffering from irritation of the kidneys. An over-dose might produce inflammation of the stomach.

Nitrate of potash or saltpetre, a compound of potash and nitric acid, is now brought chiefly from India, where it is obtained by "lixiviation," or by dissolving the nitrates of lime, soda, and potash, out of the soil, in which they exist in large quantity; the lixiviation being conducted over wood ashes. In this way the other nitrates are decomposed by the potash of the ashes, and nitrate of potash or saltpetre formed. Nitrate of potash may be also formed artificially, as it was in France during the war, when the British cruisers interrupted the foreign supplies to the country, at a time when the salt was so largely required in the formation of gunpowder. It is made by throwing up large compost heaps, containing lime in some form or other, either mingled with decaying animal matter, or watered regularly with urine. These heaps are allowed to remain two or three years unmoved, during which time, by slow decomposition, nitric acid is formed in combination with the lime, and the nitrate of lime being then dissolved out by water, is easily converted into nitrate of potash by decomposition. At present, however, "a great part of the nitre (nitrates of potash), used for the manufacture of powder in France, is obtained in Paris, from the lower stones of the houses, which are constantly in contact with the liquids of the streets and drains. The lime of the walls is gradually dissolved by the nitric acid formed; the walls lose their coherence and

firmness; hence the name of wall corrosion, given to this injurious formation of nitre. The potash of the nitre is generally derived from bricks, and even the mortar contains some potash which gradually decomposes the nitrate of lime, aided by the superior crystallising power of nitre, so that the latter salt is formed. But, generally, in order to obtain all the nitric acid, as nitrates, potash must be added to the liquid obtained from the scrapings of the walls, by lixiviation with water.

Saltpetre is usually sold in crystals of various sizes, or in the form of crystalline powder; its taste is peculiarly cooling. In doses of twenty grains, dissolved in two or three ounces of water, it increases the flow of urine, and is most frequently given for this purpose. In large doses, such as half an ounce or more, it occasions pain at the stomach, and vomiting, with extreme depression of the system, and may thus prove fatal. Free dilution with some demulcent, such as thin gruel or barley-water, induction of vomiting, and counteraction of the depression by stimulants, would be the most appropriate treatment.

Iodide of potassium is a compound of iodine, or rather of iodic acid, with potash; it occurs in the form of white and, when well-formed, cubical crystals. It is a preparation now much used by medical men for syphilis, and as a means of eliminating mercury, lead, and other foreign matters from the system, but is not a remedy calculated for domestic administration. It may, however, be used in the form of its ointment and liniment in swollen joints, the effect of chronic rheumatism, and in enlargement of the glands, especially in bronchocele or full throat.—See *Bronchocele.*

Bromide of potassium is prepared in a similar way to iodide of potassium, substituting bromine for iodine; it resembles the latter in appearance, but has a more pungent saline taste. It has come much into use of late years as a remedy for numerous nervous affections, particularly epilepsy, and is largely used in cases bordering on delirium tremens from mental excitement and over-worked brain. It is also frequently used and recommended to check the craving for drink in dipsomaniacs. The dose is from ten to twenty grains, and if necessary to forty or sixty grains.

The citrate of potash is the result of an admixture of carbonate of potash with citric acid, and is a soluble white powder, very deliquescent and crystalline. It is an exceedingly pleasant, safe, and useful remedy, rapidly absorbed and decomposed in the blood, increasing the flow of urine, and acting slightly on the bowels. Citrate of potash is employed with benefit in red gravel, and it possesses valuable properties as a remedy against scurvy. The dose is from thirty to sixty grains.

Permanganate of potash—better known in its liquid state as Condy's fluid—is the result of a chemical combination caused by the union of chlorate of potash, peroxide of manganese, and caustic potash, and presents to the eye dark purple crystals, a grain of which is sufficient to colour deeply an ounce of water. It is largely used as an oxidising and antiseptic agent, either as an external application to foul sores, or as a gargle in aphthous ulceration of the throat, and as an injection in fœtid discharges from other external passages. Condy's fluid, the solution of permanganate of potash, consists of four grains of the latter to an ounce of water. A tea-spoonful of the fluid to a tumbler of water makes an excellent wash for the mouth at the morning ablution, and a small quantity poured into the wash-hand basin frees the hands of the medical man or nurse from unsavoury smells.

POTATO.—This well-known tuber, introduced into Ireland in the sixteenth century, from South America, by Sir Walter Raleigh, not only forms a daily article of food throughout a large proportion of the civilised world, but, unfortunately, owing to the ease with which it is cultivated, has become the staple article of nutriment to millions. As an addition to other and more nutritive food, the potato is most invaluable; as the sole article of diet (although capable of supporting life), it is a wretched substitute, and any combination of circumstances, which induces or compels a population to depend upon it in too great a degree, must be regarded as most unfortunate.

The potato, undoubtedly, contains the elements of nutrition, that is, starchy and gummy matters (see *Food*), capable of sustaining the animal heat and respiratory processes, and also albumen and fibrin, adapted to build up the muscular and other constituents of living animal bodies, but those plastic materials are so deficient in quantity, their amount is so small compared with that of the other constituents of the tuber (which, moreover, contains a very large amount of water), that a man living solely upon potatoes must consume a very large quantity to keep himself in health and strength, even if he can do the latter, when undergoing anything like exertion. Prior to the potato famine, when potatoes were almost the universal diet of the Irish peasantry, from seven to ten pounds of potatoes per day was by no means an unusual amount for a labouring Irishman to consume; but the ten pounds of the root contained no more real nutriment than one pound and a half of good wheaten bread, notwithstanding the abundance of heat-giving matter which the former possessed. In consequence of the less amount of muscular "plastic" nutriment contained in his food, the Irish labourer is less adapted for *continued* exertion than the Englishman on his bread and meat, or the Scotchman on his oatmeal (see *Oats*). Moreover, it has been remarked, that the constitution of the Irish labourer is apt to give way earlier in life than that of the men of the sister kingdoms, and he

is certainly more liable to be the victim of epidemic disease.

The following represents the chemical composition of 100 parts of potato :—

Water,	75
Flesh-formers,	2·3
Starch,	15·4
Gum,	2
Fat,	0·3
Cellulose,	1
Mineral matter,	1

The small amount of flesh-formers in comparison with starchy matters shows the necessity of combining the potato with other nitrogenous materials, and perhaps the simplest and most economical would be found in the addition of butter milk.

There can be no doubt that as an addition, simply, to other varied and more nutritious aliment, the potato must be esteemed most valuable; it supplies the natural desire for vegetable food, and affords it of a kind well adapted to promote the health of the system, in one of its most digestible forms. The appearance of true sea scurvy in so many parts of the kingdom during the period when, in consequence of the potato blight, the population generally were compelled to use a variety of substitutes, sufficiently indicates how much we owe, in the matter of health, to the regular intermixture of the potato with our ordinary diets, and it is a questionable system of dietetics which, except from some very cogent reason, excludes the *well*-cooked potato from the dinner table of the invalid—the well-cooked potato, for nothing can be more indigestible than a badly-cooked one. It is, perhaps, superfluous to point out that a *well-boiled* potato should break down in a mealy form to its very centre; by well boiled is not meant excessively boiled, for when this is done, much of the nutriment of the root is lost. In Dr. Beaumont's tables, roasted and baked potatoes are said to take but two and a half hours for digestion, whilst boiled potatoes take an hour longer. The water in which potatoes are boiled contains some of the deleterious properties of the natural order to which the plant belongs (*Solanaceæ*), and ought to be thrown away. The potato itself should be freed from water when eaten.

Potatoes which boil "waxy" are peculiarly unwholesome, and often pass through the bowels unchanged. The same may be said of early potatoes; not the early kinds when matured or ripe, but, as they are generally used, in an immature condition. Mashed potatoes do not generally get sufficiently mingled with the saliva to secure the full digestion of their starchy constituents (see *Digestion*). Potatoes soaked with gravy and dripping from roasted meat, though suitable for persons of strong digestion, are very liable to disagree with dyspeptics.

Potato starch, in the form of "British tapioca," is a very wholesome preparation, and is cheaper than most starches.

Potato spirit or brandy, a liquor frequently made and consumed in the northern regions of Europe, has been found more than usually deleterious.

Refer to—*Food—Fecula.*

POTENTILLA TORMENTILLA. — See TORMENTILLA.

POULTICE. — A poultice is generally understood to be an application adapted to afford moisture, and generally warmth, through the medium of some soft substance; or rather, it ought to afford these essentials, for, too often, cold dampness, or hardness and irritation, are the only derived effects from the ill-made and badly-applied poultices with which ignorant people are apt to indulge their charges.

As above stated, any soft substance which will retain heat and moisture, may be used to form a poultice; but some materials are better adapted than others for the purpose. The substances most generally used for poultices are, bread, linseed meal, oatmeal, charcoal, hemlock, yeast, &c., and combined with these numerous antiseptics are often employed, such as carbolic oil, solution of permanganate of potash or of chlorinated soda; with these, bran, so often recommended in this work, as a medium for applying heat and moisture, can scarcely be considered as a poultice properly so called. The mustard cataplasm is also sometimes called a poultice, but improperly. The name cold poultice is also used.

The essentials of a good poultice are, that it shall be perfectly smooth and free from lumps or hardness, that it shall be as soft and moist as possible without being sloppy, and that it shall have sufficient bulk to retain both its warmth and moisture, without being too heavy. No material, perhaps, offers more domestic facility for making a good poultice than bread, and accordingly we find that the

Bread Poultice is, perhaps, more commonly used than any other. It is made either with water or milk, but the latter is a very doubtful addition, and the same may be said of the grease or lard often added to this form of poultice. The milk is apt to turn sour, and can answer no better purpose than the water; and when a greasy poultice is used, the bread is not requisite. The best mode of making a bread poultice is to break the crumb of bread into a hot basin, pour boiling water over it sufficient to soak it thoroughly, and allow it to stand covered over for a few minutes by the side of the fire; any superfluous moisture being drained off, the pulp should be thickly spread upon a piece of cloth of the requisite size. In some cases it is advisable to interpose a piece of thin muslin between the poultice and the surface on which it is placed. The temperature at which a poultice is to be applied must vary according to circumstances, but gene-

rally the best is that which is most agreeable to the patient; occasionally it is useful to have it as hot as it can be borne. After a poultice is applied to the body, it is a good plan to cover the part, either with a fold of flannel or with oiled silk, to assist in retaining the warmth and moisture; the latter, moreover, prevents the moisture, which necessarily exhales from the application, damping the clothes, &c., often a very great inconvenience in badly applied poultices. Indeed, the bad management of poultices generally, among the poorer classes, constitutes a serious objection to their use; they are often either made so sloppy as to wet everything around, and to put the patient in great risk from cold, or they are made so small and stiff as very quickly to become caked and hard upon the surface, particularly if not sufficiently often renewed. Even in the most favourable circumstances, a poultice requires renewal at least three times in the twenty-four hours.

The cold bread poultice is often convenient, and must be made simply with cold instead of hot water.

The bread poultice may be made the medium for various medicated applications; thus hot decoction of poppy "heads," &c., may be used instead of hot water, or goulard solution may be added to the cold poultice with advantage. It is a necessary caution, that the material used for these medicated poultices should not, after use, be thrown where it can be picked up by poultry. After the bread poultice, probably the

Linseed meal poultice is more generally recommended by medical men to be used than any other. For this purpose, ground linseed, free from grit, should be procured. To make the poultice, a sufficient amount of boiling water is to be poured into a hot basin, and the meal stirred in till the whole is of the proper consistence; the mass, being beaten smooth before use, is then to be spread evenly upon the cloth. This forms a very smooth poultice when well made, and the oil, which the linseed naturally contains, tends to keep it soft. It is rather more stimulating than the bread poultice,—occasionally it is made by mistake, of the whole seed instead of the meal.

The oatmeal poultice may be made in a similar way to the linseed, but, although oats contain a considerable amount of fatty matter, it is not sufficient alone to make an oily poultice like the linseed; it is, therefore, very common to add a little lard; this, however, must not be done when the oatmeal poultice is, as very generally it is made, the medium for the

Charcoal poultice, which is often applied to sores where there is much offensive discharge, and powdered charcoal is frequently sprinkled over the surface of common poultices to destroy fœtor. The charcoal poultice is directed to be made with half an ounce of charcoal, two ounces of bread-crumb, one and a half ounces of linseed meal, and ten ounces of boiling water. The bread is macerated in the water for ten minutes, the linseed meal being gradually added and stirred till the mass assumes the consistence of a poultice, after which one-half of the charcoal is to be added, while the remainder is sprinkled over the surface of the poultice when spread on lint or linen rag.

The hemlock poultice, so frequently recommended to relieve pain in cancerous and other painful wounds, is made with one ounce of the powdered hemlock leaf, three ounces of linseed meal, and ten ounces of boiling water. The hemlock and linseed meal, thoroughly mixed, are to be added to the water gradually, with constant stirring.

The yeast poultice has a reputation for absorbing and neutralising fœtor from wounds, especially in cases of gangrene. The British Pharmacopœia directs it to be made with six ounces of beer yeast, fourteen ounces of flour, and six ounces of water, heated to a temperature of 100°. Mix the water with the yeast and stir in the flour, keeping the mass near the fire till it rises.

The chlorine poultice is also an excellent deodoriser and cleansing application. It is made with four ounces of linseed meal, two ounces of the solution of chlorinated soda, and eight ounces of boiling water. The linseed meal is to be mixed gradually with the water, constantly stirring, after which the antiseptic solution is to be added.

Bran poultice.—See *Bran*.

Other substances, such as carrots, turnips, &c., are often recommended and used as poultices, but they possess no advantage over those already named, and are objectionable from their smell; they may, however, be used, and indeed any soft substance, consistent with cleanliness, which will retain warmth and moisture, when bread and meal are not procurable, or when their use in this way is an object. When medicated poultices are required, as mentioned above, it is better to make the bread poultice with the infusion or decoction of the medicinal agent.

Honey, treacle, &c., are not desirable additions to a poultice.

Few applications are more generally used, either in regular or domestic surgery, than poultices, and, in their proper place, few are more useful. It is worthy of remark, that the most ancient poultice on record is that of figs, applied to King Hezekiah, by the direction of the prophet Isaiah.

In painful swellings, attended with inflammation, such as boils, in inflamed wounds, and the like, or for promoting the discharge of matter, no application is more suitable than the poultice. To the use of poultices, however, there is a limit, not always well observed —particularly in the case of wounds and ulcers. Up to a certain point they are most valuable, beyond it they do harm; instead of soothing

and encouraging sufficient discharge, they attract the blood too strongly to the part, increase, beyond due measure, the discharge, and encourage the formation of "proud flesh." It is only practical experience which can teach the appearances indicative of the precise time when a poultice should be left off, but it may be guessed at, when healing processes, which have been going on favourably, seem to come to a stand-still, or retrograde; when the discharge rather increases than diminishes, and the surface and edges of the sore seem to become full, and at the same time pale and flabby.

After poulticing has been carried sufficiently far, the simple water dressing (see *Dressing*) is in most cases most suitable, it is cooler, pleasanter, and not so like a hot-bed as the common poultice. Mr. Liston, the celebrated surgeon, was the first to substitute water dressing for the poultice, which he held in great abhorrence. That Mr. Liston carried his prejudice against the poultice too far, may be learned from the fact that many of the first surgeons of the day continue to take advantage of it; but that the water dressing may be substituted in most cases is unquestionable, and it is certainly a much more elegant and agreeable application in every way. It does not, however, in all cases answer the purpose of the poultice; indeed, that it does not act in the same way is evident from the fact, that when a sore has been stimulated, as above described, by over poulticing, the substitution of the water dressing quickly gives it a more healthy character, thereby proving its less excitant character.

Somewhat similar, in principle at least, to the lint and oiled silk application, is the Spongio Piline, introduced a few years ago as a substitute for the poultice. This, the invention of Mr. Marckwick, consists of sponge cut up into fragments, and felted into a mass with cotton wool, a layer of this mingled material being backed with a waterproof varnish. The mingled sponge and cotton will of course absorb moisture freely and retain it, and therefore in some measure act as a poultice. The author, however, cannot from his own experience speak favourably of its effects; in moderate-sized pieces it certainly does not answer well, but where large sheets of the material—as for a whole limb—are required and used, it may probably be very useful.

Poultice-bags made of thin waterproof and muslin are very convenient. They are made of all sizes, and may be used over and over again.

Refer to—*Dressing*—*Heat*, &c.

POULTRY as food, must be considered under the divisions of the oily and non-oily. The flesh of the first class, including ducks, geese, &c., is certainly difficult of digestion, and perfectly inadmissible, even when plainly cooked for invalids. The flesh of the non-oily kinds, such as common fowls, turkeys, &c., is more soluble in the stomach, but it is far from being so easily digested as generally imagined, certainly it is not equally digestible with tender mutton. The flesh of this description of poultry, as of chicken, for example, is more likely to agree if boiled rather than roasted. The flesh of poultry, when digested, does not, probably, prove so stimulant to the system as that of the larger animals, it is therefore more useful in many cases of convalescence, when animal food is first permitted.

"In the boiling or roasting of poultry, the flesh of which is white, and contains little blood, the temperature of the inner parts, when the flesh has been well cooked, seldom exceeds 130° or 140°. The flesh of poultry or game is, therefore, sooner dressed than flesh which contains much blood, such as beef or mutton" (*Liebig's Chemistry of Food*). The broth made from chicken or fowl offers one of the best forms for giving animal nourishment in early convalescence.

POWDER.—The form of powder is a very common one for the administration of medicines, as in this way the peculiar actions of the drug are more readily and certainly developed. Powders generally are prepared on the large scale by *drug grinders*, but as in the process, the drug is sometimes liable to extensive adulteration, some persons prefer preparing their own powders, although it is a very troublesome process. As drugs are more liable to spoil in the form of powder, emigrants and others may, in some instances, find it an advantage to powder their own. An iron mortar is generally used for powdering crude drugs, and if these are at all acrid, or indeed in any case, it is an advantage to have it fitted either with a wooden cover, or with a leather fastened round both mortar and pestle; a fine sieve is required to separate the finer portions of the powder from the coarser. Sir R. Christison remarks in his *Dispensatory*:—"The most prompt and effectual mode of obtaining fine powder is to use the mortar and sieve alternately—that is, to sift away the finer particles as soon as partial pulverisation is accomplished, to pound, or triturate again what remains on the sieve, to sift this as soon as a little more fine powder is formed, and to repeat the alternate trituration and sifting frequently, till the whole substance has passed through the sieve. In this way much time is saved, and much less of the finest powder is lost, by being driven off in triturating or pounding the coarser residue." As simple powders of the majority of the drugs used in medicine are prepared, it would take up unnecessary space to enumerate them here. The most useful compound powders admissible for domestic use are the—

Compound Cinnamon powder.
Aromatic powder of chalk with opium.
Compound powder of ipecacuanha or Dover's powder.—See *Dover's Powder.*
Compound jalap powder.—See *Jalap.*

These are better purchased, particularly the compound chalk with opium, but may be made.

The compound cinnamon powder is made by reducing to fine powder equal parts of cinnamon, cardamom seeds, and ginger.

Powders ought always to be kept in well-closed bottles, otherwise they lose their medicinal properties; some, such as squill or aloes, become damp and caked into a mass.

Powders are generally administered in some thick vehicle, such as preserve, thick gruel, or the like; if given in thin fluids, such as tea, &c., they are apt to sink to the bottom, and are partly lost.

PRACTICE.—The old saying that "practice makes perfect," is applicable to the practice of medicine, but it is with *some reservation;* a reservation which is not always taken into account by the public, nor admitted by a certain class, the "practical men," in the profession. Without practical experience, it is certain no man can be either physician or surgeon, however great his theoretical knowledge; but it is equally certain, if practical experience alone be trusted to, it will do but little to bring its possessor up to his proper position as regards medical science, and must often leave him at fault, when he ought not to be so, particularly in cases which differ from the ordinary routine. Neither years, nor extent of practice, can make the man a good practitioner, or at least as good a practitioner as he ought to be, if he neglects those aids and appliances in the treatment of disease which the industry and investigations of his numerous brethren are daily bringing forward. The public may draw their own inferences.

PRACTITIONER, GENERAL.—The term "general practitioner" has come into use as the designation of those belonging to that large majority of the medical profession who practise their profession in all its branches, in contradistinction to the physician, who eschews the lying-in chamber or the knife, to the pure surgeon, whose province is the treatment of external diseases or of such as require operative procedure, and to the accoucheur. These distinctions, useful in themselves, under certain restrictions, can only be followed out in large towns, or in isolated cases in particular districts: the mass of the profession must still continue to be general practitioners, apt for all that comes under their care. The term in question has superseded the old name of apothecary, which had become perfectly inapplicable to the practitioners of medicine in this kingdom, who, although sprung in the first instance from the apothecaries or chemists, the mere dispensers of the prescriptions of the physician or surgeon, have, by means of their high education and the stringent examinations of the various Licensing Boards, taken the place of the medical advisers generally of the people of all ranks—a place they are fairly entitled to. What is now required to complete the position of the general practitioner of medicine is, that they should as a body, except, perhaps, in the country, where it could not be conveniently acted upon, eschew the dispensing of their own drugs, and, certainly, in every case, cease to base their remuneration for advice and skill upon their medicines.

Refer to—*Medicine, Practice of—Physician—Surgeon, &c.*

PRECIPITATE. — Something thrown down; in chemical language the term is applied to a substance which is separated in a fluid by decomposition, and which falls to the bottom.

PRECOCITY—untimely maturity—is occasionally seen in the development of the body, and can only be regarded as a form of disease. Precocity of mind is by no means uncommon in children, and in too many instances is equally significant with undue physical development, and is much to be dreaded. The morbid excitability of brain is but the result of disease, and gives no promise of supereminence in after life. As a general rule, a precocious, or "strikingly clever," child, cannot be too much kept back from mental exertion; every effort should be made to divert the tendency to cerebral excitement, and by encouraging physical exertion, to divert the nervous power to the body at large: too often the reverse system is practised.

PRECORDIAL REGION.—The forepart of the chest over the heart.

PREDISPOSITION. — See DISEASE—HEREDITARY TENDENCY—MARRIAGE, &c.

PREGNANCY is the condition of a female between the periods of conception and delivery. The state is to be considered, both as regards the symptoms which usually indicate its existence, and also with respect to the bodily disorders which are most commonly associated with it; some of the symptoms, moreover, are also disorders. It is usually considered that pregnancy cannot take place before the establishment of menstruation; and, as a general rule, it does not, but cases are recorded in which it has done. The suppression of the above function, also, is always regarded as one of the most unequivocal proofs of pregnancy, but it is not by any means invariable; cases have been known, in which the secretion has appeared during the whole period up to the time of delivery, and in many it is manifested for one, two, or three months after conception. The swelling of the breasts, another sign of pregnancy, does not always occur, in a marked manner, if menstruation goes on, and may also be excited sympathetically by the presence of tumours, or by other causes of irritation connected with the womb. The breasts, also, may increase, simply from accumulation of fat; in this case, they do not afford the somewhat knotty feeling to the

hand that they do in pregnancy, but are smoother and more uniformly increased in size; probably, too, the increased deposition of fat is general. For the first few weeks of pregnancy the abdomen is flatter than usual, that is, before it begins to enlarge. The countenance undergoes an alteration, better known than to be described; the features look sharper, and the eyes larger than heretofore; these appearances, however, are more strongly manifested in some women than others. Among the earliest and best known of the symptomatic disorders of pregnancy, is nausea, with sickness. This is sometimes developed very early in the condition, occasionally within the first few days, but more generally not for two or three weeks; it is most usual in the morning, on the female first rising, but in some cases, is almost constant, and is then very distressing. Toothache is not an unfrequent attendant on pregnancy in all its stages. Salivation, that is, a constant flow of saliva into the mouth, causing constant spitting, is another though not very common symptom. Irritability of the bladder is common. Heartburn is most general in the later stages of pregnancy, but may be suffered from in all. In many, there is no very definite symptom, but a general feeling of unrest, with irritability of temper, &c. As pregnancy advances, other symptoms, or symptomatic disorders, show themselves; but, frequently, after the first few months, the health which has been disordered undergoes a remarkable change for the better, and continues good up to the period of child-birth; when this change occurs, as a sequence to symptoms of the first stages of pregnancy, and the general symptoms of the condition remain, any doubt of the true state of the case, if such has existed, may be laid aside. Some women never enjoy such regular good health, as they do during the entire nine months they carry their child. About the sixteenth week, a little before or after, the symptom of "quickening" occurs. This is popularly, but erroneously, thought to indicate the period when the child first becomes endowed with life; indeed, so fully has this error been embraced, that upon it, a principle of English law involving life and death has been established. The child is living from the commencement of pregnancy, the symptom of quickening is occasioned by a sudden change of the position of the womb, consequent upon its increase in volume; after quickening, however, the movements of the child are more perceptibly felt. Quickening is generally accompanied with temporary sickness and faintness, and with a sense of alarm for a short time. After its occurrence, the abdomen enlarges more perceptibly. Milk is now, or even before this found in the breasts, and the capability of its expression from them, may be taken as a corroborative, but not as an absolute sign of pregnancy, for it may occur independent of that condition, and in women who have already borne children, milk is apt to linger in the breasts for a considerable period. The nipple is sensibly enlarged after conception, and in most cases is surrounded by a more or less coloured ring, the "areola," as it is called by medical men. In some females, especially those with dark hair and skin, the areola is often extremely deeply coloured, of the deepest brown—from this shade it is of every variety, and in some is absent altogether; it, therefore, is not an invariable sign of pregnancy, for the reason, more especially, that it is sometimes witnessed without that condition.

The urine is found to be in some cases altered during pregnancy, particularly in the later months. If a portion of the secretion is allowed to stand four and twenty or six and thirty hours, a greasy-looking scum, with a cheesy smell, and presenting peculiar appearances under the microscope, is found on the surface. This does not show in all cases.

From the remarks above made it may be gathered, that although there are many signs and symptoms of pregnancy, there is, probably, not one which can by itself be depended upon in doubtful cases. In most instances the combination and perfect development of a certain number of the above symptoms make the case certain; but it may happen that there is much difficulty in coming to a satisfactory conclusion, especially in the earlier stages, and if there is any desire for concealment. Medical men are often unjustly blamed, and now and then laughed at, for having in the earlier stages of pregnancy treated the disorders thence resulting as ordinary ailments, characterised by the same symptoms. Where there is reason, as in the case of marriage, to expect pregnancy, this is not likely to be the case; for if the examination of the practitioner did not lead him to the fact, it is probable the female herself would intimate the possibility of her symptoms arising therefrom; in those cases, however, in which pregnancy can neither be expected nor suspected, and especially if there is reason for and attempt at concealment, it must be obvious to all how little comparatively there may be to lead to a conclusion which is not looked for; and further, how delicate must be the position, and how guarded the opinions of a medical man so situated. Were these matters better understood, and their difficulties more appreciated, his—often only apparent—errors in these matters, would be more charitably regarded.

By the fifth month of pregnancy, all the symptoms have for the most part become evident, but there are disorders which more generally show themselves during the latter part of the period. One of the most frequent of these is costiveness, occasioned, doubtless, in part by the mechanical obstruction caused by the enlarged womb. The legs are apt to become swollen, or their veins to enlarge, from the same cause acting upon the large veins

within the abdomen. The impediment to the flow of blood also exhibits itself in the formation of piles, which may cause much inconvenience during the last months of pregnancy.

Cramp in the lower limbs, caused by the pressure of the enlarged womb upon the nerves, often causes much annoyance, and sympathetic nervous pains throughout the body are not uncommon. Irritability of the bladder is apt to be much increased at this time; headaches, too, occur in some women, and may be of great severity, threatening convulsion. The above is rather a formidable array of the ailments from which many pregnant women may suffer, and some unquestionably do suffer, and severely so; but very many are free from the majority of them, except perhaps in slight degree; as said above, some women never enjoy such perfect health as they do when "in the family way."

The proper management of the disorders incidental to pregnancy will certainly do much to alleviate their inconveniences.

The first which generally requires attention is the sickness. This may in some measure be prevented by attention to diet, and by the avoidance of all articles of food which were known to disagree, or which are found to disagree; for the rule which holds good in the ordinary state does not always do so in pregnancy. Effervescing draughts of soda or potash water, or made at home with soda and lemon juice (see *Effervescing*), are useful, and to each may be added from half to a whole tea-spoonful of sal volatile. A medical man may possibly add a drop or two of the medicinal prussic acid to each dose, but this must be left to medical regulation. If there is much acidity, the bicarbonates of soda or potash, or the fluid magnesia, will be found useful, and at the same time check the vomiting. In cases of debility, a tea-spoonful of calcined magnesia, in three parts of a wine-glassful of sherry, may be given with advantage. In obstinate heartburn and indigestion, with or without vomiting, a wine-glassful of the infusion of calumba, in combination with soda, potash, or magnesia, is one of the best remedies, and may be taken twice, or, if requisite, thrice a day. In cases of extremely obstinate vomiting, creasote (see *Creasote*) may be tried, or spirits of chloroform in doses of twenty drops at a time in a little water. Small pieces of ice allowed to melt in the mouth may also prove of advantage. In some cases of obstinate sickness the writer has found the administration of one drop of ipecacuanha wine, in a tea-spoonful of water, given every hour, of the most essential service. The tincture of nux vomica, in twenty-drop doses, will very likely prove serviceable, but can only be given with safety by a medical man.

The costiveness of pregnancy is often more troublesome to manage, as the usual convenient aperient pills are inadmissible, on account of the aloes they contain.

Castor oil is the most generally useful and safe aperient when it can be taken regularly, but very many find it impossible to continue its use for long, in consequence of the nausea it occasions. Those whose bowels are very easily moved sometimes find the finest olive or salad oil answer well in table-spoonful doses. Senna infusion may be safely taken in the pregnant state, and in those who are of full habit, small well-diluted doses of the neutral salts, such as Epsom or Rochelle, are extremely useful. Rhubarb and magnesia is a safe combination, but generally too mild. The regular use of some form of injection (see *Enema*), which is found to be sufficiently efficacious, is one of the best methods of regulating the bowels in pregnancy, and regulated they must be in some way; there is nothing more likely, not only to increase the uncomfortable sensations incident to the condition itself, but to render delivery more difficult, and recovery from it more liable to accident, than a habitually constipated condition of the bowels. When piles occur, it is generally in connexion with costiveness (see *Piles*). Irritability of the bladder, characterised by constant desire to pass urine, is sometimes very obstinate, and, in the later stages, in which it depends on the mechanical pressure of the enlarged womb, very difficult to remove. It is most likely to be alleviated by the use of a broad belt or band passed round the abdomen, so as to give adequate mechanical support to the enlarged womb; indeed, the belt will not only often relieve the above troublesome symptom, but will remove many of the other uneasy or painful sensations which accompany the latter stages of pregnancy. When, along with irritability of the bladder, the urine is scanty, high coloured, and deposits red sediment on standing, ten-drop doses of the solution of liquor potassæ taken in barley-water, twice or three times a day, will probably give much relief; in weakly and debilitated constitutions, ten drops of the tincture of perchloride of iron, in a wine-glassful of water, twice a day, will be perhaps a better remedy. Malt liquor is apt to increase the urinary irritation, and must therefore be avoided; and, if stimulants are required, wine and water, or weak brandy or gin and water substituted.

Cramp, being dependent on a mechanical cause, is difficult to remove; it may, however, be alleviated by the use of the abdominal belt, and by strict attention to the state of the bowels and digestive organs; indeed, during the whole period of pregnancy, carefulness and moderation in diet will be found to influence, greatly for the better, many of the casual inconveniences. The author can speak highly of the great value of the abdominal belt in relieving many of the uncomfortable sensations connected with pregnancy. These belts are manufactured in different ways by the makers,

but patients may make very efficient ones, with a little care, for themselves.—See *Cramp.*

Swelling of the legs, and of their veins, being dependent, like cramp, on mechanical causes, is to be relieved by attention to mechanical modes of treatment, particularly by care that no unnecessary accumulation in the bowels adds to the obstruction to the return of the blood through the veins; keeping the feet and legs up as much as possible, bandaging, friction, &c., are all useful in relieving the condition.—See *Veins.*

The breasts should be left as free as is consistent with appearance, and the nipples especially attended to (see *Nipples*). Headache, if continued and severe in pregnancy, is a symptom which must not be overlooked; it may simply be owing to costiveness, or other slight temporary causes, and be easily removable; but if its severity continues, accompanied with flushing of the features, fulness or redness of the eyes, throbbing of the vessels of the head and neck, medical assistance should be sought without delay; in the meantime, the measures recommended in cases of threatened inflammation of the brain are to be carried out more or less actively, according to the severity of symptoms. Convulsions sometimes occur in pregnancy: a medical man must see the case without a moment's unnecessary delay, if possible; but if delay must occur, the patient should be managed as recommended under the article *Convulsion*, or as directed in the remarks upon the same affection after delivery (see *Childbirth*). Fainting is a symptom which *may* be of grave import: its cause should be investigated by a medical attendant; in the meanwhile it must be treated as fainting generally, unless it is dependent on loss of blood, as in abortion.—See *Abortion.*

Troublesome itching eruptions on the skin, sore and ulcerated mouth, are all apt to be attendant on the condition of pregnancy; they are to be treated in the ordinary method (see *Aphtha,—Skin, &c.*), but are often very intractable, and disappear only after delivery.

The above are the chief physical considerations connected with this most important phase of human life; but this article would be very incomplete without some allusion to those moral conditions and requirements which exert so powerful an influence over the well-being and well-doing of both mother and infant. And, it may be remarked, that without attention to the physical health of the body, the moral atmosphere is much more liable to be disturbed, and that the mind is much more apt to become irritable, especially if the digestive organs are disordered, as they often are by the too great indulgence of food, which is frequently thought to be not only allowable, but desirable in the pregnant state. The same effect follows the indolent habits so often indulged in. Unless prohibited for cogent reasons, regular and sufficient exercise ought to be taken daily, up to the time of confinement —nothing tends more to preserve the health of the body or the cheerfulness of the mind. It is not by any means desirable for a female, during pregnancy, to withdraw from the performance of the ordinary active duties of life; the mental engagement resulting therefrom is most beneficial, and prevents the thoughts from reverting, as they *will* do sometimes, to disagreeable or gloomy subjects. At the same time, a woman, during pregnancy, ought to be freed from any of the severer and more harassing occupations, and as much as possible kept from mental uneasiness, and spared, as far as can be, those things which excite unpleasant emotions in the mind. That the infant is affected by the mental condition of the mother, is undoubted; she cannot be too careful in keeping guard over herself, not for her child's sake solely, but for her own in future years, when that child may display tendencies which it owes to the maternal influence in the first period of its existence. The morbid longings of pregnancy have been already alluded to (see *Longings*).

The ordinary period of gestation is important, if only as a matter of convenience, to enable the mother to calculate and make the necessary arrangements for her confinement; but its precise duration, or the number of weeks or days required to complete its term, not unfrequently becomes of the most serious moment, as a point of law, on which may hinge the inheritance of fortune or of title, or the happiness and fair fame of families and individuals. The generally allowed calculation for the duration of pregnancy is forty weeks, or 280 days, from the last menstrual period; but evidently such a calculation must be liable to some variation; in law, all births which occur before the thirty-eighth week of pregnancy are considered premature; those after the fortieth week, as protracted cases. It is certain that cases are frequently protracted beyond the fortieth week of calculation at least, and that these generally prove male births.

The subject of false pregnancy is of considerable interest and importance: the following remarks from Dr. Montgomery's *Signs and Symptoms of Pregnancy* are instructive, and may put some on their guard:—"It is necessary," says the author, "to notice a condition of the female system of a remarkable kind, most frequently observed about the turn of life, when the *catamenia*, becoming irregular, previous to their final cessation, are suppressed for a few periods, and at the same time, the stomach being out of order, nausea or vomiting is experienced, the breasts enlarge, become sensible, or even slightly painful, and sometimes a serous or sero-lactescent fluid exudes from the nipples and orifices of the areolar tubercles; the abdomen grows fuller, and more prominent, especially in women of full habit, and constitutionally disposed to *embonpoint;*

and the abdominal enlargement progressively increases, partly from deposition of fat in the integuments and in the omentum, but still more from distension of the intestines by flatus, which, passing from one part to another, communicates a sensation like that produced by the motion of a fœtus; the nervous system is generally much disturbed, and the woman feels convinced that she is pregnant, an idea which, at the time of life alluded to, is cherished by the sex with extraordinary devotion, and relinquished with proportionate reluctance, and not unfrequently at the end of the supposed gestation the delusion is rendered complete, and almost assumes the character of reality, by the occurrence of periodical pains strongly resembling labour.

The occurrence of abortion during pregnancy, and the precautions to be adopted when the tendency exists, or indeed at any time, having been already treated of under the head of *Abortion*, it is unnecessary to reiterate them here.

Refer to—*Abortion—Child-bed—Pelvis, &c.*

PREMATURE BIRTH.—One which occurs before the thirty-eighth week of pregnancy. In most cases the occurrence of premature confinement is to be sedulously guarded against, for it cannot be expected that children generally, born out of due time, can be as strong as those whose birth is in every respect regular. Cases, however, do occur in which, both on account of the mother's safety, and as the only possible chance of having a living child produced at all, it is necessary to induce premature labour (see *Pelvis*). The induction of premature labour can, of course, only be entrusted to the hands of the skilful. —See *Child-bed—Pregnancy, &c.*

PRESCRIPTION.—A medical prescription is the form, with directions, in which a medicine or medicines are ordered or "prescribed" by a medical man. In England, both prescriptions and directions are usually written in Latin; in Scotland the directions are very generally given in English, and though, perhaps, the method is not so consistent as that which preserves the same language throughout, it is safer and more convenient. In former times prescriptions were much more complicated than they are now, generally at least, and certainly the simplicity may be regarded as a sign of increased medical knowledge, and of greater confidence in the action of medicines. Some persons even contend that in prescriptions there should be no intermixture of medicines, but that one only should be given with a certain definite object, and allowed to operate unembarrassed by the presence of others. It is not difficult to show how materially this would interfere with the efficiency of practical medicine, at least in the present state of our knowledge. The Pharmacopœia abounds with prescriptions containing combinations of remedies in various forms, and there can be no doubt that it is desirable alike in the interests of patients and doctors that the formulæ there given should be adhered to when possible, but circumstances constantly occur which render a deviation from this principle necessary. Thus, a medical man may desire to combine a purgative with a diuretic, or a tonic with a sedative, in a state of graduation such as no officinal preparation presents, and he is consequently left to fall back on his own judgment, as to how he can best meet the peculiarities of each individual case. Another object of a prescription is to give directions relative to administration, so as to render the medicine least repulsive to the recipient.

Many persons seem to imagine that because a medical man can sit down and write off a prescription in a few minutes, it is quite as easy for him to *give* it when requested. This erroneous impression does not extend so much to physicians practising only as such, but it often operates to the injury of the general practitioner, who is not unfrequently, when persons are leaving his vicinity, either temporarily or permanently, asked for his prescription of medicine they have been taking, while at the same time there is but little idea of its being paid for. A moment's reflection will show that this prescription is as much a work of skill, and the result of previous labour, as the design of the artist, and that, moreover, in furnishing it the medical man is probably interfering with his own remuneration at some future time, when the prescription is made to stand in lieu of his advice. Some general practitioners refuse their prescriptions altogether; this they are not justified in doing, but if they do furnish them, they are quite entitled to their guinea fee. Another error with respect to prescriptions is, that one having been found of service at some former time, is very generally had recourse to at another; in some few cases the act may not be followed by any particular injury, but, generally, it is a very foolish system, and persons who can afford to fee a physician, but prefer, instead, to take advantage of some old prescription, deserve to pay in a little inconvenience for their stinginess.

PRESERVED PROVISIONS.—The tendency of all dead organised matter which contains moisture is, at ordinary temperatures, to undergo chemical change (see *Putrefaction*), or, in other words, the various vegetable and animal products, when deprived of life, decay. When these products are such as are employed for food, it of course becomes a matter of considerable importance to counteract this tendency to decomposition, by which the articles are speedily rendered useless. It becomes of importance to preserve them as perfectly, and for as long a period as possible. The preservation of provisions may be effected—1st, by cold, that is, by keeping them at a tempera-

ture below that at which putrefaction takes place; 2nd, by heat, which acts by hardening and coagulating the albumen and other constituents, so that they are more disposed to resist chemical change, or by heat and dryness combined, so that the water, which is essential for the process of putrefaction, is removed; 3rd, by the use of certain agents, or antiseptics (see *Antiseptics*), which impart the power of resisting decomposition; and 4th, by excluding the action of the atmosphere, the oxygen of which is requisite for the putrefactive process.

The preservation of articles of food by keeping them at a low temperature is sufficiently well known; and among such nations as the Russians, whose climate during the winter months is one of unvarying frost, the preservative action of cold is largely taken advantage of. Cattle, poultry, &c., are killed at the commencement of frost, allowed to become frozen throughout, and in this condition are brought to market at the large winter fairs; fish are treated in the same way, and are thus preserved for months in a perfectly fresh and wholesome state; provisions thus preserved only requiring the precaution of being *gradually* thawed, before use, by immersion in cold water. In this country ice has always been largely used to pack salmon, and fish generally, in summer time, but it is only within the last few years that the process of preserving meat by refrigeration has come into general use.

The importation of dead meat from America in vessels fitted with chilled chambers, has now become an extensive and rapidly increasing trade, bidding fair to revolutionise the sale in this country, as well as in those parts of the world where mutton and beef have been hitherto scarce and expensive. In the methods employed it does not appear to be desirable to expose the meat to a temperature sufficient to freeze it, though it is essential that the air should pass readily through the chambers at a temperature a few degrees above freezing. It is easy to see how much waste of meat, including fish and perhaps poultry, could be avoided, if such cold storage chambers were annexed to our chief provision marts, to preserve the meat until it was wanted. With such an arrangement, the irregularity of the demand and atmospheric changes would not entail the losses they now do, both to retailer and consumer. More recent attempts to introduce frozen meat from Australia hold out hopes that the sources of supply may be still further enlarged, notwithstanding the prejudice which exists among many persons against partaking of meat that has undergone congelation.

The action of an elevated temperature, such as is employed in cooking food, must be regarded rather as a retarder than as a complete preventive of putrefaction; it is therefore inapplicable, except as a mere temporary expedient. When heat is combined with dryness, it acts much more perfectly as a preservative, as is shown by the preservation of the bodies of men and animals who have perished in the African deserts; and also in the practice, more especially of the Indians and others of the South American Pampas, who preserve their beef by cutting it in strips and hanging it to dry in the hot sun in a current of air; preserved in this way it will keep for a considerable time.

In the case of vegetables, which contain so large an amount of water, in proportion to their solid and nutrient material, the process of drying is peculiarly applicable, and seems likely to be largely employed as the means of furnishing *fresh* vegetable food for ships in a compact and easily carried form, when, in addition to the dessication, compression is also resorted to. This double process "appears to have been put into execution with very considerable success, under the patent of M. Masson, head gardener to the Horticultural Society of Paris. This gentleman has succeeded in preserving in a very perfect manner various descriptions of vegetables and fruits; the substances thus preserved are dry and shrivelled, contain but little water, and it is evident from their appearance that a very essential part of the process of preservation consists in the abstraction of the water, which forms so very considerable a portion of the weight and bulk of nearly all vegetables and fruits. When vegetables thus prepared are immersed in water for some time, they swell up, become soft and tender, and resume, to a great extent, the appearance, colour, and flavour proper to them in the fresh state. M. Masson has managed to preserve completely spinach, Brussels sprouts, cabbage, beans, peas, sliced carrots, parsnips, potatoes, apples, &c.

"It is stated that a cubic yard of these dried and compressed vegetables contains as much as 16,000 rations; and that they are of better flavour, and much cheaper than the vegetables preserved in canisters."

The preservation of provisions by their impregnation with antiseptic agents, such as salt, is perhaps more extensively practised than any other method. Salt, sugar, spices, vinegar, spirit, and fumigation by burning wood, which is in fact preserving by means of creasote, are the most common preserving methods, and for many purposes answer perfectly, both as regards the agreeability, and within certain limits of use, the wholesomeness of the food to which they are applied; they have, however, the drawback of being partly, in themselves, chemical additions to food, and also of inducing chemical changes, which modify, at least, the quality and digestibility of the aliment. Moreover, salt extracts, "draws out," from meat some of its most important nutrient constituents. Liebig, in his *Chemistry of Food*, remarks:—"It is universally known that in the salting of meat, the flesh is rubbed and sprinkled with dry salt, and that where the

salt and meat are in contact a brine is formed, amounting in bulk to one-third of the fluid contained in the raw flesh. I have ascertained that the brine contains the chief constituents of a concentrated soup, or infusion of meat, and that, therefore, in the process of salting, the composition of the flesh is changed; and this, too, in a much greater degree than occurs in boiling. In boiling, the highly nutritious albumen remains in the mass of flesh; but in salting, the albumen is separated from the flesh; for when the brine from salted meat is heated to boiling, a large quantity of albumen separates as a coagulum.

"It is now easy to understand, that in the salting of meat, when this is pushed so far as to produce the brine above mentioned, a number of substances are withdrawn from the flesh which are essential to its constitution, and that it therefore loses in nutritive quality in proportion to this abstraction. If these substances be not supplied from other quarters, it is obvious that a part of the flesh is converted into an element of respiration—certainly not conducive to good health. It is certain, moreover, that the health of a man cannot be permanently sustained by means of salted meat, if the quantity be not greatly increased, inasmuch as it cannot perfectly replace, by the substances it contains, those parts of the body which have been expelled in consequence of the changes of matter, nor can it preserve in its normal state the fluid distributed in every part of the body, namely, the juices of the flesh. A change in the gastric juice, and consequently in that of the products of the digestive process, must be regarded as an inevitable result of the long-continued use of salted meat; and if, during digestion, the substances necessary to the transformation of that species of food be taken from other parts of the organism, these parts must lose their normal condition."

From the above objections, the process of preservation by exclusion of the action of atmospheric air is free; it does not preserve by inducing change, but, like cold, by preventing it. This mode of preserving food is yearly assuming more importance, and being more largely practised. The action of the atmosphere may be prevented in various ways, as by covering the articles with melted fat, &c., but the most perfect method, and that which is most largely resorted to, is the inclosure of the food in cases from which the air is then expelled, and which are made so impervious as to prevent the access of air; upon the perfection of the air-excluding process, both at the time and permanently, depends entirely the preservation of the article.

The following description is taken from the *Lancet*:—"The article to be preserved is placed, sometimes in the raw state, but generally cooked, in a tin canister, the lid of which is soldered down, but is perforated with a small aperture, or pin-hole. It is then subjected to the action of either steam, boiling-water, or a muriate of lime bath, until the contents of the canister, if not previously dressed, have become about two-thirds cooked. The aperture in the cover is then closed, and the canister and its contents are once more submitted for a shorter period, that is, until the article is completely dressed, to the operation of heat. As soon as it has become cold the canister is covered over with a coating of paint; its preparation is then completed, and it is removed to the proving-room. The proving-room is simply an apartment the temperature of which has been raised to the degree most favourable to decomposition. If the operation has been well performed, the top and bottom of the canister, as also, in some cases, the sides, will have fallen in or have collapsed to some extent; this indicates the exhaustion of the air within, and is regarded by the manufacturer as a tolerably correct proof that the process has been properly conducted. If, however, after some days' exposure in the proving-room, the top and bottom of the canister first become flat and subsequently even convex, it is a certain sign that the contents have not been well cured, and that they are not in a condition to keep for any length of time; such canisters have therefore to be either rejected, or else subjected to the process over again. . . . It should be known that it is not only *boiled* provisions which may be preserved by the above process, but *roasted* also, with but a little extra care."

The preparation and employment of provisions preserved in a fresh condition are important both in a sanitary and in an economic point of view; independent of the means of luxury which is thus afforded, it might be, and will probably be, of cheap luxury.

In all situations, as on board ship, where access to fresh provisions in their usual state is necessarily curtailed or denied, the preserved provision store is most invaluable as a means of maintaining health, and those, such as emigrants, who meditate a long sea voyage, unless they are satisfied that the ship they embark in is well supplied with fresh preserved food, ought, if possible, to have a small private store. It has occasionally happened that tinned meats have turned out badly, from defects in their preparation or from other causes, and this fact might prejudice some against this description of meat; but with the improvements now made in the process of preservation, as well as the tests to which the canisters are subjected before being offered for sale, there is little to fear from the meat turning bad.

As regards the economic advantages to be derived from the employment of preserved provisions, it is sufficient to advert to the facts, that in South America the cattle are sometimes slaughtered for the sake of their hides, horny parts, bones, &c., and that the flesh is wasted; that in Australia sheep have been boiled down for the sake of their tallow alone. The extensive

preparation of Liebig's and other extracts of meat, and notably the importation of large quantities of Australian tinned meats have, however, in a great measure, checked these abuses.

Charcoal, from its remarkable power of absorbing gases, is sometimes used as a preservative in which articles of food are packed. Lastly, such preparations as the patent meat biscuit, meat lozenges, and soups of various kinds, dessicated and moist, offer other forms in which nourishment may be preserved in a concentrated state. The meat biscuit is a useful preparation of concentrated meat and bread, and can be prepared for use in the shortest time as a soup. One pound of this meat biscuit, contains the nutriment of five pounds of the best beef, the extract of which is combined and baked with the finest flour, forming a most portable and convenient diet. It is eminently adapted for emigrants, travellers, and for ordinary use in families, &c. Its easy digestibility and highly nutritious properties render it very valuable for invalids and convalescents, and generally for use in hospitals.

Brand's essence of beef is a costly but valuable preparation, which has not undergone any chemical transformation. The other essences and extracts, such as Liebig's, Whitehead's, Gillon's and Moir's, no doubt, represent a quantitive value out of all proportion with the bulk of the essence, when compared with the amount of meat expended in their preparation; but it must not be supposed on that account that such essences exhibit an equal amount of nutriment.

Pemmican, which "consists of the muscular fibre of beef, baked and reduced to a coarse powder," is another form of preserving animal food worthy of attention.—See *Pemmican.*

Refer to—*Antiseptics.*

PRESSURE.—The effect of continued pressure upon the living body may be regarded either as a cause of disease or as a curative agent. For some centuries pressure to death by loading a prisoner with the weight of chains was occasionally had recourse to, and pressure from the thumb-screw and the boot were among the most excruciating means of torture.

The effect of pressure in altering the shape, &c., of even the hardest portion of the animal frame, is well known: the savage Carib employs it to flatten the skull of his children into a hideous deformity, by him thought beauty; and the civilised female too often has recourse to it, with equally false ideas of proportion, to mould the ribs at her waist into a state of permanent contraction. Both instances show how even the bones may be affected by pressure from without, applied over an extended surface; when the surface of pressure is small the bone is absorbed, as evinced by the hollow often formed in the breast-bone of shoemakers, who have for many years pressed the "last" against the one spot. The effect of pressure upon the surfaces of the body, if long continued, is to cause thickening, as seen in the horny hand of the labourer, or in the corn from the tight shoe. When, however, pressure is too suddenly and continuously applied to surfaces unused to it, especially in debilitated states of body, instead of giving rise to thickening, it is apt to occasion mortification, or, at least ulceration. This effect of pressure is one of the most serious complications of long-continued illnesses, in which the difficulty, and often almost the impossibility, of moving a patient, or at least of preventing continued pressure upon the most prominent points of the body, are a source of much suffering on the one hand, and of anxiety on the other. In a long case of fever it may happen, especially if there is neglect, and, at times, under even the most attentive management, that ulcerated or "sloughing" spots form on the back of the head, the tips of the ears, the points of the shoulder-blades, over the hips, &c. To alleviate these effects, there are the various inventions of spring and water beds, elastic cushions, &c.—See *Fever, Enteric—Bed—Bed-sore—India-rubber, &c.*

The effect of pressure, as a curative agent, is often valuable. Thus, when swelling of a part, or of a limb, has followed from weakness in the circulation, the continued and even pressure of a bandage, or of an elastic covering, will do much to hasten its reduction. Tumours, such as bronchocele, will sometimes disappear under well applied pressure. Bleeding which threatens life may be stopped by pressure properly applied (see *Artery*), and for many years past, pressure instead of operative interference has been successfully employed as a remedy in aneurism, acting by interrupting the circulation of the blood through the vessel with which the aneurismal tumour is connected. The writer had the satisfaction some time since of completely curing by long-continued pressure, extending over two years, a large vascular nævus on the side of the neck, so evidently connected with an artery beneath, that the surgeons, in the country and in London, to whom it had been submitted, refused to interfere with it.

The continued pressure of the atmosphere upon the surface of our bodies at ordinary elevations, by its *variation*, as indicated by the changes of the barometer, probably exercises a greater influence upon our health and sensations than is generally suspected. The distressing effects experienced from the diminished pressure, in part at least, by those who ascend great heights, is well known.—See *Air.*

PRICKLY HEAT is a peculiar affection of the skin which affects those who live in hot climates, especially when first resident, and which also occurs in hot summers in this country. The following description of the late Dr. James Johnson, from his experience of the affection in India, is often quoted:—"The sensations arising from prickly heat are per-

fectly indescribable, being compounded of pricking, itching, tingling, and many other feelings for which I have no appropriate appellation." "It is usually, but not invariably, accompanied by an eruption of vivid red pimples, not larger in general than a pin's head, which spread over the breast, arms, thighs, neck, and occasionally along the forehead. This eruption often disappears in great measure when we are sitting quiet, and the skin is cool: but no sooner do we use any exercise that brings out a perspiration, or swallow any warm or stimulating fluid, such as tea, soup, or wine, than the pimples become elevated, so as to be distinctly seen, and but too distinctly felt."

In reference to the imagined dangers of repelling this eruption, Dr. Johnson continues, "Indeed, I never saw it even repelled by the cold bath, and in my own case, as well as in many others, it seemed rather to aggravate the eruption and disagreeable sensations, especially during the glow which succeeded immersion. It certainly disappears suddenly, sometimes on the accession of other diseases, but I never had reason to suppose that its disappearance occasioned them. I have tried lime juice, hair powder, and a variety of external applications, with little or no benefit; in short, the only means which I ever saw productive of any good effect in mitigating its violence, till the constitution got assimilated to the climate, were light clothing, temperance in eating and drinking, avoiding all exercise in the heat of the day; open bowels, and last, not least, a determined resolution to resist with stoical apathy its first attacks. To sit quiet and unmoved under its pressure, is undoubtedly no easy task, but if we can only muster up fortitude enough to bear with patience the first few minutes of the assault, without being roused into motion, the enemy, like the foiled tigers, will generally sneak, and leave us victorious for the time."

PRIVIES.—In scattered rural districts it is probable that privies must continue to exist, but in towns and large villages it is high time that this filthy system of excretal disposal should be abolished. Efforts are being made in some districts to bring this about, and the recent introduction of an appliance by which the slop water of houses is made use of as an automatic flush for a form of out-door water-closet has greatly simplified the question. A description of the slop-closet will be found in the section devoted to water-closets.

If circumstances forbid the adoption of a better mode of excretal disposal, the privy should be constructed on the lines laid down in the model Bye-laws of the Local Government Board. These requirements differ in accordance with whether the receptacle is a fixed one, receiving ashes and excreta, or movable, for excreta only. In the former case the admissible capacity amounts to 8 cubic feet, whereas in the latter the movable receptacle should not exceed 2 cubic feet. It is also requisite that both the floor of the fixed receptacle, and the floor of the compartment which receives the movable receptacle, should be at least 3 inches above the level of the surface of the ground; and it should be flagged or asphalted; the sides also must be constructed of flagging, slate, or good brickwork, 9 inches thick, rendered in cement.

It is important to remember that a fixed receptacle is inadmissible unless the ashes of the household are applied to the excreta. By keeping the contents dry these tend to retard decomposition, and so limit the nuisance which is inseparable from the system even under the most favourable conditions. The privy itself should be ventilated, should be placed at least 6 feet from any dwelling-house, and the contents should be removed *regularly*.

PROGNOSIS is the opinion of a medical man respecting the ultimate issue, possible, probable, or certain, of a case of disease. The formation of a prognosis involves a great variety of considerations. Independent of the nature of the disease itself, the constitutional tendencies of the patient, hereditary or acquired, must be duly weighed; the age, the mental condition, the external circumstances, and many others have all to be taken into account. Thus, for instance, in a person threatened with consumption, who has lost relatives, more or less, from the disease, the prognosis must be a more unfavourable one than when the disease is apparently, if we may so speak, accidentally developed; or, again, in a case of disease of the heart, occurring in a man forced to engage in bodily labour for his bread, the prognosis will be of a graver character than when the same disease affects a man at ease as regards this world's goods.

When a medical man sees a patient, if the case be at all serious, either the individual, or surrounding friends, are usually very anxious for a prognosis, an opinion, as to the ultimate issue of the case. In many cases it is possible to give this decidedly, and at once, and if it can be, it ought to be done; but, in many cases, it is quite impossible to come to any conclusion, and at least a second visit, if not more, must be paid before a just idea of the termination can be approached.

Some medical men are in the habit of giving, generally, a bad prognosis, that is, they express their opinion of the worst possibilities. This may arise from constitutional tendency to regard the dark side of matters, but more generally it originates in a selfish wish to serve their own reputation; if the patient dies, they are right; if he recovers, they have the more credit in the cure. However politic the course, it is neither considerate nor honest, for it sacrifices the feelings of relatives at least, to a selfish expediency, and causes unnecessary anxiety. In some measure, however, the

public are themselves to blame in the matter, from the little consideration often shown to a medical man, if his prognosis of a case turns out to be erroneous, especially if a favourable opinion has been given, and an unfavourable event ensued. It ought to be remembered that even in health, day by day, sudden changes to severe and dangerous illness, or to sudden death, are not unfrequent,—and if in health, how much more in illness,—changes, which it is impossible for the most skilful and observant to foresee. Again, a medical man is often most undeservedly censured in another way. A case is perhaps submitted to his examination at an early stage, before its more marked characteristics have shown themselves, and he perhaps gives an encouraging opinion; after a time, the case gets worse, more serious symptoms are developed, another opinion is taken, and this time the sentence of the first consulted is reversed; the last given prognosis proves correct, and, too often, without reflecting upon the altered aspect of the case in the one and in the other examination, the gentleman first consulted falls under the unjust imputations of those connected with the patient. The case is a common one.

The habit of giving a favourable prognosis when not justified by the state of the case, cannot be too strongly condemned. It is often practised with a view to sustain the spirits of the patient and others; but whilst every reasonable cheerful hope is to be held out, if death *must* close the case, for the sake of higher considerations than those of this world, for the sake of sparing the aggravated shock which *must* fall upon relatives when the fatal truth in all its intensity, and all its nearness, comes upon them, a tempered, it may be, but yet a true prognosis should be given.

Refer to — *Death* — *Diagnosis* — *Opinion*, *Medical*.

PROLAPSUS is a slipping or falling down of any internal portion of the body, so that it appears externally. The term is most commonly used with reference to prolapsus, "falling down," of the womb (see *Womb*, *&c.*), and also to prolapsus or eversion of the lower gut at the fundament, "coming down of the bowel," as it is often called. This accident is not uncommon in childhood, and in the aged, but occurs at any age, frequently in connexion with piles. Coming down of the bowel often happens from children being permitted to sit too long on the chamber vessel, after a movement of the bowels; it is often, too, a consequence of straining, of irritation from worms, or of stone in the bladder. The extent to which the gut is protruded, varies from the slightest possible, to a considerable length, causing a red or purplish swelling, according to the length of time the protrusion has existed.

If quickly attended to, the protrusion is usually easily returned by pressure exerted by the hand through the medium of a piece of greased cloth, the person being of course laid in the horizontal posture; or the forefinger should be oiled and introduced into the anus, when it will probably convey the protrusion with it, if, however, the protrusion has been neglected, and allowed to continue unreduced for some hours, it becomes in a measure strangulated, congested with blood, and consequently swollen, and is then sometimes very difficult to return; in such a case a medical man will probably be required, and, indeed, ought to be called; in the meanwhile, by gently squeezing the neck of the protrusion, and exerting gentle pressure upwards, having previously freely applied grease of some kind to it, efforts may be made to effect its return. When protrusion of the gut occurs habitually,

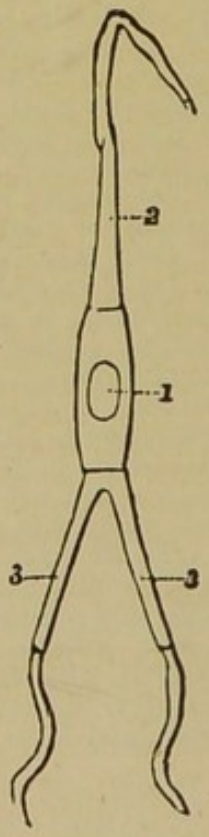


Fig. 171.

a medical man should investigate the cause, so that any source of irritation may be removed; the bowels should be kept perfectly lax, so as to prevent straining, and in children, especially, too long sitting at stool prevented, the seat being made so high that the legs cannot touch the ground.

Cold injections, and astringent lotions injected into the bowel are often useful. As recommended by Mr. Vincent, a small quantity of a solution of one grain of sulphate of iron to the ounce of rain or distilled water, may be thrown into the bowel after each relief, and *retained*. Bathing the loins regularly with cold water will be of service.

Some cases of protrusion depend on causes, such as internal piles, which require a surgical

operation for their removal. Persons liable to prolapus of the gut often experience much comfort from wearing the form of bandage, fig. 171. This consists of a sponge, which must be moistened, or a pad of some soft or *smooth* firm material, which is applied to the fundament, and kept in place by means of straps, which are best made of elastic material; the strap (2), fastening behind and (3, 3) in front to a belt passed round the body. A bandage something similar to fig. 22, article *Bandage*, will, with the requisite pad, answer the purpose.

Refer to—*Piles—Rectum, &c.*

PROSTATE GLAND.—See BLADDER.

PROTEINE—a name formerly (and still) employed to denote the basic constituents of certain animal and vegetable principles of first importance in connexion with food and the structure of the body, and which are synonymous with the albuminates, albuminoids, or nitrogenous elements, as distinguished from such as contain no nitrogen. They comprise albumen, fibrine, and caseine, which are alike common to the animal and vegetable kingdoms, and other products such as syntonin, globulin, and keratin, exclusively belonging to the animal kingdom. Proteine bodies are identical in their chemical composition, containing always the same proportions of the four principal elements with a varying proportion of sulphur, though not exceeding 1·6 per cent. Soluble in their natural state, they are rendered insoluble, or, in other words, are coagulated, by heat and the mineral acids.

PROTRUSION of various portions of the body may take place either through natural or artificial openings.—See *Prolapsus—Rupture, &c.*

PROUD FLESH. — See GRANULATION—ULCER, &C.

PROXIMATE CAUSE, in medicine, is the most immediately traceable cause of the symptoms of a disease, or of the death of a person; thus, dropsy following disease of the kidneys, liver, or other organs, or disease of the heart following rheumatism, become the proximate cause of the suffering, and very probably of their fatal termination.

PRUNES,—the dried fruit of the common plum, contain a considerable quantity of sugar, and when cooked, as stewed, are wholesome, and at the same time laxative (see *Purgatives*). Unless softened by stewing, prunes are indigestible. The bark of the Virginia prune is said to be sometimes used as a remedy in intermittent fever.

PRURIGO—a papular affection of the skin, attended with troublesome itching.—See *Skin.*

PRURITUS.—Itching of the skin.—See *Skin.*

PRUSSIC ACID, or HYDROCYANIC ACID, exists in the distilled waters, principally of the peach tribe, as of the bitter almond; but is usually formed artificially. It is a compound of the three elementary gases, nitrogen, hydrogen, and carbon. Although called an acid, its acid properties are but feebly developed. The odour of hydrocyanic acid is powerful and peculiar, and pungent to the nostrils; it is often compared to that of the bitter almond. Pure prussic acid is sometimes prepared, but quickly decomposes; it is usually met with in a diluted form, and that which is used in medicine is, or ought to be, made of a certain regular strength. The uses of medicinal prussic acid in the hands of a medical man are most valuable; it acts as a powerful sedative, allaying pain, sickness, and nervous irritability; it is, too, a most admirable addition to lotions for various purposes; but in any form could not safely be had recourse to as a domestic remedy. Poisoning by prussic acid or by cyanide of potassium, a preparation largely used by photographers and containing prussic acid, is, unfortunately, not of rare occurrence; in most cases, life is destroyed so rapidly that little if any time is afforded for the employment of antidotes, at least, by a medical man; it is, therefore, important that the best remedies in such cases should be immediately had recourse to, although too often, from the powerful nature of the poison and the quantity swallowed, all is in vain.

When a large dose of prussic acid has been swallowed, "the symptoms may commence in the act of swallowing, or within a few seconds. It is rare that their appearance is delayed beyond one or two minutes. When the patient has been seen at this period he has been perfectly insensible; there is convulsive respiration at long intervals, and he appears dead in the intermediate time. The breath commonly exhales a strong odour of the acid. The finger nails have been found of a livid colour, and the hands firmly clenched. When a small over-dose has been taken, the individual has first experienced weight and pain in the head with confusion of intellect, nausea, and a quick pulse; although these symptoms are sometimes slow in appearing."

Many antidotes have been proposed for employment in cases of poisoning by prussic acid, but few of them are likely to be available in so sudden, and generally so unlooked for, an emergency. The cold affusion—that is, water as cold as it can be procured, dashed freely over the body, the head and spine especially—is a remedy generally available. Ammonia, either in the form of sal volatile, or hartshorn, &c., is to be given and its vapour inhaled; or better still, but not so likely to be at hand, chlorine in some form. Thirty drops of the solution of chlorinated lime, or of chlorinated soda, may be given at once in a little water, their vapour being at the same time inhaled; this may be more abundantly evoked by the addition of an acid. Artificial respiration (see *Opium*) should be had recourse to. and galvanism, if available. To repeat: the

best antidotes are—cold affusions; chlorine, swallowed and in vapour; ammonia, swallowed and in vapour; artificial respiration.

PSOAS.—Belonging to the loins. The psoæ muscles are large muscles connected with the loins and spine. A psoas abscess is one originating in the loins.

Refer to—*Lumbar.*

PSORA.—The itch.

PSORIASIS—a peculiar disease of the skin.—See *Skin.*

PTISAN, or TISANE—a vegetable infusion or docoction, generally of a mucilaginous character, which may be drunk freely by, and is given freely to, the sick. Barley-water is a ptisan. Ptisans are extensively used in France, and in many different forms.—See *Drinks.*

PTYALISM, or SALIVATION. The increased flow of saliva produced by the action of mercury on the system.—See *Mercury.*

PUBERTY is that important transition epoch in human life, when childhood passes into youth, the forerunner of manhood and womanhood. In English law, the time of puberty is considered in the male to be at fourteen years of age, in the female, two years later; but these periods must be generally considered quite sufficiently early, as regards this latitude at least; in warmer climates the period of puberty probably arrives a little sooner, but not so much so as has generally been imagined; as a great deal depends upon the natural constitution of the individual, and upon the influence of external circumstances. The important changes and excitements undergone by the constitution at the period of puberty, necessarily render it a critical period, when disease, to which a latent tendency exists, may be roused into activity. At this time, therefore, a stricter watch than usual should be kept upon the health of the young, and any unusual symptoms at once submitted to the judgment of a medical man.—See *Menstruation.*

PUBLIC HEALTH.—Progressive in most respects as this country is, it has been slow to initiate measures of a comprehensive and stringent character for the protection of the lives of the community, not so much from the apathy of the legislature as from the absence of unity of action and authority on the part of the separate bodies to whom such measures were relegated. Vestries, Boards of Guardians, Poor-law officers, with occasional instructions from the Privy Council, as well as Acts passed from time to time on the advent of an epidemic, or famine visitation, constituted the main apparatus for battling with disease in a national sense; and, as a consequence, legislative enactments passed for the benefit of the community were embarrassing in their operation, and too often became a dead letter. Until the Act of 1872 was passed, establishing the Local Government Board, and consolidating the various departments bearing on Poor-law relief and Health into one, with a Minister of State for its president, it cannot be said that the Health of the Community was fully recognised as an object of legislative control.

The Public Health Act of 1875; *Powers of the Local Government Board:*—The Act of 1872, followed by the Public Health Act of 1875, conferred large powers on the Board, to enable it to deal with subjects in relation to health, which had been but imperfectly attended to before; and as an important step towards unity of action, the country was divided into Rural and Urban districts, supervised by local boards, termed Sanitary Authorities, with Medical Officers and Inspectors of Nuisances attached, all subject in a greater or less degree to the central authority. To these separate agencies are referred the power of passing rules or bye-laws for the administration and building of workhouses, infirmaries, and asylums for contagious diseases; the planning of streets and houses; the direction of sewers, and the arrangements for water supply, for vaccination, and for the prevention of disease in its widest acceptation. In addition to these subjects, which have special reference to health, there are numerous clauses in the Act having a less direct application, and which deal more with the habits and customs of the people,—such as the regulation of markets, hackney carriages, public baths, and pleasure grounds, together with the removal of public and private nuisances,—the central authority being possessed of the power of enforcing its enactments through its Inspectors. The Board has also authority, should it appear necessary, to obtain money through the public funds on the security of the local rate to carry out all necessary improvements in a district.

Duties of the Medical Officers of Health:—The Medical Officers of Health appointed to separate districts are required to report periodically on the health of the population, the rate of mortality, the existence and incidence of epidemic disease, and the means of its prevention, or of checking its extension. They are armed with sufficient power to inspect premises where they have reason to believe a nuisance exists, and to take proceedings for its removal; to seize meat of any kind exposed for sale which they may deem unsuitable for human food; to inspect premises known to be in an over-crowded condition, and dangerous from the accumulation of filth and the want of suitable means of ventilation; to remedy or suppress nuisances arising from noxious vapours and offensive trades; to ascertain the course of drains and their numerous ramifications; and to give advice on all matters relating to the health of their several districts.

Bye-laws of the Local Government Board.—In questions involving so many complex problems, and public as well as individual interests, it was easy to foresee that the unification of a system organised by so many separate

sanitary authoriries must be a work of time and labour, and accordingly the Public Health Act of 1875 provided for the issue, from time to time, of a series of Model Bye-laws by the Local Government Board, for the guidance of sanitary authorities, to aid and supplement the provisions of the Statute law. Apart from other Acts bearing on the Sale of Food and Drugs, on Workshops, Factories and Mines, and the Vaccination Acts, the Model Bye-laws of the Local Government Board have special reference to thirteen distinct departments of the public health, of which the following is a summary:—

1. Removal of nuisances.
2. Prevention of nuisances.
3. Common lodging-houses.
4. New streets and buildings.
5. Markets.
6. Slaughter-houses.
7. Hackney carriages.
8. Public bathing.
9. Baths and wash-houses.
10. Pleasure grounds.
11. Pleasure boats and vessels.
12. Horses, &c., standing for hire.
13. Houses let in lodgings.

It will suffice, however, to refer here briefly to the Model Bye-laws which concern the first four sections of the above list, and it may be as well to state at the outset, that the Act of 1875 defines a *nuisance* to be any thing which by fouling the air may prove injurious to health.

1. *Removal of Nuisances.*—The first section respecting the removal of nuisances enacts that the occupier of any premises fronting the street is bound to cleanse the footways daily, and to remove weekly all house refuse from the premises; that he shall once, at least, in every three months, cleanse every earth closet and cesspool on such premises, and once, at least, in every week, cleanse every ashpit and every privy furnished with a movable receptacle for fœcal matter.

2. *Prevention of Nuisances.*—The second section enacts that occupiers are bound under penalties to remove nuisances that may arise from snow, filth, dust, ashes, and rubbish of all kinds, in and around their premises, at reasonable intervals of time; and the law specially refers to the abatement of nuisances caused by keeping animals whose condition, if not carefully guarded, would prove injurious to health.

3. *Common lodging-houses, and the Dwellings inhabited by the Poor.*—The Model Bye-laws of the third section, which relate to common lodging-houses, are equally applicable to other buildings inhabited by the poor, as they refer to conditions of wholesomeness for occupied buildings generally, and specially to the arrangements necessary to prevent over-crowding. With regard to the health character of the house, the memorandum explanatory of the scope of the Bye-laws specifies that "the house should be dry in its foundations, and furnished with proper drainage, guttering, and spouting, and that its drains should have their connexions properly made, and that they should be trapped where necessary, and adequately ventilated. Except the soil-pipe from a properly trapped water-closet, there should be no direct communication of the drains with the interior of the house. All waste pipes from sinks, basins, and cisterns, should discharge in the open air over gullies outside the house. The soil-pipe should always be efficiently ventilated. The closets or privies, and the refuse receptacles of the house, should be in proper situations, of proper construction, and adapted to any scavenging arrangements that may be in force in the district. The house should have a water supply of good quality, and if the water be stored in cisterns, these should be conveniently placed, and of proper construction to prevent any fouling of water. The walls, roof, and floors of the house should be in good repair. Inside walls should not be papered. The rooms and staircases should possess the means of complete ventilation, windows being of adequate size, able to be opened to their full extent, or, if sash-windows, both at top and bottom. Any room that has not a chimney should be furnished with a special ventilating opening or shaft, but a room not having a window to the outer air can seldom be proper for registration."

With respect to the amount of sleeping accommodation in lodging-houses, the Memorandum states that in rooms of ordinary construction—that is to say, with means of ventilation by windows and chimneys—300 cubic feet of space ought to be secured for each person. "The house should possess kitchen and day-room accommodation, apart from its bed-rooms, and such rooms as are partially under ground should not be used as bed-rooms. The amount of water supply, closet or privy accommodation, and the provision of refuse receptacles, should be proportionate to the numbers for which the house is registered. If the water is not supplied from works with constant service, a quantity should be secured for daily use on a scale per registered inmates of not less than ten gallons a day where there are water-closets, or five gallons a day where there are dry closets. For every twenty registered lodgers, a separate closet or privy should be required. The washing accommodation should, wherever practicable, be in a special place, and not be in the bed-rooms, and the basins for personal washing should be fixed and have water taps and discharge pipes connected with them."

Where illness arising from infectious disease occurs in a lodging-house, the Bye-laws enact that "The keeper shall adopt all such precautions as may be necessary to prevent the

spread of such disease," by isolating the patient in a separate room from the other inmates, or by seeing to his removal to a hospital at the request of the health-officer, and after death, or removal, shall have the room which the affected person occupied, together with the articles in it, cleansed and disinfected.

4. *New Streets and Buildings.*—The Model Bye-laws which refer to new streets and buildings, are of a most comprehensive character, and relate in detail to (*a*) the level, width, and construction of new streets, and the provisions of the sewerage thereof; (*b*) to the structure of walls, foundations, roofs, and chimneys of new buildings, for securing stability and the prevention of fires, and for purposes of health; (*c*) to the sufficiency of space about buildings to secure a free circulation of air within and without; (*d*) to the drainage of buildings, to water-closets, earth closets, privies, ashpits, and cesspools in connexion with buildings, and to the closing of buildings or parts of buildings unfit for human habitations, and to prohibition of their use for such habitation.

(*a*) *Laying out of New Streets.*—The Bye-laws enact that every new street should be laid out so as to afford the easiest practicable gradients, that if intended for a carriage-way, the street shall not be less than thirty-six feet in width, and if not intended for this purpose, the width shall be twenty-four feet at the least. It is also specified that, on each side of such street, a footway of not less than one-sixth of the entire width of the street should be constructed, sloping toward the kerb, which should not be less than three inches above the highest level of the carriage-way.

(*b*) *Erection of New Buildings.*—With respect to new buildings, the Bye-laws prohibit the builder from constructing a foundation upon any site impregnated with animal or vegetable refuse, until such soil has been removed, and the ground surface asphalted or covered with a layer of concrete at least six inches thick, that the materials used for the building should be of the best quality, and that the footings of the walls should project on each side to an extent equal to one-half of the thickness of the wall at its base. A damp-course of slate, or other durable material impervious to moisture, must be placed beneath the level of the lowest timbers, and at a height of not less than six inches above the surface of the ground. The strength of the walls of new buildings is determined by the height of the respective stories, and varies from nine inches in thickness, in the one-story building, to twenty-six inches in thickness at the base, and up to the height of the first story, in a building one hundred feet high, gradually diminishing as it ascends through the different floors. To avoid danger of fire from smoke-flues becoming ignited, it is rendered imperative that, unless the flue is constructed of fire-proof piping of stone-ware, it shall be secured in cement at least one inch thick; and if the flue is intended for use in connexion with a close range, stove, or steam boilers, for purposes of cooking, or for manufacturing, or business purposes, it must be surrounded with brick work, at least nine inches thick, for a distance of ten feet at the least in height from the floor.

(*c*) *Area for Ventilation.*—With respect to sufficiency of area to admit of free ventilation, the Model Bye-laws enact that, in building a house, provision shall be made that it shall be free in front to a distance of not less than twenty-four feet, and that a space of not less than 150 square feet exclusively belonging to such building shall be left open in the rear, free from any erection save a privy or an ashpit. To insure interior ventilation, it is provided that in the wall of each story of the house which fronts the open spaces, there shall be a sufficient number of windows communicating directly with the external air, that in every habitable room a window shall be placed, and in the event of the room being without a fireplace, a flue, properly constructed, is to be provided, with a sufficient aperture or air-shaft, giving an unobstructed sectional area of one hundred square inches at the least. It is also expressly enacted that the rooms on the ground floor of a new building shall be provided with a boarded floor, under which there shall be a clear space of at least three inches in every part, ventilated by means of air bricks in the walls.

(*d*) *Drainage and Disposal of Sewage.*—The Model Bye-laws are minute in their details with respect to the drainage of buildings, and enact that every one erecting a house shall cause the subsoil, if damp, to be drained by earthenware pipes in such a manner that they will not communicate readily with any drain containing sewage; that all drains intended for sewage shall have an internal diameter of not less than four inches, to be laid in a bed of concrete with a proper fall, and shall be furnished with water-tight joints. That such drains, unless any other mode of construction is impracticable, shall not pass under any building; that they be furnished with suitable means of ventilation at points between the main drain or other drains of the building with which they may communicate, such ventilating openings in every case to be situated on the side of the trap nearest to the building. Numerous other arrangements with regard to drainage and disposal of sewage are given in detail, besides minute instructions respecting water-closets, earth closets, ashpits and cesspools in connexion with buildings, which our limited space forbids us further referring to here.

5. *Hospitals for Contagious Diseases.*—One important function of the Sanitary Authority, however, must not be omitted in this summary. It relates to the power which the Public Health Act allows for the establishment of hospitals for the isolation of infectious disease, and for the removal to them of persons suffering from

infectious complaints, who cannot be conveniently or safely treated at their own homes. It also empowers the Sanitary Authority to destroy infected bedding and clothes, to disinfect, cleanse, and whitewash premises which have been occupied by persons suffering from infectious disease, and to erect mortuaries in populous districts, or wherever they are likely to be required.

The Act likewise makes provision to enable the Sanitary Authority to obtain a suitable water supply for a district, and requires that measures shall be taken to prevent its pollution from extraneous causes.

This short summary of the more important provisions of the Public Health Act, in addition to what are furnished by the Vaccination Act, and other Acts of Parliament bearing on various trades as well as the customs of the people, shows the large powers which the legislature has conferred on the various local authorities throughout the country, for the prevention of disease, and of the causes which occasionally lead to its extension. The metropolis is now governed by the Public Health (London) Act, 1891.

Throughout the kingdom, the various sanitary enactments have been the silent means of doing an immense amount of good in saving life, and in promoting the health of the population, and it mainly rests with the people themselves still further to increase their usefulness by aiding the exertions of those to whom the duty of superintending their operation is entrusted.—See *Air—Drainage—Earth Closet—House—Ventilation—Water-closets, &c.*

PUDDINGS are articles of diet, the principal ingredient of which is some farinaceous material, at least such ought to be the case, when they are made for invalids. The puddings most generally admissible, and best adapted for the sick-room, are, the light egg and flour, or "twenty minute" pudding, as it is often called; the simple rice, sago, or tapioca pudding, the boiled bread pudding, &c. In making baked puddings, the eggs are generally put in previous to baking, and in general cookery this may answer very well; but when nutriment, and at the same time extreme lightness, are requisites for an invalid, it is better to cook the farinaceous article, such as sago, bread, or whatever it may be, thoroughly in the milk, and whilst it is perfectly hot, to break the egg into it, and beat them well up together; in this way the egg is quite sufficiently cooked, but its albumen is not hardened, as it must inevitably be, when baked along with the other materials.

Of course, greasy puddings generally are unsuited for invalids, and for the same reasons butter or sauce must be forbidden.—See *Cookery for the Sick.*

PUERPERAL.—Connected with child-bed.—See *Child-bed.*

PULMONARY.—Connected with the lungs.

PULSE.—The term pulse may be applied to the beating of the heart and arteries generally, but it is more usually restricted to the sensible beat or stroke of an artery which is felt by the finger placed over and slightly pressed upon the vessel; popularly, the pulse is considered to be confined to the wrist alone. The pulse or beat of an artery is felt simultaneously, or nearly so, with the beat of the heart, which takes place as each contraction of that organ sends a wave of blood through the arteries; the elasticity and muscular properties of those tubes, influencing in a considerable degree the "character" of the pulse.—See *Artery—Circulation—Heart, &c.*

The sympathetic connexion of the central organ of the circulation, and indeed of the circulating system at large, with changes and states of the whole system, renders the pulse a most important guide in the investigation of those states and changes; it is, however, a guide which it requires much education and no little practical experience fully to take advantage of. It may have appeared to some, that throughout this work generally, when different diseases have been treated of, the state of the pulse has been comparatively little noticed; the previous sentence affords the explanation, which is, that to feel a pulse properly, and to gather from the feeling, any real, definite, trustworthy information, requires more practical knowledge than unprofessional persons usually possess; consequently, the author has preferred directing attention, in most instances, to symptoms more palpable, more easily appreciated, and less likely to mislead the uninitiated. If the frequency of the beats of the pulse were an unvarying indication of the state of the system, and if the knowledge as to frequency, or the reverse, were all that could be gathered from feeling it, the case would be abundantly different; but with certain reservation, the frequency of the pulse is, in many cases, a far less important piece of information to a medical man than its rhythm or tone; whether it be full and bounding, or jerking, or soft, or wiry, or compressible, feeble, or remittent, or intermittent; all these and other varieties of pulse convey impression to the mind of a medical man, but the ability to receive these impressions, and to form conclusions from them, is only the result of daily, almost hourly practice. It is unnecessary to say more to show how very slight and imperfect the information must be which a casual feeler of the pulse can gather from the operation. At the same time, the author would not discourage persons, such as the clergyman, or nurse, or the intelligent emigrant, from endeavouring to gain some practical knowledge respecting the pulse; but the above will show that useful knowledge must be attained, either assisted or unassisted, by practical attention and persevering availment of opportunities.

The average pulse of a healthy man in the

prime of life, may be taken as beating 72 times in the minute; but from this average there is every possible variation, and even in the same individual the pulse varies greatly, according to the period of the twenty-four hours; according to the times of meals; to the posture, whether recumbent, in which it is slowest, or sitting or standing, in which it is most frequent; it varies also according to physical exercise or mental emotion, and also according to external temperature.

In some persons the pulse is always quick, ranging at 90, or even more; in others it is slow, perhaps does not exceed 40 beats in the minute. Age influences greatly the frequency of the pulse. The following is the table drawn up by M. Quetelet:—

Age.	Average of Pulsations per minute.
Birth, ...	136
5 years, ...	88
10—15, ...	78
15—20, ...	69
20—25, ...	69
25—30, ...	71
30—50, ...	70

According to other observations the pulse in many children is found not to be more frequent than it is in adults; as a general rule, however, it is so. It is, moreover, a generally received opinion, that the pulse of the aged is slower than that of the young; the reverse is the fact.

As a general rule, when the system at large is in a state of excitement, feverish or otherwise, the pulse is increased in frequency, and modified; in depressed states of the system, unless accompanied with irritability, the contrary takes place. In affections of the brain causing pressure on, or oppression of that organ, the pulse is usually slow. If a particular portion of the body be inflamed, such as the hand or foot, the pulse in the artery going to the part is increased in force, or in the power of its beat, but of course not in frequency, unless the entire circulating system is equally excited.

Most are aware that the pulse is distinguishable at the wrist, about an inch above the ball of the thumb, the pulsating artery lying by the side of the strong tendon of a muscle of the fore-arm. The pulse is felt by the fore and middle finger together.

Disease, of course, increases or diminishes the pulse, but other causes have a corresponding influence, such as the mental emotions expressed by fear, joy, or anger; while many people have constitutionally slow, rapid, or irregular pulses. All these refer to the question of counting, but apart from the quickened or retarded action of the heart, the impressions conveyed to the fingers by the pulse are often of the greatest importance. The three best marked characters are the hard, soft, and wiry pulse, which occur often in various stages of the same disease, and which are also influenced by external causes, such as heat or cold, or from within by stimulants and the action of remedies. We naturally look for a slow pulse in persons suffering from extreme weakness, either from privation or exhaustion; but when the debility is extreme, as in profuse hæmorrhage, the pulse becomes alarmingly quick, and the symptom must be regarded as dangerous. The quick pulse, conveying every variety of feeling to the fingers, is the ordinary accompaniment of all inflammatory complaints, as well as fevers of every description. The irregular and intermittent pulse points generally to disease of the heart, though not necessarily so, as it is not uncommonly met with among people of low nervous tone, and is often a symptom of hysteria. Lastly, the pulse becomes imperceptible in the fainting state from failure of the heart's action, and if not restored, death from syncope must ensue, a comparatively rare occurrence, but the absence of pulse always shows the necessity of prompt action to restore animation. In such cases, the best stimulant is plain cold water, dashed on the face, but if internal stimulation is thought to be necessary, those agents are to be preferred which act promptly by diffusing their action throughout the system, such as ammonia, ether, and strong spirits. Pulse glasses, for counting the pulse on the principle of the sand glass, and which run for fifteen seconds, are sold by the instrument-makers. These are found useful for nurses and others interested in the sick, and who may not be possessed of a watch with a minute hand wherewith to count the pulsations.

Refer to—*Artery—Circulation—Heart, &c.*

PUMP, STOMACH, is an instrument which ought only to be used by a medical man.

PUMPS, for water, when made of lead, are apt to prove dangerous.—See *Lead—Water, &c.*

PUNCTURED WOUNDS.—Refer to Wounds.

PUPIL.—See Eye.

PURGATIVES are medicinal substances which excite and accelerate the muscular movements of the alimentary canal, and increase the discharge therefrom. For the sake of convenience, under the head of purgatives, aperients generally are treated of. These are divided into:

Laxatives—Purgatives—Drastic Cathartics. A further class of "hydragogue" cathartics is also recognised (see *Hydragogue*). Laxatives, which gently increase the natural movements of the bowels may be arranged as dietetic, mechanical, and medicinal. Dietetic laxatives are chiefly vegetables and fruits of various kinds, honey, treacle, preparations of the grains, cold water, malt liquors, bacon, &c., but many of these act mechanically also. Most succulent vegetables and fruits act upon the bowels by virtue of their peculiar nature, but, undoubtedly, also by the mechanical bulk of their

refuse. Of the mixed dietetic and mechanical laxatives, the farinacea or grain substances are the most important; these owe their property entirely to the presence, either whole or ground, of the external covering or testa of the grain, as in the case of bran bread, or of Scotch oatmeal. The flour of the Egyptian lentil, or Revalenta Arabica, is almost medicinal in its power of relaxing the bowels. The seeded fruits, such as currants, gooseberries, &c., fall under the head of mixed dietetic and mechanical laxatives.

The purely mechanical aperients are not numerous; whole mustard seed, and the common dried currant, as it is often given domestically, are examples of the class.

Injections may be classed under the head either of purely mechanical or of medicinal aperients, according to their nature (see *Enema*). The following table includes the principal aperient and purgative medicines which may be used domestically:—

I. Laxatives.
- Almond oil.
- Cassia pulp.
- Cream of tartar.
- Honey.
- Magnesia.
- Manna.
- Olive oil.
- Phosphate of soda.
- Prunes.
- Sulphur.
- Tamarinds.

II. Purgatives.
- Aloes.
- Castor oil.
- Epsom salts.
- Euonymin (according to dose).
- Glauber salts.
- Iridin (according to dose).
- Jalap.
- Mercurials { Blue pill. Calomel. Grey powder.
- Rhubarb.
- Tartrate of potash and soda.
- Senna.

III. Cathartics—Drastic.
- Colocynth.
- Scammony.

The two cathartics put down may be used domestically,—indeed, the first is every day used in the form of the compound colocynth pill. Croton oil, elaterium, gamboge, and podophyllin are included in the drastic cathartics; but, except under peculiar circumstances, ought only to be administered by a medical man. For details respecting the various aperient agents above mentioned, the reader is referred to the individual articles.

Purgative or aperient medicines are, unquestionably, much more generally had recourse to, both by medical men and the public, than any other form of remedial agents, but while it is undoubted that their use is great, it is also certain that they are, and have been, very greatly abused. It is intended to consider, first, the use of aperients, and, secondly, the abuse. Under such articles as *Alimentary Canal*, *Digestion*, *&c.*, it has been sufficiently explained how the food mass, after undergoing its principal digestion in the stomach, is gradually propelled through the entire tract of the bowels, and how, during this propulsion, its nutrient constituents are absorbed from it, the refuse being left for discharge; it has also been explained that the discharge from the bowels does not consist simply of the food refuse, but contains also various secretions and excretions thrown out into the bowels from the general system, which excretions cannot be retained in the system without injury to health.

From these considerations it must be obvious to all how great the importance, not only that the bowels should be active as regards the excretions into them, but as regards their own discharge, both of these excretions and of the food refuse. When the bowels are inactive in these respects, the state is termed *Constipation*, or costiveness. As, under the former term, the reader will find the evils which result from this condition, and also its most frequent causes, &c., sufficiently explicitly stated, it is unnecessary to repeat the information here. Under the same article will be found an explanation of those general remedies which are most useful in removing the condition; and, indeed, when they prove sufficient, are certainly to be preferred to medicinal agents; when they do not prove sufficient, either as temporary or permanent means of relief, the purgative or aperient medicines must be employed—under the general rule that they should never be used stronger than requisite. By this it is not meant that because manna, or sulphur, or magnesia are classed in the laxatives, they are always, when possible, to be substituted for the purgative aloes, or castor oil, or rhubarb, or senna; such a distinction could not be observed without other and greater counterbalancing inconveniences; but the rule should be, that relief to the bowels is to be afforded with as small an amount of purgative action as possible, unless that purgative, or, in other words, lowering action, is called for as a part of the treatment, as it is in persons of very full habit of body, &c.

Where aperient medicines are either taken or given domestically, there is often too little care in the selection: unless it be in pregnancy, or in consequence of individual experience, the idea seems to prevail with many, that one aperient is as good as another. This is far from being the case.

Except in persons whose bowels are very easily acted upon, or in such cases as those where the aperient is taken rather to give addi-

tional action than to open the bowels, the "laxative" aperients are scarcely sufficient as general aperients; those classed as purgatives, and the cathartic colocynth, under the form of its well-known compound pill, are in daily use.

There are few ailments in which increased action of the bowels is called for, in which one or other of the aperient remedies in the list will not be applicable. Aloes is valuable for certainty of action on particular portions of the bowels, for the small bulk of its general dose, for its tonic bitterness and continued effect even after frequent repetition, but it must be used carefully in pregnancy, piles, and other affections situated about the lower part of the canal. Castor oil is recommended by its safety in almost all cases, by its certain, perfect action, and like aloes, by its not losing effect by repetition; but, unfortunately, it is too often the medicine most disliked and sickened at. It is one of the greatest desiderata in medicine to obtain an article which should combine all the advantages of castor oil with a less disagreeable taste, and with less tendency to cause sickness, as well as being less bulky. It has been sought for in vain among the numerous oils belonging to the same natural family, for although some of them are very good, they are uncertain in their action.

One of the most useful substitutes for castor oil is the syrup of the *Rhamnus frangula*. It is pleasant to take, gentle in action, and tolerably certain. The lately introduced "Tasteless Castor Oil" of Messrs. Allen & Hanbury, has done much, however, to do away with the objections to such a useful medicine. Epsom salts require much discretion in use, but have deservedly thrown Glauber salts into disuse. Jalap is certain and active, but is apt to gripe and to sicken, and its bulk is an objection. Mercurials alone, or followed by castor oil or senna, or combined with aloes, rhubarb, or colocynth, although most valuable, are most abused. Rhubarb, mild, and with some persons effectual, is also tonic, but is apt to heat, and its bulk and taste are an objection, especially with children. Rochelle salts, similar to Epsom salts in action, is pleasanter. Senna, *the* medicine of the nursery, is invaluable, and if properly prepared, is safe and certain.

Colocynth, in its well-known compound pill, forms part of the most generally used and useful purgative in costive habits. Scammony is, in many of the affections of children, especially when combined with a mercurial, our most valuable purgative, and is recommended by the small bulk of its dose.—See articles on all the above-mentioned.

Purgatives, however, are used, not only as a means of clearing the bowels of their contents, but also as agents for the relief of those organs, such as the liver, which are closely connected with the bowels; and further, as remedies calculated to relieve distant parts, or the system generally. Thus, in many head affections, free purging is one of our most powerful remedies; in congestion of the liver it is most serviceable; in overfulness of the system at large, it relieves greatly. To the above fact, nature strongly points in those cases in which sudden and striking relief often follows an attack of spontaneous purging or diarrhœa.

The abuse of aperient medicines owes its origin, probably, to a variety of causes. Constipation, either alone, or as a concomitant of disease, is so obvious and common a symptom; it so often occasions distress, or at least uncomfortable sensations, its removal is generally so simply effected, and often is so sensibly felt as a relief, that it cannot be matter of surprise if both doctor and patient, habitually almost, look to the action of the bowels by purgative medicines as almost the requisite preliminary to all other treatment, and within certain limits they do right; but the fatal facility of the treatment, assisted moreover by the powerful advocacy which it has received in years gone by, has certainly produced a far too general use of aperients as purgatives, not simply in the treatment of acute disease, but as a general rule of daily life. If the question be put—Which is the greater evil of the two, to have the bowels habitually confined, or habitually to take aperient medicines? there can be no question, if the choice *must* lie between the two evils, that the latter is the lesser one; but there are few cases in which the choice is so circumscribed. The bowels probably are confined, but they are so because the general conditions requisite for their healthy action (see *Constipation*) are neglected, and because the aperient medicine is used as the readiest substitute for a little trouble and perseverance. Thus used, the aperient is abused, and injury, more or less, is inflicted upon the system, according to the nature of the medicine, the frequency of its use, and the strength of the dose. One most general effect of the abuse of aperients, is the weakened digestive power of the stomach, another, the weakness of the system at large; and a third, not unfrequently, is continued irritation of some portion of the alimentary canal. The weakened digestion which follows the abuse of aperients may not be obvious at first; indeed, if the digestive organs have been overloaded and oppressed, instead of being weaker after an aperient, they are actually more active, and this apparent increase of activity is very apt to lead to a too frequent renewal of the remedy, and too often, trusting in the remedy, to a continuance of those habits of excess which caused the first disorders (see *Indigestion* and *Pills*). The debility of the system which follows the abuse of aperients is the natural result of the digested food mass being hurried too rapidly through the bowels to admit of its nutrient portion being taken up and conveyed into the system; debility is also the result of the too frequent employment of purgatives, such as the salines, which in-

crease unnecessarily the discharges, especially of the serous portion of the blood, into the bowels. Further, the too frequent use of purgatives irritates the bowels by depriving them of their natural protective mucus; in this way ulceration may result.

As a natural consequence of the food mass and of the secretions and excretions, such as the bile, being hurried too quickly into and through the bowels, and also of the mucus being carried off too abundantly, the stools, under the continued use of purgatives, assume an unhealthy character; perhaps contain too much bile, &c., and in consequence of this unhealthy appearance, and with a view to its correction, persons are too often induced to continue the very cause of its production, and go on purging. This is a very common case.

In connexion with the foregoing article, the reader is referred to *Alimentary Canal—Biliary Disorder—Digestion—Indigestion — Constipation, &c.*

PURGING FLAX, the *Linum catharticum*, deserves especial notice from the fact of its being a plant commonly native to this country, and often used as a domestic remedy, although not generally prescribed by medical men, nor, indeed, as much as it might be, for it is well understood to be an "excellent cathartic." The purging flax is a slender plant, about six or eight inches in height, with smooth, narrow leaves placed opposite upon the stem; it blossoms about the end of June, and the flowers, which are small and white, are "gracefully drooping before expansion." Every part of the plant is bitter. One drachm of the dry powdered leaves, or two or three drachms of the fresh plant, in the form of infusion, will, according to Sir R. Christison, act briskly upon the bowels, without causing either sickness or griping.

PURPURA, popularly "The Purples," is a disease in which the blood escapes from the smaller or capillary vessels; it is best known from its outward manifestations on the skin, on which account it is often, but erroneously, classed as a skin disease, whereas it is truly a constitutional affection, which, although most visibly manifest on the skin, yet exhibits its effects in various internal portions of the body. The attack of purpura may be sudden, or it may be preceded for a week or more by symptoms of general illness, lassitude, feebleness, &c. Purpura generally first shows itself on the legs, in the form of red or purple spots of various sizes, which do not elevate the skin, and do not disappear on pressure; in the course of a few days these spots become changed to a brown or greenish-yellow; in fact, they go through the same changes in colour that we see in a bruise, in which, as in purpura, effusion of blood has taken place beneath the skin. The above description applies to purpura in perhaps its mildest form; when more severe, the spots or blotches are spread over the body, and blood is discharged from the mucous membranes of the nose, mouth, stomach, bowels, bladder, &c., and in fatal cases it has been found effused into the substance of the brain. The hæmorrhage is always a dangerous symptom, and may occur either alone, or in connexion with other diseases, such as fevers, measles, small-pox, &c. Such a disease as purpura is of course not one for domestic management, and ought, if possible, on its earliest appearance, to be confided to proper medical care. It *may* occur in the strong and plethoric, in which case, of course, lowering measures, perhaps bleeding, may be called for, or at least free purging, with calomel and jalap, or calomel and colocynth; the administration, two or three times a day, of one or two drachms of Epsom salts, dissolved in water, each dose being acidulated with fifteen drops of diluted sulphuric acid, would be very suitable treatment.

Most frequently purpura is a disease of debility, and requires treatment the very reverse of lowering; quinine in grain doses, three or four times in the twenty-four hours, will be useful, along with strong animal broths, wine, or porter, and tonic remedial measures generally. Turpentine in ten or fifteen-drop doses, given three or four times in the twenty-four hours, or tannic or gallic acid in six or eight-grain doses, three or four times daily, have proved invaluable remedies. Having been found useful in different species of hæmorrhage, the juice of the common nettle might, in places where other remedies are not procurable, prove of service.

Where the tendency to purpura exists, with debility, means of strengthening should be resorted to which have been recommended under article *Debility*. In every case, however, whether threatened or actual, a medical man must be called without delay.

PURULENT—consisting of pus or matter.—See *Pus.*

PUS, or MATTER, is, or rather ought to be a smooth, yellow, cream-like fluid; when warm it exhales a faint sickly odour. Under the microscope, pus is seen to consist of granular corpuscles, somewhat larger than the globules of the blood, which float in a transparent serous fluid. The above are the properties of healthy pus, which, however, may differ very greatly from the standard; it may be thin, and serous, or flaky as it is in a scrofulous abscess; it may be bloody, it may be fœtid, &c. Pus is a consequence of inflammation, its formation is, in fact, the "termination" of that process by "suppuration" (see *Inflammation*), and may be formed in various situations and textures. It is the most general secretion from an ulcer. When contained in a cavity formed in the substance of any of the bodily tissues, it constitutes an abscess; it is a frequent consequence of inflammation, either of mucous or of serous membranes, in the one case constituting

a purulent discharge, in the other, a purulent effusion, such as takes place into the chest. In some cases it is extremely difficult to distinguish the mucous, purulent, and muco-purulent discharges from mucous membranes, from one another. Less importance is now attached to the distinction than formerly.

Refer to — *Abscess—Inflammation — Ulceration.*

PUSTULES are elevations on, and partly in the skin, which contain matter. A pustule may commence as such, when it is usually conical in shape, or it may commence as a vesicle, as in the cases of small-pox or cow-pox; the vesicle, in the first place, containing transparent lymph or fluid, and its contents afterwards becoming purulent, constituting it a pustule.

Refer to—*Skin, Diseases of.*

PUSTULE, MALIGNANT, sometimes known by its French name, *Charbon*, is a species of carbuncle produced by inoculation from some infected source, such as the sting of an insect, or the cut of a poisoned knife, or from eating the flesh of an infected animal. The part affected proceeds rapidly through various stages to gangrene, and often causes death by blood poisoning. The treatment consists in the destruction of the infected part by caustics, or by the introduction of carbolic acid into the swelling. This may be done either by threads saturated with the acid passed through, or by the hypodermic needle.

PUTREFACTION, or PUTREFACTIVE FERMENTATION, is the peculiar chemical change undergone by many organised bodies after death. The following extracts on this subject from Liebig's *Letters on Chemistry*, are full of interest and instruction:—"The proximate cause of these changes, which occur in organised bodies after death, is the action of the oxygen of the air on many of their constituents. This action only takes place when water, that is, moisture, is present, and requires a certain temperature. This influence of atmospheric oxygen is very distinctly seen in fruits and other soft parts of vegetables, when, by an injury to their surface, the juice comes into direct contact with the air. When an apple is bruised at one point, a process of decomposition begins from the injured part; a brown spot appears, which increases in a regular concentric circle, till at last the whole apple becomes rotten, or is changed into a brown, soft, viscid mass." "In like manner, a process of decomposition sets in, after death, in the bodies of men and animals, which begins in the inside, in those parts, such as the lungs, which are in contact with the air. When there are wounds, it spreads from them, and in diseases from the diseased part; so that, in many cases, death itself is nothing else than the result of a decomposition going on in an inward part; with the disease, of which it is the proximate cause, this process begins, and it continues after death. The most remarkable of these phenomena is certainly this, that in many cases, the change once begun in organic matters, continues when, after transient contact with the air, the atmospheric oxygen is entirely excluded." "All these processes of decomposition which begin in a part of an organic substance, from the application of an external cause, and which spread through the whole mass, with or without the co-operation of that cause, have been called the processes of putrefaction." "The number of substances occurring in nature which are truly putrescible, that is, capable of putrefaction, is singularly small; but they are everywhere diffused, and form part of every organised being. Before all other substances, this property of putrescibility belongs to the highly complex matters of the animal and vegetable kingdoms, which contain nitrogen and sulphur, such as albumen, fibrine, caseine, gelatine, and the like." One of the most remarkable properties of putrescible substances is their power of exciting fermentation in bodies capable of this change.—See *Fermentation.*

"The grand natural process of putrefaction, of the dissolution of all compounds formed in living organisms, begins immediately after death, when the manifold causes no longer act, under the influence of which they were produced. The compounds formed in the bodies of animals and of plants undergo, in the air, and with the aid of moisture, a series of changes, the last of which are the conversion of their carbon into carbonic acid, of their hydrogen into water, of their nitrogen into ammonia, of their sulphur into sulphuric acid. Thus their elements resume the forms in which they can again serve as food to a new generation of plants and animals. Those elements which had been derived from the atmosphere take the gaseous form and return to the air; those which the earth had yielded return to the soil. Death, followed by the dissolution of the dead generation, is the source (medium?) of life for a new one. The same atom of carbon, which, as a constituent of a muscular fibre in the heart of a man, assists to propel the blood through his frame, was, perhaps, a constituent of the heart of one of his ancestors; and any atom of nitrogen in our brain has, perhaps, been a part of the brain of an Egyptian or a negro. As the intellect of the men of this generation draws the food required for its development and cultivation from the products of the intellectual activity of former times, so may the constituents or elements of the bodies of a former generation pass into and become parts of our frames.

"Finally, by a knowledge of the causes of the origin and propagation of putrefaction in organic atoms, the question concerning the nature of many contagions and miasms becomes capable of a simple solution, and may be reduced to the following:—

"Are there facts which prove that certain states of transformation or putrefaction in a substance are likewise propagated to parts or constituents of the living animal body; that, by contact with the putrescent matter, the same or a similar condition is produced on such parts as that in which the particles of the putrescent body are? This question must be decidedly answered in the affirmative.

"It is a fact that dead bodies in dissecting rooms frequently pass into a state of decomposition, which is communicated to the blood in the living body. The slightest cuts with the scalpel used in dissecting often cause a very dangerous, and even fatal, disease. The observation of Magendie, that putrid blood, brain, bile or pus, when laid on fresh wounds, produce in animals vomiting, languor, and death, after a longer or shorter interval, has not yet been contradicted.

"Further, it is a fact, that the use of various articles of food, such as flesh, ham, sausages, if in a certain state of decomposition, is followed in healthy persons by the most dangerous and even fatal symptoms.

"These facts prove that animal matter, in a certain state of decomposition, is capable of exciting a morbid action in the body of healthy individuals. Now, since by the term products of diseased action, nothing else can be meant than parts or constituents of the living body, which are in a state of change, in form and quality different from the normal one, it is evident, that so long as this state continues, and the change is not completed, the disease may be communicated to a second or third individual, and so on.

"Besides, when we consider that all those substances which destroy the communicability or arrest the propagation of contagions and miasms, are likewise such as arrest all processes of putrefaction or fermentation; that under the influence of empyreumatic bodies, such as pyroligneous acid, which powerfully oppose putrefaction, the diseased action in malignant suppurating wounds is entirely changed; that in a number of contagious diseases, especially in typhus, ammonia, free or combined, is found in the expired air, in the liquid and solid excreta—in the latter as ammonio-phosphate of magnesia—it seems impossible any longer to entertain a doubt as to the origin and propagation of many contagious diseases.

"Finally, it is an observation universally made, and which may be regarded as established, that the origin of epidemic diseases may often be referred to the putrefaction of great masses of animal and vegetable matters; that miasmic diseases are found epidemic where decomposition of organic substances constantly goes on in marshy and damp districts. These diseases also become epidemic, under the same circumstances, after inundations; and also in places where a large number of persons are crowded together with imperfect ventilation, as in ships, in prisons, and in besieged fortresses. But in no case may we so securely reckon on the occurrence of epidemic diseases, as when a marshy surface has been dried up by continued heat, or when extensive inundations are followed by intense heat."

In connexion with the above, the following instructive anecdote is related in the appendix to the publication from which the foregoing extracts are taken:—

"In order to procure a roast for Easter, C—, in R—, desired his family to set a snare for a roebuck. Accordingly, one of these poor animals was caught in the snare, which as its head and breast had passed through, held it by the hinder part of the body, the abdomen and pelvis being enclosed in the cord, so that it must have succumbed after a most agonising struggle. It was found next day dead."

"The master and mistress of the family ate on Easter-day the best part of the dainty; the servants had little; the remainder was laid in vinegar, but not eaten.

"On the same day, all in the family who had eaten of the venison observed a striking dryness of the mouth, oppression at the stomach, and nausea; the features in all became anxious and pale; all complained of oppression of the head, giddiness, and great weariness of the limbs. The master lost his sight for several days, and, in short, there now began a series of remarkable symptoms, requiring in many ways the assistance of a medical man. The husband was only restored to health in July, but the wife never recovered: she lingered more than two years, and at last died after severe sufferings. The daughter, the man servant, the maid who had eaten little of the tortured animal, were soon cured. The symptoms in many respects recalled those of the effects of the bite of rabid animals, and of the sausage poison of Würtemberg."

Modern research has established conclusively that putrefaction is always due to the action of microscopic organisms known as bacteria. If by means of exposure to heat or by chemical antiseptics the bacteria are destroyed or rendered inactive decomposition ceases to take place; on the addition of the bacteria the processes of putrefaction recommence. The bacteria when present under suitable conditions reproduce and multiply with extraordinary rapidity; when conditions are not favourable for their action they may exist for long periods of time in a dormant condition. As they abound in atmospheric air and in all kinds of dust they are always ready to attack any putrescible substance. Of recent years the study of these organisms has become a science known as bacteriology, and much light has been thown on their action, not only in promoting putrefaction, but also in relation to infectious or so-called zymotic diseases.

The extreme interest and importance which surround the processes of putrefaction, must be the apology for the length of the above extracts on the subject, from one of the first authorities on these matters. Whether we regard putrefaction in a sanitary or medical point of view, as the originator of disease, when *favoured by man's ignorance or carelessness*, or as the process by which the material atoms of a generation which has passed away are again started on their mission to furnish material clothing for a generation living or to live, our attention is alike deserved.

Refer to—*Fermentation—Germs of Disease.*

PYÆMIA, SEPTIC**Æ**MIA, and BLOOD-POISONING, are used often synonymously to denote a morbid condition of the blood attended with fever, consequent on infection from wounds, suppurative inflammation of bones, the puerperal condition, and surgical operations. The blood is poisoned by its absorption of disease products, and abscesses form in the internal organs, especially in the lungs and liver, often in the joints, and occasionally in the skin. In many cases the large veins in the neighbourhood of the primary wound become subject to inflammation, and from this cause the disease was at one time termed *phlebitis.* As a rule, pyæmia is a disease of an acute and alarmingly fatal character, though it occurs occasionally in a chronic form, continuing for months and without any wound or injury to account for the symptoms. It commences with rigors and high temperature of the blood, followed by copious perspiration; the countenance is anxious and depressed, and there is great sleeplessness and restlessness present. True pyæmia is almost invariably fatal, but some of the milder forms of the disease, to which the term *Septicæmia* is applied, recover. The disease has been brought prominently into notice on account of its frequent occurrence in hospitals after surgical operations and accidents, especially when the bones were injured; and it was assumed (not without reason) to originate from the hospital atmosphere becoming tainted with noxious products, consequent on placing a number of persons suffering with open and sloughing wounds in the same apartment. Since the introduction of antiseptic surgery by Lord Lister, the disease, as a cause of death after surgical operations and injuries, is a rare event.

PYLORUS.—See ALIMENTARY CANAL—STOMACH.

PYROLIGNEOUS ACID is acetic acid obtained by the "destructive distillation" of wood.

Refer to—*Acetic Acid.*

PYROSIS.—See WATER-BRASH.

QUACK, QUACKERY, and **QUACK MEDICINES.**—The origin of the term quack is doubtful; it is sometimes derived from Quacksalber, the German for a quack, or vendor of quack medicines, which, again, may perhaps be traced to Quecksilber, quicksilver, or mercury, which was first used by irregular practitioners. However that may be, the terms "quack" and "quackery" are not now confined to medical matters, but are applied generally to those who pretend to exercise functions of which they are incapable, and who support their pretensions with deceit, and generally with impudence.

History has proved, and facts of the present day testify, that of all the openings for deception and chicanery in connexion with the dealings of man with man, medicine opens one of the widest.

In former times, when even the learned entertained most crude and erroneous ideas of much of the structure, and of most of the functions, of the living body, and when the mass of the people were in the most perfect ignorance on these points; when, moreover, superstition was rife, when charms and king's-touches were trusted to cure disease, when occult virtues, dependent upon all sorts of fancied and fanciful conditions and circumstances, were considered to be active or not according to the observance of these conditions and circumstances; when, it is observed, these things prevailed, it cannot perhaps be matter of surprise that people believed the man who could lie most glibly, and who held out the most specious promises, in connexion with that dearest possession of man—dearest, at least, when lost—his health. The most natural thing for ignorance and superstition was to believe the tricked-out mystery. But is it natural, or rather reasonable, that the foolish belief in mysterious cures and quack panaceas should still prevail at the present day, and that the most notorious quacks should amass immense fortunes, simply by deceiving the many foolish? Reasonable or not, the fact is incontrovertible; reasonable or not, it is to be accounted for by the almost perfect ignorance which still prevails, *even amongst the most educated classes,* of the structure and functions of their own frames, of the requirements of their own constitutions, and of the true principles on which the latter are to be preserved in soundness and health, or to be treated when afflicted with disease. Moreover, the principles of health, in health, also extend, or ought to extend, to the management of illness, when health is sought to be restored. These principles are too frequently dwelt upon in the various sanitary articles in this work to require reiteration here, but, it is once more repeated, they ought to be part of the education of all. The diffusion of such knowledge can, and will, put an end to quackery; and yet the diffusion of such knowledge is dreaded and condemned, even by some medical men who seek legal enactments against the irregular

practitioner and his practices, in the vain idea that these will prevent the credulous and ignorant from resorting to the man who lies most to their ignorance, or flatters their blind prejudices most unscrupulously.

Quacks, generally, may be divided into those who quack for profit, and those who are merely amateurs, the latter class including the Lady Bountifuls and others, who, not content with using such simple means of alleviating disease or suffering among their neighbours as can be safely employed, must, *without necessity*, get handling such edged tools as antimony, calomel, &c., and with considerable vigour too, very often, without having given themselves much trouble to get any idea of the proper mode of, and reasons for, the administration of what they prescribe. Such practices cannot be too strongly condemned. When such a combination of circumstances occurs that the *immediate* care of dangerous accident or illness devolves upon some intelligent or responsible individual, in the absence of, or at least until the arrival of, a medical man, it is quite admissible to use even active measures, such as are often recommended in the present work, if proper precaution be observed; but this is very different from persons, without necessity, and for the mere love of amateur quackery, taking upon themselves the management of cases of serious disease. "Without entering upon that difficult ground which correct professional knowledge, and educated judgment, can alone permit to be safely trodden, there is a wide and extensive field for exertion, and for usefulness, open to the unprofessional, in the kindly offices of a true domestic medicine, and in the timely help and solace of a simple household surgery.

"But when it is remembered how the nicest judgment that observation and experience can form, the most patient attention, aided by practised ear and eye, by microscope and test tube, are frequently necessary, to enable the conscientious physician to judge of his case before he can apply the remedy, it is evident how great must be the responsibility of those who, in rashness or ignorance, venture upon the treatment of serious disease, either in their own persons or in those of others; incapable of judging of its nature, still less capable are they of selecting the appropriate treatment." There is, however, a vast difference between the management of real disease, and of ordinary ailment—between endeavouring to strike at the root, or only to relieve the symptoms. Any unprofessional man, or woman either, in this kingdom, who, with all the facility that there is for procuring skilled advice, ventures to take the medical management of a case of real illness, acts most unwarrantably. Still less justifiable is interference with cases upon which a medical man is already in attendance. —See *Advice, Medical.*

The quacks, whose sole object is gain, are divisible into those who sell some nostrum, and those who profess to investigate and prescribe for diseases.

The quack medicines sold as such under the seal of Government are of every variety; some profess to cure everything, and therefore carry absurdity so plainly on the surface, that it is difficult to imagine any persons being sufficiently credulous to employ them; others are more circumscribed in their professions, but yet, so far as they go, are advertised as infallibles. One instance will demonstrate the danger of trusting to them. Under such articles as *Debility, &c.*, it has been pointed out that there is a false weakness, to be distinguished from that which is really dependent on actual debility, both being accompanied with languid depression. For such a condition, many quack pills and the like are advertised, they relieve "languor, nervous depression, &c." Such pills are generally powerful purgatives, and by their strong action in this way, perhaps, relieve some individual suffering under the languor of an oppressed system; he is delighted at the change, and meeting his invalid friend, who is suffering from the real debility of incipient consumption, or from some other disease, persuades him to try the wonderful pills,—need it be said, with how great probable, perhaps irremediable, injury. It would be easy to multiply instances; one is enough.

Of the prescribing quacks, some are so wonderfully skilful as not to require to see their patient; these include the "water doctors" —not the hydropathists, but the "casters" of the urine, those who require merely to see the urine, and therefrom pronounce the verdict of life or death, or send medicines accordingly. The chemical and microscopic examination of the urine is, indeed, to the physician, a most valuable aid in the investigation of disease, when taken in conjunction with the other symptoms of a case; but to imagine that its inspection yields any definite or trustworthy information to the ignorant and illiterate "water caster," ignorant alike of the nature of the secretion from which he or she—for there are female quacks of this kind—professes to derive information, ignorant of the structure or functions of the animal body, is too absurd. In such cases, as, indeed, in those of the prescribing quacks generally, the system of fraud is supported by lying assertions and promises, and by working upon the fears of the unfortunate dupes; this is especially the case in those who profess the venereal department, and who cannot be too carefully shunned. The most shameful impositions are practised by this description of quack, and the consequences are very serious. The conduct of newspaper publishers in giving currency to announcements connected with this obscene and disgusting phase of quackery is most reprehensible. Some quack prescribers follow their business on the strength, real or pretended, of

having received the "receipts," as they are popularly called, of some predecessor, regular or irregular. Even supposing such "receipts" were good for anything, it would be difficult to prove that their possession gave the faculty of applying them; but the fact is, with the exception of a few general medicines, such as the common aperient pills, every case of disease, every constitution almost, requires some modification in the medicines prescribed, and the same prescription is no more applicable to three or four different individuals than the same coat would be; moreover, almost every case of illness calls for changes and modifications of medicine, to meet the ever-changing symptoms which occur, but the quack panacea ignores such distinctions, and professes by its wonderful property of curing at once, to cut the Gordian knot,—well if it does not do this by cutting the thread of life at the same time.

As it is impossible for any man to treat disease with full advantage unless he has acquired by education a sufficient amount of the very varied knowledge, both theoretical and practical, which is now embraced within the limits of medical science; so, every man who undertakes the treatment of disease as a practitioner without such knowledge, necessarily falls under the designation of a quack, because he pretends to that which he does not possess—he deceives. It is true, many receive the necessary education, and yet follow out irregular theories and modes of practice; if, in doing so, they do wrong, it is unfortunate, but if the error is followed in sincerity, the follower cannot justly be called a quack. On the other hand, the upholder of the most orthodox medicine, may do so in a quackish manner, if, in his practice, he makes a display of methods, either of investigating or of treating disease, which are not requisite. Such things flourish because ignorance abounds. As any system of medical practice may be converted into one of quackery, so may any medicinal agent, even that which is safest when properly used, become, in the hands of the unprincipled empiric, an agent for evil. In fact, quack medicines generally are compounds of drugs which are regularly and daily prescribed by medical men; it is not in the composition, but it is in the application of the compound that mischief is done. If it be matter of indifference *when* a purgative, an anodyne, or any other medicine is taken,—*what* medicine of the class, so that it belongs to the class, is selected,—or if it matters not whether its peculiar action is suited to the case and constitution of the patient or not, and whether the same doses are suitable for all, then may quack compounds, each professing to do more than another, be permitted, unchallenged, to go forth on their errands of mischief, under the sign and seal of Government. But if a medical adviser requires to investigate his case, to weigh in his own mind the constitution, circumstances, and tendencies of his patient, and finally to select from the stores of his own experience and that of others the best adapted remedy or remedies, it must be evident to every reflecting mind, either that these latter necessities enjoined upon the man of educated mind and sense are a tissue of deceptions and shams, or that the whole system of quack medicines *must* be founded upon fraud, and that it flourishes upon the credulity which believes specious lies, or puts trust in the easily obtained testimonials of some weak-minded individuals, such as are to be found in all ranks and classes. It is difficult to account for the eager credulity and secure indifference with which otherwise sensible persons swallow or use what they believe to be agents capable of acting powerfully upon their own bodies, whilst all they know of these agents is, that they are put forth by persons they know nothing of beyond their advertisements filled with assertions so impudent, or attempts at deception so palpable, that the wonder is they do not defeat their own ends. Perhaps few would be inclined to trust an individual whom they had detected in the attempt to cheat them by offering a forged cheque, with, perhaps, the precaution taken to place the would-be deceiver out of the reach of the law, by the change of a letter in a name; and yet people are deceived daily by some such devices, and eminent names, with some slight alteration in spelling, are made the attractions by which an unprincipled vendor seeks to puff off his wares. Come from what authority it may, as soon as a medicine, or combination of medicines, is held forth as a "cure," irrespective of contingent circumstances, it becomes a quack medicine; in other words, it becomes a source of danger to some, probably to many. The passion for gambling is a very widely distributed one; and as men will risk their fortunes, their liberty, upon the throw of the dice, so it can only be the same love of hazard, that induces many of them to risk the possibility of injury, against the possible recovery of some of those great goods, those prizes of health, which they have in time past thrown away, but which are now held out as the tempting baits of the speculator.

Solomon's Balm of Gilead, which was said to be composed of nothing more than rum and milk, realised a handsome fortune for its promulgator, of whom the following anecdote is told:—Being asked how it was that people bought his medicine so freely, he replied, "Of ten men who pass my door, nine, at least as far as medicine is concerned, are fools; if you will give me the nine fools for customers, the regular practitioner may keep the one who is wise in these matters."

In advocating the doctrine that quackery is only to be successfully combated by imparting to people generally the information necessary to enable them to see through the deceptions of the charlatan, the author does not by any means dissent from the suppression of quack-

ery by the strong arm of the law, *at present*, as a means of protecting the people till they can protect themselves; for, as it must be long before information is sufficiently diffused to effect the end proposed, in the meanwhile, the external guard ought to be substituted till the dictates of educated intelligence are sufficient for the purpose. Governments ought to protect the poor and ignorant in these matters, instead of throwing the "patent" protection over deleterious compounds, which destroy annually so many of the people. A case in point of the injurious action of quackery has come under the author's notice lately. A labouring man, suffering from obscure internal disease for which he has been treated without relief both in private and in the wards of a general hospital, is induced, by the fair promises and lying opinions of an itinerant quack, to resort to him for advice (?), given whilst the medicine is paid for at the rate of five shillings a bottle, and *paid for at the time;* at the same time the poor man is applying for parish relief, and his family in want. He is to be cured in three weeks; that is, he is to pay fifteen shillings, and by the time the quack has reaped that amount, got together somehow, the patient may open his eyes, if he likes, to the fraud.

It is high time for the legislature of the country to interfere, seeing that heads of families often complain that books and pamphlets of the most offensive and indecent description are handed in at their door, or sent by post, and fall into the hands of those whose young minds they are meant and intended to pollute. Nothing also is more common than the obtrusion of certain advertisements meant to catch the eye of young people at a time when the constitution is undergoing natural changes, and enumerating a whole host of symptoms, on reading which the victim immediately supposes that he is the subject of some horrible disease, whereas a consultation with his family medical attendant would have at once procured him ease of mind and body.

The quacks are not so much to blame as the British public, which fosters and cherishes them; but if the public only knew the serious cases that daily come under the notice of medical men, cases where the maltreatment of quacks has produced deadly disease, they would be more chary in employing men who have nothing to recommend them to confidence but their own unblushing impudence and assertion.

The sum expended by the public of Great Britain upon advertised drugs and nostrums of various kinds has been calculated at not less than from five to seven hundred thousand pounds per annum. Upwards of forty thousand pounds are paid annually into the revenue for stamps to enable the vendors to dispose of quack medicines, and it has been affirmed that one notorious vendor of a quack nostrum spends no less than thirty thousand pounds per annum in advertising it to the public. A writer on this subject very justly observes—"Were all patent medicines submitted to a board of censors competent to examine them before the stamps were issued, the public might be preserved in some degree from decidedly injurious drugs."

St. John Long, the great impostor, was a painter from Cork, who professed to be able to draw "Morbific matter" from the body. At his trial for manslaughter he was found to be completely ignorant of everything, even allied to medicine or surgery, though many noblemen, clergymen, and men of distinction came forward to swear to his great medical skill. One of these witnesses swore that he saw Long draw several pounds weight of a liquid, resembling mercury, from a patient's brain!

"Nervous Cordials," "Balm of Gilead," "Balm of Mecca," "Botanical Syrups," "Guides to Health," So and So's "specific" or "drops," are being everlastingly introduced to public notice, the intelligent public all the while forgetting that if any one of these remedies was once able to cure all diseases, as was stated by its advocates at the time of its introduction, it should not have been superseded by any new remedy. It is a curious fact that medicines of a secret nature are generally said to be the property of some would-be benefactor of his species—probably a retired physician or clergyman who is willing, before he has "shuffled off this mortal coil," to part with his grand secret for a few postage stamps.

The most wonderful instances are on record of bone setters and cancer curers having made large fortunes by deluding the public, till they were found out, exposed, and forgotten. No class of quacks, probably, have been the cause of more immediate harm than the so-called curers of cancers, who generally profess to have discovered somewhere in the East, or elsewhere, a wonderful and certain cure. Their applications are either perfectly inert, and merely used as a means of dallying with the patient, or they consist of caustics of one sort or another which only eat deeper into the wound, without eradicating the disease, and often cause speedy death by opening into blood vessels. Their vaunted cures have not been cures of cancer at all; or, if so, have only been temporary or apparent cures, owing to the healing of a portion of skin over the cancerous wound.

The Government of this country, owing to an absurd and enthusiastic outcry as to the merits of a well-known nostrum called Stephen's Specific, was induced to vote five thousand pounds for its purchase, but, after its publication, no one could be found foolish enough to use it. The French Government also were induced to give a fair trial to a so-called cancer curer's method, and allowed him to choose seventeen patients afflicted with cancer, and place them in the Government Hospital of

La Charité for observation. He did so, and undertook to cure the whole in six months; but, alas! at the end of two months seven were dead, and at the end of the six months all were dead but two, and those two were reported dying.

But advertising goes a step further than recommending favourite remedies in the shape of medicines, elixirs, tractors, tar waters, life pills, at one shilling and three halfpence a box! for most of the papers now inform us that we require "no more pills, or any other medicine," but that all manner of diseases may be cured by the use of some compound closely resembling pease flour, and, no doubt, equally efficacious in all respects. Surely the monstrous absurdity of such statements ought to be sufficient protection against their being believed and acted upon.

QUARANTINE is derived from the Italian word signifying forty; forty days having been the usual space of time that persons or goods coming from places in which infectious disease, or disease thought to be infectious, prevails, or that have been exposed to the influence of any such disease, during a sojourn on board ship. The quarantine or isolation is either "performed" on board the vessel, which none are allowed to leave, or in a building called a "lazaretto," set apart for the purpose, and cut off from all communication with the surrounding country. The necessity of these restrictive measures is mainly felt, in Europe at all events, in the countries bordering the eastern and southern shores of the Mediterranean, and lasts usually for periods varying from six to fifteen or more days. Quarantine laws seldom require to be enforced in British ports, although they have been occasionally imposed by orders in Council. The Local Government Board has the power of taking strong measures with regard to the quarantine of vessels coming from suspected ports, and the Port Sanitary Authority may, if it thinks necessary, visit and examine such vessels, isolate those contagiously infected, destroy all material supposed to be infected, and detain the ship until it is fumigated and disinfected. Much difference of opinion has always prevailed respecting the laws of quarantine, and in some countries they are enforced often with little discrimination. The term of isolation is usually less than the forty days.

QUARTAN—a term applied to an ague, the paroxysms of which occur every seventy-two hours.

QUASSIA.—The quassia wood is obtained from a tree, native to Jamaica and other West India islands; it is named the *Quassia excelsa*, from its height, which is often one hundred feet. Quassia wood is usually sold in the form of chips, or raspings of a lightish yellow colour, it is intensely bitter, and forms a valuable tonic and stomachic remedy. It is best given in infusion, made by infusing two drachms of the raspings in a pint of water for a couple of hours. The dose, one to two fluid ounces, twice daily. The infusion is poisonous to flies and other insects, and is often used as an injection to destroy thread worms. The root bark of another species of quassia, or at least what was formerly ranked as a quassia, is also sometimes used in medicine.

QUICKENING.—See PREGNANCY.

QUICKLIME.—See LIME.

QUICKSILVER.—See MERCURY.

QUINCE SEEDS, when boiled in water, yield a mucilaginous decoction, which is not, however, in any way superior to other more common preparations. Two drachms of the seeds are ordered to be boiled in two pints of water for ten minutes, and the decoction strained.

QUININE.—See BARK.

QUINSEY.—See THROAT, SORE.

QUOTIDIAN—a term applied to an ague, the paroxysms of which occur daily.—See *Ague.*

RABIES, as a term, is usually synonymous with hydrophobia or canine madness.—See *Hydrophobia.*

RADISH, the *Raphanus sativus,* like other vegetables which are eaten uncooked, is not suitable for persons of weak digestive powers.

RADIUS, one of the bones of the fore-arm.—See *Fore-arm.*

RAISIN.—The dried grape, in which the mucilaginous and perhaps acid constituents of the fresh fruit have been converted into grape sugar in the process of dessication. Raisins are used in the preparation of the compound tincture of cardamoms, and tincture of senna. As an article of diet they are unwholesome only if the tough, indigestible skins are eaten. In the case of children, much disorder is frequently caused by the undigested skins of raisins passing into the bowels, and lodging in the sacculi or little pouches of the large intestines, where they cause much irritation, and probably troublesome diarrhœa, which is only relieved when a dose of castor oil, or of some other aperient, clears out the offending accumulation. Raisin skins may thus lodge in the bowels for weeks.

RANULA is the name given to an encysted tumour situated under the tongue, and containing a glairy mucous fluid of a bluish colour. It is usually got rid of by incision or by snipping off a portion of the sac of the tumour.

RANUNCULUS.—The various species of ranunculus, or "buttercup," so common in this country, are chiefly remarkable for their acridity, as any one may prove who will chew a small portion of one of the leaves. Their action is emetic, and also, when bruised and

applied to the skin, irritating, acting like a mustard plaster or blister, a fact, the knowledge of which might prove useful. These plants completely lose their acridity by drying.

RASH is a popular term for eruptions on the skin, more especially such as scarlatina, nettle-rash, &c., which do not present either vesicles or pustules.

RASPBERRY, the *Rubus idæus* is a native of this country, and grows wild in many situations, especially in Scotland, amid the stony banks of streams. The raspberry is one of the most wholesome fruits we possess, either in its fresh state, or preserved. In the latter form, it is a most grateful addition to the sick-room comforts. In fever, and feverish diseases generally, when the acid is not an objection, the well-known raspberry-vinegar is both an agreeable and salutary beverage. When the acid is inadmissible, a pleasant drink is made by mingling the preserve, or jam with water.

RASPBERRY ACID.—Put six pounds of raspberries into an earthenware pan, and pour over them two quarts of spring water, previously acidulated with two and a half ounces of tartaric acid. Let them remain twenty-four hours—and not more, or they begin to ferment—then drain them, taking care not to bruise the fruit. To each pint of clear liquor add one and a half pound of lump-sugar, which melts easier and quicker for not being pounded. Stir it frequently. When quite dissolved, bottle the syrup. The whole process to be done cold. This quantity of fruit will fill two wine quart bottles. This recipe answers equally well for black currants, strawberries, or red currants.

REACTION, in medicine, is the recovery of the animal system from depressing causes; a recovery which tends not only to restore to the ordinary level of action, but to go farther, and to stimulate to action above that level; thus, after shock from an injury or collapse from hæmorrhage, the reaction gives a skin hotter than usual, a pulse quicker and probably stronger than usual; the same effect occurs in reaction after depression from other causes, such as after fainting or fright; in combating, therefore, especially by means of stimulants, the depression which in such cases at first seems almost to threaten life, the after reaction must not be lost sight of, and the means of relieving the depression administered with a sparing and judicious hand. When reaction can be procured by the natural powers or resilience of the system, by external warmth, and by warm, comparatively unstimulating, fluids, such as tea, &c., it is better effected than by the use of more powerful excitants. In some cases, however, the latter are absolutely necessary to preserve life, and then ammonia, in some form, but especially as sal volatile, alcoholic stimuli, such as wine and brandy, and the others, are all powerful promoters of reaction. In some peculiar cases, emetics of mustard, by rousing the system, greatly assist reaction.

READING ALOUD and speaking aloud for a length of time are wholesome exercises for the strong, but if carried to excess, or even if only practised moderately, may produce in the predisposed injury to the lungs, spitting of blood, or affection of the throat (see *Clergyman's Sore Throat*). The modification of the respiration and circulation produced by continued loud speaking or reading, is also apt to produce unpleasant symptoms in those predisposed to apoplectic or head affections. The exercise of reading aloud has been recommended as useful in cases of hysteria and nervous disorders.

RECREATION, or the renovation of the powers of body or mind, after they have been exhausted by toil, is one of the highest pleasures enjoyable by man; a real pleasure, because it can only be purchased by those previous exertions, in the performance of which, although they are exertions, man feels that he is fulfilling the ends of his being. Those who live in a constant round of what is called pleasure, the idle, the saunterers after their work, do not know what true recreation is, cannot realise the thorough enjoyment with which the man who works in the true sense of the word, who, "whatever his hand findeth to do," does it "with all his might," throws off his toil, and takes to recreation in the same hearty spirit that he brings to his daily effort, whatever that may be.

Recreation is the enjoyment of man especially, and the higher he rises in the scale of *true* intellectual being, the more thoroughly must he enjoy it, the active pleasurable excitement of both mind and body, in contradistinction to "rest," which is the passive enjoyment of repose after exertion.

The animal enjoys rest, but can scarce be said to enjoy recreation; the man of physical toil enjoys rest, and, if the mind be dull and untutored, finds his chief enjoyment in the intervals of labour, in rest, like the animal; rest, which recruits the physical powers, whilst the mind is comparatively vacant. But when the mind is at all inclined to activity, after the rest which follows action, comes the desire for reaction, for recreation, an active state, more useful in many respects than rest, because it is a state of stimulation, of wholesome excitation, if kept within proper bounds. Such a condition of moderate pleasurable excitement of the mental and physical powers, which act and react on one another, is highly conducive to health, is, in fact, a means of preserving health, to which man, *except in a very artificial state*, is periodically, almost instinctively impelled.

The subject of recreation involves a great practical truth. Those who do not work cannot know recreation; without the action there can be no reaction, for the one follows the

other as effect follows cause, and when all is in order, as a necessary cause.

Again, recreation must alternate with work, if the power of working is to be retained. If recreation cannot be enjoyed without work, neither can work be enjoyed, or vigorously pursued without recreation; but the fact has been greatly overlooked in this busy age, and work is pursued unceasingly, until either body or mind sinks under the never-ending tension, or, if they do endure, until the power of taking recreation is lost, until the mind becomes so immersed in its daily engagements, in its daily routine, that it cannot divest itself of the trammels thrown around it. The man becomes so bound down in the pursuit of money, of power, of reputation, that he is a slave to his own desires, he grudges every moment abstracted from the advancement of his darling *cares*, he *cannot* recreate. This is neither the time nor place to point out how far this inordinate slaving is removed from the true ends of man's being in this world, or how little it is in accordance as a preparation for another. It is a system but little calculated to afford either continued health, or happiness, or usefulness, in man's daily life; the physical powers must eventually give way under it if persevered in, and dyspepsia, miserable hypochondriasis, paralysis, and cerebral disease will be the probable consequences; or, without the presence of tangible disease, the power of exerting the mind may be lost. A man who thus feels himself enslaved by work, should, by an effort, break through the restraint; an effort it *will* require, to cast off the morbid state of mind which is generally connected with the condition, but the effort must be made, and those from whom it is most required, are generally those who most have it in their power to avail themselves of the means of recreation to the utmost,—they are our wealthy, but overtasked in mind and body, merchants, lawyers, men of business, and in some cases medical men. They think they cannot leave their posts without everything going wrong; without risk of loss; risk of some rival taking up an investment, a cause, or a patient; and it may be so, but is the chance of such petty losses, a reason for sacrificing health, and life, and real happiness too? for *that* cannot be real happiness which is dependent for its continuance upon the same mill-horse round of actions. It is repeated, recreation is a duty which the man of real work owes to God, to society, to himself, and to his family, and it is a duty which he cannot altogether neglect, without risking the loss of both mental and bodily health.

The kind of recreation in which a man should indulge must of course depend greatly upon circumstances, but, generally speaking, a complete change of scene and air is desirable, such as will break in upon old trains of thought, give new ideas, and afford pleasurable recollections, when the active exertions of life are again returned to. It argues well, both for the physical and mental elevation of the population at large, that the means of recreation, the cheap trips, the excursion trains, the public parks, &c., are so abundantly taken advantage of, and are becoming yearly more common, for these must be regarded as part of the great sanitary movements of the age, the means of affording cheap and thorough recreation to classes, who, some years ago, scarcely dreamed of such a thing. It ought to be the duty of all, of every government, of every master, to give abundant facility for pure healthy-minded recreation to the people; to do so is true economy of that real wealth, social and political, the healthy mind, and healthy frame of every individual of the community.

Recreation, reaction after toil, or in other words, periodical stimulation of mind and body, in those who work, is so strongly instinctive, that it *will* be sought, and if not found in one way,—in the reading-room, the lecture, the concert, the garden, or even in the cricket ground—if not afforded in the fête or the excursion—will be procured in the tap-room, or in degrading and vicious pursuits.

To sum up: the stimulus of recreation is one of those stimuli necessary for the continued healthy tone of both mind and body. It cannot be neglected without injury to both, and its gratification ought to be directed into those channels which will preserve its utility, because they preserve it in order, in moderation, and in purity.

Refer to—*Exercise*—*Dancing*—*Pleasure*—*Rest*, *&c.*

RECTUM.—The rectum is the terminating extremity of the large bowel which opens at the anus or fundament. It derives its name from its straight course, as compared with the tortuosity of the other portions of the intestines; it is about nine inches in length, lies in front of the "sacrum" (see *Pelvis*), and expands into a dilatation just above the external opening, or "anus," at which it is closed by a "sphincter" muscle, which retains the contents of the bowel, unless, when under the influence of the will, it permits their expulsion, the latter act being effected by means of the muscular fibres of the gut itself, aided by the downward pressure of the diaphragm, and other muscles of the abdominal boundaries. The rectum is of course lined by a continuation of the mucous membrane which lines the intestines throughout. The rectum is subject to various diseases, which generally require efficient surgical assistance for their safe and speedy cure.

Infants are occasionally born with what is called "imperforation" of the rectum, that is, the gut instead of being an open canal, is closed wholly or partially, either at the external opening, or higher up. When "imperforation" of the rectum in an infant is either evident, or is suspected, from the non-passage

of the natural contents of the bowel downwards, from the belly becoming tense and full, and from vomiting of the contents of the bowels, the child should at once be seen by a surgeon, for it is possible that a simple operation adopted, without loss of time, may rectify the evil and preserve life.

Obstruction of the rectum, painful or otherwise, may occur either in adults or children, in consequence of the presence, either of hardened "fæces," in considerable quantity, or of foreign bodies which have descended after being swallowed, and become fixed in the gut, just above the lower opening, or which have been introduced directly into the canal, either by accident or design, and forming the nuclei of indurated masses of fæcal matter.

The dilatation of the rectum just above the anal opening rather favours in some cases the accumulation of the hardened fæcal contents of the bowels, especially in the aged, a condition which is apt to occur from the repeated use of large injections, and to occasion much suffering and inconvenience. Such an accumulation *may* require the aid of the surgeon, who removes it by mechanical means, such as scoops, and such like instruments; or the handle of a spoon is sometimes used in the absence of the above. In proper hands the case is of course safe, but it would not be well for unprofessional persons to attempt such interference; much, however, may be done by the persevering use of injections of soap and water, of about half a pint of fluid at a time, which will first soften, and finally induce the discharge of the mass. Foreign bodies lodged in the rectum may produce distress simply from their bulk, or they may produce much suffering by lacerating the lining membrane by sharp edges or points, causing intense pain on any attempt being made to evacuate the bowels; children not unfrequently suffer in this way from the stones of plums, &c., which they have swallowed, and the author has seen a case in which the greatest agony was apparently caused in a child by the hard core of an apple becoming fixed at the opening. In all such cases it is advisable to get proper advice at once, but in the absence of this, injections of tolerably thick gruel may be used, or the finger well greased, may be carefully introduced within the gut, to ascertain, if possible, the presence, and assist the removal of any small body within reach, but no instrument can be safely used except by a medical man.

Obstruction of the rectum may likewise be the result of disease, generally cancer, which causes narrowing or "stricture" of its canal; this disease, which generally occurs after middle life, and which may either be of a simple or of a cancerous nature, is thus described by the late Mr. Syme, a high authority on the subject. "The symptoms of simple stricture are slow, painful, and imperfect evacuations of the bowels, the desire to empty the rectum continuing after the most powerful and prolonged efforts of expulsion, the discharge of fluid matters with great force, as if from a squirt, the appearance of the solid evacuations in the form of slender cylinders, or small round masses, and the admixture of a large quantity of mucus, often bloody, with the feculent excretions. The disease generally manifests itself very insidiously, and before long is usually accompanied with a distended state of the abdomen, which is owing partly to retention of the intestinal contents, and partly to a tympanitic condition, induced by the irritation thus occasioned. The desire to empty the bowels becomes at length almost incessant, and the frequent attempts which are made to do so, being seldom followed by any evacuation, except of fluids, there is a risk of erroneously supposing that the patient labours under diarrhœa; and with this view of prescribing medicines which have a tendency to increase the distension of the intestines." It is only requisite to add, that when such symptoms as the above show themselves, there is but the one course left, that of procuring the best advice as soon as possible.

Ulceration of the lining membrane of the rectum, fissure at the anal opening, and other diseases, especially the last named, which produce painful sensations, when the bowels are evacuated, can only be properly investigated and treated by a surgeon.

Falling, or prolapsus of the bowel, and piles, have already been considered under their proper articles.

Fistula is a disease connected with the rectum which often causes much inconvenience; it is the result of abscess, which, having formed and discharged at the side of the gut, remains unhealed and unhealing, and often opens both externally, and into the bowel, forming as it were a side passage, by which wind and fluids are apt to escape along with the discharge peculiar to the artificial passage. As may be imagined, such a state of matters gives rise to much annoyance, and calls for speedy removal, which can only be procured with certainty by operative procedure on the part of a surgeon; the sooner, therefore, this is submitted to the better, the bowels being in the meanwhile kept lax, and the unpleasantness of the condition alleviated as much as possible. Fistula is far more common in males than in females, and is often associated with consumptive tendencies.—See *Intestines*.

REFRIGERANTS, in medicine, are remedies employed to reduce the existing temperature of the body, either locally or generally. Internal remedies such as the vegetable acids, nitrate of potash or saltpetre, &c., have been used under the name of refrigerant, but it is difficult to trace to them any direct action, further than that of allaying thirst; indirectly, they probably act by reducing the

force and frequency of the circulation. The best and most direct refrigerant is the obvious one, cold itself, used through the medium of cold air, cold water, or ice, and in most cases, when the temperature of the body is raised above the natural standard, in some of these forms cold is useful. The late Dr. Currie, of Liverpool, established the practice of treating fever by the refrigerating action of cold, used very boldly, in the form of cold water dashed freely over the patient, and the practice has been again revived by some modern physicians, who go a step further than Dr. Currie, and add ice to the bath in which the patient is immersed until the body temperature is reduced to near its normal standard.

Refer to—*Cold—Ice, &c.*

REGIMEN is the regulation of the habits of an individual, with reference to health. Diet is properly included under the term, but is generally spoken of separately. The proper regulation of the regimen of an invalid is obviously a matter of great importance. It includes the prescription of the hours and kind of employment, of exercise or of amusement, of the times of meals, and of sleep, of dress, &c. As the particulars of regimen are sufficiently entered into under the various articles, it is superfluous to notice them further here.

RELAXATION.—See RECREATION.

REMITTENT FEVER.—See FEVER.

RENAL.—Appertaining to the kidney.

RESINS are vegetable juices, which are solid, are not soluble in water, but dissolve in alcohol ; they are generally brittle, and more or less transparent. The resins best known, and which are used in medicine, are left after the distillation of the essential oil of turpentine ; they vary in appearance, according to the mode in which the distillation has been conducted. Turpentine resin is only used in medical practice at present as an addition to plasters. It enters into the composition of the well-known Basilicon or resin ointment. Resins obtained by heat or rectified spirit are now extracted from guaiacum, scammony, jalap, and podophyllum, and admitted as remedies in the British Pharmacopœia.

Refer to—*Basilicon—Plaster, &c.*

RESOLUTION.—The term is used in medicine to designate that termination of the process of inflammation by which the affected part is left without obvious change of structure, in other words, is left in the same condition as it was previous to becoming inflamed.—See *Inflammation.*

RESPIRATION. — Breathing, in its widest sense, is the process by which atmospheric air is brought into contact with the fluids existing in the interior of organised beings, whether vegetables or animals; in man it is the function by which atmospheric air is introduced or drawn into the lungs or respiratory organs, and again expelled, after its oxygen has been exchanged for the carbonic acid with which the venous blood is loaded as it enters the lungs. Thus the process of respiration in man comprises, first the act of drawing in the air, or "inspiration"; and secondly, that of expelling the air, or "expiration." The acts of respiration in health number from sixteen to eighteen in a minute, each act being usually equivalent to four beats of the pulse. The amount of air inspired and expired each time is calculated to be from twenty to thirty cubic inches, while that remaining in the lungs during respiration, called the residual air, averages 100 cubic inches. As the reader will find all requisite information upon this vital function under articles *Aeration, Blood, Chest, Circulation, Lungs, &c.*, it is unnecessary to repeat it here.

RESPIRATORS are instruments used to protect the air-passages from the direct effect of the air, especially when it is cold. They are, undoubtedly, when used with proper discretion, most valuable. The first instrument, probably, to which the name of the respirator was applied, was Jeffrey's well-known one, constructed upon the principle that the warm breath passing out from the lungs should impart its heat to a number of small, closely-set wires, the heat being taken up at the next inspiration by the cold air, in its passage through those wires to the lungs. Jeffrey's respirators are made so as to protect the mouth alone, the nose alone, or mouth and nose together. In many cases of chest affection these instruments furnish a means of protection of the highest value, particularly for those who, suffering from delicacy of the lungs, cannot, by reason of their avocations, avoid exposure after nightfall, or to cold or foggy air of any kind. With warm clothing and a respirator an invalid may almost defy climate, particularly as the instrument not only protects the air-passages from the direct influence of the cold, but seems to assist in preserving the animal heat of the body generally. The nose respirator is principally intended to be worn during sleep, and enables persons who suffer from delicacy of chest to occupy, during winter, bed-rooms much more freely ventilated than they could without its assistance.

The curative properties of antiseptic substances, when applied to wounds, has induced medical men to test their efficacy by means of the respirator-inhaler in cases of consumption, even where the disease has advanced to an extent in which abscess cavities are formed in the lungs. Dr. Coghill, of Ventnor, recommends a respirator for this purpose, consisting of two perforated metal plates, between which is placed a pledget of lint, or cotton wool, saturated with the antiseptic solution, which requires renewal morning and evening, and oftener if necessary, the instrument being worn at varying intervals during the day. Fig. 172 represents a respirator for the mouth

only; fig. 173 one for both mouth and nose; known as the oro-nasal. In order to obtain the full benefit of the agent, the person using it should be taught to inspire by the mouth only, and to expire by the nose, a somewhat difficult operation at first, but to be surmounted by a little practice. Carbolic acid, creasote, iodine, thymol, and eucalyptus, are among the best antiseptics for the purpose, their volatility being increased, if thought necessary, by the addition of a little ether or spirits of wine to the cotton wool. Dr. Coghill employs the following formula for moistening the respirator:—ethereal tincture of iodine and carbolic acid, of each two drachms, creasote or thymol a drachm, rectified spirit one ounce.

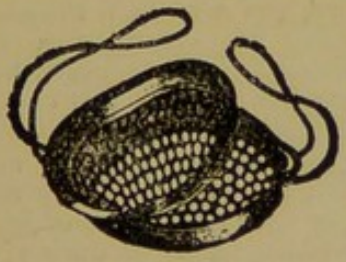


Fig. 172.

When the cough is urgent and the breathing embarrassed, chloroform or sulphuric ether may be added to relieve urgency. In addition to the above, the compound tincture of benzoin, either alone or combined in equal parts with tincture of henbane, is specially useful in chronic bronchial affections, as well as in consumption, and is specially corrective



Fig. 173.

of any tendency to fœtor in the expectoration; fifteen to thirty minims of each may be used upon the cotton of the inhaler.

The chief objection urged against ordinary respirators is, that they keep the air of respiration in too artifical a state of warmth, and thus render the wearers peculiarly susceptible on the slightest accidental exposure, in fact, render them so sensitive of cold as to be almost entirely dependent on the instrument for comfort, and health, and even for life. Notwithstanding these objections, when as full protection as possible from cold air is required, Jeffrey's respirator is the best instrument, care being taken, of course, that it is not unnecessarily had recourse to. When a minor degree of protection only is required, it may be attained by some protective material worn across the mouth, which acts upon the same principle as the respirator above named. A handkerchief of silk or of woollen material is at once a simple and efficient respiratory protector, and various forms of respirators, made of woven materials, may be procured at the shops. Some persons find respirators of any close material so confining, as to cause difficulty of breathing; for such cases, open knitted protectors of Shetland wool are well adapted. Veils of the same material are made, which form an additional protection for females.

Persons who are not very delicate, but who yet find it requisite to wear a respirator, will often find it a relief, when walking, to slip the instrument off the mouth when they turn away from the wind, or in very sheltered situations, readjusting it whenever they again meet the wind, or pass into a more exposed situation.

The late Dr. Stenhouse introduced a form of charcoal respirator for the use of persons engaged in working amongst noxious gases. This antiseptic respirator, made to fit over the nose and mouth, has been occasionally found useful by nurses and others who have had to dress very offensive wounds. Oro-nasal respirators are also employed by workmen in various deleterious substances, to prevent the fine dust of foreign matter from being inhaled. They are also recommended for miners and firemen, who are enabled by this means to breathe in safety vapours of a deadly character, or to enter houses in the performance of their duty, no matter how dense the smoke is.

REST—Refer to SLEEP.

RESUSCITATION, the restoration to sensibility of persons apparently dead, is sufficiently treated of under articles *Carbonic Acid or Choke damp—Cold—Drowning—Hanging, &c.*

RETE MUCOSUM.—the internal layer of the outer or scarf skin.—See *Skin.*

RETENTION OF URINE signifies a want of ability to pass the urine in the ordinary way, due to paralysis, obstruction, or functional derangement of the expulsive powers of the bladder. When the complaint is not of a severe character, relief is often obtained by the hot bath, or the administration of an opiate; more often it is necessary to relieve the bladder by means of the catheter. The symptom is not uncommon among hysterical women.

RETINA.—The retina (fig. 174) is the expanded sheet of nervous substance derived from the optic nerve, which forms the inner coat of the eye; it is the essential portion of the visual organ, the mysterious link between material appearances and mental impressions, without which, or in a diseased state of which, all other arrangements for vision, however

perfect, must be futile. The eye may seem as lustrous as ever, its depths as clear, but if the retina or its nerve fail, all is dark,

"And knowledge from one entrance quite shut out."

The retina (fig. 175) does not extend quite to the fore part of the interior of the eye-ball, but only as far as what is called the "serrated

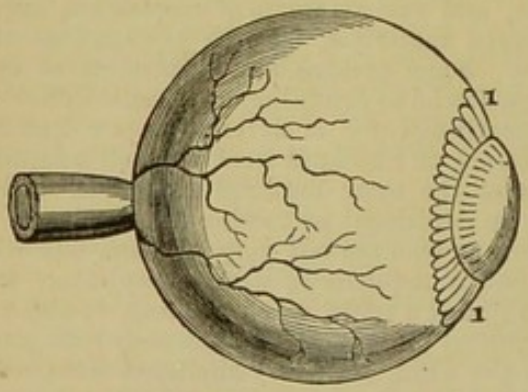


Fig. 174.

line" (3); in front of this serrated line, lie the ciliary foldings (2) of the coloured coat of the eye, and more anterior than these the "iris" (1), the posterior view of which is represented in the drawing.

Blindness from disease of the retina is referred to under the article headed *Amaurosis*. In a living, or perfectly fresh eye, the

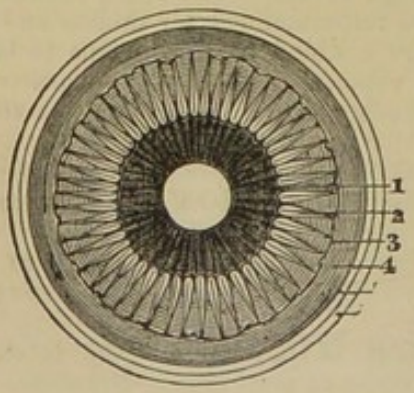


Fig. 175.

retina is transparent, but soon after death acquires an opacity somewhat resembling that of ground glass. The minute structure of this portion of a wonderful organ, is in itself most wonderful and complex.—See *Eye*.

RHEUMATISM.—Under this well-known name are comprehended two forms of disease, differing greatly from each other, so greatly, indeed, as to be distinguished even by the unprofessional. The acute form of rheumatism, frequently called "rheumatic fever," by medical men, is popularly named the "rheumatics," whilst the chronic form, the "chronic rheumatism" of the physician, is known to the public as simply "rheumatism," or in vulgar parlance, as "the rheumatiz." "Muscular rheumatism," is also included under the term rheumatism.

Acute rheumatism, or rheumatic fever, is characterised by symptoms of high inflammatory fever, there is shivering, great heat of skin, followed by profuse sour-smelling perspiration; the pulse is rapid and full; the tongue, covered with a white, creamy-looking fur, is red at the tip and margins; there is much thirst, and the appetite is deficient. The urine is scanty and high coloured, and deposits on cooling a large quantity of red sediment. Delirium does not often occur, unless the heart becomes involved. Coincident with the above constitutional symptoms, one or more of the large joints, or some of the tissues in the neighbourhood of a joint, become exquisitely tender, swollen, and inflamed, the skin over the affected part turning pink. Whatever may be the part or joint first affected in a case of acute rheumatism, it rarely becomes the fixed seat of the disease, which, before long, almost invariably transfers the site of its manifestation to some other joint, leaving the one previously affected entirely free, or nearly so; this shifting from one place to another, goes on during the whole period of the disease, and, indeed, constitutes its most characteristic and well-marked feature. Few diseases are accompanied with more pain and suffering than acute rheumatism, the slightest movement often causing the most exquisite torture; the patient lies in a state of helplessness more or less complete, according to the extent of the affection of the joints. A disease which, like acute rheumatism, can thus shift its local indications from one part of the body to another, must evidently be a constitutional one, and there can be no question that it is a blood disease; that is, that it is dependent on a morbid condition of the blood, or the circulation of a poison generated in that fluid. The near resemblance in many of their circumstances between gout and rheumatism, renders it probable that a similarity, at least of cause, may be expected. In the former disease, the blood poison, the "uric acid," not only separates itself spontaneously under the form of chalk stones, but it has been separated from the blood itself by Dr. Garrod. That a superabundance of peculiar acid, probably lactic acid, does exist in the system, during an attack of acute rheumatism, is unquestionable. So long as an attack of acute rheumatism confines itself to the joints, and to the parts in their vicinity, it is a disease devoid of danger, but, unfortunately, in a very considerable proportion of cases, there is a tendency of the disease to attack some of the "fibrous" structures connected with the heart, which resemble those fibrous tissues, which, in the neighbourhood of the joints, are the common seat of the disease. These inflammatory rheumatic affections of the heart attack principally the pericardium or outer covering, but the lining membrane or endocardium as well as the valves are also often

involved. These diseases having been already referred to (see *Carditis*) require but little further notice here; it is sufficient to remark that they are complications of rheumatic fever which are always to be anxiously looked for, and their appearance is to be treated with the utmost caution. The heart affection is more liable to occur the younger the subject, and, indeed, the author has reason to believe, from a case which has come under his own notice, that where strong hereditary predisposition to rheumatic affection exists, the heart in a child may become affected rheumatically, and the foundation laid of future organic and incurable disease, without any of the usual joint affection of rheumatic fever being mixed up with the first attack, which has probably been passed over as a feverish cold. Probably, such cases are not common, but their possibility should put parents, who are aware of hereditary predisposition to acute rheumatic disease, upon their guard as respects their children. In considering the causes of acute rheumatism, the strong predisposition that exists in individuals and families hereditarily is most important; for in such persons extra care is always requisite, as they are liable to become the subjects of the disease from contingencies which would leave others quite unaffected. This circumstance of hereditary predisposition to acute rheumatic affection ought always to be considered by parents in directing or advising upon the future destinations of their children, who ought never to engage in any occupations which may involve much exposure to the vicissitudes of weather, for if they do, they almost certainly become the victims of rheumatic fever, involving long and painful present illness, and in all probability laying the foundation of years of future suffering, and of half usefulness, from heart disease. Indeed, so serious are the considerations involved in hereditary predisposition to acute rheumatic disease, as to make it a question whether persons thus predisposed would not find it their best plan to leave the changeable and often damp climate of Britain, and make their home in one such as that of Australia, free from such objections; provided, of course, that after the move occupations are not engaged in which involve exposure. The question of hereditary predisposition to acute rheumatism is one which no Life Assurance Company should overlook.

Of the direct causes of acute rheumatism, there can be no question that cold and damp combined are the most usual; out of all proportion, consequently, the poor and ill-clad are they who suffer most frequently from the disease, although any person exposed to such influence is liable to be similarly affected. For the above reason, acute rheumatic affections are most prevalent during cold, wet weather; they are, however, by no means uncommon during the prevalence of extreme heat. This circumstance is perhaps traceable to the fact that persons are apt to have the free action of the skin, the profuse perspiration, checked by incautious exposure in hot weather. Whatever the cause, the disease prevails. The author likewise believes he has traced attacks of the affection in the predisposed to unusual exertion, without any appreciable check having been given to the perspiration. The disease is most generally met with between the age of puberty and the fortieth year; it is more common among males than females.

The treatment of acute rheumatism is not either likely or desirable, except under peculiar circumstances, to be trusted to unprofessional management; the long continuance of the disease, its painful nature, and, above all, the possibility, almost probability, of so serious a complication as affection of the heart arising during its progress, all combine to render proper medical assistance from the first highly desirable.

When an individual who has either suffered from an attack of acute rheumatism, or is hereditarily predisposed to it, or indeed when any one, after exposure likely to produce an attack, suspects the disease to be impending, the first efforts should be to excite the free action of the skin. If a warm or vapour bath can be procured, it is highly desirable; if it cannot, the best substitute will be a well-warmed bed, with hot bran bags, or hot bottles, and the free use of warm diluent drinks. A draught, composed of half an ounce of spirit of mindererus, one drachm of paregoric, and fifteen drops of ipecacuanha wine, in a wine-glassful of water, may be given every four or five hours, or a drachm of sweet spirit of nitre may be substituted for the mindererus. To the above draught, fifteen minims of liquor potassæ, or ten grains of the bicarbonate of potash may be added with advantage. Under the above circumstances, any stimulant diaphoretic may be given with benefit, even a little gin, or other spirit, or wine, *well diluted* with hot water; these stimuli being used, of course, only at first, and whilst fever is not yet present.

When an attack of acute rheumatism, characterised by the symptoms detailed at the commencement of this article, is unequivocally established, if medical assistance is not immediately procurable, the patient must be kept in bed, *moderately warm*, the thirst quenched by the free use of simple diluent drinks, and the diet reduced to a very low scale, anything like alcoholic stimuli, or animal preparations, being strictly forbidden, except in the cases of very debilitated persons, when animal broths, such as beef tea, may be permitted in moderation. If fever runs high, tartar emetic, in from an eighth to a fourth of a grain-dose, may be given every four, five, or six hours, and with this, from six to ten drops of laudanum may be combined to alleviate the pain. This will, however, under the circumstances, be better

effected by the use of from one grain to two grains of solid opium, given at bedtime, along with five grains of calomel, the dose being followed in the morning by a purgative, a black draught, or senna alone, or, in a strong subject, senna combined with Epsom salts. The safest way of managing the opium will be to give a grain the first night, and if that does not procure sleep, gradually to increase the dose. If the mouth becomes affected by the calomel it must of course be discontinued. Instead of simple opium, Dover's powder, in doses of from five to twenty grains may be given, likewise combined with calomel, and followed in the same manner by the purgative. The above measures might with safety be adopted under peculiar circumstances in the absence of medical assistance; there are however many other modes of treatment—bleeding was formerly much employed. It has fallen into comparative disuse, at all events it could only be had recourse to legitimately by a medical man. The treatment by large doses of nitrate of potash, or saltpetre, has had its advocates, and may be tried: the mode of administration as laid down by Dr. Basham is, to dissolve two ounces of the saltpetre in two quarts of water, and to give this quantity in the course of the twenty-four hours. This treatment, which is said to be very successful at times, might be available in the absence at least of other remedies; of course, if symptoms indicative of irritation of the stomach or bowels came on, it would require to be abandoned. More recently, the treatment of acute rheumatism by lemon juice, as introduced by Dr. Owen Rees, has come into practice, and seems in many cases to answer extremely well; on this point the author can speak favourably from his own experience. This treatment has the advantage of being perfectly safe, and therefore, where the lemon juice can be procured, may without danger, be pursued in the absence of a medical man. One table-spoonful or half an ounce of lemon juice, is to be given every four hours. The "alkaline treatment" of acute rheumatism has been largely adopted on the authority of the late Dr. Fuller, and many other leading physicians, and has been found to be very beneficial in relieving pain and hastening convalescence. Bicarbonate of potash, in doses varying from twenty to thirty grains, given in milk or barley-water every four hours, may be employed alone, or in combination with the acetate or nitrate of potash. Most persons have heard of colchicum in connexion with the treatment of rheumatism, and in proper hands, properly used, it is at certain times most valuable, but its employment requires too much discrimination to make it safely usable, in this disease at least, by unprofessional persons. But the remedy which before all others has come of late years into universal use in rheumatic fever is salicine, as it has the remarkable power of reducing the temperature, relieving pain, and shortening the malady. Salicine and its preparation, salicylic acid, and salicylate of soda, are given in doses of ten, twenty, or even thirty grains every three or four hours. Dr. Southey, of St. Bartholomew's Hospital, administers fifteen grains of salicylate of soda every two hours till sixty grains are taken, and afterwards continues the same dose of the drug every four hours; while Dr. Maclagan, who first introduced the medicine as a remedy in rheumatic fever, gives fifteen grains continuously every two or three hours, till the symptoms are checked. It is important to notice that the administration of salicine, in large and frequent doses is often the cause of much mental excitement and aberration, and it may be necessary to discontinue it. As regards the local treatment of the inflamed joints, little is to be done in a disease which shifts its site so rapidly as acute rheumatism; for even if it can be driven from one joint, it must, as long as the poison is in the constitution, show itself elsewhere, it may be in the heart; above all things, leeching the joints, unless under peculiar circumstances, of which a medical man only can judge, is to be avoided —hot bran bags sometimes give relief, but probably the following plan laid down by Dr. Bentley Todd will be the most advantageous local method of treatment. When the joints are much swollen and painful, much ease may be given by enveloping them in a large quantity of the soft carded cotton—"cotton wool"—over which there is wrapped *completely* a piece of oiled silk or gutta percha tissue secured by a few loops of a bandage. By this air-tight covering, the joints are kept in a perfect vapour bath, and when it is removed after twelve or twenty-four hours, the wool will be found saturated with moisture which is strongly acid. Dr. Todd says this treatment affords great relief, supports and keeps the limb steady, and at the same time promotes sweating. It is also serviceable in gout. Of local medical applications, a mixed alkaline and opiate solution may be used as a fomentation, or the chloroform and belladonna liniment will frequently give relief, but the cotton wool applied as above is by far the best treatment.

There are few diseases so tantalisingly tedious as acute rheumatism; it may disappear quickly, possibly in a week, or it may extend its visitation, ebbing or flowing, to ten, twelve, or fifteen weeks, in spite of treatment, apparently the best directed; but yet, provided the heart, the diaphragm, the brain remain unaffected, it is free from danger, and, generally speaking, does not leave joints which have been severely affected worse than they were before. It is very rarely the case that matter forms in consequence of rheumatic inflammation. It has been said that there is a rheumatic predisposition: not only does this show itself in a tendency to attacks of acute rheumatism properly so called, but it tends to modify any inflam-

matory action in the body, as for instance in the eye, when it gives rise to the peculiar "rheumatic inflammation." The causes of acute rheumatism already pointed out will suggest to most persons the precautions to be adopted, especially when liability to the disease exists. Cold and wet are particularly to be guarded against, and, after exposure, the preventive measures already laid down adopted. Flannel or wool stuff worn next the skin, must always be regarded as one of the chief preventives; it should of course be proportioned in thickness to the season and temperature. Some persons imagine that their liability to rheumatism, either acute or chronic, is increased by flannel; if it is, it is probably because the wool keeps the skin in too excited a state, and by increasing perspiration increases the risk of suppression; in such cases, woven silk when it can be afforded, is useful, or spun cotton, may be used in winter: many rheumatic patients find their chief protection in an under dress of chamois leather. At all events, perfect warm clothing and protection against suppressed perspiration is essential in all such cases. Many of the above precautionary measures apply likewise to chronic rheumatism. Persons of full habit, liable to rheumatic attacks should eschew malt liquor generally, should take animal food sparingly, and avoid violent exertions which heat the body. Persons of spare or feeble habit, may live better, and indeed require to keep up the condition of the body to as good a pitch as possible.

Chronic Rheumatism.—There are various forms of chronic rheumatism, but that with which we are most familiar is the rheumatic affection of old people, associated with chronic pain, stiffness, and swelling of one or other of the larger joints, and which most frequently shows itself in persons who have been much exposed by the nature of their avocations to cold and wet. The symptoms are aggravated by change of season, east winds, and exposure.

By chronic rheumatism, however, in the proper sense, should be meant a disease somewhat resembling the acute form, accompanied with but slight febrile derangement, if there is fever at all, and affecting one or more of the joints, generally the smaller ones, which continue for a greater or less length of time swollen and tender, the inflammation either subsiding without effect, or after long continuance, causing permanent thickening around the joints, probably with permanent distortion; the process being more or less accompanied with pain. In this form of rheumatism, instead of heat, there is often a sensation of cold around the affected parts. The chronic nature of this disease must generally place it under proper medical control; the chief efforts of the unprofessional must be, to correct any slight deviations from the general health, to protect the affected parts especially from cold, by means of warm clothing, and to use friction, either with simple oil, or by means of the compound camphor oil combined with soap and opium liniment, one-third of the former, to two of the latter. Much comfort is not only derived from friction, but if combined with proper exercise of the joint or joints, it may do much to prevent permanent deformity. In the class of cases relieved by warmth, guaiacum is often a valuable remedy. It is best given in the form of the ammoniated tincture, of which a tea-spoonful may be taken in milk three times a day, or the guaiacum mixture may be used in two table-spoonful doses three times daily. The vapour and Turkish baths are often found valuable remedies. In chronic rheumatism warmth of climate is of much importance, and as much should be done towards the attainment of this as circumstances will permit. Sir James Clark recommends Nice and Rome as the best European climates, but these, of course, are the resources only of the wealthy. Australia, however, is open to the poorer classes. Warm bathing, especially the saline bath, such as is furnished by Bath or Buxton, or Ashby-de-la-Zouch, is of the highest service in cases of chronic rheumatism, and in all cases of long standing should, if possible, be had recourse to. The charities connected with many of the baths are available to the poor.

Chronic rheumatism, properly so called, is such as above described, but the term rheumatism, or rheumatic pain, is also used to a great variety of anomalous pains, and from this has arisen considerable confusion. The best marked of these is "muscular rheumatism," which affects chiefly the thick muscles, such as those of the shoulders, arms, neck, loins, giving rise to such well-known complaints as lumbago and wry neck, &c. This form of rheumatism often comes on suddenly, after exposure to a current of cold air, sometimes after cold bathing; its chief characteristic is severe pain, when the affected muscles are thrown into action. This muscular rheumatism seems to be a purely local affection, and is generally removable by purely local remedies. Of these, the best is a large hot bran poultice, or some other means of applying heat and moisture, repeatedly applied over the affected part for eight or twelve hours; this often at once cures, care must of course be taken to protect the part to which the heat has been applied by a covering of flannel. After the hot application is removed, if the heat does not entirely cure, and even instead of it at times, a mixture of the soap and opium liniments, either alone or combined with one-third turpentine or cajeput oil added, may be used with advantage, two or three tea-spoonfuls being well rubbed into the part every six or eight hours. In situations where other means are wanting, counter-irritation, by means of pieces of metal dipped in boiling water, and applied to the skin, or by means of

Dr. Corrigan's hammer (see *Counter-irritation*), may be resorted to. In rheumatism of the thick muscles about the shoulder the use of the acupuncture needles often removes the affection in a strikingly rapid manner, indeed, sometimes in a few minutes.

Any notice of rheumatism at the present day must be imperfect, without some allusion to electric and galvanic agencies. That these appliances are at times of apparent service in cases of chronic rheumatism is undoubted, and if such is the case, we are not justified in rejecting their aid, because we cannot exactly explain the why and wherefore of their action. The effect of the acupuncture needles, above alluded to, in curing muscular, and also nervous rheumatism, such as sciatica, is sometimes almost magical, but how the simple introduction of a needle into the substance of the body acts so as almost instantaneously to remove a most painful affection, it is very difficult to say. In using electric or galvanic appliances for the use of chronic rheumatism, those apparently which keep up a slight but continued electric excitement are the most useful. The continuous current Leclanché battery is best adapted for this purpose.

Refer to—*Acupuncture—Carditis—Gout—Salicine—Electricity.*

RHUBARB, MEDICINAL.—Rhubarb Root. Well known as this valuable medicine is, there is yet considerable uncertainty respecting which of the many recognised species of rheum, or rhubarb, yields the true medicinal drug. A species known as the *Rheum palmatum* is considered to be the most likely source of the best rhubarb, but it is not improbable that other species of the genus *Rheum* yield much of the rhubarb root imported from the East, and it is certain that different species of rhubarb are cultivated in this country and on the Continent both for adulterating the genuine article when in the form of powder, and for simulating it in substance, being "dressed up" in a manner similar to the real root. Dr. Royle says:—"The greater part of the rhubarb of commerce grows in Chinese Tartary, and is gathered in summer from plants six years old. When dug up, it is cleansed, peeled, cut into pieces, bored through the centre, strung on a string, and dried in the sun." A portion of this rhubarb goes to China, the remainder passes through Russia, and is known in this country as Russian or Turkey rhubarb. When genuine, this rhubarb is always a superior drug, chiefly on account of the care bestowed upon the examination of the samples before they pass the Russian factory, through which they are transferred to the European markets. At this factory the inferior samples of the root are, or ought to be, rejected. Russian or Turkey rhubarb "varies in shape, being irregularly roundish and angular, from the bark having been shaved off with a knife; some pieces are cylindrical, a few flattish, many of them pierced with holes. Externally smooth, of a yellow colour; internally the texture is rather dense; fracture uneven, irregularly marked with white and red veins, having a strong and peculiar slightly aromatic odour, a bitter, rather astringent taste, feels gritty when chewed, and produces a powder of a bright yellow colour." The grittiness is owing to the presence of numerous crystals of oxalate of lime, that salt being found in the rhubarbs generally. Chinese, or East Indian rhubarb, is probably derived from the same source as the Russian, which it resembles in essentials, although less uniformly good. English rhubarb is cultivated chiefly near Banbury, in Oxfordshire. "It is the kind frequently sold by men dressed up as Turks, as genuine Turkey rhubarb. The pieces vary in shape, some being ovoid, others cylindrical, smoothed externally, and rubbed with a yellow powder, light, rather spongy, with a reddish hue. It is rather mucilaginous in taste, and a little astringent. Its odour feeble, but unpleasant." Few medicines are more extensively used than rhubarb, few are more valuable or safer. The most characteristic action of rhubarb is that of a mild, but effectual, aperient, the action depending upon the amount of the dose; it rarely gripes; it exerts, moreover, a beneficial tonic action upon the stomach. On account of its astringency, rhubarb is apt to leave a tendency to constipation after its purgative effect is over.

Rhubarb may be taken alone, as an aperient, in doses of from ten to thirty grains, either simply mingled with water, or made into pills. Some persons habitually carry a piece of the root in their pockets, and cut off small fragments as they think them required. Infusion of rhubarb is made, according to the British Pharmacopœia, by infusing for two hours a quarter of an ounce of the sliced root in ten ounces of boiling water. The preparation is too weak for an efficient aperient, but may be used as a stomachic.

The compound rhubarb pill, one of the best forms of common aperient we possess, has been already considered.—See *Pills.*

The compound rhubarb powder is better known as Gregory's Powder, or Gregory's Mixture (see *Gregory's Powder*). The tincture or compound tincture of rhubarb is an extensively used, and most valuable remedy, chiefly as a stomachic cordial and anti-spasmodic; it ought rarely to be given as an aperient, on account of the large amount of spirit which must necessarily be taken with it in this form by most persons, a few individuals, however, of weak habits, whose bowels are very easily acted upon, find it beneficial, not only for its aperient action, but for its subsequent tonic and astringent powers. When increased action is required in such cases, the compound rhubarb pill is the more useful preparation. To make the "tincture of rhubarb": Take of

rhubarb sliced, two ounces; cardamoms, a quarter of an ounce; coriander, a quarter of an ounce; saffron, a quarter of an ounce; proof spirit, twenty fluid ounces; macerate and percolate.

For infants and children, rhubarb alone, or combined with calomel or grey powder when requisite, forms a most excellent medicine; the chief objections are the bulk and taste, which render it sometimes difficult to administer. It should be remembered, that in persons who are taking rhubarb the urine acquires a deeper colour from the drug; so also the milk and perspiration. Rhubarb in small doses, combined with bicarbonate of soda, is an excellent alterative, and an invaluable remedy in many cases of indigestion depending on acidity and tendency to constipation. The dose should be about six grains of the former to ten of the latter, taken two or three times a day, and is all the better for being combined with a few grains of powdered ginger. A very elegant stomachic preparation is made by digesting, for a week, one ounce of rhubarb root sliced in eight ounces of liq. potassæ. Of this ten, fifteen, or twenty minims may be given in half a wineglassful of peppermint water, with ten minims of chloric ether.

RHUBARB, GARDEN, is too well known in its numerous varieties to require description; its agreeable acid depends on the presence of the oxalic and malic acids, which it contains abundantly. As a cooling article of diet, it is wholesome for most persons, but some cannot take it without suffering after from stomach disorder, and others who have any tendency to certain urinary disorders must most strictly avoid it; indeed, if garden rhubarb is too freely indulged in, it may give rise to urinary irritation.

When used as food, garden rhubarb exerts an aperient action upon the bowels. This is increased, if shortly after it has been eaten, a moderate dose of magnesia be swallowed.

Refer to—*Oxalic Acid.*

RIBS.—The ribs are the curved bones which inclose the chest (fig. 176) and upper part of the abdomen. They are twelve in number on each side. Of these the first seven on each side (1, 1) are directly connected with the breast bone or "sternum" (3), and are called the true ribs, the remaining five are called the false ribs, of these the upper three are indirectly connected with the breast bone, by means of cartilages attached to the cartilage of the last two ribs; the lowest two (2, 2) are unconnected with the breast bone, or other ribs in front, and are therefore called floating ribs. The "cartilages" (4, 4) by which the seven superior ribs are connected with the breast bone, and by which the three upper false ribs are connected with the cartilage of the last true rib, are very elastic in early life; as, however, age advances, they become less so, and ultimately are converted into bone. The posterior extremity, or head of the rib, is attached to the spine (fig. 177) by means of ligaments (1) which admit of a certain amount of movement. These ligaments are so strong as completely to resist displacement of the bone by violence, fracture, as is the case at

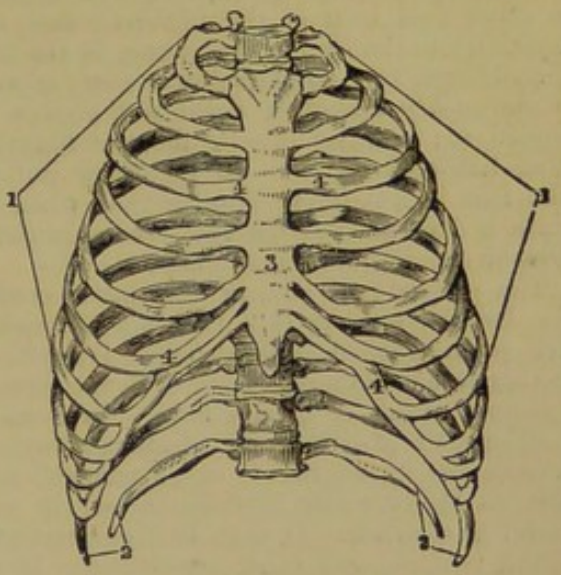


Fig. 176.

the ankle, taking place instead (see *Fractures*). The ribs are likewise attached in front to the breast bone by means of ligaments, and are connected to each other by short "intercostal"

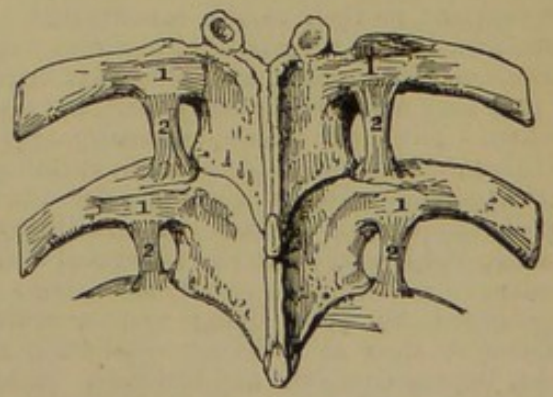


Fig. 177.

muscles, which act in the efforts both of inspiration and of expiration.

RICE.—This well-known grain, although far below most others of the class in actual nutritive power,—not yielding more than three or four per cent. of plastic nutriment,—forms the staple article of food to millions in warm climates, especially in Asia, and is largely used as an occasional article of diet in this country. Its chief constituent is starch, of which it contains eighty per cent., and when it is cooked in water, it absorbs that fluid so largely, as to swell to many times its bulk in the dry state. It is unquestionable that rice is well adapted as food for the inhabitants of those warm climates, in which it flourishes so luxuriantly, and that its unstimulating nourishment must be conducive to health, whilst at the same

time its blandness to the palate and stomach can be corrected by the aromatic condiments which usually grow under the same climate as that which brings the grain to perfection. In climates like our own, rice probably could not form a staple article of food, but as an addition to other food it is of the highest value, and especially to the food of the young, in the form of puddings, &c., *care being taken that the grain is thoroughly cooked*, a point not always attended to; nothing can be more indigestible than half-cooked rice. In puddings and the like this is less likely to occur than when the grain is dressed as a vegetable, and required to present the distinctness of grain.

The property of rice, in tending to confine the bowels, renders it a valuable adjunct to sick cookery when such an effect is required; in this case it is most beneficial in the form of "ground rice," or of rice flour. In cases of diarrhœa, or of irritability of the stomach or bowels, rice water, that is water prepared from rice, as barley-water is from barley, is very useful as a drink. It may be flavoured with lemon peel, or any other condiment. If the case is a severe one, the solution of a teaspoonful of isinglass or gelatine in every pint of the "water" is a useful addition.

Arrack, a spirit used by the Orientals, is made from rice.

Refer to—*Grains*.

RICKETS is a disease in which the bones are deficient in their earthy constituents, and consequently lose their natural hardness; they become soft like gristle, and somewhat brittle, so that they are not only easily bent, but easily broken. The term rickets is usually applied to this softening, when it occurs in childhood, but a similar disease also attacks adults, especially females. Rickets is a constitutional disease, and is very generally associated with a tendency to scrofula, either hereditary, or engendered by poor living and unhealthy influences, such as deficient ventilation and light, impure damp air, and bad food. Rickets may show itself within the first few months after birth, but is more generally perceived when the child first attempts to walk, and the limbs give way under the weight of the body. By far the largest number of cases arise during the first two years of life. Coincident with, or rather preceding the evidence of weakness in the bones, the child's general health is observably impaired; there is languor and pallor, with dingy complexion, loss of flesh, tumidity of the belly, impaired or fickle appetite, and unhealthy secretion from the bowels; in fact, the child presents all the evidences of a depressed state of health. Not unfrequently there is an approach to the cretin head and features (see *Cretin*). It need scarcely be said, that a child showing the symptoms above detailed cannot too soon be placed under proper medical attendance, for life and future well-being are at stake. Every means for improving the constitution will be requisite. If the situation is an unhealthy one, removal, if possible, should be effected; if the child is still at the breast, unless there is positive evidence that the milk is of good quality, it should be weaned. Animal broths will probably be required even for infants, certainly, along with animal food, for older children. Clothing will require attention as regards its warmth, and tonic and other medicines, especially iron, must be requisite. For a child of a year old, powders, containing half a grain of grey powder, and three grains of carbonate of iron in each, are a very useful remedy, given twice a day for some time. The above are only general directions, for such a disease as rickets ought always to be under proper medical care. In the later stages, when the bones are very soft, much care will be required in moving, to avoid inflicting either pain or injury. Very many children who become ricketty die, but a certain number recover, and though perhaps with distorted limbs, yet they grow robust in health, the bones becoming quite firm and strong, even more so than those of other persons.

Many children, without becoming the subjects of confirmed rickets, yet exhibit the tendency in an enlarged state of the extremities of the long bones, especially those of the forearm, at the wrist. Such an indication ought never to be neglected, every possible means, by change of air, by diet, clothing, and medicine should be used to improve the child's general health. The powders above recommended will be useful, or five drops of the tincture or solution of perchloride of iron may be given twice a day in water, the bowels being regulated by simple aperients, and an occasional dose of grey powder. To resume, it must be borne in mind that rickets is a disease of debility, and of an enfeebled constitution, which every means must be used to counteract. The deficiency of earthy matter in the bones, naturally suggests the use of lime, which may be given in the form of lime water, along with milk. The use of salt by the affected children should be insisted on. The saccharated solution of lime, in doses of from ten to thirty minims, may be used with advantage; or the syrup of the various phosphates, especially that known as Parrish's food, which contains lime, iron, and magnesia, and which should be taken immediately before meals. Cod-liver oil also suggests itself as a remedy, with change of air, especially to the seaside.

Rickets, or softening of the bones in adults, occurs, as might be expected, in the debilitated, and in those of depraved constitution; it is most common in females, and the pregnant state seems to favour its establishment and progress; it has also been thought to be dependent on the gouty and rheumatic constitution. The disease is often preceded by severe pains in the limbs and bones, which are apt to be considered as rheumatic.

As in the case of children, rickets or bone-softening in adults, requires every means to be used for invigorating the constitution, but the proper remedies, and their application, must be regulated by a medical man. When a female has at any period of life been the subject of rickets, the fact may seriously affect the capability of her becoming a mother, either with safety to her own life or that of her child; for as the bones of the pelvis (see *Pelvis*) partake of the general softening, and yield under pressure, the entrance of the child into the world may be rendered impossible or nearly so. The fact should not be lost sight of.

Refer to—*Scrofula*, *Childhood*.

RIGOR is the sudden sensation of cold, accompanied with shaking, or in other words, the "shivering" which precedes the inflammatory stage of many acute diseases. In an aggravated degree it is symptomatic of the development of suppuration in some part of the body. It is probably a nervous affection, for it occurs likewise in many states of the body in which there is neither fever nor inflammation. It is a common symptom of the presence of bile in the stomach; it is a concomitant on the passage of gall-stone or of renal calculus; it often occurs at the commencement of labour, and may even be caused in a slight degree by certain sounds.—See *Shivering*.

RING, FIXED.—See FINGER.

RING-WORM.—The real nature of this very troublesome affection of the skin is accounted for by the presence of a fungus which is developed between the scarf and true skin, and which forms a sheath round each separate hair. Inflammation of the hair follicles and their surroundings results, with the formation of purulent matter, which has the double effect of checking the growth of the hair, and causing baldness. The sporules of the growth are to be seen in the form of white powder at the roots of the hair, and when examined by the microscope present the appearances figured in accompanying illustration (fig. 178). The most usual site of the disease is the scalp, but it is apt to extend to the forehead, to the beard, and also to other parts of the body. Generally, the first indications of the presence of ringworm are the falling or breaking off of the hair, which leaves a bald generally circular patch, and the itching which accompanies the disorder. If examined at this time, the patch will be found scurfy, slightly red, with the irregularly broken hairs protruding. If the disease be unchecked by treatment, it goes on extending, until at last it involves almost the entire scalp. The hair, which is not detached, on the affected parts, becomes lighter in colour and woolly in character. If pustules form, the discharge from them dries upon the surface in the form of scurfy scabs, or in crusts. That the disease is highly contagious there can be no question; it is frequently, too, extended to different portions of the same head, by combs, brushes, &c., or by the nails, which children are apt to use freely on account of the itching. It is also very liable to spread in schools and among members of the same family.

Few diseases have given more trouble or vexation in their management than ringworm, nor was it until the true nature of its parasitic origin was fully understood, that the medical treatment of the complaint could be considered as at all satisfactory. The main object is, of course, to destroy the fungus, for if this can be successfully accomplished, the disease is cured; but the fungus will remain so long as the hair follicles are intact. It is therefore necessary to remove the hair, if it should not have already been destroyed by the disease itself, and then to apply some chemical agent capable of destroying the fungus embedded in the hair follicles and surrounding tissues. To enumerate the various applications used would be a very lengthy business, and we will content ourselves with those which have of late years been most in favour. The oil of cade or pitch, derived by dry distillation from Juniper

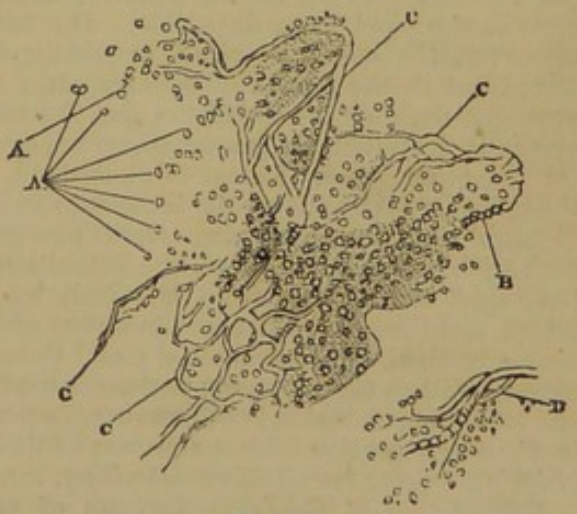


Fig. 178.

A, A. Isolated Spores. B. Spores united at their ends. C, C, C. Empty Tubes. D. Sporular Tubes.

wood, was introduced by French dermatologists, and is still upheld as probably the best means of destroying the parasite; it should be combined with glycerine in the proportion of a drachm of the oil with an ounce of glycerine. Lotions composed of sulphurous acid and water, one part to three, or of hyposulphite of soda, one ounce to twelve ounces of water, are found very efficacious. Chrysophanic acid, the active principle of goa powder, has obtained much favour of late years in the treatment of ringworm; it is used in the form of ointment prepared with from ten to sixty grains of the acid to an ounce of lard or vaseline. Apart from shaving the scalp, it is often necessary to remove each hair separately by means of tweezers or depilatory forceps made especially for the purpose. The oil of cade is said to

possess the property of destroying the sensibility, and loosening the attachment of the hair, thereby rendering it easier of removal. In ringworm of the scalp an oil silk cap is necessary to prevent the evaporation of the lotions. For the microscopic appearances presented by the hair in ringworm see article *Microscope*.

The writer has treated successfully many cases of true ringworm with a solution of nitrate of silver in pure nitric ether, in the proportion of two scruples to the ounce. The solution is easily applied, and penetrates the superficial structures, even blistering at times; two or three applications at intervals of five or six days will generally suffice.—See *Scalp*.

ROASTING, like broiling, is one of the most primitive methods of cooking; in the latter process, however, the surface of the meat is more quickly hardened, and the juices and fat more effectually retained. During roasting, the watery portions of the meat evaporate, and much fat is melted out, at the same time the coagulation of the albumen, the usual result of heat on animal food, takes place. The loss of fat in roasting renders meat thus cooked more digestible. It retains, moreover, the gelatine, which is greatly dissolved out in the process of boiling. If, however, the cooking is carried too far, the meat overdone, its nutritious properties are impaired. On the other hand, if meat is underdone, although more nutritious, it is certainly less digestible. "By enveloping small pieces of flesh with a covering of lard, the extraction of the sapid constituents from the flesh by its juices, and the evaporation of the water, which causes hardening, are prevented; and the surface, as well as the subjacent parts, are kept in the tender state, which is otherwise only found in the inner portion of large masses of flesh" (*Liebig*).—Refer to—*Boiling—Broiling*, &c.

ROCHELLE SALT.—Tartrate of soda and potash.—See *Potash*.

ROLLER.—See BANDAGES.

ROOM.—See BED-ROOM—HOUSES—VENTILATION, &C.

ROSE.—See *Erysipelas*.

ROSEMARY is chiefly used on account of its fragrant volatile oil, which is stimulant and anti-spasmodic. The oil may be added to liniments, as a fragrant stimulant addition to these applications. A spirit of rosemary is made, which may be used as an anti-spasmodic, in doses of thirty drops, in water or in sugar.

ROSE PETALS, or LEAVES.—The petals of the red rose are used in medicine, partly on account of the colour they yield; but their most valuable preparation is the confection, made by beating up one part of the fresh petals or flower leaves with three parts of refined sugar, and chiefly used in the formation of pills, for which it is well adapted, being less apt to harden than other materials used for this purpose.—See *Pills*.

When the petals of the red rose are dried for use, the white "claws" at one end should be cut off, and the red portion dried as quickly as may be, without too great heat being used. The petals should then be sifted, to remove dust, &c., and packed in vessels closed against light and air. Dried rose leaves are used in the form of an acid infusion, which is made with one-fourth of an ounce of the leaves, one drachm of dilute sulphuric acid and ten ounces of boiling water. The infusion is slightly astringent, and is occasionally used as a gargle, but its colour is its chief recommendation. Rose water, distilled from the petals of the cabbage rose, is an agreeable substitute for pure water in mixtures and lotions.

ROSE-RASH.—Rose-rash occurs both in children and adults in the form of rose-red patches of various sizes, somewhat resembling measles in many cases, but of a redder hue. The disease is generally accompanied with some light constitutional disorder or fever, but the symptoms differ from those which accompany measles. It is devoid of danger, and generally subsides after the administration of a simple aperient. If it is rose-rash or nettle-rash connected with teething, the gums should be scarified.

RÖTHELN, a variety of measles known also as German measles, is occasionally epidemic. It differs from true measles chiefly in the absence of bronchitis and other lung affections; the eruption, as a rule, is not so marked as in measles, and may resemble mild scarlet fever; especially if associated with marked sore throat and slightly enlarged glands in the neck. It is usually mild, but if the eruption simulates scarlet fever medical advice is needed.

RUBEFACIENT—an application which reddens the skin. According to this definition, a great variety of agencies must be included in the class. When the irritant effect of any agent upon the skin amounts to blistering, or causes discharge of pus or matter, the action is said to be vesicant, or suppurative. All these agencies, therefore, are included under the one term, counter-irritants, the rubefacient action being the mildest of the three, and dependent, generally, upon the form and duration of the application; as, for instance, heat, mustard, ammonia, or other excitant agents, may be used so as to produce only the most transient redness, or may be made to cause either blistering or suppuration. The most commonly used rubefacients are:—Ammonia or hartshorn; friction; heat; mustard; spirit of wine, ether, and chloroform; turpentine, &c. Refer to—*Counter-Irritation*.

RUE—the *Ruta graveolens*.—This plant is too well known to require description. It is valuable, and much used in domestic practice on account of its powerfully stimulating volatile oil, which is strongly anti-spasmodic. Medical men certainly too much neglect rue as a medicinal agent. In accumulations of flatulence in the bowels, *Tym-*

panitis, a strong infusion of rue given as an injection, is often of the highest service, and second only to assafœtida; in worms — the thread-worm—in the lower bowels, the infusion of rue, also used in injection, is serviceable. In suppressed menstruation, when stimulants are required (see *Menstruation*), the rue enema may prove of much use. Rue is *abused* when given, as it frequently is by nurses, to new-born infants.

RULE, LIVING BY.—There are few departments of practical medicine which have been carried out to a more mischievous extent of refinement than that which is noticed in this article. Mischievous, because an important principle has been overlooked in the prescription or following out of petty detail. That principle is, that there is nothing more likely either to create or to keep up disorder in any of the organs of the body, which usually act independent of the will, than continued, especially, anxious attention directed to them whilst in active operation. It is unquestionable that in some diseases, such as diabetes, dysentery, &c., the strictest regulation of diet and regimen is absolutely necessary, neither can it be doubted that in most ailments, even in those of a trivial character, some general regulations as to living are required; it is not against such as these that these remarks are directed, but against the absurd "living by rule," the worse than useless clockwork regulation of every action of daily life, eating, sleeping, walking, &c., which many dyspeptic and hypochondriacal patients either adopt for themselves, or are advised into. In such cases, instead of a wholesome varied diet, the nature of the food is confined within an unwholesomely narrow compass, and its amount, if not weighed physically, is at least so mentally, by the trammelled invalid, who trembles lest, inadvertently, half an ounce more than the prescribed quantity should find its way into his stomach, and then, after his meal, disturbs the digestive process, by thinking how it is going on, and by directing his attention to the sensations of his stomach, which is petted, and considered, and allowed to choose its own work, and mode of working, till, of itself, it nauseates the uniformity of too regulated a diet, and sours even to mutton of the tenderest, and to the most unexceptionable brown bread. At last, forcing its miserable possessor to the conclusion that he is yet over-taxing its powers, the animal diet is perhaps eschewed, and farinaceous foods of different kinds are resorted to, as more digestible by the "very weak stomach." As already remarked rules of life, and stringent ones too, must often be laid down by medical men for persons labouring under serious disease, nor can they be too strictly attended to, but these cases are abundantly different from that numerous class of nervous and dyspeptic complaints, which are fostered by the too close attention to health, by the "living by rule," the weighing and measuring, and considering every morsel of food, and every action of the body or mind. As said under article *Indigestion*, the stomach, and other organs too, must, in part at least, be brought up to their work by observation of the rules of health generally; the endeavour to bring the work down to the organs is worse than useless.

Refer to—*Indigestion.*

RUM.—This well-known spirit is distilled from the products of the sugar cane; when genuine it contains about forty-eight per cent. of alcohol. New rum is apt to contain lead, dissolved off the leaden worm of the still in which it is made. When this is the case, the rum is of course unwholesome, and may give rise to symptoms of colic; but after the liquor has been permitted to stand some time in casks of oak wood, it becomes freed from the lead, which forms an insoluble compound with the tannin of the oak, and falls to the bottom. Rum is a favourite domestic remedy in cases of incipient cold. It possesses, probably, no advantage over other stimulants, and in such cases the use of an alcoholic stimulant at all may do harm. A mixture of rum and milk was supposed at one time to be a remedy for consumption; it is, however, scarcely necessary to say that the milk should be taken without the rum.

Refer to—*Colic—Lead, &c.*

RUPTURE, by medical men called *Hernia*, is the protrusion of some portion of the bowels, or of the viscera usually contained within the abdomen, through any part of the walls of that cavity. Unless the skin is wounded from without, the rupture remains covered by it and by certain tissues which lie beneath it, at the points where the accident usually occurs, these points being at those portions of the walls which are naturally thinner and weaker than others, or at which there are openings naturally for the passage of blood-vessels, &c.

The existence of rupture is always a serious matter, and on the first suspicion of it, medical advice should at once be sought; it is, moreover, an accident much more common than is generally imagined. It has been calculated that ten per cent. of the population in Britain are the subjects of rupture.

It is sufficient here to notice the three principal kinds of rupture; of these, one occurs at the navel, two in the groin. Rupture at the navel is a very common accident soon after birth; its nature and management have been fully entered into in article *Childhood*. When it occurs in adults, it is not unfrequently the result of neglect in early life, but it may be of recent origin; in females it may be the result of pregnancy and child-bearing. Rupture at or near the navel is known by the presence of an elastic or doughy swelling, which is usually capable of being "reduced," pressed back into

the cavity of the abdomen. When this form of rupture is discovered to exist, a truss should be applied without delay, under the direction of a medical man. The essential part of the truss is a pad made to fit over the site of the protrusion, this pad being kept in place by different contrivances of springs, or of elastic belts, &c. Fig. 179 represents "Salmon and Ody's" truss for the purpose; 1 being the pad which is fitted over the rupture; 2 a pad which is applied to the spine; 3 the steel spring; and 4 the strap which helps to fix the apparatus. The pads are made of various materials, sometimes of ivory, sometimes of padded materials, and also of caoutchouc bags, inflated with air, &c.

Rupture in the groin in adults is of two kinds, inguinal and femoral. In inguinal the swelling first appears above the fold of the groin, in femoral below it. The former is most

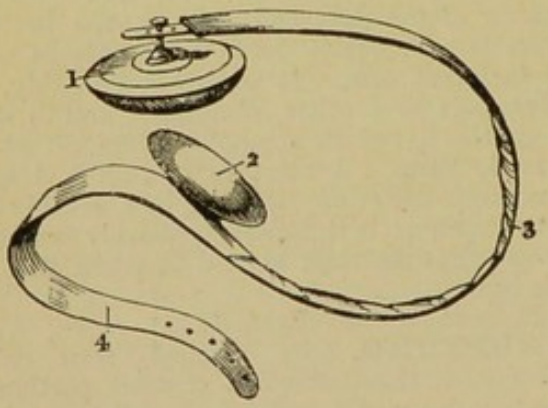


Fig. 179.

common in males, the latter in females; the affection generally, is, however, much more common among the former sex, the calculation being, that four men are the subject of hernia, for one female. Rupture in the groin also occurs in infants, it is "congenital."

It is found that rupture prevails most among those whose occupations involve strong muscular efforts. Rupture may come on gradually, or, suddenly, during some violent exertion. When its formation is gradual, it is preceded by some amount of pain and fulness in the part; at last, or when its invasion is sudden, a decided swelling generally shows itself, more or less painful, varying in size, and elastic or somewhat doughy under the pressure of the fingers, the swelling becoming tense and larger, and as it were pushed forward, when the person coughs or sneezes, and usually disappearing during lying down in sleep. It is proper, however, to caution our readers against the supposition that rupture must *always* be accompanied with swelling; sometimes the tact of the experienced surgeon is insufficient satisfactorily to detect the tumour, especially in stout people, and he is forced to base his treatment upon the general symptoms, when that accident which constitutes the danger of rupture occurs, that is when rupture becomes "strangulated," or assumes such a condition that it cannot be returned into the abdomen, and is so tightly grasped at its "neck," by the sides of the ring or opening through which it is protruded, that the natural functions of the part are interfered with. A rupture may assume this condition at any moment, if it be permitted, for want of a truss, to continue "down," as it is usually called, that is in a protruded state. When a rupture becomes strangulated, distressing symptoms very quickly follow; all motion of the bowels downwards is prevented, and their natural movements becoming inverted, their feculent contents pass upwards into the stomach, and are rejected by vomiting; at the same time, there is severe pain, especially of a dragging character, from the back; there is thirst, and depression of the bodily powers. If the above state of matters be not speedily rectified, either by the return of the bowels into the abdomen, or by a cutting operation, the person speedily dies; generally, in consequence of the protruded portion of bowel becoming mortified.

It is needless to remark, that upon the first symptoms of strangulated rupture showing themselves, efficient medical advice should at once be sought. Every minute is precious. Until medical assistance arrives, however, some methods of relief may safely be tried.

When a surgeon first sees a case of strangulated "hernia" or rupture—if it has not been of so long continuance as to lead him to suspect the possibility of the bowel having become tender, and liable to be burst—he makes an effort to return the protruded bowel; this effort, conducted in a peculiar manner, is technically named the "taxis," it is in fact skilful manipulation. The first step in the exertion of the taxis is to place the individual in the position most favourable to the return of the bowel, this position is the horizontal one, with the shoulders half raised, and the legs and thighs bent upon the body, so as to relax as much as possible the walls of the abdomen, and the rings through which the rupture passes, and by which it is so tightly constricted. The above position having been assumed, the neck of the rupture, that is to say, the portion of it next the opening, from which it protrudes, is to be compressed by the fingers of the left hand with moderate firmness, whilst the right hand is used as gently as is consistent with the requisite effort to knead, or mould as it were, the protruded bowel through the opening. At first this process perhaps seems to have little if any effect, but if the rupture is returnable at all in this way, and if the taxis is properly made, after a time a perceptible diminution of the swelling takes place, which goes on till at last the rupture passes suddenly as it were, back into the abdomen, frequently with a gurgling sound.

Such is the process of reducing a rupture by

means of the taxis; it is one which, to perform well, requires both skill and practice, but it is one which may be safely tried for a short period by an unprofessional person, if medical aid is far distant in point of time, indeed, it is a process which persons who have suffered from rupture for some time not unfrequently perform for themselves. In a case of strangulated rupture, if medical assistance is quickly procurable, the best course is, with the exception of laying a person in the horizontal position, and the administration of twenty or thirty drops of laudanum, to leave the case entirely alone, and to avoid handling the swelling, for this only places it in a more unfavourable condition for the manipulations of the surgeon. When however, as said before, medical aid is far distant, the taxis may be tried, but must not be continued for more than twenty minutes or half an hour. In almost all cases, efforts are made by the patient, or by the persons around, to return the rupture; it is better that these should be made in an intelligent and efficient manner. If, by the taxis simply, the surgeon does not succeed in "reducing" a "strangulated hernia," he probably has recourse to other methods, with a view of assisting it. These methods are such as either assist the relaxation of the muscular parts around the rupture, or such as tend to diminish the size of the swelling. To effect relaxation, the surgeon may administer chloroform, or opium, or put his patient in a warm bath, till faintness comes on, when he again has recourse to the taxis. Many of the means had recourse to by a medical man are of course quite inadmissible for the unprofessional, the two last mentioned, however, they may use carefully. Opium, given so as to affect the system, will sometimes greatly facilitate the reduction of a hernia; for this purpose twenty drops of laudanum, or one grain of solid opium, may be given to an adult, the former every hour, the latter every hour and a half, till three doses have been administered, taking care, of course, after the second dose, that the system does not seem too powerfully affected. The warm bath will generally produce faintness in less than half an hour; during the condition an attempt should be made to return the rupture; some surgeons, however, object to the use of the warm bath.

The chief means of facilitating the return of a rupture, by reducing the swelling, is the application of cold. For this the best agent is snow, or pounded ice, put in an icebag, which is laid upon the swelling. If snow or ice are unavailable, cold may be artificially produced by mingling five parts of diluted hydrochloric acid with eight parts of glauber salt in powder; or by mixing two parts of oil of vitriol with two parts of water, allowing the mixture to cool, and then mingling with five parts of glauber salt; or by mixing equal parts of muriate of ammonia and nitre—saltpetre—in water. Cold may likewise be produced by the continued evaporation of ether dropped upon a piece of lint laid over the swelling, or the cold douche may be used with advantage. Under the continued application of cold for from half an hour to an hour and half, a rupture may possibly "pass up," without any manipulation at all; if it does not, however, manipulation should be tried.

Such are the principal means which may be resorted to, by unprofessional persons, in the event of a case of strangulated rupture occurring at a distance from medical aid; they are pointed out, not to induce any one to hazard one moment's delay in procuring proper assistance, but as a resource, when that assistance is far distant, and when the suffering and danger of this serious affection render it advisable not to wait entirely its arrival. In a case such as might occur, when a surgeon could not be procured for many hours, it might be some days, the author thinks the treatment by opium most calculated to relieve, it is at least that most likely to afford comfort to the patient under so fearful a contingency. If the stomach will not retain opium given by the mouth, it can of course be administered by injections.

It sometimes occurs that purgative medicines are administered in cases of rupture. This should never be done; they may greatly increase the distress of the patient, and they afford very little chance of relief. Neither can any good, but only harm, result from frequent efforts to return the rupture by manipulation after the first well-directed efforts have failed. Neither is it well to be too hasty in giving purgative medicines after a rupture which has been strangulated is reduced,—very frequently the bowels act of themselves soon after; if they do not in the course of a few hours, an injection, or a gentle dose of castor oil, or of rhubarb and magnesia, will be the most suitable aperients. The fact must be kept in mind, that after the existence of strangulated rupture there is always danger of inflammation of the bowels generally, and that consequently perfect quiet and low diet for several days is requisite. As soon as, from the symptoms as detailed in the first part of this article, any one suspects he is ruptured, *however little inconvenience he may suffer*, not a day should elapse without medical advice being *sent for*. Till this is obtained, quiet in bed is the safest plan—many a rupture has been strangulated in a long walk to the doctor. The same rules should be observed after the reduction of a rupture which has been strangulated. Every minute in the upright posture, passed without the protection of a truss, is one of peril. If there is any necessary delay before a proper truss can be procured, a pad composed of cloth, wrapped round firm material, and held in its place by a spica bandage (fig. 23, article *Bandage*), will be of some service during the confinement to bed. The selection of a truss is always better left to the judgment of a medi-

cal attendant. Where price is an object, the simpler forms of truss (figs. 180 and 181) may be used, and answer extremely well. They are made to suit both forms of rupture, the pad in the truss for femoral hernia (fig. 181) being directed more obliquely downwards than in the other fig. 180. In some cases, however, a Salmon and Ody's truss, somewhat similar to fig. 179, but modified to fit the groin, is found more useful. The peculiar feature of this truss is, that the circular or oval pad is attached to the spring by a ball and socket joint. In some persons, owing to flatness of the back, it is difficult, almost impossible, to make a spring truss fit at all; for such and other difficult cases, the spiral supporters of M. Bourjeaurd (fig. 182) may probably be found of use. There are many advantages connected with this elastic form of truss, particularly the extended support which it gives to the walls of the abdomen, at those parts where they are weakest, and most apt to give way. This, it need scarcely be observed, the simple steel spring cannot do. The use of air pads is an additional comfort. In the case of labouring men and others, who perspire much, the springs of the steel trusses are constantly breaking, in consequence of the corrosion caused by the sweat. The author has suggested covering the springs with sheet gutta percha as a preventative. In a few cases it is necessary to wear a truss even during the night, for some time at least, but generally it may be dispensed with during the horizontal

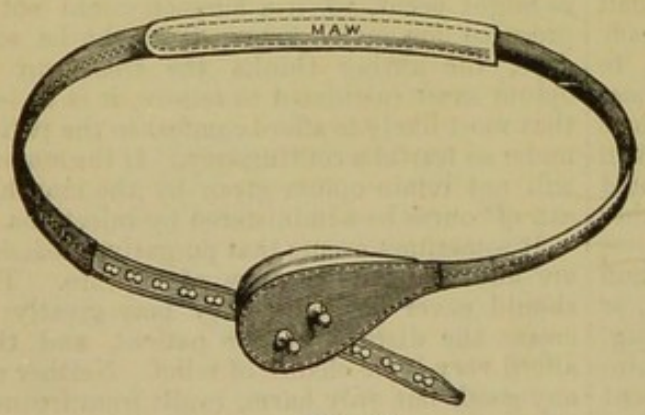


Fig. 180.

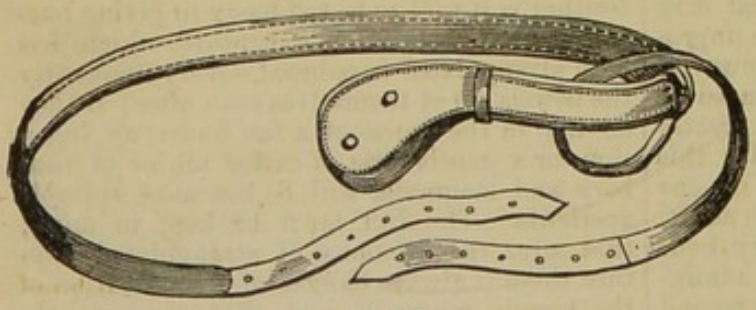


Fig. 181.

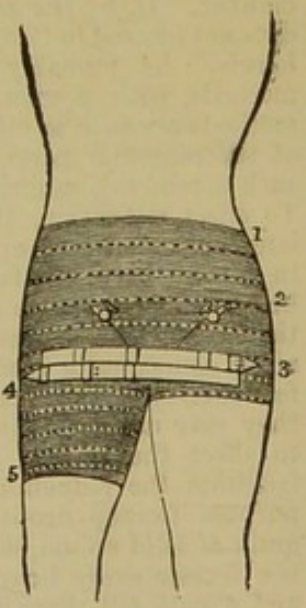


Fig. 182.

posture, being put on before getting out of bed. It is important that a truss fit well, otherwise it is of little actual service, and is apt to cause excoriations, &c.; it is also requisite that the strength of the spring be proportioned to the nature of the case. Further, it is important that the truss is not put on whilst any of the hernia is "down." When, as sometimes happens, a rupture is "irreducible," that is, cannot be entirely returned within the abdomen, a bag truss suited to the nature of the case is requisite. The causes of rupture are various; in one sense it may be said to be hereditary, that is, some individuals inherit a tendency to weakness about those parts, which are the usual seat of rupture. The direct causes are such as induce undue pressure by the walls of the abdomen upon its contained viscera, hence the disease is most frequent among those who have to make strong exertions. Soldiers whose belts compress the upper part of the abdomen, and cavalry soldiers, who at certain times ride without stirrups, are not unfrequently the subjects of the disease. It is also brought on by hard riding, or by leaping in the hunting field. Hence, those who are in the least liable, should avoid all such causes; and those who wear a truss, should bear in mind, that if the natural support has given way, the artificial may also. It may become a question with a ruptured individual, how far the hazard of sea-sickness, and the consequent mechanical action of vomiting is to be incurred. Strict attention to the state of the bowels is imperative on all who are the subjects of rupture, more especially as nothing is more likely either to cause or to aggravate the affection than the straining of constipation; at the

same time, strong purgatives are not advisable. The danger of a rupture is not in proportion to its size; when small and recent, it is more liable to become strangulated. Ruptures may of course occur in both groins of the same person; in this case a double truss is requisite.

When rupture in the groin occurs in infants, it is usually of considerable size, descending into the scrotum, and becoming very tense whenever the child cries. In the early periods of life spring trusses cannot very well be worn, those made of elastic material will answer best, and frequently no truss is used. Strict attention to the bowels, and bathing the loins of the child every morning in cold salt water, will do much to prevent the disorder getting worse, and will sometimes effect a cure. In some cases where the ordinary truss-pad causes pain or irritation, the water-pad, as made by Mr. Pratt of Oxford Street, will be a comfortable and easy substitute.

RYE.—This hardy grain possesses a nutritive power about equal to that of barley. It has slight aperient properties. The chief point of interest connected with this grain is the peculiar diseased or fungus growth, the Ergot of Rye, which is apt to be developed upon the seed.—See *Ergot.*

SACCHARINE—of the nature of sugar.—See *Sugar.*

SACRUM, or Os Sacrum, is the bone of the pelvis which fits in like a wedge between the two irregular lateral bones; upon it the spine rests (see *Pelvis*). The bone derives its name from having been formerly offered in sacrifices, whence it was considered sacred.

SAFFRON is procured from the blue autumn flowering crocus, which is cultivated extensively for the sake of the drug, both in this country and in France, Spain, &c. In the centre of each crocus flower rises the "style," which terminates in three wedge-shaped, notched divisions (fig. 183) which are called

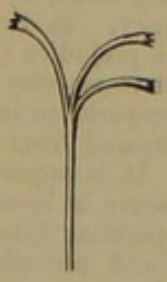


Fig 183.

"stigmata." These stigmata, with a portion of the upper part of the style, constitute saffron, being clipped off when fully developed, and dried carefully. Saffron is sold either in the form of "hay saffron," or of "cake saffron," the former being composed of the loose dried stigmata, the latter of these parts beaten into a cake before they are quite dry. In eastern countries saffron is largely used medicinally; in this, except as a colouring matter in several pharmaceutical preparations, it is little employed. It is stimulant and supposed to be slightly anti-spasmodic. Saffron is liable to much adulteration from marigold and wall-flower petals.

SAGE, like other plants which contain essential oil, is stimulant and carminative. It is a good deal used domestically in the form of "tea" or infusion, especially as a gargle, combined with vinegar.

SAGO.—This well-known dietetic article is the produce of various species of palm tree being obtained from the cellular substance contained within the stems of that tribe of plants. The stem is split, the cellular substance scooped out, and stirred up with water to separate the fecula or starchy matter, which, while suspended in the water, is passed through a sieve, then allowed to subside, and, being dried, forms the "sago meal" of commerce. This sago meal, after having been made into a paste with water, "granulated," and again dried, constitutes the sago of the shops; common or "brown sago," or white or pearl sago, according to the mode of preparing. Sago is nearly pure starch, and closely resembles in composition arrow-root, for which it is a frequent and cheap substitute. The remarks made upon the nutritive properties and dietetic uses of arrow-root apply equally to sago, the chief difference is in the former being the more agreeable preparation of the two, and requiring a somewhat different mode of cooking.—See *Cookery.*

Refer to—*Starch.*

SAINT ANTHONY'S FIRE—a popular name for erysipelas.—See *Erysipelas.*

SAINT VITUS'S DANCE, known to medical men by the name of *Chorea*, is a disease strongly indicative of nervous disorder; its precise nature, however, is at present obscure. Probably it may be occasioned by direct causes, that is, by causes seated in the great centres of the nervous system, or by indirect causes, which act by "reflex action" (see *Nervous System*), in the same way that teething in infants produces convulsion; that is to say, irritation in some portion of the body, as in the bowels, may, in the first place, give rise to functional irritation of the brain and spinal chord, which irritation acting as if its original seat was in these great centres, is "reflected" on the body generally, or at least upon some portion of it, causing the irregular muscular movements of the disorder in question. St. Vitus's dance is, for the most part, a disease of youth, occurring before puberty, and usually disappearing at that period of life, if it has continued so long. It is more common in girls than in boys, in the proportion of three to one. It may, however, continue into adult life, but rarely occurs after twenty. It

rarely proves fatal; indeed, in those subjects of the disease who have died during its existence, it has been a question whether death has not been the result of other coexisting maladies, especially of heart disease, with which it is sometimes associated.

The most manifest symptom of St. Vitus's dance is continued involuntary action of the voluntary muscles, to a greater or less degree, the extent of the muscles affected, and the intensity of their affection, varying with the severity of the disease. The movements, however, generally cease entirely during sleep, and in all cases certainly are diminished. The ordinary voluntary movements are still capable of being performed after a fashion; that is, in an unsteady, uncertain, and sometime grotesque manner. It seems as if, after the voluntary impulse had been communicated to them, an additional involuntary one interfered to throw the limb or other part out of the usual steady movement.

The disease generally commences with twitching about the face or neck, or in a particular limb, gradually extending to one side of the body, and in the vast majority of cases, ultimately involving the whole body. Pain is seldom complained of, but it does sometimes occur in the head. The appetite may remain quite good, but the bowels are possibly confined, and their secretions unhealthy. To this depraved state of the bowels, or to constipation, or to the presence of worms, the disease is often traceable; in females it is not unfrequently connected with the menstrual function, especially if it be delayed or imperfect. The irritation of the coming of the second teeth has been assigned as a cause; and there is no doubt that imitation, especially among females, may spread the disease, which is most general, as might be expected, in persons of a nervous tendency; and it is said those with dark hair and eyes are more liable to it than those of a blonde complexion. The duration of the attacks varies from ten days or a fortnight to months; but having once existed, it is, up to the age of puberty at least, apt to recur, or to be re-excited.

As regards the treatment of chorea, the best plan is, as soon as possible to submit the case to a proper medical examination, for, as already explained, it may be dependent merely on some casual irritation, which skill will at once detect and remedy. The disease, moreover, is one which is usually devoid of danger, and while there can be no question that many cases of it will get well without any treatment at all, there are others in which the cause and true nature of the malady can only be satisfactorily elucidated by a medical man.

Sir Thomas Watson says that when pain in the head exists, he finds benefit from the moderate abstraction of blood by leeches, and if *persistent* pain does exist, the application of four or five leeches might be had recourse to if the individual is of full florid habit. In any case no harm, but almost certain benefit, will result from acting on the bowels freely, more moderately, of course, in a weak subject than in a strong one. For this purpose, the compound colocynth pill simply, or combined, for two or three doses in succession, with calomel or blue pill, will be of service, or the blue pill and black draught, or compound decoction of aloes draught, may be given. After the bowels have been well cleared, if the subject of the disease be weak and pallid, iron will be required. In the disease in question the red carbonate of iron, as given by Dr. Elliotson, has been found extremely useful in large doses, from a drachm upwards, given twice or three times a day; other preparations of iron, however, may be given, or quinine. The author has also found the oxide of zinc of much service, but these are remedies which ought to be given under medical sanction. The shower bath is often serviceable in St. Vitus's dance, but for some individuals the shock is too powerful, and seems rather to increase the disease; for such, the douche down the spine may be substituted. Galvanism applied along the spine is also found serviceable in many cases. In all cases attention to the general health is required. Good diet, exercise, change of air, and attention to the hours of sleep, and to free ventilation of sleeping rooms, are all circumstances to be kept in mind in such cases.

Refer to—*Convulsion—Nervous System, &c.*

SALADS generally, being composed of raw vegetables, are unsuited for persons of weak digestion; when, however, the stomach is capable of digesting them, the general effect on the system appears to be beneficial, particularly in salads derived from the tribe of the cruciferous plants, to which the water cress, radish, mustard cress, scurvy-grass, &c., belong.

Many persons with whom raw vegetables such as salads, cucumbers, &c., invariably disagree if eaten "undressed," find the addition of the ordinary salad, or "Florence" oil, correct the tendency. In this country some individuals have a prejudice against the use of oil. It is difficult to see why it should extend to the beautiful preparation in question.

SALEP is prepared from the bulbs of the *Orchis mascula*. It is imported chiefly from the Levant, but some is brought from India. It consists of a peculiar kind of gum termed bassorine starch, and phosphate of lime. In some respects it is more nutritive than either arrow-root or sago, and consequently is better adapted for the convalescent than for the sick. It is prepared by dissolving the powdered salep in hot water, with assiduous stirring, and adding to the solution sugar and milk. Prior to the introduction of coffee, salep was much used as a diet beverage in this country, and it might still be employed with advantage.

SALICINE is a "peculiar bitter crystallisable principle," obtained from the bark of the willow. In some respects it resembles quinine, and has been brought forward as a cheap substitute for that expensive medicine, especially in the treatment of ague, neuralgia, &c. It has more lately come into extensive use as a remedy for acute rheumatism, and as a means of reducing the temperature in all febrile conditions. It is also a powerful antiseptic, salicylic acid being employed largely to prevent fœtor from gangrenous and offensive sores. That salicine is a most excellent tonic remedy there is no doubt, one, moreover, which is applicable to cases in which quinine is inadmissible, the former remedy being less likely to heat, or to cause headache; in such cases, however, as ague or neuralgia, it does not seem to exert the same powerful curative effect, although it might well be used, either in its prepared form or in the form of an infusion of the willow bark itself, in the absence of quinine or of cinchona bark. The dose of salicine as a tonic is from two to four grains given as a powder, or dissolved in water, or if a stimulant be required, dissolved in a little sherry. For neuralgia it should be given in still larger doses. Since Dr. Maclagan, of Dundee, first introduced salicine as a remedy for rheumatic fever, it has been employed with almost universal approval by nearly every medical practitioner. The preparation of the drug in most extensive use, because of its solubility, is the salicylate of soda, which, Dr. Ringer recommends, should be taken in doses of from ten to fifteen grains every hour, until the temperature is reduced. The medicine has also proved of much service in chronic rheumatism, lumbago, and sciatica; but it is to be kept in view that its free employment in many cases is attended with delirium, deafness, and headache, and though these inconveniences are not of a lasting character, the fact is enough to indicate that the remedy should not be used except on the recommendation of a medical man.

SALINES, or salts, are distinguished from other bodies by their general properties of incombustibility, aptness for combination, and a peculiar taste generally known as "saline." Salines are better illustrated by their many well-known examples and compounds, such as common salt, potash, soda, Epsom salts, pyretic saline, Eno's fruit salt, &c., than by any description. A good aperient saline powder may be made by combining half an ounce of sulphate of soda with the same quantity of Epsom salts, to which should be added eight grains each of chloride of soda and bicarbonate of soda. Dose from a tea-spoonful to a table-spoonful as required.

SALIVA, or SPITTLE, the fluid which moistens the mouth is secreted by glands, disposed around that cavity. These glands are three on each side. The principal, or parotid gland (see *Parotid*) is situated beneath the angle of the lower jaw, the salivary fluid secreted by it being conveyed into the mouth by a duct, which opens between the gum of the upper jaw and the cheek, opposite the second double tooth. A second salivary gland lies deep below the tongue, its duct opening by the side of the bridle, or tie, of the tongue, just behind the corresponding front "incisor" tooth of the lower jaw. Where the duct opens there is a perceptible eminence, from which, when some individuals gape, a small jet of saliva is apt to be projected at least a foot beyond the mouth; this is caused by the muscles exerted in gaping, compressing the gland and its duct. The third salivary gland, the "sublingual," lies partly just below the duct of the last mentioned, its small ducts conveying the saliva into the mouth, close to the other. As, therefore, these glands are situated on each side of the mouth, there are six salivary glands in all. The saliva, or spittle, for the supply of which such ample provision is made, contains about one per cent. only of solid matter, which consists partly of animal constituents, and partly of saline. The saline constituents are similar to those contained in the blood, with the addition of a peculiar salt, a sulphocyanide. The animal principle, known by the name of "ptyaline," resembles in action the vegetable principle "diastase" in possessing the power of converting the starchy constituents of the food into saccharine aliment (see *Digestion*). When food is not being taken, the secretion of saliva is very greatly diminished, and in sleep seems to be almost suspended altogether; no sooner, however, is the appeasement of hunger by food commenced—and, indeed, previous to the food being taken—than the flow of saliva begins, the secretion continuing to be poured out as long as the meal continues. The amount of saliva secreted in the period of four and twenty hours has been estimated at from fifteen to twenty ounces, but it is very difficult to ascertain the precise quantity, and probably it varies.

The importance and the functions of the saliva in the process of digestion have been variously estimated by different observers. Its action upon starchy matter has been already noticed. The experiments of Dr. Wright, of Birmingham, detailed in his valuable papers on the saliva, tend to show that its alkaline properties are necessary to the perfect fulfilment of the digestive process generally. Dr. Wright observed that after a full meal the saliva became more strongly alkaline, and that if, instead of swallowing this alkaline saliva, he spat it out, there was manifestation "of abundance of acidity, with much pain at the stomach," but that if he neutralised the acid in the stomach, by a dose of carbonate of soda, the alkaline condition of the saliva quickly diminished, as if, being no longer required, the alkalinity was withdrawn. The saliva, how-

ever, is not constantly alkaline, it is frequently acid, especially during fasting; the acidity has been attributed to the mucus of the mouth, with which the secretion is necessarily intermingled. Dr. Wright performed a variety of experiments with the view of determining the influence of the saliva in the digestive process. From these experiments he formed the following conclusions:—

That saliva has the power of modifying, and to a certain extent of digesting, vegetable and animal substances.

That it has a more powerful action upon vegetable than upon animal matters.

That acids or alkalies added to saliva diminish or destroy its digestive properties.

That the presence of saliva in the stomach is essential to healthy digestion.

Of course the saliva performs other functions beyond the simple assistance of digestion, it facilitates especially all the movements connected with mastication and speech. The "tartar" which accumulates about the teeth is a mixture of the earthy salts and animal matter contained in the saliva.

The influence of the mind upon the secretion of saliva is very considerable; the popular saying of the "mouth watering" at the sight of tempting food, is an illustration of its increase from this cause; its diminution under the influence of painful emotion, such as fear, is well ascertained, and indeed, in some eastern countries, is practically acted upon as a means of detecting crime. If a crime, such as a theft, is committed, and a number of persons such as a staff of servants are generally suspected, the whole of the suspected are placed together, and caused to chew and then spit out a handful of rice in the presence of the examiner: it is said that such is the feeling in these countries with regard to the test, that the fear of the real criminal diminishes the secretion of his saliva to so great an extent, that the portion of rice chewed by him remains comparatively unmoistened. There is a peculiar affection of the salivary secretion, to which some dyspeptic persons are liable, which the author has never seen described in any medical work, and which he believes is generally confounded with pyrosis or water-brash; it consists of the rapid flow of a quantity of limpid saliva into the mouth, or from it in a stream, if permitted, accompanied with a sense of constriction about the jaws, the flow continuing for a minute or two at a time. It is generally preceded by symptoms of indigestion, of heartburn, or of irritation in the stomach. It is in fact a symptom of indigestion, and an instance of "reflex" action (see *Nervous System—Indigestion*) or of irritation in the stomach acting upon the salivary glands, which seem to be peculiarly susceptible to irritation from such causes. The above remarks upon the use of the saliva may explain in some measure the disordered digestion from which many smokers, who waste this fluid, suffer. Indigestion is a very common malady in America, and may in part be occasioned by the well-known habit of "spitting," peculiar to the country.

SALIVATION is the excessive secretion of saliva from any cause. The term is best known in connexion with mercurial salivation (see *Mercury*); salivation, may, however, arise from other causes, a course of iodine medicines may occasion it, and nitric acid has the same effect; it also arises from constitutional causes. Salivation, that is, simple increase of the flow of saliva, is not an unfrequent concomitant of the first stages of pregnancy.

Refer to—*Indigestion—Mercury, &c.*

SALMON, like the other oily fishes, is less digestible than white fish generally for persons of weak stomach. Like other articles of food too, which contain oil, it is apt to prove highly injurious, if eaten in a state of decomposition. Indeed, death has been the result of a meal of pickled salmon which had become somewhat decomposed.

SAL PRUNELLE is saltpetre which has been fused by heat, and cast in a mould generally of a globular form. The preparation is used by some persons in incipient sore throat with advantage; the ball of the salt being allowed to dissolve gradually in the mouth.

SALT.—The term salt is applicable to saline matters generally (see *Salines*). In this article, however, it is regarded in its conventional acceptation of "common salt," as used in daily life. Common salt is a compound of chlorine and sodium and water. It was formerly supposed to be a combination of hydrochloric acid with soda; but Davy clearly showed that this view was incorrect, as both substances, when in combination, underwent decomposition resulting in the formation of water, the chlorine of the first uniting with the sodium of the last, and forming chloride of sodium or common salt. Common salt is one great source whence the soda of commerce, now so cheap, and so extensively used, is obtained. —See *Chlorine—Soda, &c.*

Common salt is most generally procured either from the salt mines, such as those of Cheshire, from saline springs, such as exist in America, or in Germany, or from sea water; in the two latter cases, by evaporation. However obtained in the first instance, salt generally requires to be purified from other saline ingredients with which it is usually mingled, and which particularly interfere with its keeping properties, causing it to become moist. Of late years the finer descriptions of salt have become so cheap that the coarser kinds are scarcely seen.

As regards the use of salt as a condiment, or as an addition to food, by man, there can be no doubt as to its beneficial effects; indeed, the desire for salt seems almost to be instinctive, as a necessity for health. In countries at a distance from the sea, and where from the ab-

sence of saline springs, salt is difficult to procure, as in the interior of Africa, it is most highly prized as a necessary of life. Many travellers have described a temporary deprivation of salt as one of their greatest hardships; and, to descend to the lower creation, the way in which the salt springs or "licks" in America are frequented by the wild animals is evidence of instinctive desire; and, indeed, the eager devouring of salt by, and consequent improvement of condition among, domestic animals, sufficiently testify, if not the absolute necessity for, at least the great benefit arising from the admixture of salt with food. Salt unquestionably assists, and renders more perfect, the process of digestion; moreover, it forms one of the constituents of the blood, and of the body generally. If salt be denied, the digestion is weakened; the general tone and nourishment of the body are impaired, and it is observed that worms are more likely to be generated in the intestines. Salt, therefore, ought to be an addition to the food of all, and attention should be paid to children in this respect; they should be made to eat a certain proportion of salt with their food—their greater liability to be infested with worms than adults is an additional reason.

It is, however, a very different thing to eat salt with food, and to live upon meat or fish which has been salted. In the latter case, it is well ascertained that certain chemical changes take place in the meat and its nutrient constituents by the action of the salt, which modify considerably the nutriment afforded to the body (see *Preserved Provisions*). Indeed, the effects of a continued diet of salted meat are most injurious (see *Scurvy*). The exclusive and continued use of salted provisions is here alluded to, not their moderate occasional employment. Salt may almost be regarded as medicinal in some cases of convalescence, in which the craving for it becomes intense. It should be allowed. It appears to act as a tonic. From one to two ounces of salt dissolved in half a pint of water forms a good, and not unfrequent domestic emetic. It may however purge, instead of causing vomiting. It is used in the form of enema to destroy worms, and to act on the bowels. An excellent domestic injection may be prepared with an ounce of salt and from half a pint to a pint of oatmeal gruel. The occasional use of salt in the treatment of typhus fever, and of cholera, &c., does not require notice here. Externally, salt is used in solution, generally as in sea or salt water cold bathing, in which cases it seems to exert a tonic effect; warm saline bathing is efficacious in rheumatism. For local bathing after injuries, such as sprains, &c., the salt water douche is well adapted to give strength. For the above purposes, a pound of salt dissolved in three gallons of water is a good average strength. The "brandy and salt" application, so much in vogue some years ago, is of the same use as any other stimulant application. Salt is widely distributed throughout nature, forming a constituent of the animal and vegetable kingdoms.

Refer to—*Preserved Provisions—Sea, &c.*

SALT MEAT.—See SALT—PRESERVED PROVISIONS, &C.

SALT OF TARTAR—a name for the impure carbonate of potash.—See *Potash.*

SALTPETRE.—See POTASH, NITRATE OF —SAL PRUNELLE.

SAL VOLATILE.—Aromatic spirit of Ammonia.—See *Ammonia.*

SAMPHIRE.—This plant, which grows on rocks close to the sea, is used as a pickle, and is about as wholesome as pickles generally. —See *Pickles.*

SANATORIUM is an institution for the promotion and preservation of health, in contradistinction to a hospital, which is devoted to the cure of disease. The sanatorium as a home substitute for a warm climate is at present but little known, or brought into use, although probably it will become more so. The hospital for convalescents must be regarded as a sanatorium of the most useful description; and at the present time sanatoria for consumptive patients have been established at Torquay, Bournemouth, Ventnor, and other places on the south coast of England. The author, however, is not aware that these are on the plan suggested in this article, the nearest resemblance to which is (or was) the enclosed space of what is usually termed the Tropical end of the Crystal Palace at Sydenham. The beneficial effects of winter residence in a warm climate, in some cases of disease, have been too well proved in numberless *individual* instances to admit of doubt that such a change is not, in the cases adapted for it, in the highest degree serviceable; at the same time, there cannot be a doubt that change of climate, as it is usually resorted to, has been much abused, and that in numerous instances, uncalled-for sacrifices, not only of a pecuniary nature, but of the strongest feelings and affections of the human heart, are made, to give a beloved invalid the change of climate considered necessary for the restoration of health, or for the preservation of life. Not only doubt, but certain conviction, exists in many minds, that numerous cases which formerly would have been sent abroad, should now, and will now be kept among home comforts and home affections, to live or to die; but it must be matter of thankfulness that when the hope, too often the delusive one, of that last resource of "climate" is, to say the least, weakened, another and a better one is likely to open up, one which involves neither severance from home nor friends, and one which may be made the resource of the indigent as well as of the rich. The resource is the glass-covered sanatorium—the acres of pleasure and of exercise ground, under a climate which may be rendered more certain and genial than any open to the winds of

heaven, which may be accessible to the delicate, and to the invalids, during a winter season in Britain. The various arrangements under which a glass-covered sanatorium may be made available are very palpable. With buildings such as the Crystal Palace at Sydenham, or the Alexandra Palace, but away from the London fogs and otherwise specially adapted for the purpose, it might be possible to *connect* the villas of the wealthy, in which invalids, though resident in the houses, and mingling in the society of their own families and friends, might yet enjoy in the winter and spring, the benefits of a free and genial atmosphere. But even without the magnificence, wide extension, and consequent expense of such fabrics as we have named, it would be very possible to enclose glass-covered spaces of one, two, or more acres in extent, into which the windows of some of the apartments of adjoining houses might open, apartments to be occupied by the invalids, whilst the rest of the house, for a family generally, has the ordinary aspects and arrangements. Or under another construction, detached houses, or sets of houses, might be connected by covered glass or other passages with the general glass-protected garden, or promenade, or climate, as it may be named. The varied arrangements of which glass structures, for the benefit of consumptive and other invalids in this country, are capable, need not be entered into here. The possibility of such structures is certain, not less so, perhaps, the fact of their wide adoption in years to come; but, amid the various plans for glass structures in the vicinity of our large towns, for the purposes of pleasure or instruction, the author has regretted to see little or no notice taken of their important availabilities as regards health. This important point seems to be overlooked—their capability of supplying a great want, of serving as an antidote to our comparatively rigorous climate, which so often presents the apparent necessity of the young and the delicate seeking a home, and too often finding a grave, in a foreign climate, exposing them to the depressing, and therefore necessarily injurious, influences which severance from home scenes, home comforts and society, and home affections, cannot fail to produce in a greater or lesser degree.

It would be possible to dilate greatly upon the advantages offered by the glass sanatorium —perhaps enough has been said for the purpose.

SANITAS, now manufactured on an extensive scale, is becoming largely and deservedly used on account of its properties as a "disinfectant, antiseptic, and deodoriser." Its discoverer, Mr. Kingzett, became convinced by experiment that "the hygienic influence common to groves of pine and blue gum trees consisted in the constant evolution of peroxide of hydrogen, camphoric acid, and certain other camphoraceous bodies, caused by the volatilisation of naturally secreted oils," dependent upon "the atmospheric oxidation of the terebene or turpentine principle common to all." Having arrived at the fact that "these purifiers can be produced from common turpentine, Mr. Kingzett set to work to manufacture them in such quantities as would make them practically available as antiseptics and disinfectants." In this he has by certain processes been completely successful, and sanitas, in all its varied preparations, in shape and form, "may find daily application in every household." In one form the writer can bear testimony to its eminent value. A case of severe burning, involving extensive destruction of tissue of both lower limbs and one arm, was treated by means of the ordinary liniment of oil and lime water, to which was added not quite a fifth of sanitas oil. The patient, after seventeen days, succumbed to the injury, but, notwithstanding being in a small room and the weather being warm, the application completely extinguished the fœtor of the extensive sloughing surfaces. No better testimony could be given to the value of sanitas. It may be added that the sanitas fluid was also freely used over the dressings in the form of spray. The application caused no pain, indeed, the suffering patient described the sanitated liniment as more soothing than the liniment as first used without the sanitas.

SANITATION. — Sanitary or Sanatory regulations and observances are daily acquiring more importance, both in a public and in a private point of view. The numerous Acts of Parliament passed with reference to the public health during the last twenty years, the various treatises on the subject both of a scientific and popular character, the authority given for local legislation on all matters appertaining to health, and the efforts made to educate the people at large to the necessity of adopting measures to ward off disease, are among the most noticeable features of the age we live in. But notwithstanding the increase of knowledge generally, combined with the best intentions on the part of the legislature, it is to be feared that the spread of true sanitary principles among the poor, who stand in most need of their aid, has been slow and limited. We refer mainly to matters which concern the individual himself, and which, as rational beings, every one is bound to consider, not on selfish grounds only, although these are all important, but for the sake of his family, his friends, and his neighbours. Comprised under this heading are one's daily and hourly habits, clothing, food, sobriety and moral conduct, in fact, every thing which contributes to develop "the sound mind in the sound body," and to make each unit of the population a worthy member of the commonwealth. Attempts to inculcate health principles among children in our Elementary Schools, and the dissemination of plain facts in plain language on the same subject among all classes of the community, cannot be too

highly commended. Though comprehensive, the knowledge need not be extensive, but should be made to embrace the fundamental facts relating to the physiology of the respiration, circulation, and digestion, as well as the causes of varying death-rates, and the measures necessary for the prevention of what are now usually termed "preventable" diseases. The principles of sanitation ought to be made part of all modern education; there are no situations in life in which they would not be useful, while in some they would be invaluable. In fact, no educated man in any position of life, especially if he has either by courtesy or by appointment influence or command among his fellows, can with propriety be ignorant on these subjects. A more extensive acquaintance with them on the part of the clergy especially, would greatly add to their means of usefulness in their visits amid the poorer classes. In the words of Dr. Guy, who first introduced the subject of Hygiene to a class of students in divinity in King's College, "sanitation has to do with persons of every rank, of both sexes, of every age. It takes cognisance of the places and houses in which they live; of their occupation and modes of life; of the food they eat, the water they drink, the air they breathe. It follows the child to school; the labourer and artisan into the field, the mine, the factory, the workshop; the sick man into the hospital; the pauper into the workhouse; the lunatic to the asylum; the thief to the prison. It is with the sailor in his ship, the soldier in his barrack, and it accompanies the emigrant to his new home beyond the seas. To all these it makes application of a knowledge remarkable for its amount, and the great variety of sources whence it is derived. To physiology and medicine it is indebted for what it knows of health and disease; it levies large contributions on chemistry, geology, and meteorology; it co-operates with the architect and engineer; its work commends itself to the moralist and divine." Attention to the principles and practice of sanitary observances and regulations, included under the single word *Hygiene*, is so constantly enforced in the present work, that further notice here would be superfluous. The articles more especially devoted to sanitary matters to which reference should be made, are—

Acclimation — Air — Bed and Bed-room — Chimney — Climate — Clothing — Cold — Contagion — Damp — Disease — Drainage — Education — Exercise — Food — Grave-yards — Heat — Houses — Life — Light — Public Health — Putrefaction — Recreation — Skin — Sleep — Temperance — Town — Training — Traps — Ventilation — Walls — Water — Water-Closets.

SANTONINE.—This is a white resinous crystalline powder, obtained from the *Artemisia santonica*. It is an infallible remedy for "round worms," that is, for the long round worms, like earth worms in shape, which are so commonly met with, especially in children, in certain localities. The dose of santonine is from two to six grains. It is tasteless, and may be taken in milk, or between thin slices of bread and butter. It should be given when the patient is fasting. Three doses may be administered at intervals of twelve hours. The powder may be mixed or made up with an equal quantity of sugar of milk, or it may be given alone as above.

Nothing could be more certain than its action in killing or poisoning this kind of worm. Patients complain that, after having taken a few doses of the drug, they see things of a greenish-yellow colour, and are much distressed lest this state of things should continue permanent. It never does so. The urine is tinged of a citron yellow colour and stains the linen. Amongst many other cases, the writer prescribed small doses of santonine to two children in a village where these round worms were very common. At the second dose the two children passed no fewer than ninety-two of these loathsome parasites. Altogether we must look upon santonine as one of the most valuable additions which has been made to our list of medicines, inasmuch as, by so effectually and speedily getting rid of these troublesome creatures, we are often enabled to cure patients of fits, and other affections, of which these worms have been the perhaps unsuspected cause. Moreover, the worms are dangerous in themselves, as they have been found perforating the walls of the bowels, and so causing death. Their effect, too, upon the general health of children, as well as adults, is oftentimes most pernicious. Patients troubled with them complain of pain in the region a little below and to the right of the stomach (*i.e.*, in the bowel next to the stomach), of sickness, and often of a peculiar sensation of "rising in the throat," with sickness, and tendency to vomit. Sometimes, probably owing to the effect on the sympathetic nervous system from the violent movements of the worm within the economy, fainting fits, and other nervous seizures occur at intervals. After a dose of purgative medicines one or more worms are sometimes evacuated, in which case a dose of santonine should at once be taken. They are sometimes vomited also, but most frequently their presence remains undetected, till the continuance of such symptoms as those noted above induces a medical man to suspect their existence, and he prescribes for them accordingly. Santonine, though often administered for, has no destructive effect on the tape worm or on the thread worm.

The following prescription may be made use of by an adult, and for a child one half or less may be given:—Take of santonine eight grains; sugar, or sugar of milk, fifteen grains; mix, and divide into three powders. One powder to be taken every night, till the three are finished. A dose of castor oil, or some simple

aperient, is generally necessary afterwards, but it need not be given unless required.

SARCINÆ VENTRICULI.—"Sarcina vomiting" is the name given by physicians to a peculiar condition, accompanied with dilatation of the stomach, with sickness and vomiting, generally of a large quantity of acid frothy fluid, in which are discovered, with the microscope, numerous vegetable parasites, named as above. They are very often found accompanied with the yeast fungus, *Torulæ cerevisii*, and were first noticed and described by Professor Goodsir, who gave them the name of the "woolpack parasite," owing to the appearance they present under the microscope. They are met with in organic disease of the stomach, which causes the food to be long detained in that organ, and hence to undergo a sort of fermentation. They are also developed in the stomach, owing to the use of improper food, and in the course of various forms of indigestion, accompanied with acidity. The treatment proper can only be undertaken by a medical man. It consists in the administration of remedies which kill or destroy the vegetable growth, such as the sulphite or hyposulphite of soda. The patient's diet is also regulated, and it is recommended that unfermented should be substituted for the ordinary bread.

The occurence of sarcinæ without organic disease of the stomach is most frequently met with in those who live almost entirely upon vegetable food, and the affection is consequently most common in some parts of Scotland and Ireland. The accompanying indigestion is sometimes the cause of the most intense hypochondriasis, and even suicidal melancholy.

SARDONIC SMILE, or GRIN, is a peculiar characteristic expression of countenance, which occurs in some diseases as in *Tetanus* and in other convulsive affections. The corners of the mouth are retracted, and the teeth exposed.

SARSAPARILLA is the root of a tribe of creeping plants, natives of Central America, and of Northern South America. The drug is brought to this country in the form of the roots, tied up in bundles, which are distinguished by various characteristics, according to the place from whence they are imported. These roots are cut up into chips for retail selling. Medical men are greatly divided in opinion, not only as regards the medicinal properties of sarsaparilla, but as to whether it possesses any medicinal properties of value at all, while some contend that if the root itself has medicinal power, this is destroyed by the usual modes of preparation. Whatever the truth may be, sarsaparilla is not a medicine likely to be used domestically, that is without medical prescription; and when it is employed, it will be most efficaciously so as sold in some of the usual prepared forms of extract, infusion, decoction, &c. The decoction is ordered to be made by digesting two and a half ounces of sarsaparilla chips in thirty fluid ounces of boiling water, reducing the preparation down to a pint by heat. The dose of this preparation is from two to ten ounces. The compound decoction, to which sassafras and guaiac wood are added, has a better reputation, and is largely employed by some surgeons in combination with iodide of potassium in the treatment of constitutional syphilis. The dose of the compound is the same as that of the simple decoction.

SAUSAGES, generally speaking, are indigestible as an article of diet, but they chiefly demand notice here from the liability, especially of some of the German forms of the preparation, to undergo a peculiar kind of decay, by which they are rendered highly poisonous; indeed, the defect goes by the name of the "sausage poison." Many hundred deaths have occurred from this cause in Germany. The sausages in question are generally made of liver, blood, with fat, &c., salted, and spiced, and smoked, and if properly prepared, keep well, and are wholesome for months. If badly prepared, they undergo the poisonous putrefaction, which is probably analogous to that which takes place in some descriptions of cheese, in bacon, salmon, and other oily articles of diet. The symptoms of poisoning from sausages are not very quickly developed; they are similar to those described under article *Putrefaction.*

Refer to—*Putrefaction—Trichina.*

SAVINE.—See JUNIPER.

SCABIES.—The ITCH.—See *Itch.*

SCALD.—See BURN.

SCALD HEAD, or, as it is technically called, "favus" or "porrigo favosa," is a disease of vegetable origin, mainly affecting the hairy scalp, though sometimes spreading to the face and neck, and occasionally attacking other parts. The parasitic fungus which occasions the disease, has its seat in the hair follicle outside the layer of scarf skin investing the root of the hair. There is another form of the eruption in which the plant is discovered in cells or depressions on the surface of the skin, giving it a honeycomb appearance, and from which it takes the name of favus. These plant cells form crusts and appear in crops or patches in different parts of the scalp, sometimes running together, but occasionally remaining separate and distinct. At an advanced stage of the disease, and when it has not undergone any medical treatment, the encrustation spreads over the entire scalp, presenting somewhat the appearance of a mask or vizor. The smell of the yellow encrustation is most peculiar, resembling that of the urine of a cat, or of a cage in which mice have been kept. The disease begins by itching, which is soon followed by a slight eruption of red pointed elevations which increase in size, and according to Dr. Aitken, "before twelve hours have elapsed, a yellow point forms on each of the apices. The surface

appears now as if covered with specks of a sulphur-yellow colour, and each elevation appears as if set in the skin with a depressed centre, and any fluid exudation concretes into a dry, brittle honeycombed scab." While increasing in size, the crusts preserve their circular form, and the hairs become dry and brittle, and having no hold on the scalp are easily detached.

Like ringworm, the great point in the treatment of scald head is the destruction of the fungus, which is best accomplished by removing the hair, applying poultices and fomentations to the scalp, and using the tar ointment to the affected parts morning and evening, taking care to wash the scalp thoroughly with soft soap and water, prior to each application. As it is barely possible to shave the head in the majority of cases, the hair must be cut as short as possible, and if the disease does not yield to the treatment recommended, it may be necessary to remove each hair separately by the forceps, and to follow up the treatment prescribed in the article *Ringworm*.

For the microscopic appearance presented by the hair in favus, see article *Microscope*.

SCALP.—The skin of the head is tolerably thick and firm, and is connected with the parts immediately subjacent by a rather loose cellular tissue. These circumstances often give a peculiar character to the effects of violence, and to wounds of the head, for the skin being firm, and the cellular tissue being easily torn, large portions of the scalp are occasionally separated in flaps, either entirely or partially. When, as the result of violent accident, a portion of scalp is separated, the best thing that can be done by a bystander is, provided grit or dirt have not been forced into the wound, to replace the parts as nearly in their proper position as possible. This will require a little care, for the skin is apt, from its own elasticity, to curl up. If the wound has got dirt in it, and if it is possible to procure surgical aid in the course of a few hours, the best plan will be to rest content with a superficial cleansing of the wound and adjacent parts, and then simply to lay the detached portion somewhat in its proper position, and to place over all a cloth wet with tepid water, till the arrival of the surgeon, who will clean the wound in the most effectual manner, a matter of some importance. If, however, surgical assistance is far distant, some one should endeavour, *carefully*, to free the wound of foreign matter, by means of washing with a soft sponge, and also by picking out small portions of gravel, or the like, if these are present, by means of forceps or tweezers. After the wound has been cleansed, the detached scalp must be fitted as closely as possible in its proper position; and if the hair around the wound has not been already clipped close off, this should now be done: in addition, it will be requisite in most cases to shave the scalp perfectly clean for some distance around. To retain the detached portion of scalp in its place, if it be large, two or more stitches, according to the size of the wound, may possibly be required (see *Wounds*) in addition to plaster; if the wound be small, strips of plaster laid evenly, so as to hold the edges together, will probably be sufficient; but in any case, in order that these may retain their hold, the hair must be shaved clean off. After the plasters are applied, a piece of lint, double, and wet with simple soft water, is to be laid over the wound, and over this, to retain all in place, a bandage of some kind. A handkerchief applied as represented (fig. 17, article *Bandage*) will generally answer every purpose, or a cap may be made to fit close upon the head; indeed, the cap or the handkerchief is better than any regular bandage, and generally more accessible. After the wound has been thus dressed, the person who has suffered from it, should, whether feeling ill or not, go to bed, keep perfectly quiet on low diet, especially avoiding stimulants for some days, and, if of full habit of body, take a dose of common purgative. A few hours after the dressing, the wound will probably feel hot and dry, but these symptoms must be kept down by the use of cold water, used so as to soak through the dressings without removing them. In the course of two or three days, according to circumstances, the wound may again be dressed (see *Dressing*). Simple incised wounds of the scalp are to be treated in a manner similar to the above, but of course they are less troublesome, the scalp not being detached. Some persons condemn the use of stitches and plasters, entirely, in the treatment of wounds of the scalp, and prefer the use of pads adapted, by bandage and otherwise, to retain a flap in its place; it is doubtful whether this method could be applied by a non-professional person, at least with sufficient accuracy. Bleeding from wounds in the scalp is often profuse, especially if an arterial branch has been divided; it may, however, generally be stopped by the use of cold, or by pressure. Even when a very large portion of scalp has been detached, it is often marvellous how quickly and completely it becomes reunited to the other parts; at other times, however, portions of the skin die, leaving a granulating wound to heal like other wounds of the same kind. One chief danger to be apprehended after wounds of the scalp—independent of the violence to the brain which is often a concomitant of such accidents—is the occurrence of erysipelas, which may set in, spread over the head, cause extensive formation of matter under the skin, and perhaps destroy the patient. Such a case must, of course, be treated as erysipelas from any other cause; but if a medical man has not before seen the patient, he ought to do so now without delay; it may require all his skill to save life. A method of treating scalp wounds has been highly spoken of in the surgical practice of the American army, which certainly has simplicity as its recommendation.

It consists of the union, by plaiting or braiding, of strands of the patient's own hair across the line of the wound or incision. This method is said to be highly successful, and is much more simple than the old method of shaving, stitching, and plastering scalp wounds, while in the case of females especially, it has the advantage of preserving the hair, and causing little or no disfigurement. The writer has tried this method in several cases, and has never failed to secure union by the first intention.

The scalp is often the seat of "encysted" tumours, which are at times conspicuous on the heads of aged people; they are perfectly harmless and painless, if they do not interfere with the wearing of the usual head covering. If desired by the patient, their removal is simple. Soft fluctuating tumours beneath the scalp of infants are sometimes met with immediately after birth, they generally disappear shortly, but it is better they should be examined by a medical man.

The scalp is the seat of different forms of eruption, or of skin disease, especially in children. For the more important of these, see articles *Ringworm* and *Scaldhead*. It would be quite superfluous and useless, so far as the non-professional are concerned, to attempt to enter into the numerous differences in the character of the various diseases of the scalp, and the treatment and its modifications applicable to each: general observations are all that can be offered with any advantage. The first great object in eruptions of the scalp is to get them under treatment as early as possible, the next to observe the strictest cleanliness. The variety and the obstinacy of the diseases in question are reasons for placing them under proper medical treatment as early as possible. When this cannot be done quickly, the first step should be to examine the head thoroughly, that no affected spot be undiscovered; the next to clip the hair moderately short, and around the affected parts, perfectly close. If the eruption is extensive, it is better to cut the hair close off altogether at once. The hair having been removed by clipping, in preference to shaving, washing with good brown soap, with warm soft water, night and morning, is a process which will cure many a scalp eruption, especially among those classes in whom deficient cleanliness is often the cause of the evil. When this does not suffice, an ointment made with ten grains of the red oxide of mercury to the ounce of lard, smeared slightly over the affected part, is often of much service. As long, however, as there are any scabs or incrustations on the head, there is no use applying either this ointment or any other application; these, therefore, should be removed in the first place by poulticing. In some kinds of scalp eruptions, alkaline washes are often of service. The late Dr. Hughes Bennett recommended in some forms of the disease a lotion composed of two drachms of bicarbonate of soda to the pint and half of water, to be applied to the affected parts, by means of lint soaked in it, and covered with oiled silk. Very many applications for eruptions on the scalp are and have been used; but if a disease of the kind does not yield to the simple measures above detailed, a medical man should see the case; moreover, in some forms of scalp eruption it is scarcely desirable that the eruption should be done away with, at least quickly, or without the constitution being acted upon by medicine; for it may happen that, after the disappearance or cure of a scalp eruption, a child has become the subject of convulsions, or of other affections of the brain.

In all cases of tendency to eruption on the scalp, the diet should be attended to, salted meats forbidden, and in those of full habit, the allowance of animal food curtailed, and milk and farinaceous diet substituted, more or less according to circumstances; on the other hand, in the weak and delicate, it may be requisite to improve the diet both in nourishment and stimulation.

In strong children, three grains of grey powder, given at bedtime, and followed in the morning by a dose of senna or other aperient, will often be useful; in more delicate children, half a grain of grey powder with two or three grains of carbonate of iron given twice a day for a week or ten days at a time, is a useful remedy. In all such cases, however, proper medical attendance is the best and safest plan.

When there is eruption on the scalp, the glands of the neck are liable to become enlarged and painful.

Refer to—*Erysipelas—Skull—Wounds.*

SCAMMONY.—This drug, which belongs to the class of purgatives called cathartics, is obtained from a species of *Convolvulus*, a native of the countries of the Levant. It is one of our most valuable medicines, but from its high price, one of the most adulterated drugs in use; indeed, the scammony generally met with does not contain above fifty per cent. of the pure drug, and the doses are generally regulated according to this; consequently, if pure, or, as it called "virgin" scammony was generally attainable, the doses would not be above half what they now are. Scammony is generally met with in the form of a greyish mass, or grey powder; the adulterations are chiefly chalk, flour, &c. Scammony acts as an efficient purgative without griping, and is not liable, if properly given, to produce violent effects; its certainty of action is, however, increased by combination with other purgatives; on this account it forms a valuable addition to the compound colocynth pill. A compound scammony pill has been recently introduced into the British Pharmacopœia. It is prepared with equal parts of scammony, resin of jalap, and curd soap, dissolved in strong tincture of

ginger and rectified spirit, the latter being evaporated by heat until the mass has acquired a sufficient consistence to form pills. The dose is from five to ten grains. For children, when free purging is required, scammony is remarkably well adapted, combined with small doses of calomel or grey powder; moreover, its small bulk of dose, and the comparative absence of nauseousness, fit it for such administration. For a child of four years of age, four grains of ordinary scammony alone, or one grain and a half of calomel, or three grains of grey powder, with three grains of scammony, will prove a certain and active purgative. The twelfth of a grain of podophyllin mixed with two grains of scammony makes a good and safe purgative for a child of three years of age, or scammony alone may be given rubbed up with milk in the form of emulsion.

SCAPULA, or SHOULDER BLADE, is a flat triangular bone connecting the arm to the trunk of the body, forming a protection to the chest wall, and affording attachments to numerous muscles of the arm and chest.—See *Shoulder*.

SCARF-SKIN, or EPIDERMIS, or CUTICLE. —See SKIN.

SCARIFICATIONS are deep scratches, or superficial cuts, made generally upon the skin, or upon a mucous membrane. The chief use of scarifications is to give exit to blood or serum from parts in which there is an improper accumulation of either of these fluids. The scarification of the gums in children is not, as is often supposed, to assist the passage of the tooth, but to relieve the tension and inflammation of the gum by allowing the escape of blood from the over-loaded vessels and tissue. Scarifications of other parts act in a similar way.

Refer to—*Childhood*.

SCARLET FEVER and SCARLATINA are both designations for one and the same disease, although an idea prevails, popularly, that the latter is the name of a milder and less dangerous affection than the former. "It is a highly contagious disease; the person suffering from it generates a poison communicable by the atmosphere or by inoculation, and few persons at all susceptible to its influence fail to escape an attack when brought much in contact with the infected. There are also good reasons for supposing that under peculiar conditions connected with drainage and water supply, the disease is intensified in severity, and will spread as an epidemic among those subject to these conditions. The fact is unquestionable, that the contagion permeates everything that proceeds from the body of the patient, the clothes and the excretions, and is spread in a great measure by the tiny scales that are being continually thrown off from the skin, especially during the period of convalescence."

Scarlet fever belongs to the class of eruptive fevers; and is characterised by symptoms so well marked that it can scarcely be mistaken for any other disease, even by unprofessional persons. Generally, the first symptom complained of in the incipient stage of scarlet fever, is sore throat, either accompanied, or quickly succeeded by the usual symptoms of a feverish attack, shivering, headache, loss of appetite, perhaps vomiting, followed by heat of skin, quick pulse and thirst. The eruption appears early on the second day after the first symptoms of indisposition; it first shows itself in the form of minute red points either on the neck, face, or chest, or on the arms, especially about the elbows, the points becoming more numerous, till they form one diffused surface of a tolerably bright scarlet eruption, which extends to the abdomen and body generally. On the second day, when the eruption is appearing, the symptoms of general fever, and especially the heat of skin, continue unabated, the throat is more inflamed, and the tongue assumes the appearance characteristic of the disease. It is probably covered with a white creamy looking fur, through which the "papillæ" on its fore part, about the tip especially, project like red points, resembling a white strawberry; this appearance may continue, but in many cases the fur comes off as it were in patches at a time, and ultimately leaves the tongue preternaturally clean and red, covered with the elongated papillæ, in some cases almost like a pile upon it. The eruption in scarlet fever generally looks more patchy upon the extremities than it does upon the trunk. In a moderately favourable case of scarlet fever the eruption begins to fade between the third and fourth day from its appearance, and with it the feverish symptoms, and other general symptoms of the disease, such as sore throat, &c. The patient of course is left weakened, but with moderate care, convalescence is for the most part speedy. The chief care is required until the desquamation of the cuticle, or peeling, is completed; during this period also the power of communicating the disease by contagion appears to be retained.

Although favourable cases of scarlet fever pass through the course nearly as described above, there are much severer forms of the disease. The feverish symptoms from the first may have a high inflammatory form; or the reverse may give evidence of an extreme condition of bodily depression, with tendency to malignant disease, and to a putrescent or typhoid condition. In such cases the eruption is tardy, and when it does appear, patchy and dusky in colour; the swelling of the throat is great, and if they can be seen, the tonsils are evidently ulcerated, the breath offensive, the tongue swollen, and swallowing difficult, if not impossible; offensive discharges take place from the nose, and at the same time there is evident extreme depression of the constitu-

tional powers, with delirium. Between the comparatively mild form first described, so mild indeed at times as scarcely to constitute a perceptible disease, and the malignant, scarlet fever is met with in every degree of severity. As a general rule, the severity or mildness of the attacks of scarlet fever depend greatly upon the type of the prevailing epidemic, which at one time may be so favourable that almost every case does well, whilst at another, the greatest fatality attends it, and sorrowing parents see their children carried off one after another with fearful rapidity.

The great variation in the severity of the attacks of scarlet fever must render the variation in the treatment equally great. When the form of the prevailing epidemic is extremely mild, little if any treatment is required, and many cases get none at all, not even confinement to the house, and certainly not to bed. This is not well even for the sake of others, and should the weather be ungenial, or should cold be taken, a mild affection may be at once converted into a dangerous disease. A moderately smart attack of scarlet fever requires, certainly, confinement to bed, in as well ventilated a room as possible, kept at an average temperature of 60° Fahr.; the diet should be kept low, and should consist of milk, farinaceous articles, &c., and the thirst may be freely indulged with diluent drinks and iced water; the patient must not be loaded with bed-clothes, which will keep up feverish heat. If the heat of skin is great, which is usual in most cases of this disease, sponging the surface of the body with tepid water, with or without the addition of a little vinegar, is at once most beneficial and grateful to the patient. A gentle aperient should be repeated once or twice in the course of the disease, a table-spoonful of castor oil, a dose of magnesia and rhubarb, or from half to a whole Seidlitz powder, may be required, or in fuller habits, or where fever runs high, a more active purgative still, of calomel and scammony, or in an adult, calomel or blue pill, and colocynth.

The common effervescing aerated waters are often liked, and may be permitted in moderation to all; but more freely, and, indeed the salines generally, to persons of full habit. From five to ten grains, according to age, of chlorate of potash given every six or eight hours, in a little sugar and water, is one of the most appropriate cooling salines in this disease.

If the feverish symptoms run high, of course the lowering and cooling remedies must be more actively enforced. The throat affection is often the most serious to grapple with, and various local as well as constitutional remedies are employed for this purpose. Inhalation of the vapour of hot water, hot poultices and fomentations to the throat, gargles composed of chlorate of potash, nitrate of potash or permanganate of potash, are much in use, and may be combined with rose water and tincture of myrrh. When ulceration occurs, the ulcerated points may be touched with a solution of lunar caustic, or with equal parts of turpentine and glycerine brushed on the parts with a camel's hair pencil. If the case be one of a malignant character, every method of supporting the strength by wine and beef-tea must be used. Diffusible stimulants, such as the aromatic spirit of ammonia, or the carbonate of ammonia, in six or eight-grain doses, given three times daily, are much relied on. But perhaps the best remedy, where the disease assumes a malignant aspect, is to be found in one or other of the preparations of chlorine. The author prefers the following mixture, which will probably be found equally efficacious in diphtheria: put ten grains of chlorate of potash finely powdered into a pint bottle, add one drachm of hydrochloric acid, leave five minutes with the cork loosely inserted, add one ounce of water and shake, gradually add water shaking the bottle till it is full. Dose for a child of eight years, two table-spoonfuls every hour when the case is severe.

Although the above directions are given for circumstances which *might* render them useful, it is not with the idea that any one in their senses would have recourse to them, if medical aid could in any way be procured. The fearful rapidity of a fatal case of malignant scarlet fever calls for the most energetic exertion of the highest skill, which is too often of no avail.

After the eruption has faded, the person may sit up, and gradually return to fuller diet, such as pudding, broth, fish, &c., the bowels being kept free, but not purged, and close attention given to the state of the urine as to quantity and appearance. At this stage, which is a very critical one as regards the communicability of the disease, on account of the peeling of the skin, much comfort will accrue by anointing the body with olive oil, which is all the better of being impregnated with camphor, sanitas oil, or carbolic acid. Some recommend the anointing to be done daily, and although the process may be both troublesome and inconvenient to the attendant, there can be no doubt of its efficacy, not only in checking the diffusion of the noxious atoms from the skin, but also in relieving the excessive itching which is liable to occur at this period. The anointing should be continued till the patient is well enough to have a warm bath, when the body should be well scrubbed with carbolic soap, the hair of the scalp coming in for an extra share. It is well to have the bath repeated, say every second day, till the end of a week, by which time the patient will in all probability be able to leave his chamber for the open air, and enjoy the benefit of nature's best disinfector. The occurrence of dropsy, after scarlet fever, is always a serious matter, and the possibility of it, a cogent argument for guarding against all those influences which, by interfering with the

perspiratory function of the, for the time, morbidly susceptible skin, tend to induce it. It is observed that the attacks of dropsy after scarlet fever are by no means in accordance with the severity of the attack itself, and this is supposed to be because those who have had only a mild attack are more careless as to after exposure than those who have suffered a severe one. However this may be, it is certain that many who have passed safely through the disease itself, fall victims to the subsequent dropsy, purely as the result of carelessness on their own part, or on that of others. The attacks of dropsy are most likely to occur from the end of the first fortnight to the end of the fourth week after the decline of the eruption. Its symptoms are generally those of languor and oppression, with headache, and it may be vomiting, the swelling coming on simultaneously. Usually, the face, the eyelids especially, is first affected, and the dropsical swelling may go no further, but generally the feet and legs, the hands, arms, chest, &c., become involved. Concomitant with these symptoms, the urine is scanty, high coloured, or "smoky" in tinge; it presents, moreover, peculiar chemical changes.

Little has hitherto been said about medical attendance in a case of scarlet fever. Although mild cases may be, and every day are, carried safely through with simple nursing, should the case be at all a smart one, it ought to be visited by a medical man; if it is severe, his presence is indispensable, equally so, whatever the case may have been, if the least symptoms of the after-dropsy show themselves. Should this last contingency occur, warm baths ought to be used to restore, if possible, the functions of the skin, hot bran poultices applied to the body, and if there is pain about the kidneys, blood taken by leeches or cupping. The bowels should be well cleared, or rather purged, by the calomel and rhubarb, or calomel and colocynth pill, or better still, by calomel and compound powder of jalap; at the same time a draught consisting of a drachm of nitrous ether, half an ounce of spirit of mindererus, and ten or fifteen drops of ipecacuanha wine, in a wine-glassful of water, may be given every four or five hours. These measures ought to be sufficient till medical assistance is procured; if, as sometimes occurs, convulsions or delirium come on, they are to be treated as directed in the articles on those disorders. Besides dropsy, scarlet fever is liable to be followed by other affections, particularly in those of weak or scrofulous constitution. If the affection of the throat has extended to the ears by the eustachian tubes, the structure of the organs of hearing may be materially damaged, and deafness, total or partial, be the result. Frequently, runnings from the external ear, from nose or eyes, continue long after the subsidence of scarlet fever, and if the attack has been a severe one, a permanent state of impaired health may be the consequence. Of course, if a patient, after an attack of scarlet fever, remains weak, tonic medicines, quinine, or iron, with wine and good nourishment will be required, also, warm clothing.

Measures for Disinfection.—The preventive measures to be taken to check the contagion of scarlet fever are of great importance, as few diseases retain the power of propagation longer; indeed it is impossible, in the absence of any precautions, to say how long the poison may remain persistent. The first precaution is to isolate the patient, to place him in a room apart from the other members of the family (the nearer to the top of the house the better), and to which no one should be allowed to enter but the immediate attendant. All superfluous material should be removed from the apartment; carpets, curtains, and all textile fabrics not absolutely required, may be dispensed with, as they are well known to harbour the germs of the distemper. The dress of the attendant should consist of cotton or linen in preference to woollen stuff, or at all events it should be made of some good washing material. The question of disinfection of the house must always be difficult so long as the patient is an inmate of it; still, much can be done to dilute the intensity of the contagious virus. The floor of the sick-room can be sprinkled with carbolic acid solution, or with a solution of chloride of zinc, and Condy's fluid should be always at hand wherewith to wash out cups, feeders, urinals, and bed-pans, for the ways in which contagion spreads are manifold and mysterious. Carbolic acid soap should be readily available for purposes of ablution, and all towels, handkerchiefs, body linen, draw sheets, and the like, should be steeped in a solution of carbolic acid before undergoing the usual washing. When the person has recovered sufficiently to be able to leave the house, we are in a position to deal with the infected apartment, and possibly to prevent the disease from committing further ravages. This may be done in various ways, the ordinary plan is to open the window wide, to limewash the ceiling and the walls (if they do not happen to have been painted or papered); and the floor, as well as all articles of furniture which can bear it, should be washed with carbolic acid soap. If the walls of the room have been painted, they should be washed down in a similar manner; and if papered, the paper should be stripped, and the walls covered afresh. If the room must be used at once for habitable purposes, it may be necessary to have recourse to an aerial chemical disinfectant, and the best of these will be found in sulphurous acid gas generated from bisulphide of carbon. This is a dense heavy fluid of an intensely inflammable nature, composed of one part of carbon to two of sulphur, and which burns like spirits of wine. It may be

burned in an ordinary spirit lamp, or in lamps specially contrived for its combustion, but the best apparatus is a simple metal cup into which the spirit may be poured, and afterwards set light to, care being taken that the vessel is raised on a metal stand a little above the centre of the floor, and that all windows, doors, and crevices, which could admit air to the room, are carefully sealed. In the process of combustion, sulphurous acid gas is liberally set free, and the atmosphere of the apartment is rendered so pungent that no human being could exist in it for long, but on the other hand it destroys all vestiges of the disease.

Scarlet fever is generally a disease of childhood, and is usually passed through once in a life time; but adults who have escaped it in early life are liable to be affected. Second attacks are rare. Although, however, those around persons suffering from scarlet fever may not have the disease, they are very liable to suffer from sore throat, often in a severe form. It is a serious thing for women to be exposed to the contagion of scarlet fever soon after child-birth; every means, therefore, should be used to guard against such a contingency.

Scarlet fever has sometimes been confounded with measles; a comparison of the described symptoms of the two diseases will point out the complete difference.

SCHOOL.—It too often happens that, in consequence either of ignorance or of carelessness, the health of young people suffers irretrievable injury during the years of instruction. In day-schools, the chief source of injury is from deficient ventilation. The consequences of this, and the remedies, are sufficiently entered into under such articles as *Air* and *Atmosphere*, *Bedroom*, *Ventilation*, *&c.*, and require no further comment here; suffice it to remark, that the effect of breathing an atmosphere deteriorated by the carbonic acid and organic matter exhaled from the lungs of a number of children into a small or badly ventilated room, must be to produce drowsiness and languor, and consequently to neutralise in some degree the exertions of the teacher.

In boarding-schools, the health of the pupils is of course subject to those general conditions and laws of health, which are commented on in the various sanitary articles; and parents would do well to assure themselves that due attention is paid to these, ere they commit the daily life of their children to influences over which they have no control. It is to be hoped that there are few seminaries for the young in this kingdom in which actual deficiency of food occurs; but it is possible, that in the selection and preparation of the food, there may be defects, which to strong-constitutioned children are of comparatively little moment, but which are of the greatest importance to the delicate. The point should not be overlooked. It is impossible in the limited space of this work to enter into particulars, but the reader is referred to the various articles on *Food*, *Digestion*, and the principles of *Nutriment*. Equally important with quantity and quality of food, is the permission of sufficient time for meals, not only for the mere eating, but for rest after, before school-work is resumed. The author is induced to notice this point especially, from having recently had his attention drawn to the regulations of a large educational institution, in which the time allowed for meals is so short, that the meal itself must be a scramble, independent of the injury which may result from the resumption of head work immediately after taking food (see *Digestion* and *Indigestion*). It does seem to be the case with some, that in seeking to cultivate the mind they forget the body, forget how dependent the activity of the instrument they seek to form is upon the well-being of its material clothing. There are many other points connected with school-hygiene which are important, but, as before said, they fall under the heads of sanitary information generally, as already given in other parts of this work, and which space forbids to be reiterated.

Refer to—*Air*, *&c.*—*Bedroom*—*Childhood*—*Education*—*Ventilation*, *&c.*

SCIATICA is neuralgia or nervous rheumatism, affecting the great or sciatic nerve of the lower extremity. This nerve, the largest in the body, passes down the back of the thigh to the ham, a little above which it divides into two main branches. The nerve sometimes becomes the seat of severe neuralgic pain, felt down its entire course, or perhaps in the hip only, or sometimes in the foot and ankle only; the pain comes on in paroxysms, and is generally increased by exercise; in some cases, pressure upon the course of the nerve causes pain.

Sciatica is often attended with so much suffering, that it affects the general health to a considerable degree; moreover, it is frequently most difficult to get rid of. For these reasons, the case should be under medical superintendence. The remedies used in sciatica are mainly those which are found of service in other neuralgic affections, keeping in view the causes and circumstances of the disease. Heat and counter-irritation, with mustard poultice, are frequently beneficial, but if the pain is severe, it may be found necessary to employ a narcotic in the form of a subcutaneous injection of morphia, which seldom fails to give relief; but as it is unwise to persist daily with this treatment, recourse is had to liniments of opium, aconite, belladonna, or veratrine. It has been found of late years that many cases, often defying the ordinary means of treatment, have yielded to the continuous galvanic current applied along the course of the nerve. The bowels being cleared by a purgative, if there is no tendency to fever, twenty-grain doses of the saccharated carbonate of iron, given three times in the twenty-four hours, often cure quickly;

or turpentine, in doses of fifteen drops, given in milk, three times a day, may be tried; or quinine, in two-grain doses, every eight hours. There is considerable uncertainty in the effect of remedies in sciatica, even in skilful hands. In obstinate cases, the author has found much benefit from the use of the warm saline baths, such as those of Moira, or of Ashby-de-la-Zouch. Acupuncture is often of service in this disease, and is, perhaps, not so much employed as it might be. It may be done by a Duchenne needle, or by an ordinary large darning-needle which is thrust into the hip betwixt the great trochanter of the thigh bone and the bony prominence on which the body rests when sitting, with the view of transfixing the nerve. In all cases of sciatica, perfect rest of the limb is essential. Again, it is repeated, the obstinacy of the disease, the uncertainty of remedies, and the possibility of its being symptomatic of irritation in the kidney, make it the safer and wiser plan to have the case treated by a medical man at once.

Refer to—*Neuralgia.*

SCIRRHUS—a form of cancer characterised by its peculiar hardness in the incipient stage of the disease.—See *Cancer.*

SCLEROTIC.—The outer thick coat of the globe of the eye.—See *Eye.*

SCREAMING of infants, if continued, and if increased on particular movements of the body, should not be neglected. Intermittent screaming may be indicative of painful affection of the chest or abdomen, which incites the child to scream; whilst, on the other hand, the aggravation of the pain thus induced, compels it again to desist, thus giving the intermittent character. Screaming of children during, or on awaking from sleep, may arise from the irritation of teething, or of worms, &c., or from indigestible matters in the bowels; for these causes the suitable remedies are to be used, as directed in the proper places. Screaming in sleep may be simply a bad habit, untraceable to any cause, or may be attributable to dreams, or excitement of mind produced by fright during the day, excited accidentally, or by design, by foolish nurses. Lastly, screaming may arise from incipient disease of the brain. If the affection be persistent, its cause should be investigated by a medical man. It is said that, in some cases of screaming, a small dose of belladonna given to a child at bedtime is useful as a preventive. The author has no experience of the remedy.

SCROFULA is the name rather of a constitutional tendency, or *Diathesis*, than of a disease, although cases of scrofulous disease alone do occur, where the tendency is strong. That many persons may be tainted with scrofula, and nevertheless be free from those external signs which are usually considered to indicate the tendency, is unquestionable, but generally, if the scrofulous diathesis is at all strongly marked, its evidence is sufficiently apparent, and often strikingly so. The following description of the signs of scrofula in the two forms in which the complaint is likely to appear, by Dr. Phillips, one of the highest authorities on the subject, is peculiarly truthful. "In the form of the body there is usually observable a want of muscular development; but even this is often absent. There is often an appearance of plumpness and roundness, which is the result not of muscular development, but simply of an infiltrated condition of the cellular tissue, and which rapidly disappears under fatiguing exercise, privation, or disease. Commonly, there is a general paleness and coldness of the surface of the body, which is owing to a feeble circulating apparatus; but in a large number of cases that paleness does not extend to the face. The colour of the hair is very variable, but for the most part it inclines to a dark tint. Of nearly nine thousand scrofulous children examined, a little over thirty-two per cent. had light hair and eyes. The abdomen is commonly tumid, discharges from the nose, the eye, and the ear, are common, the tongue has commonly a dirty whitish coating; the tonsils are usually enlarged, and they are often so tumid as to impress a disagreeable and frequently husky character upon the voice, and to cause snoring when the patient is asleep. The stomach and bowels are frequently disordered, and digestion is ill performed. Sometimes the evacuations are clay-coloured, very offensive, and of varying consistency, at others having a redundancy of bile. The skin, though often dry and hard, is frequently the seat of a considerable greasy exhalation, sometimes it is found to be fœtid and sour. The scalp and other parts of the cutaneous integument are often the seat of eruptive affections. The absence of vascular and muscular energy often causes the child to lie and sit about much, and indisposes him to enter into the energetic games of his playfellows. As to the intellectual development claimed for scrofulous persons, that is usually wanting. That many scrofulous children present this character is quite true; but the result of very careful observation," says Dr. Phillips, "has convinced me that the overwhelming majority are without those superior intellectual qualities, which have been pointed out as their ordinary characters." Moreover, if the intellectual powers are forced, as too often happens, "and the nervous and intellectual systems have the vital actions concentrated on them too intensely, the sufferer loses flesh, the general health languishes, and the intellectual faculties may give way, destroyed by an opposite, but not less sure, method than that which breaks down the poor man's child."

As noticed above, the very common idea that scrofula is usually associated with light hair and complexion, is far from being correct, the larger proportion of scrofulous subjects have dark hair and eyes, with a dingy

complexion, and some are ruddy, and to the common observer look robust; others with delicate skin, inclined to freckle, have red hair.

Of the causes of scrofula, there can be no doubt that hereditary predisposition is *the* cause above all others; the fact is beyond dispute, and there are few families in this kingdom who have not, indirectly at least, practical connexion with the fact. It is to be observed, however, that the predisposition is strengthened, if a parent adds to the taint an acquired state of bad health, or if in a father the bodily powers are impaired by age; probably the reverse holds good, that whatever conduces to health and vigour, even in parents tainted with scrofula, tends to improve the constitution of offspring as regards the predisposition. Further, it is undoubted, that whatever hereditary tendencies children may possess, they are greatly retarded or strengthened by the external conditions to which such children are exposed. If the climate in which they reside is dry and bracing, if they are so placed that healthy habitations, good clothing, and nourishing food are provided for them, and especially if their parents and guardians are awake to the importance of these things, of being on the watch for any tendency to failing health, or to disease, the chance of health and life are far greater than they are for children of even originally better constitution, who are exposed to a damp cold climate, and to the unhealthy influence attendant upon the circumstances of poverty. These, in fact, of themselves, especially cold, damp, badly-ventilated apartments, and unwholesome food, frequently engender the disease among children who have no hereditary tendency to it. It ought always to be an object in those predisposed to scrofulous disease, to maintain the highest possible conditions of health.

In children, the glands, those of the neck, chest, and bowels, are the most usual seat of scrofulous disease, though it presents itself in other parts, particularly in the joints, which often become the seat of chronic inflammation; in the bones, which are liable to carious ulceration; and in chronic affections of the eyes, known as scrofulous ophthalmia, and marked by extreme intolerance of light. In adults the lungs most generally suffer. Whatever disease affects a scrofulous person, whether it be, like enlargement of the glands, distinctly traceable to the scrofula itself, or some other ailment, it is apt to be modified in its course and appearances by the existing tendency. Purely scrofulous inflammation is slow in its progress, and unattended in any marked degree by the usual phenomena of inflammation. When suppuration ensues, the matter is not always healthy pus, but is often more like whey or serum; if ulceration results, it is indolent, while the healing process is also protracted, leaving behind it an ugly puckered cicatrix. The formation of tubercles or of tubercular matter is another characteristic of scrofula. This deposit so common in the lungs, may also occur throughout the body, consisting of a cheesy-looking substance, exciting inflammation, and formation of matter in the adjacent parts of the tissue, in which it is deposited. When this occurs in the lungs, the tubercles become as it were softened down in the surrounding matter, and the fluid or semi-fluid mass is discharged by cough.

Under the head of causes, sufficient has been said to indicate the general course to be followed when a tendency to scrofula exists; when the disease actually breaks out, the same measures must be continued, and new ones of a more direct medicinal character adopted. These, to be thoroughly carried out, require the superintendence of a medical man. Flannel must be worn next the skin in all seasons of the year, and in winter it may be supplemented with a chamois leather jacket, while free exercise in the open air, when the weather admits, should be constantly enjoined. Iodine in its various preparations, especially that of the iodide of iron, also iron itself, with tonics generally, and above all the use of cod liver oil, are the principal remedies; and change of air, when obtainable, to the sea, or to a dry bracing air is always advisable. Season, as might be expected, exerts considerable influence over the scrofulous constitution; the early spring months being the most unfavourable. In some countries there is considerable importance attached to the contagiousness of scrofula. It cannot be considered contagious in the ordinary acceptation of the word, but it must be always advisable, especially for those predisposed to the disease, to avoid continued contact with the affected. The scrofulous is often spoken of as the "strumous" diathesis.

SCURF.—See DANDRIFF.

SCURVY.—This disease, so well known and so fatal in times past to voyagers and others, has attracted notice in modern times by its appearance under circumstances which, in the present state of our knowledge concerning its causes, ought to have been all-powerful to prevent it. From the absence of vegetable salts and acids in the daily rations, the disease broke out among the allied troops during the Crimean War, as well as among the soldiers in the American Civil War, and more recently it is known to have afflicted the sledge parties of seamen engaged in recent Arctic expeditions. It is requisite here to explain, that what is meant by scurvy in this article is a very different disease from that implied in the popular acceptation of the term, which is applied to undefined cutaneous disorders, especially of a scaly character. The error has probably arisen from the dry scurvy appearance of the skin, which often precedes an attack of the real scurvy. True scurvy is a severe disease, unquestionably owing to deterioration of the

blood, as a result of inappropriate nourishment, especially of nourishment unvaried by the admixture of fresh vegetables, and the mineral matter peculiar to them. Scurvy commences with languor and signs of general debility, and great depression of spirits, the gums become swollen, and spongy, red or purple looking, project over the teeth, and bleed easily, this tendency to the exudation of blood extending to the various mucous surfaces within the body, in bad cases, and showing itself in the discoloured patches of effused blood beneath the skin. The lower extremities become first stiff, then swollen and hard, the skin being as it were glued down to the parts beneath, and covered more or less with brownish or purple patches. If the case goes on unchecked, blood is passed from the various outlets of the body, and the patient sinks. Fortunately, for this formidable malady, we possess the well known and almost certain cure of lemon juice, but although this is the most strikingly speedy, and most certain curative agent, it is by no means the only one; as the deprivation of fresh vegetables or of milk, seems to be one chief cause of the disease, so a return to the use of these articles appears to be an antidote, and in this way, potatoes and vegetables generally, without medicine at all, are often sufficient to cure. Indeed in the epidemic of scurvy which prevailed in 1846, in the General Prison at Perth, the cases which occurred were cured, and the further progress of the disease arrested, by the addition of milk, and in some cases meat, to the usual dietary, showing plainly that scurvy may be caused by malnutrition, apart altogether from the absence of vegetables. Malt liquor is likewise found useful in diminishing the tendency to, and in arresting the progress of scurvy.

Of course, in a bad case of scurvy, when lemon juice is procurable it should be used; half a pint may be given in the day, alone or diluted. Until lately, the opinion has prevailed that the curative powers of lemon juice in scurvy depended upon its acid, and that the good effects of other vegetables arose from their containing that or other similar acids; the researches of Dr. Garrod, however, have thrown doubt upon this, and apparently go to prove, that the beneficial influence is rather due to the potash which exists in combination with the acid. This view is supported by the fact, that citric acid—the acid of the lemon—when used alone, does not cure scurvy. It would appear, notwithstanding, that when the acid is combined with fresh vegetables and fruit, it affords a most efficacious remedy for this severe and often fatal affection. Although, however, it is certain that the disease in question depends for its development upon the deficiency of certain articles, or constituents of food, it is no less certain that its attack is greatly favoured by the deficiency of sanitary regulations generally, and that those who are subjected to confinement, as in a prison, or on board ship, especially if ventilation and other necessary arrangements are neglected, will much more quickly become the subjects of scurvy than those who are not exposed to the same depressing influences, even if the food be the same. Salt provisions alone will not produce scurvy, unless other conditions favour the disease. It has been observed that infants fed exclusively on milk which has been boiled or sterilised occasionally develop scurvy.

SCYBALÆ are hard lumps, generally black-looking, of feculent matter.

SEA, SEA AIR.—The effects of the sea upon health have to be considered under the two aspects of exposure to "sea air," and of "sea bathing." That exposure to the air of the sea, especially in the case of persons unaccustomed to it, exerts a stimulant and tonic effect cannot be doubted. The freshness and, in summer, comparative coolness of the air in the vicinity of the sea contributes to this, and its impregnation with saline particles, the chlorides especially, probably adds to its tonic properties. Moreover, the average temperature of sea-coast places is more equable than of those inland, being generally warmer in winter. Although, however, the general character of sea air, and its effects upon health, in different places, are similar, it varies greatly, according to locality, as to particular influences; thus, at Torquay, the relaxing air is the opposite of the stimulating atmosphere of Brighton, which again is very different from Hastings. These differences, it is true, depend more upon land influences, such as formation of coast, the vicinity of hills, &c., than upon the sea itself, but still they modify the effect of the latter so greatly, as to make them a serious consideration when residence, either temporary or permanent, is chosen with reference to health. Under any circumstances, it is considered as a general rule, that invalids derive more benefit from sea air, at a little distance—quarter of a mile—from the water than they do close to it.

Refer to—*Climate.*

SEA BATHING, when properly employed, is a stimulant, in the first instance to the skin, and further to the body generally. The stimulant action upon the skin indeed, even proceeds so far as to cause eruptions, somewhat resembling scarlatina; in some cases the smarting from these eruptions is so severe, after each immersion, that the practice has to be discontinued, at least for a time.

The abstraction of caloric from the body, in consequence of bathing in sea water, certainly appears to be less than it is from bathing in fresh. The effects, however, from bathing in the sea must vary, as the proportion of the saline constituents varies considerably in different localities. "The average quantity of saline matter is three per cent., which consists of chloride of soda or common salt—sulphate of

magnesia, or Epsom salt—sulphate of soda, or glauber salt; also muriate of magnesia and of lime, with salts of iodine and bromine." The above constituents are uniform as to presence, but are increased or diminished by locality and in proportion to the amount of evaporation from the surface; thus in the Mediterranean and within certain lines in the tropics, the saltness and with it the specific gravity of the water, is greatly increased, while in the Black Sea, the Baltic, and in the Arctic Regions, it is much diminished. "From the beginning of July the temperature of the sea is constantly on the increase, and during the month of August it is at the highest, remaining the same with very little alteration till September, when the temperature again becomes less. The minimum temperature of the sea, for each day, is in the morning before ten o'clock, its maximum from twelve to five. Other circumstances being the same, the temperature of sea water is observed to be higher in proportion to the proximity of continents and islands." Moreover, the temperature of the sea on a line of coast is modified by the construction of the shore; if this be rocky, rapidly deepening, the temperature of the sea during summer will be lower than it is on a flatter shore, where the advancing tide travels over an extent of sand warmed by the sun, and *vice versâ* in winter.

Persons who are unaccustomed to sea bathing may sometimes find it of service to take two or three tepid sea baths before going to the open sea. There is, however, no necessity, as some suppose, for a course of medicine beforehand, unless the individual is decidedly out of health, and then sea bathing should not be engaged in, before consulting with a medical man, who may give medicine for the existing ailment, but certainly persons in good health have no occasion for preparatory medicine. Individuals who are very plethoric, who are the subjects of any organic disease, or who have any tendency to fulness about the head, also aged persons, should not bathe without medical sanction.

If a person is in a state of body to benefit by bathing, and if the good effects are not counteracted by too long immersion in the water, the bath should be followed by reaction, which conveys a sensation of increased strength and spirits, a glow of warmth on the skin, and increased appetite; if, on the other hand, the reaction is tardy, if the skin continues cold and blue-looking, if the fingers and toes become what is called "dead," if there is bodily and mental depression, with languor and sleepiness, it is certain the bathing does not agree, from some cause or other.

Refer to—*Bath.*

When cold sea bathing does not agree, or is too depressing, the tepid sea bath is often of much service, and does not relax like fresh water tepid bathing.

Sea water, as may be expected from its saline constituents, acts as a purgative. The usual dose is half a pint, repeated once or twice according to effect. It may be gone on with, with less risk of depressing consequences than arises from the use of saline aperients generally; indeed, it exerts a tonic influence. In worms, both when taken by the mouth, and used as an enema, sea water is often useful. In his work on *Materia Medica*, Dr. Thomson states that "Sea water has been frequently taken in habitual costiveness, particularly by those of full habit who lead a sedentary life. In this instance, its stimulant properties are as useful as its purgative qualities. When it is to be given to children, they are easily persuaded to take the dose if its nauseous taste be covered with a little port wine. It is a curious fact, that by the continued employment of sea water as a purgative, although for a short time it produces emaciation, yet its secondary effect is to promote obesity."

"It is not easy to account for the fact, that no artificial mixture of the component parts of sea water produces a compound of powers equal to the natural." "Although sea water cannot be regarded as a purgative of much power, yet in some constitutions it operates when no other cathartic will take effect." "When it fails to purge, which it does in some habits, it produces fever of a low kind, accompanied with purple spots on the skin." Crystals of sea salt sold under the name of Tidman's and Brill's, dissolved in water, make an excellent substitute for sea water when the latter cannot be obtained.

Refer to—*Jelly-fish.*

SEA SICKNESS.—See SICKNESS.

SEASONING.—See ACCLIMATION.

SEASONS.—The influence exerted by the changes of the season upon man's health and life has been considerably elucidated by the researches of different observers, and by the statistical returns of this and other countries, but it is a subject so much mixed up with coincident influences and circumstances, that accurate results are with difficulty attainable. As, for instance, while, according to the returns of mortality in this kingdom, the winter months present the greatest average of death; according to the researches of Casper and Quetelet, summer is the most fatal season in Stockholm, in Montpelier, and in Berlin; and probably throughout Central Germany. These differences perhaps depend on local causes. Along with this uncertainty, however, there are certain general rules of climate, connected with the seasons, which are well ascertained; such, for instance, as extremes of temperature; thus the greater prevalence of inflammatory attacks, and of disorders of the respiratory organs during winter and spring; the frequent occurrence of apoplexy during frost, and the tendency to diarrhœa and English cholera towards the close of summer and autumn, after

the high temperature and the new fruit season have permitted the accumulation of carbonaceous matter in the system. The influence of season is of course much less felt by the young, the robust, the well-fed, clothed, and housed, than by those who are exposed to the reverse circumstances. "At no period of life is the influence of the seasons on mortality more perceptible than in old age; and at no age less than between twenty and twenty-five, when the physical man, fully developed, enjoys the plenitude of power" (*Quetelet*). Of course, much is to be done by care, in guarding against the influences of climate consequent upon season, both in old and young.

Refer to—*Acclimation—Climate—Clothing—Cold—Heat, &c.*

SEBACEOUS, GLANDS OR FOLLICLES, are glands situated in the skin, which secrete an unctuous matter; they are most common on the face, and about the nose. In many persons, especially in those who live in towns where there is much smoke, the orifices of these glands become black, constituting what are called "black-heads." When these are squeezed, the "sebaceous" matter is expelled in a worm-like form, and with the black head at the extremity, from its resemblance to a worm, has actually been taken for such. The sebaceous matter itself is not indeed a worm, but it has within the last few years been discovered by Dr. Simon, of Berlin, that it is the seat or "habitat" in many persons—according to Sir Erasmus Wilson, in all—of a minute parasitic animal (fig. 184). According to Sir

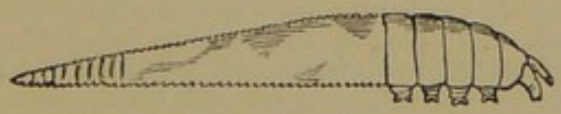


Fig. 184.

E. Wilson, the animal varies from $\frac{1}{133}$th to the $\frac{1}{44}$th of an inch in length. There are usually two, but often more, in the small mass of sebaceous matter squeezed out of a follicle. Even in the most healthy-looking skins they are said to exist, not causing irritation, unless by accumulation in undue numbers.

When irritation takes place in a sebaceous follicle, it causes the inflammation, and formation of matter which constitute a common pimple. The formation of black-heads is best prevented by bathing with warm water, and then rubbing the surface well with a towel; frequently, however, the tendency is connected with disorder of the digestive organs, which requires rectification.

Refer to—*Skin.*

SECALE CORNUTUM.—See ERGOT.

SECRETION.—The term, as usually applied either to vegetables or animals, signifies the separation of a specific substance from the ordinary fluids of the organised body. In the stricter acceptation, it is more applicable to such processes in animals as the secretion of the saliva or of the gastric juice &c.

SECUNDINES.—The after-birth and membranes cast off after the birth of the child. —See *After-birth—Child-bed.*

SEDATIVES are medicines which depress the activity and sensibility of the nervous system, without causing subsequent excitement; in this they differ from narcotics. There has been considerable diversity of opinion respecting the action of sedatives, and as to what agents belong truly to the class. Prussic acid, bromide of potassium (see *Potash*), aconite, carbonic acid applied locally, chloroform, inhalation, heat, and cold, are among the best examples of this class of remedies.

Refer to—*Narcotics.*

SEDENTARY.—The observations made under such articles as *Exercise, Motion, &c.*, render comment upon the effect of sedentary habits superfluous.

SEIDLITZ.—The waters of this well-known Bohemian spa owe their aperient activity to the presence of Epsom salts, or sulphate of magnesia, one hundred grains of which are said to be contained in every pint of water. It also contains lime in small proportion. These ingredients are very different from those which distinguish the commonly used Seidlitz powders.

SEIDLITZ POWDERS.—These consist essentially of two drachms of Rochelle salt (tartrate of potash and soda), mingled with forty grains of carbonate of soda in the one paper, and thirty-five grains of tartaric acid in the other, usually the white paper. Seidlitz powders possess the advantages and disadvantages of saline aperients generally, except that they are pleasanter than most. The effervescing citrate of magnesia has greatly superseded the use of the Seidlitz powder.

Refer to—*Effervescence—Purgatives—Salines, &c.*

SELTZER WATER is chiefly distinguished by the large amount of carbonic acid it contains, in combination with alkaline carbonates, such as those of soda, magnesia, and lime, but chiefly soda; it also contains common salt. It is useful in some form of dyspepsia, gravel, &c. It cannot, however, be used habitually, as it is by some who are in good health, with any apparent advantage. It is now manufactured artificially on a large scale.

SEMOLA and **SEMOLINA** both belong to the class of farinaceous preparations. The former is deprived of most of its starch by washing in water, while the latter consists of the hard particles of wheat which escape being reduced to powder by the mill-stones, and consequently do not pass through the flour sieves. Semolina can only be prepared from the hard grain wheats of Italy, Spain, and Southern Russia; it contains a large amount of nitrogenous, or flesh-forming material, and is an excellent food for children and in-

valids. Indeed, in some degree, it approaches animal food in its chemical constituents. Semolina is much used in France and Italy for making bread, in Britain it is most used for puddings.

SENDING FOR THE DOCTOR.—Under the head of *Advice, Medical*, a few observations applicable to the present subject have already been offered, a few more may be serviceable. In large towns, where distances are short, and medicines procurable in every street, it is generally of less consequence for a medical man to be strictly informed of the nature of any case of emergency, to which he is summoned, than it is in the country. In the latter, if the case is at all an urgent one, or if it is an accident, the message should always be, either clearly given to an *intelligent* messenger, or sent by note, which is the safer plan, giving such an idea of the nature of the case, as may serve to guide the practitioner in taking with him remedies or instruments, the immediate employment of which may save much inconvenience to all parties, much suffering to the patient, perhaps life. A medical man cannot, of course, at all times, even from the plainest message, form a correct idea of the case he is to meet, but he may in many. When a case is one of accident or emergency, of course any hour, night or day, is the same; and if medical attendance is required, it should be summoned at once; in other cases, however, much convenience to all parties may be secured by messages properly timed. Some persons have a habit of putting off till evening sending for a medical man; this, when it can be avoided, is neither just to themselves nor to their medical attendant; they get a man, jaded perhaps with a day's work, and with his energies less alert than in the morning, and they also perhaps subject him to unnecessary fatigue, which a timely morning message might have saved. Of course, cases of illness which have appeared slight in the morning, may, by becoming much more aggravated in the lapse of a few hours, and especially towards night, call for that attendance which before seemed unnecessary; these are not what are meant, but, in ordinary cases, it ought to be a rule, to let a medical man have the message as early as possible in the forenoon. It not only enables him to arrange his own business better, and when he is busy, the question of arrangement is no slight consideration, but it renders it probable that his patient will be earlier visited. Again, when a message is sent, care should be taken that there is no exaggeration.

The above advice may probably surprise some persons, but every medical man, who has been in general practice, must have experienced its want, not so much among the wealthier classes as among the poor; above all, the subject last alluded to, that of sending exaggerated messages, requires notice. The message that a person is "dying," or "killed," even in cases of comparatively slight, though sudden, illness, or of an accident, is an extremely common one in the country; and although when a practitioner has been deceived by such calls time after time, he gets more wary and takes them for what they are worth, it may occur, that the repeated "cry of wolf," will in some instance cause him unintentionally to overlook a case, by turning a careless ear to the call which has so often before proved untrue. Certain it is, that such is the real explanation of some of those cases of apparent neglect of the poor by medical men, which now and then come before the public. The general readiness of the members of the medical profession to attend to the poor, either by engagement or gratuitously, when such attendance is really requisite, might save them from some of the censure, public or private, with which they are occasionally visited for such omissions, by those who know little of the trials and vexations to which they are subjected.

It is not meant to say, that whenever an exaggerated message is brought, it is a wilful misrepresentation; in many cases, some relative or bystander, without waiting to ascertain the real state of matters, starts off in a fright to the surgeon; in other instances, however, among the ignorant, the system is one of deliberate forethought, under the idea that the medical man will make greater haste in attending to his patient. It has been shown, how, in the long run, this defeats its own end, and does mischief as well. Lastly, some persons send for the doctor by irregular channels, through third or fourth parties, or by leaving messages at houses, &c.; this is always uncertain, and often, by the message being forgot, inflicts disappointment. If a medical man is really required, send for him direct, soon in the day if possible, and if there is any distance to be traversed, by note, giving a clear account of the case to which he is summoned.

SENNA.—This most useful purgative is the leaf or rather leaves of different species of cassia. It is a very old medicine, having been used by the Arabians. Senna grows abundantly in Northern Africa, from whence large supplies are obtained; it is also cultivated in India, and a considerable amount exported thence. The most familiar designations of senna are Alexandrian, Tripoli, and East Indian senna; other varieties are known in commerce, but not commonly in this country.

Alexandrian senna has the highest general reputation. It is brought chiefly from Nubia and Upper Egypt. As imported, its long lance-shaped leaves (fig. 186) are mingled with the pods, flowers, stalks, &c., of the plants, with the broad leaves of another description of senna (fig. 185), and with the leaves of a plant which is not a senna at all. The latter adulteration, which is always introduced into this description of senna to some extent, and sometimes largely, goes by the name of argel.

This leaf (fig. 187), may be known from the true senna by its being thicker and more fleshy looking, by the absence of the prominent veins of the true leaf, and by the regularity of the leaf, which, it will be seen, differs from that of the senna, one side of which is more prolonged down the midrib than the other. The "picked senna" of the shops is chiefly the Alexandrian senna, from which the impurities, broken leaves, &c., have been removed.

Tripoli senna closely resembles the above, but probably, from more careless gathering and



Fig. 185.



Fig. 186.



Fig. 187.

packing, the leaves are more broken and the admixture of impurities greater. It is cheaper than the picked senna, but if the impurities are not very abundant, the mere fact of the leaves being broken up, if they appear to be properly dried, does not militate against the perfect efficiency of the drug; indeed, it is as good as the other.

Some varieties of East Indian senna, such as the Bombay, are of but low value, owing to being badly prepared; there is one kind, however, the "Tinnivelly senna" (fig. 188),

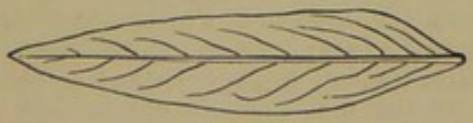


Fig. 188.

which is described by Dr. Royle, as "well grown and carefully picked; the leaflets of a fine, rather lively green colour; thin, but large, being from one to two inches in length, and lance-shaped." This kind is now highly esteemed, and is rapidly displacing the other sorts in many places. "It is mild in operation, certain as a purgative, and operates without griping."

Senna, as a purgative, is safe, certain, and convenient, and deservedly holds a high place among domestic remedies. It is a pure aperient, does not depress or debilitate, and is admissible in most forms of disease, and at all times of life. Senna is often accused of griping, but this effect generally results from faulty preparation, or from the admixture of the argel leaf above alluded to. Senna is generally given infused; if time permits, the infusion may be made with cold water, which in the course of a night, will fully extract the purgative principles of the leaf. When quicker preparation is necessary, the infusion may be made with hot water, like common tea, but should *never be boiled;* the higher the temperature employed in preparing the senna infusion, the more likely is it to gripe. Formerly, an idea prevailed, that the griping properties of senna depended on the presence of the leaf-stalks. It is erroneous. Additions, such as ginger, caraway, &c., are frequently made to senna to prevent griping, and saccharine matters are often added for the same purpose; the inconvenience is better rectified by attention in preparing, and no addition covers the slight nauseous taste of the drug so effectually as a small portion of common black tea infused along with it, with or without the addition of a little milk and sugar. Besides infusion, senna is given in the form of confection, tincture, and syrup; but none of these preparations are so actively certain as the infusion, and they may disorder the stomach. The extensively used Prussian compound liquorice powder owes its laxative properties chiefly to powdered senna; it is an excellent preparation.

The common combination of Epsom salts with senna infusion, or, as it is called, black draught, forms a very active purgative, but is only suitable for the strong. The average dose of senna is a quarter of an ounce, infused in rather less than a breakfast-cupful of water; this will make a tea-cupful of infusion, and be a suitable dose for a child ten years of age. Confection of senna, the old "Lenitive Electuary," agrees well with some persons as a habitual aperient, particularly if they are liable to piles. It is also an agreeable form in which to administer the drug to children. The dose is two drachms or tea-spoonfuls.

SENSATION and **SENSIBILITY.**—See NERVES AND NERVOUS SYSTEM.

Refer to—*Pain.*

SEROUS MEMBRANES. — The enclosed cavities of the body are lined by serous membranes, which are closed sacs consisting of two continuous walls, one of which lines the cavity, while the other closely invests the organ. They are adapted to give protection and to facilitate motion. The most important serous membranes are those of the brain and spinal cord (arachnoid), the pleuræ investing the lungs, the pericardium, the heart, and the peritoneum, the bowels. Serous membranes are specially liable to inflammation, and suffer from an excess of fluid secreted from the inner surface of their walls, causing dropsy.

SERUM.—The serum is the watery portion of the blood which remains after the clot has separated in the process of coagulation or clotting. The "water" thrown out in a blister is the most familiar example of serum. Whilst

the blood circulates in the living body, it consists of the globule (see *Blood*) floating in the "liquor sanguinis," or fluid of the blood, which is serum holding the "fibrin," in solution. When blood is withdrawn from the body, and allowed to repose, this fibrin separates, and in the act, entangling the globule, forms the red clot, the serum remaining as yellowish-looking fluid. In this state the serum still holds in solution "albumen," and earthy salts; if it be exposed to heat, the albumen is separated by coagulation (see *Albumen*), the remaining watery fluid still contains the salts of potash, soda, lime, and iron, which exist in all healthy blood.

SETON.—A seton is usually formed by means of a portion of a skein of silk passed under the true skin, so that it excites suppuration; it is in fact an issue. The surgeon forms a seton by pinching up a fold of the skin in which he intends establishing it, he then passes the silk through the base of the fold by means of a "seton needle," made for the purpose, or by cutting the skin with a knife, and using a probe to pass the silk. Caoutchouc and other tapes are used for setons as well as silk. In a few days, after a seton has been introduced, there is usually free discharge of thick matter. A seton, to be at all tolerable, requires the strictest cleanliness, and ought to be dressed twice a day with fresh linen, spread with a little simple cerate, the silk being moved from side to side at each dressing, so as to keep up the irritation; if this does not seem to be sufficient, it will be necessary to smear the silk from time to time with some Spanish fly, or savine ointment. When the silk becomes hard and stiff, it must be changed, by attaching the fresh silk to the old, and drawing it into the wound.

SEWAGE DISPOSAL.—The question of sewage disposal is too large a one to admit of profitable discussion within the limited space available here; still, as the subject is daily gaining in importance since County Councils were established as supervising authorities under the River Pollution Prevention Act, and as the public and members of Sanitary Authorities are often unaware of the principles involved, a short summary of these may serve a useful purpose. Before considering the methods of disposal, it is essential to explain the nature of the substance to be disposed of. It is popularly supposed that the term "sewage" is applicable to the fluid refuse of a household only when it contains excreta (fæcal matter and urine); in other words, that sewage is peculiar to places where water-closets exist. As a matter of fact, however, the sewage of water-closet towns differs only slightly, as regards impurity, from that of towns where the "pail" or "privy" system is in operation, it having been proved by analysis that the value as a manure of the two sewages is practically identical. It follows from this, therefore, that all sewage must undergo some purifying process before it is discharged into any stream or water-course. The polluting material which has to be removed from sewage exists in solution as well as in a solid form, and any system of treatment which does not deal with both impurities is inadequate. It is quite possible to produce what appears to be a pure effluent by removing the solid matter only, but unless, in addition to this, the soluble impurities are disintegrated and rendered harmless, the putrefactive changes which afterwards take place will convert what seemed to be a *pure* effluent into a foul one, solid matter or sludge being deposited in the process. Appearance, therefore, is no test of purity, and mere clarification, or the removal of the solid matter originally present in the sewage, is not alone sufficient.

It is often asked—What is the best system of sewage disposal? To this question no definite answer can be given, as no single method is practicable in all cases. At the same time, it is the general opinion among engineers that the best results are obtained by land treatment, provided the land is suited for the purpose, and the area available is sufficient. In the absence of suitable land, some form of artificial filtration with or without chemical treatment must be resorted to.

No matter, however, *what* the system of sewage disposal in operation, to be effective it is essential that the unseen organic elements in the sewage should undergo a change—brought about by bacterial action on land or artificial filters—in the process of which they are converted into more stable substances which will not undergo further change in the stream into which the effluent is discharged. Unless this condition is fulfilled, authorities will not have complied with the requirements of the River Pollution Prevention Act, and will have to incur further expenditure. It is then that the full consequences of a mistaken policy in the first instance are realised; for, the money, which in the first instance might have accomplished all that was necessary, has been spent, and the question has to be considered *de novo*. The fact is, the problem is a chemical and bacteriological as well as an engineering one, and before any final decision is arrived at, a chemist should be consulted.

In all cases, whether land treatment or artificial filtration is the method adopted, it is an essential preliminary to remove, by *precipitation* or other means, as much as possible of the suspended impurity. The following short summary will enable the reader to form a general idea of the various methods most in favour at the present time.

Precipitation.—It must not be supposed that precipitation in itself will suffice, although, as already mentioned, it, or a substitute for it, is now generally adopted as a

preliminary to further treatment. In the first place, some *precipitant*, in the shape of lime, alum, salts of iron, or other substances, either singly or in combination, is added to the sewage, which is afterwards conducted to tanks arranged in a series, with weirs extending across the whole width, which allow the top water only to pass on, while the large bulk of sewage remains comparatively quiescent. This enables the suspended matter to fall to the bottom of the tank, the precipitation process being greatly assisted by the chemical which has been added. The process is chiefly a mechanical one. The fine particles of carbonate of lime, and the flocculent particles which form from the salts of alumina and iron, by reason of their density, fall to the bottom of the tank, entangling and carrying with them the solid sewage particles. In addition to the mechanical subsidence thus brought about, the precipitants exercise a certain amount of chemical action upon the organic impurity in solution in the sewage, and in this way assist in the process of purification. The process of treatment has next to be carried further by one of the following methods:—

Intermittent downward Filtration.—The sewage having been clarified by the process just described, has to be further purified by the conversion of the organic matter it contains in solution into non-putrefactive inorganic substances. This, as already mentioned, can best be effected by land. It is important to remember, however, that all land is not equally well suited for the purpose. A rich loamy, porous soil of good depth is essential to successful treatment; clay has little purifying effect on sewage. The change that takes place is brought about by the action of the minute living germs (*bacteria*) universally present in the upper strata. These attack the organic matter in the sewage and split it up into less complex constituents, which are acted upon by the oxygen and carbonic acid present in the ground air, and converted into innocent salts by uniting with the mineral bases of the soil. In order that the soil may be thoroughly aerated, it is essential to allow it periods of rest—a water-logged soil exercises no purifying effect—hence the term *intermittent* applied to this form of land treatment. The rule is to apply the sewage on one filtering area for eight hours, allowing it to rest for sixteen hours before it is again made use of.

The land has to be specially prepared for the purpose. It should be levelled and underdrained to a depth of from 4 to 6 feet, channels being laid on the surface, with sluices at various points, to allow of the sewage being directed on to any part of the filtering area. The chief object aimed at in this form of land filtration is the purification of the sewage, and not the cultivation of the soil; at the same time, by an arrangement of ridges and furrows, certain root crops may be cultivated, and in this way the purifying process is assisted, and a small return is obtained from the sale of the produce. With perfect soil and strict attention to preliminary treatment, the sewage of from five hundred to a thousand inhabitants may be dealt with on an acre of land.

Broad Land Irrigation differs from the method of treatment just described, in the fact that a larger area of land is made use of, and greater attention is paid to its cropping. The same quality of land is necessary in this case also, but it is not prepared in the same manner. It is underdrained, but only to a depth of from 3 to 4 feet, and the sewage is conveyed by carriers cut on the surface, about 30 feet apart, along ridges with a gentle slope on each side, to allow of the uniform distribution of the sewage. If the sewage is applied to the land without previous precipitation, one acre can only deal with the sewage of about one hundred persons, but with proper precipitation and careful distribution, the sewage of twice that number, or even more, may be disposed of on that area.

By way of emphasizing what has been said, the essential principles are:—(*a*) The land must be of a nature which is capable of effecting the necessary chemical change in the sewage; (*b*) it must not be asked to do too much; and (*c*) the sewage in its crude state should not be applied to it except, perhaps, in the case of very small populations. Stiff clay land is incapable of dealing with sewage; gravel or sand will answer better; but a rich loam, with a porous bottom of sand or gravel, is the soil which can best bring about the necessary change. The land should never be surcharged with sewage so as to cause waterlogging, and intervals of rest should be allowed to enable the soil to get freely aerated. Also, if crude sewage is applied to land, the sludge which is deposited on the surface in time chokes the pores, and so prevents the free penetration of air into its interstices.

Artificial Filtration.—In the absence of suitable land artificial filtration must be resorted to. Until recently the method most in favour was that known as the International, the filtering medium being a specially prepared iron ore called "*polarite*," and the precipitant a substance known as "*ferrozone*." As this process is now practically discarded in favour of less expensive and, at least, equally efficient materials, it is unnecessary to occupy further space in describing it. The materials now in favour for such filters are sand and gravel, coke breeze, and more recently ordinary coal. No matter what the materal may be, however, the active agents in the purifying process are minute organisms (*bacteria*) which form in the substance of the filter, and which in the presence of oxygen have the power of rapidly con-

verting the putrefactive organic matter in the sewage into non-putrefactive inorganic substances. In fact, the process is the same as that which goes on in the soil, the only difference being one of detail, dependent upon structural arrangement, which allows of more rapid filtration than is possible in the case of most soils. As regards the management of artificial filters, success can only be achieved by strict attention to details. The filter particles should be as fine as is consistent with free and regular penetration ; the depth of the filter should be about four feet ; and the quantity of sewage applied should not exceed two hundred gallons per superficial yard per twenty-four hours ; in other words, allowing for equal periods of rest and work, the process should be conducted at a rate not exceeding four hundred gallons per twenty-four hours while at work. To allow of regular intervals of rest for aeration, the filtering area should be cut up into a series of filters so arranged that each filter, or a combination of two or more according to circumstances, may be in use at the same time while others are resting.

There is no limit to the life of a sewage filter if attention is paid to its careful management and it is not allowed to become waterlogged by being overcharged with sewage. A few days' neglect in this respect, however, will destroy the filtering capacity for the time being, and necessitate its being thrown out of use for a longer or shorter period according to the extent of the injury.

As regards the method of applying the sewage to the filter, some advocate the rapid filling of the tank while the outlet drains are closed, the sewage being allowed to stand in contact with the filtering medium for two hours and then run off. According to this method, while one tank is standing full another is standing empty to allow of its aeration. Another method is to run the sewage on to the filter continuously at a slower rate, the effluent being allowed to run away as it passes through. According to this plan each filter is in use continuously, say, for eight hours, followed by eight hours rest for aeration. From a practical experience of both methods the author has no hesitation in stating his preference for the latter.

In Staffordshire numerous trials have recently been made of ordinary coal, in fine particles, as a filtering medium, and without exception the results obtained have far excelled those of filters composed of other material, such as gravel, coke breeze, and ashes. Of course, in all cases bacteria are the active agents, and the probable reason why coal answers so well is that it forms a good medium for bacterial growth.

So far we have been considering methods of purifying sewage which, in the first instance, has undergone a process of chemical precipitation already described which has resulted in the deposit of sludge in large bulk. Recently attempts have been made to overcome the difficulty of sludge disposal by abolishing the precipitation process altogether and substituting for it one of the two other methods as a means of preparing the sewage for first treatment (either by land or artificial filtration), both of which, it is said, entirely overcome the sludge difficulty. We here give a short description of both the new methods referred to.

Septic Tank System.—What is known as the septic tank was invented by Mr. Cameron, of Exeter, where it has been at work, on an experimental scale, for about two years. It is practically a covered air-tight cesspool, large enough to hold from one to two days' flow of sewage.

The sewage while in this tank undergoes a process of putrefaction, brought about by anærobic bacteria. The solid organic matter is thus liquefied, and some of the organic matter in solution is got rid of in the form of gases. The resulting effluent is comparatively clear, but it must be further purified either by land treatment or by artificial filtration before entering a stream, this second stage in the treatment being conducted by ærobic organisms. As the septic tank effluent seems to require a larger filtering area for its final purification than a precipitated effluent does, and as the tanks have to be covered and are twice the size of precipitation tanks, even if the system proves to be successful on a large scale, it becomes a question whether the economy resulting from the simplification of the sludge difficulty is not more than counterbalanced by the capital outlay. Again, granting that the process has proved a success at Exeter, it does not follow that equal success can be looked for in towns where sewage may contain manufacturers' waste, which may retard or entirely prevent the preliminary putrefactive process.

Large-grain Bacterial Filters.—The alternative substitute for precipitation is the treatment of the crude sewage by filtration through large-grain bacterial filters, in which the sludge is liquefied by ærobic bacteria. This seems a more wholesome process than the other, and granting that the solid mineral constituents (road detritus, &c.) are got rid of by subsidence in small tanks—a condition which is equally essential in the case of the septic tank—it would seem that for the preliminary treatment of domestic sewage such filters answer very well. In the case of the sewage of some manufacturing towns, however, the same difficulty applies as in the other case, and as this may necessitate preliminary treatment before the sewage is applied to the filter, it may not after all be found to be an economical method. Under favourable circumstances, however, ultimately it will probably be found that large-grain filters afford the best solution of the sludge difficulty. After passing through these filters the purification process has to be completed either by means of land or fine artificial filters.

The sewage of individual houses in the

country, where there is no general system of sewers, can generally be disposed of on land without much difficulty.

In the case of villages, however, it is not an easy question, as many are situated on low-lying land adjoining streams, so that the sewage cannot be distributed on the surface by gravitation. If the village is small, a pumping scheme which is not automatic in its action is out of the question on account of the cost, but if water-power is conveniently available, it can be utilised to excellent advantage. A miniature wind-mill may also answer the purpose, in fact, such has been tried with success in a village in Staffordshire; this, however, necessitates the construction of a storage tank capable of containing at least six days' sewage.

It is essential in the disposal of the sewage of villages and small towns that sanitary authorities should not transfer their responsibilities to farmers who will consider their own interests rather than those of the authorities, and pass the sewage direct into streams except on those occasions when it is desirable, from a farming point of view, that the land should receive it. In practice, such an arrangement seldom, if ever, answers, and although in the case of small villages, it is not easy to see how it can be avoided, it should be understood that it is the duty of the sanitary officers to pay periodic and frequent visits to the farms and call the attention of the authorities to any irregularities that are discovered. Of course, in the disposal of the sewage of small communities, it is not reasonable to impose so high a standard as in towns; but, at the same time, no reasonable means should be neglected in order to insure as good a result as possible.

SEWER.—See DRAINAGE.

SEX.—With regard to the question of sex, in connexion with child-birth, there can be little doubt that a pregnancy in which the child is a male is likely to be more prolonged, than one in which it is a female. In his *March of an English Generation through Life*, Dr. Farr has shown the effect of the physiological law by which more male children are born into the world than female. In a million births registered in England and Wales, 511,745 are males, and 482,255 are females, but by the end of the first five years of life, the disparity is so much reduced by the larger mortality among the boys, as to alter the figures to 370,358 males, and 366,463 females. The higher mortality among the male sex is observable, though in a less degree throughout life. On the influence which the age of parents is supposed to exert on male and female births, Quetelet found from numerous researches made both in this country and in Germany, "that in general when the mother is older than the father, fewer boys than girls are born; the same is the case where the parents are of equal ages; but the more the father's age exceeds that of the mother's, so is the ratio of boys greater."

The nearer the sexes approach puberty, the greater is the consideration required for the different tendencies of constitution, and after that period the peculiar differences, of the female at least, require constant consideration. As a general rule, females require medicine in smaller doses than men.

SHAMPOOING is a system of mechanical manipulation of various parts of the body for the cure of disease. In rheumatic affections, sprains, paralysed limbs, and especially in cases of wasting of the muscles from continued inaction, much benefit is occasionally obtained by the practice of shampooing and kneading the muscles. The practice has been recommended and adopted from the earliest times, especially in the East, but of late years it has acquired additional importance, partly in consequence of its being combined with galvanism or electricity, and partly from its being carried out in a more systematic manner. The main object of the treatment is to excite vascular action, and thereby infuse new vigour into the muscles, which is done at stated intervals by a process of alternate rubbing, kneading, and pinching with the fingers and palm of the hands. To this mechanical action of the joints and muscles, combined with a liberal system of diet, which is partaken of at frequent intervals, the term "Massage" has been given, and from the success which has attended the practice in the hands of some well-known authorities in this country and abroad, it is likely to come more and more into general use. In many cases of severe nervous prostration, in hypochondriasis, and in some intractable forms of hysteria, the results have been found to be most satisfactory.—See *Circulation—Massage.*

SHELL-FISH generally are indigestible, and some, such as the common mussel, are at times even poisonous. The poisonous effects of mussels have been attributed to the presence of copper, and in some instances this metal has been detected in the fish which have caused symptoms of poisoning; in other cases, however, chemistry could afford no clue to the causes of the catastrophe—"it is probable that there is an animal poison present." The symptoms produced by mussel poisoning are described by Dr. Taylor, as uneasiness, and sense of weight at the pit of the stomach, numbness of the extremities, heat and constriction in the mouth and throat, thirst, cramps; or with swelling of the eyelids, heat and itching of the skin with nettle-rash eruption; also vomiting and diarrhœa, with colic. Emetics, followed by sal volatile, or stimulants, would be appropriate treatment.

Refer to—*Crab—Oysters, &c.*

SHERRY, one of the dry strong wines, contains, as imported into this country, rather more than nineteen per cent. of alcohol. It is

free from the astringency of port wine, and generally agrees better with persons of weak digestive powers. To be good, it ought to be free from acid, or nearly so. Sherry is the only wine used in the numerous pharmaceutical preparations of the Pharmacopœia.

SHINGLES is a disease of the skin, known to medical men as *Herpes*. It consists of groups of vesicles situated upon inflamed patches of the skin. The "breaking out" upon the lips, nose, &c., which occurs after a cold, is an eruption similar in kind to that of shingles. Shingles is usually situated near the waist, surrounding one half of the trunk of the body, like a zone or belt; it may, however, extend in other directions over the trunk, and, but rarely, on the limbs; it is always situated on one side, and that, generally, the right. The eruption of shingles is generally preceded by symptoms of general indisposition, and especially by severe darting pain in the parts where it is about to appear. At first, red patches show themselves at the extremities of the site of the future eruption, and gradually become more numerous till they form a line, upon these patches shining points form, which gradually enlarge into vesicles, a little under the size of small peas, these vesicles containing a clear fluid, which gradually becomes opaque. At length, in the course of eight or ten days, the vesicles burst, discharge, and dry off in the form of scabs, or it may be, in very weak subjects, leave sores or ulcerations. The belief was formerly entertained among physicians, and still retains its hold of the popular mind, that if the belt of the eruption of shingles was continued round the body, so as to meet, the disease proved fatal. This is perfectly erroneous. In itself, shingles is a disease devoid of danger, but requires investigation, on account of its frequently being sympathetic of constitutional disorder and disease. On this account, although the eruption itself may subside under the use of simple remedies, a case of shingles should be examined by a medical man.

When the disease occurs in the young and plethoric, the diet must be reduced to one of milk and farinaceous substances, and all sources of heat or excitement avoided. Five grains of blue pill at night, followed by senna, black draught, or Seidlitz powder in the morning, may be repeated once or twice; and, in the course of the disease, if there is much fever, five grains each of the carbonate and nitrate of potash may be taken twice or three times a day, dissolved in half a tumblerful of water; or the proportion of carbonate of potash may be doubled, and a tea-spoonful of lemon juice used to form an effervescing draught. The painful itching of shingles often causes much distress. It may sometimes be allayed by simply keeping the eruption covered with a coating of collodion, or by dusting it over with starch or white oxide of zinc powder. The severe pain often complained of between the ribs is relieved by opiate applications, such as tincture of opium, extract of belladonna, and tincture of aconite, either singly or in combination. In mild cases, cotton wool supported by a bandage round the chest is perhaps the best application.

When shingles occur in the aged and debilitated, instead of the diet being reduced, it requires, perhaps, to be improved; at all events, the system must be sustained with nourishing broths, and probably with wine, along with quinine and medicinal tonics, the bowels being regulated, but not purged. In such cases, however, a medical man must be in attendance. Care should always be taken that the vesicles of shingles are not forcibly burst, as by lying upon them; if they are troublesome, ulceration may follow. Herpes is not contagious. As above mentioned, it is generally owing to constitutional disorder, which a medical man only can discover and rectify. Its occurrence has been at times apparently traceable to violent mental emotion, such as anger. In some cases the tendency appears to be hereditary.

SHIP.—The reader is referred to the article *Emigration* in the present work for information respecting life at sea, and the preparations necessary before undertaking a long voyage. It is repeated that all intending to embark on a long passage should be convinced that the arrangements on board ship should be compatible with comfort and safety, and that the medical care of passengers and crew is entrusted to proper hands.

In addition to the ordinary provisions, the following is a list of the supply of "medical comforts" which emigrant vessels are bound by order of the Board of Trade to be provided with for every hundred adult passengers:—

56 lbs. of oatmeal.
20 lbs. of West India arrow-root.
40 lbs. of Scotch barley.
100 lbs. of sago.
20 lbs. of tapioca.
30 lbs. of preserved boiled beef, in 1 lb. tins.
20 lbs. of preserved boiled mutton, in 1 lb. tins.
400 pints of lemon juice, in wickered stone bottles, of five gallons each.
300 lbs. of sugar.
24 bottles of port wine.
12 bottles of sherry wine.
6 bottles of gin.
66 gallons of approved stout, including at least six dozen in bottles, the rest in 9 gallon casks.
5 gallons of brandy.
15 gallons of vinegar.
12 dozen pints of preserved milk.
2 cwt. of marine soap.

The above medical comforts to be issued at the discretion of the surgeon, whether for the sick, or to preserve health.

Women who may be nursing may have a pint of stout each day, if ordered by the

surgeon, and the surgeon is to make liberal use of the preserved milk for keeping up the health of the younger children.

SHIVERING, as a symptom of illness, is the sensation as of cold, which all must have experienced at the commencement of even a slight cold or ailment. When it amounts to actual shaking of the limbs and chattering of the teeth, it is more frequently called rigor. Among children it is often represented by convulsions. Most fevers commence with shivering, and the interval between the exposure to contagion and the rigor is reckoned as the period of incubation. The cause of the sensation of shivering arises from the nervous system.

Shivering, or rigor, is a symptom which frequently accompanies the formation of pus or matter within the body, in the course of inflammatory disease.

SHOCK, in medical language, is the depressing impression imparted to the nervous system, and, through it, to the constitution generally, as a consequence of severe pain or injury. The extent of the shock, its duration, and even its fatality, often depends more upon the part or organ through which it is received, than upon the actual extent of the living body injured, or the pain suffered. Thus, a comparatively slight blow over the region of the heart, upon the pit of the stomach, or on the neck, in all which situations nerves are collected in numerous interlacements, is apt to be followed by immediate, and, it may be, fatal shock. The depression of the system which follows a blow on the head is of a similar nature. Again, injuries which involve large portions of the body in destruction, which cause severe pain, or much loss of blood, are all followed by shock. To this cause was attributed at one time much of the mortality consequent on severe surgical operations, but since the introduction of chloroform and other anæsthetic agents, deaths from shock alone have been of comparatively rare occurrence, and the number of lives saved in consequence must far outweigh the number of deaths which have been attributable to the use of these most merciful alleviators of human suffering.

When an individual suffers a shock from any of the causes above enumerated, he may die at once, as sometimes occurs from a blow on the pit of the stomach; life, as it were, is simply extinguished; but if the shock is not of this immediately fatal kind, the person becomes pale, perhaps falls to the ground, and it may be vomits, consciousness is partly or entirely suspended, the action of the heart depressed, till it is all but imperceptible. This state of shock may be recovered from in a few minutes, or it may continue for many hours, and terminate either in recovery or death, its duration depending on contingent causes, often on the fact whether there has been much effusion of blood or not along with the injury. In some cases of shock, in which severe pain has been suffered in the first instance, it appears as if the intense suffering had annulled the sensations of the nervous system, the sufferer undergoing even the most severe operations apparently without feeling. This is always a most fatal symptom. The immediate treatment of a person who has suffered a shock is similar to that recommended in cases of fainting, and of concussion of the brain, with the same precaution as to the use of stimulants. When the state of shock continues, stimulants by the mouth, although required to be gone on with, must not be too strongly pressed; it is impossible to lay down any rule beyond that of cautious administration. Ammonia in different forms, the ethers, and the most readily procurable alcoholic stimuli must be employed; but along with these should be joined the stimulation of heated fluids, of stimulant injections, and of heat applied externally; the latter, especially, is most useful on account of the continued coldness of the surface, and especially of the extremities, which accompanies such cases. Above all, any injudicious interference or movement during the first state of shock must be avoided, as likely to extinguish whatever remains of struggling vitality that may be left. The absurd, almost murderous practice which formerly prevailed, of surgeons, whenever called to a case of accident, bleeding the patient, has already been alluded to (see *Blood*). Whatever is requisite to be done for the treatment of the injuries of a person in a state of shock, should, if possible, be delayed till at least some effort has been made, by the use of stimulants, to rouse from the state of depression. In alluding to the shock sustained by the wounded on the field of battle, Mr. Hennen, in his *Military Surgery*, remarks: "Many lives might be saved, and the patients placed in a more favourable condition for undergoing primary operations, by the early administration of a small quantity of wine." Most surgeons of the present day give the preference to hot brandy and water, and are guided in its employment by its effect upon the pulse and the temperature of the body.

Refer to—*Pain*.

SHORT-SIGHT.—See VISION.

SHOULDER.—The shoulder, in addition to the muscles and other soft parts, by which it is surrounded, is made up especially of the three bones, the shoulder-blade or "scapula" (fig. 189—1), the "clavicle" or collar-bone (2), and the "humerus" or arm-bone (6) (see *Humerus*), the round head of which fits to the cup (5) of the shoulder-blade (see *Skeleton*) to form the shoulder-joint (see also *Ligament*). The upper ribs (fig. 189—4) may also be considered as entering into the formation of the shoulder region generally. The whole formation and adaptations of this most important part of the body are singularly beautiful, made so as to give the most extensive motion, and yet that

fixedness and steadiness of action, by which those most perfect agents, the human arm and hand, of that most wonderful instrument, the human mind, are so specially adapted to fulfil the ends of the Creator of each. By means of the collar-bone (2), bearing at the one extremity on the breast-bone (3), and at the other upon a projection of the shoulder-blade, the shoulders are kept extended or "squared." It is this squaring of the shoulders which causes the chest to appear broader at the superior than at the inferior portion, whereas, in itself, the cavity of the chest is conical, the narrowest part above (see *Chest*). The comparatively

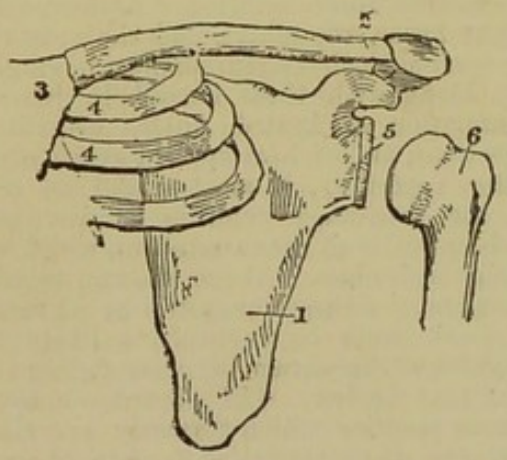


Fig. 189.

loose attachment of the great body of the shoulder-blade to the trunk admits of much freedom of motion, whilst the fullest extent of movement is secured to the arm itself by the nature of the shallow ball-and-socket joint, formed by the head of the arm-bone, and the shallow cup of the blade-bone (5). The shallowness of the cup, however, which is requisite to admit of this free movement, renders the head of the arm-bone, in some degree, liable to displacement or dislocation more frequently than other bones of the body.

Refer to—*Dislocation—Fracture—Clavicle—Ligament—Skeleton—Axilla, &c.*

SIALAGOGUES are medicines which increase the flow of the saliva, when they are chewed, such as horse-radish, ginger, &c. They are rarely prescribed.

SICKNESS.—See Vomiting.

SICKNESS, SEA.—The primary cause of the distressing affection, sea-sickness, has been a good deal disputed, but its dependence upon a peculiar condition of the brain and other nervous centres, brought about by the motion of the vessel, seems now very generally admitted. It has been imagined that the effect upon the brain was conveyed through the medium of the eye, and caused by the apparent movement of the objects of sight; as, however, blind people suffer from sea-sickness, the affection must be excitable by other means than the above. Possibly, as has been suggested, it partly results from disturbance of certain portions of the brain which have for their function the preservation of the equilibrium of the body. That, however, sight is in some degree accessory to the excitement of nausea is evident from the fact, that some persons experience the sensation simply from objects appearing to move before them, as they do from a ship moved by the waves, or indeed, in some cases by the mere appearance of a waving pattern upon a wall paper. The affection is more readily caused by long heaving waves than by a short rough sea. The best preventives of sea-sickness seem to be the horizontal posture, as near the centre of the vessel, and therefore the centre of motion, as possible; that is, where the motion is least. Exposure to the open air renders the liability less. Stimulants, combined with sedatives, certainly appear to have considerable effect in preventing or alleviating the affection. A pill, composed of four grains of cayenne pepper, with two or three of extract henbane, taken at intervals, may be found useful. Creasote was formerly considered one of the best remedies for sea-sickness, but it has been displaced by chloroform, five or six drops of which may be taken on a lump of white sugar, or chloric ether may be used in doses of twenty drops, and repeated if necessary. In the course of a long voyage, and when other remedies fail, recourse should be had to Chapman's icebags, which, when placed along the spine, enjoy deservedly a high reputation for the relief of this distressing affection. The bromides of sodium and ammonium are also useful, fifteen grains to be taken in water and repeated at intervals of three or four hours. Some persons find themselves less liable to sea-sickness if they take food freely, with others the reverse is the case; the effect probably depends upon the state of the digestive powers of the stomach, temporary or permanent. If these are vigorous, the excitement of digesting food acts probably as a counteragent to the cause of the nausea. Sea-sickness of itself is rarely injurious, but it should be a subject of consideration with persons who are liable, or likely to be, to head-affection, who are the subjects of rupture, prolapsus, &c., how far they should incur the risk of these being aggravated by the mechanical action of vomiting. Some who do not suffer from sickness while on the water, experience nausea and other uncomfortable sensations after landing, an effect, doubtless, due to a partial disturbance of the digestive organs, and probably to biliary disorder. One or two doses of compound colocynth, or compound rhubarb pill, will generally remove the inconvenience.

SIDE—Pain in the Side.—This very common affection arises from a great variety of causes. If situated high up, in the region of the chest, it may be occasioned by inflammatory affection of the pleura or of the lungs, but in this case will be accompanied with more

or less fever, and other symptoms indicative of the disorder (see *Lungs*). It may, however, be caused, in the same situation, by a kind of rheumatism, or neuralgia of the muscles connected with the ribs, termed pleurodynia. In this form there is not, generally, fever, and the usual signs of affection of the lungs are absent; the pain, moreover, is much more liable to aggravation by pressure externally, and by slight movement, than that of inflammation of the lungs. The affection requires, chiefly, the local treatment of rheumatism; bran poultice, and anodyne and turpentine liniment. The above pains may of course occur on either side of the chest. Pain on the right side, lower down, may be owing to affection of the liver (see *Liver*); on the left side, to disorder of the stomach (see *Abdomen—Stomach*). Pain on the left side, however, often occurs as a sympathetic affection, sometimes of the heart or lungs, in either sex. It is most common in females, and is then very often sympathetic of disorder, functional or otherwise, of the womb. Any person becoming the subject of continued pain in the side should have the causes investigated by a medical man.

SIGHT.—See VISION.

SILK.—Some persons, who from irritability of the skin, cannot wear woollen material next it, find a woven silk texture a good substitute.

SILVER.—The only preparation of this metal, much used in the practice of medicine, is the nitrate of silver, or lunar caustic, and this principally as an external application; it is however given internally by medical men in small doses as a tonic in dyspepsia and in some convulsive affections. For convenient use as a caustic, nitrate of silver is cast in the form of small cylindrical sticks, which are carried generally in silver or silver-gilt holders; the best having a "quill" of the metal called palladium to hold the caustic, it being found that in time the nitrate of silver acts chemically upon the metallic silver of the holder. Cheaper holders of glass, gutta percha, and vulcanite are made. When nitrate of silver in the least degree moistened touches the body, it acts as a corrosive, and on the skin leaves a deep brownish or black stain, which is only removed as the outer skin is worn off, and renewed in course of time; or, if it is applied early, by iodide of potassium. If, however, the caustic be *rubbed* on the skin, it will probably cause blistering. The modes of using nitrate of silver being pointed out in the different articles, such as *Erysipelas, Whitlow, &c.*, it is unnecessary to repeat them here. Oxide of silver is used for similar purposes internally as the nitrate, and the author has found it serviceable in some forms of stomach affection and in menorrhagia. It is not a remedy for domestic administration.

SINAPISM—a mustard plaster, or poultice.—See *Mustard—Counter-irritation.*

SINAPINE TISSUE, or MUSTARD PAPER.—In this article we have a most convenient, elegant, and efficient addition to our means of treatment. The mustard paper, made by Mr. Cooper, of Abingdon Terrace, Kensington, and introduced by him to the notice of the profession, acts very quickly and energetically, in the same way as a mustard poultice, without the disagreeables attendant upon that clammy and uncomfortable application, and it seems to leave less mark afterwards. From its energetic action, the time of application is necessarily shorter than when the old form of mustard poultice is used. There are, of course, cases and circumstances, however, when the old poultice may be preferable.—See *Mustard Leaves.*

SINGING is open to the same objections, to the delicate chested, as reading aloud, to the remarks on which the reader is referred.

SINKING.—The sensation of "sinking" at the pit of the stomach is a nervous one, generally connected with disordered digestion, and often with overloaded bowels. Persons are too apt to have recourse to stimuli for its removal, which would often be better effected by the use of an aperient, and by regulation of the digestive organs.—See *Indigestion.*

SINUS, in anatomy, is a depression, or cavity, or covered tract. The large veins within the skull, which are partly formed by depressions in the bone, are named sinuses. In surgery, a sinus is a canal, the result of disease, leading from a diseased part.

SKELETON, HUMAN.—The skeleton, or bony framework to which the muscles, cartilages, and ligaments are attached, is divided like the body itself into head, trunk, and extremities; and consists of upwards of 200 bones, united together by joints either of a movable or immovable character. In infancy and childhood, many of the bones consist of several parts, which unite together later in life, and form single bones, and this circumstance often gives rise to a discrepancy in the number of bones constituting the skeleton as given in books. The teeth, although possessing much of the structure of bone, are now usually described along with the tegumentary system. Bones are of various shapes and sizes, and are classified accordingly into long, short, flat, and irregular bones. They are invested, except at their articulating surfaces, with a tough, fibrous membrane, called *periosteum*, to which the muscles and tendons are attached, and in which the blood-vessels, which go to nourish the bony tissues, are distributed. When a portion of the periosteum is abraded (as happens more frequently from injury than from disease), death of the corresponding part of the bone is likely to ensue, in consequence of its supply of nourishment being cut off. Healthy bone consists of organic and mineral matter, in the proportion of one part of the former to two of the latter; but in infancy, bone is almost entirely composed of animal matter in the form

of cartilage; while, in old age, the mineral constituents are so much in excess that the bones become brittle, and when broken are often difficult to unite. The mineral matter of bone consists chiefly of phosphate of lime and chalk, the phosphate being in the proportion of five parts to one part of carbonate of lime. There are also small quantities of phosphate of magnesia and chloride of sodium in combination. It cannot truly be said that a skeleton is a beautiful object, in the usual sense of the term "beauty;" but the term beautiful is well applicable to the adaptation of the various parts to one another, and to the manner

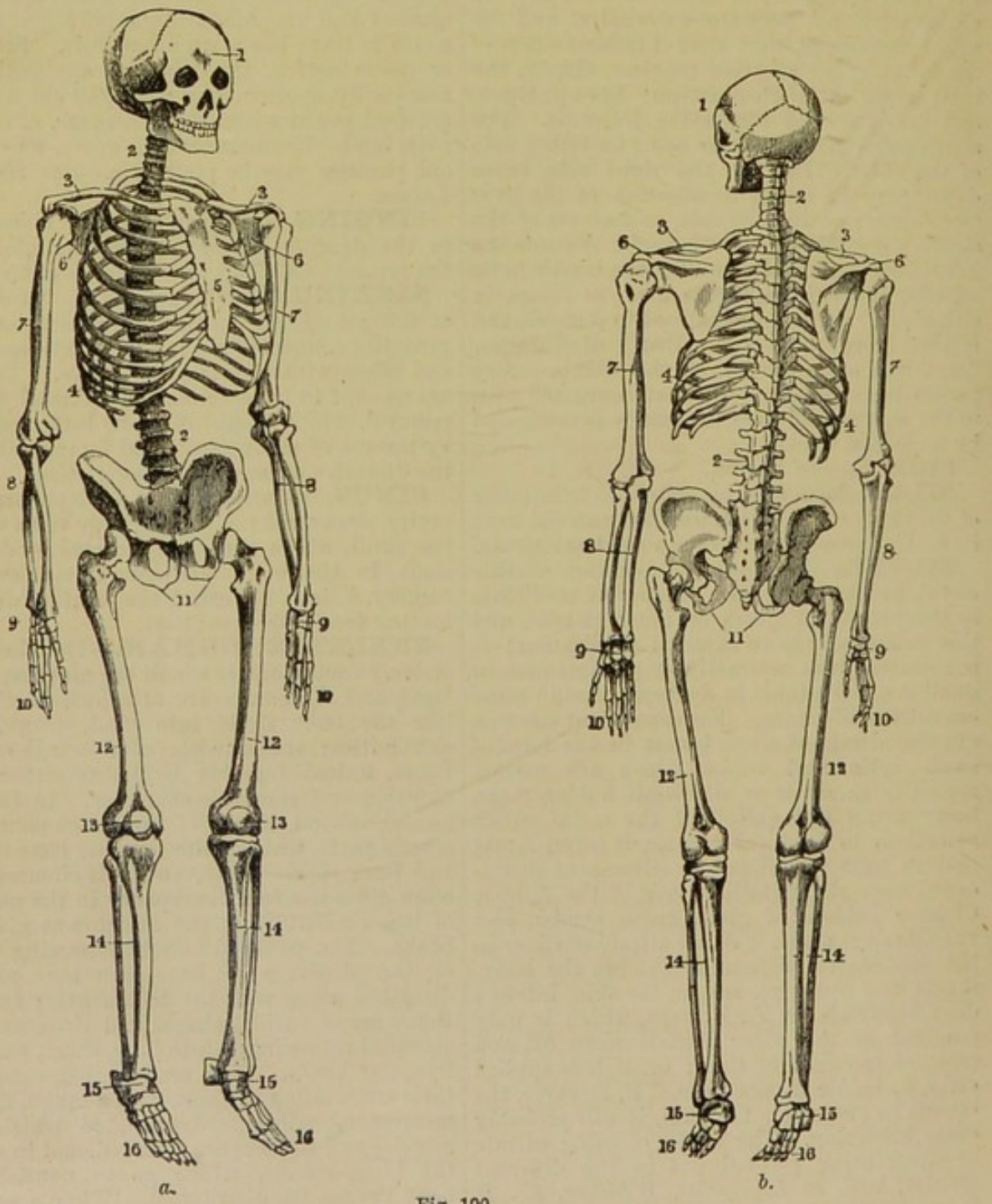


Fig. 190.

in which they subserve the object of their existence. When, moreover, the connexion of the different portions of the skeleton, by means of the ligaments, and the action, and mode of action simple and combined, of the various muscles of the machine at large, are considered; when we regard the protection given by the bones to important parts contained within the cavities, and to the blood-vessels in the limbs, the strength, and yet comparative lightness of the whole fabric; and lastly, the powers of reparation after injury, the word beautiful, in another sense, is that which really expresses the admirable perfection of the structure.

As descriptions of the most important bones are given in the separate articles, it is unneces-

sary to do more here than to point them out by name, each bone having the same numbers, on the adjoining figures (fig. 190, *a* and *b*), which give a front and back view respectively.

1. Bones of the skull and face, the former consisting of eight and the latter of fourteen bones, all of which (with the exception of the lower jaw) are united to each other by firm and immovable joints called sutures.

2. The spinal or vertebral column, composed of twenty-four slightly movable bones, increasing in size till they reach the lowest part or sacrum. The spine supports the head and trunk, and rests on the pelvis or basin.

3. The collar-bones or clavicles, by which the shoulder-blades and arms are kept in their places.

4. The ribs, twenty-four in number, comprise seven pairs of true ribs attached directly to the breast-bone, and five pairs of false ribs, of which three pairs are but indirectly attached to the sternum, and two pairs, called floating ribs, have no connexion except with the spine.

5. The breast bone, or sternum, to which the ribs are attached.

6. The shoulder-blade, or scapula, containing the shallow cavity for the head of the arm-bone.

7. The arm-bone, or humerus.

8. The bones of the forearm, radius and ulna.

9. The wrist or carpal bones, eight in number.

10. The palm and finger bones. The former are called metacarpal bones, and are five in number; the finger bones number fourteen, three to each finger, and two to the thumb.

11. The bones of the pelvis, comprising the two unnamed bones, the sacrum and the coccyx. They combine to form a girdle or basin, to support the contents of the abdomen, and to transmit the weight of the body to the limbs.

12. The thigh bone, or femur.

13. The knee-cap, or patella.

14. The bones of the leg—the larger, the tibia or shin; the smaller, the fibula or splint bone.

15. The tarsal, or ankle-bones, seven in number.

16. The metatarsal bones forming the greater part of the arch of the foot, and the phalanges of the toes. These correspond in relative numbers to the bones of the hand.

The bones above enumerated nearly exhaust all the bones of the body, but in addition there are a few minute bones in the internal ear, one of considerable size, at the root of the tongue, called the "os hyoides," and sundry small bones called *sesamoid*, which are occasionally found in the tendons of certain muscles.

SKIN.—No less wonderful than the bony frame work of the human body, which we have just considered, is the covering of that body, the skin, which, while it protects and retains in place the various parts, serves also most important purposes in the animal economy.

The skin consists of two distinct formations, the epidermis, cuticle, scarf, or outer skin (fig. 191—1; 192—1) and the dermis, cutis,

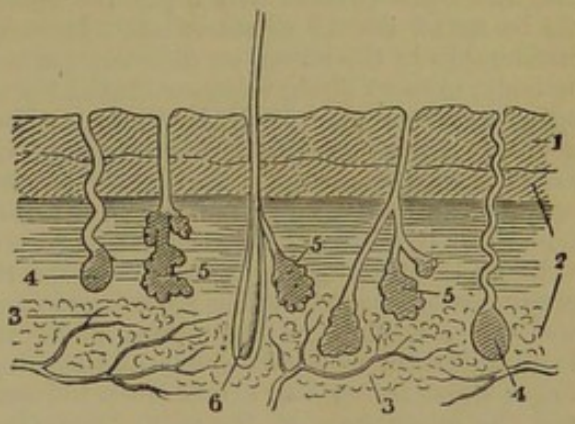


Fig. 191.

or true skin (fig. 191—2). The skin is continuous with the mucous membranes at the openings of the various cavities, such as the mouth, nose, &c., its epidermis corresponding to the epithelium of the membranes.

The epidermis is a thin, semi-transparent membrane, which is extended over the surface of the true skin of the body. Apparently, it is without structure, and indeed was long considered to be simply an exudation which became hardened by exposure to the air; it is now known to consist of regular series or layers of cells (fig. 192—1). The outermost layers of these

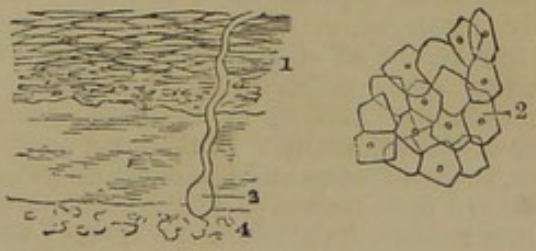


Fig. 192.

cells, which are exposed to general contact, and to the influence of the atmosphere, are comparatively hard, and are flattened as represented, becoming less flat, and softer, inward (fig. 192—1), as the surface of the true skin is approached, at which point the cells are quite soft and moist. This soft layer of the epidermis used formerly to be regarded as a distinct portion of the skin structure, under the name of "rete mucosum." The intermixture, in this layer, of "pigment cells," that is, cells containing colouring matter, gives the varied hues to the skin of different races, as most strongly exemplified in the negro; and the appearance of freckles originates from the same cause. On the surface of the epidermis the flattened cells lie over one another, as represented (fig. 192—2), the outermost becoming continually detached and worn off. When these detached scales are re-

tained, as by the hair, or by the clothing, they constitute what is called scurf or dandriff. When a blister forms on the skin, the layer of epidermis or cuticle is raised up, the fluid occupying the space between it and the true skin, and when pricked with a pin the cuticle will be found devoid of sensation. It varies considerably in thickness, on different parts of the body, even at birth, being much thicker on those, such as the heel, back, &c., which naturally require greater protection; it, however, becomes immensely thickened on any portion of the body which is subject to continual pressure or friction; of this the hand of every workman is an example. As all are aware, the appearance of the skin varies according to age, from the soft skin of the infant, or of the bloom of youth, to the flaccidity and wrinkles of age; constitution also exerts much influence over the appearance of the skin.—See *Complexion*.

The cutis vera, dermis or true skin, which lies underneath the cuticle (fig. 191—2), is much thicker than the latter; it consists chiefly of connective tissue, that is, of interlacing fibres, which enclose the blood-vessels, nerves, &c., which make up the substance of the covering. The true skin being abundantly supplied both with blood-vessels and nerves, is extremely sensitive, so much so indeed as to require the protection of the cuticle as a necessity. All are aware of the painful sensibility of the true skin, when the outer skin has been abraded. At its surface, where it is in contact with the cuticle, the true skin is elevated into little eminences or papillæ, these are most manifestly developed, on the pulpy extremities of the fingers, and on other places where sensation is acute, each papilla being received into a corresponding hollow, in the soft granular layer of the epidermis. In the most sensitive parts, such as the lips and tips of the fingers, the papillæ in their central parts are furnished with minute bodies called "touch corpuscles," which increase their sensibility. The skin varies in sensibility in proportion to its supply of nerve fibrils, papillæ and touch corpuscles being greatest at the tip of the tongue and least in the skin of the back. Fig. 193 illustrates the position of these bodies in a papilla very highly magnified, as well as the subdivision of the nerve into tortuous nerve fibrils as it nears the surface of the true skin.

The deeper layer of the true skin is composed of interlacing fibres as already mentioned, and with these are mingled elastic fibres, and a peculiar form of muscular fibre, the latter being evidenced in action, by the occurrence of what is popularly called goose skin. The deeper layer of the skin, internally, rests upon the cellular tissue, fat, &c., beneath (fig. 191—3, 3; 192—4).

Were the skin required simply for an elastic, sensitive, and complete covering to the body, the structures already mentioned might have been sufficient; but it has other functions equally important to perform, for which provision is made over its wide extent of surface. The most important, perhaps, of these functions is the discharge of the perspiration, which is going on continually. The perspiration is not, as might be thought, a simple exudation of fluid through the skin, but is a regular secretion, and excretion from the blood, by means of innumerable small glands (fig. 191—4, 4; 192—2), which are situated in the deep layers of the true skin. These sudoriparous, or sweat glands, are composed, as represented, of a rounded extremity formed by the convolutions of the tube, which opens to the surface by means of a spiral duct, about a quarter of an inch long. This duct, in many situations, makes its exit on the surface of the cuticle,

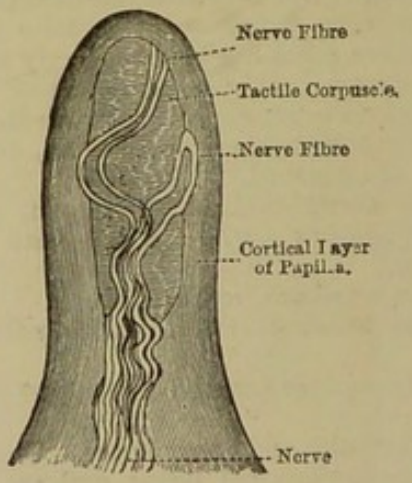


Fig. 193.

obliquely (fig. 192—2), in such a manner that it has, as it were, a valvular covering; it does not pierce the cuticle, but this latter membrane is continued down into it, as a lining. The open mouths of these ducts constitute the pores of the skin. In addition to the sweat glands, the skin is furnished with another set of excreting agents, which closely resemble the above, but which are named the "sebaceous," or oil glands (fig. 191—5, 5; see *Sebaceous*). The office of these glands is to separate certain matters from the blood, and to excrete them in the form of an oily matter from the skin, which oil or grease, although it is doubtless an excretion, serves also to lubricate the skin, and to keep it soft and flexible; on this account probably, the sebaceous glands are more abundant in the skins of natives of warm climates, to shield them from the drying effect of the heat. The sebaceous glands have been already alluded to under the article *Sebaceous;* they are often lobular in structure, frequently communicate with one another by a common duct, and in such situations as the scalp, one or two of them open into each hair follicle (fig. 191—6).

The accompanying illustration (fig. 194) will serve further to explain the foregoing remarks. It represents a vertical section of the skin.

As already mentioned, the skin contains blood-vessels and nerves abundantly; it also contains absorbent vessels. The number of the sebaceous and sweat glands, particularly of the latter, is almost innumerable, and some curious calculations have been made respecting them by Sir Erasmus Wilson, the well-known writer upon the skin, who says: "I counted the perspiratory pores on the palm of the hand, and found 3528 in a square inch. Now each of these pores being the aperture of a little tube about a quarter of an inch long, it follows, that in a square inch of skin on the

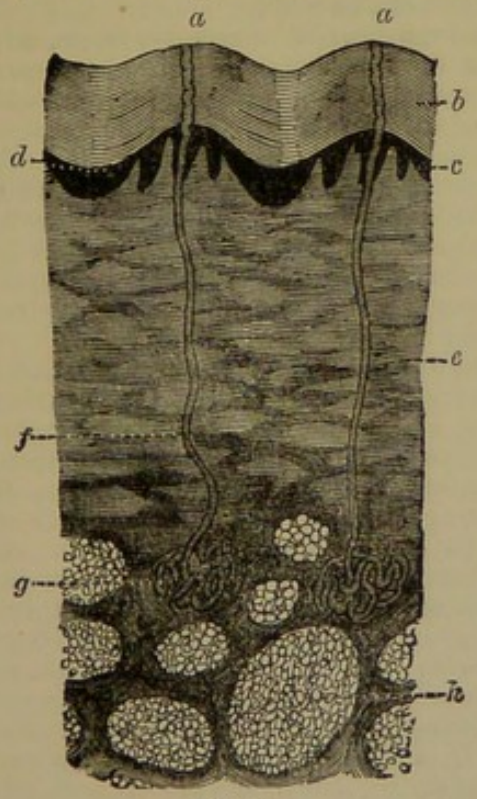


Fig. 194.

a, *a*. Corkscrew termination of Perspiration Duct. *b*. Epidermis. *c*. Deeper layer of Epidermis. *d*. Papilla on surface of Dermis. *e*. Dermis. *f*. Perspiration Duct. *g*. Perspiration Gland. *h*. Fat Cells.

palm of the hand, there exists a length of tube equal to 882 inches, or 73½ feet." "To obtain an estimate of the length of the tube of the perspiratory system of the whole surface of the body, 2800 may be taken as a fair average of the number of pores in a square inch, and 700, consequently, of the number of inches in length. Now, the number of square inches of surface in a man of ordinary height and bulk is 2500; the number of pores, therefore, 7,000,000, and the number of inches of perspiratory tube 1,750,000, that is 145,833 feet, or 48,600 yards, or nearly twenty-eight miles."

From the above exposition of the perspiratory system, the reader will be prepared to learn that the skin is often the most abundant excretor of fluid in the body, exceeding, at times, even the kidney, and always much greater than the lungs. According to the most generally trusted experiments, it is found that the average amount of watery fluid exhaled from the lungs and skin of the human body in twenty-four hours, at an ordinary temperature, is about fifty-four ounces, of which amount, thirty-three ounces are attributable to the skin, the remaining twenty-one to the lungs. This excretion of fluid is capable, however, of being largely increased, and it is an ascertained fact that a stout man undergoing strong muscular exertion, under high temperature, has, in an hour, lost as much as five pounds weight. The perspiration thus depends greatly upon the external temperature of the atmosphere; it is, however, considerably influenced by conditions of bodily health. Under ordinary conditions, perspiration takes place insensibly, that is, in the form of vapour, which passing off into the air as it is thrown out, gives no palpable indication of its presence; if, however, it is confined, as by an inverted glass, on the skin, a deposition of moisture at once occurs upon the glass. When the perspiration is so rapidly thrown out that it cannot be at once evaporated from the surface, it takes the form of sensible perspiration, or sweat, in greater or less abundance. It is evident, that when the external air is greatly laden with moisture, the perspiration will be much less quickly evaporated, and consequently much sooner evidenced than under the reverse circumstances; moreover, that as the kidneys alternate in some measure with the skin in the excretion of fluid, influences which increase the one must diminish the other, as in hot weather, when the cutaneous moisture is much increased, and the flow of urine lessened.

There is no doubt that the evaporation of the perspiration is one great means of keeping the temperature of the body down to its proper level, under exposure to heat; indeed, this is the secret by which persons have been able to endure, without injury, the heat of an oven of sufficient intensity to cook meat. It is not, however, a mere exudation of simple water which takes place in perspiration; the mixed fluid which is thrown out from both the sweat and the oil glands contains a considerable amount of free acid—lactic acid—earthy phosphates, and chlorides and phosphates of the alkalies. To these must be added carbonic acid and urea, which proves that the skin occupies an intermediate position as regards its functions between the lungs and the kidneys. The sweat is always acid, the sebaceous secretion alkaline, the predominance of one or other giving the characteristic chemical reaction.

Simple reasoning might be enough to convince us that the extensive perspiratory apparatus spread over so large an extent of skin, and in such active operation, must subserve some very important offices in the animal economy. Moreover, the injurious effects of which all are aware, as the consequences of having this secretion suddenly interfered with, prove that

these offices are intimately connected with the health of the system generally; and lastly, direct experiments have added to the proof. The experiments alluded to are those of M. Fourcault, who demonstrated, that if the transpiration of the skin of living animals was prevented by means of a coating of varnish, they speedily either died in a state resembling suffocation, or became the subjects of internal congestions of blood, especially of the liver. In addition to its excretory functions, the skin is endowed with other functions, becoming at times a medium for absorption of fluids, gases, or other substances into the system. The fact of gases being absorbed by the skin, adds to the importance of the body being surrounded by pure air; in fact, by some it is thought, that noxious effluvia, malaria, &c., are more readily absorbed into the system through the skin than through the lungs. If the body be immersed for some time in a tepid bath, it gains weight by absorption of water, and if thirst has existed, it is relieved. Certain medicines, again, such as mercury, Spanish flies, rhubarb, &c., affect the constitution through the skin. Probably, as suggested by Dr. Combe, even matter which has been once cast out by the skin, may be reabsorbed by it, and cause disease.

Enough, perhaps, has now been said to demonstrate to all of what immense importance the functions of the skin are to the animal system, to show, that while this most perfect structure fulfils the palpable office of a protector and coverer of the entire system, it constitutes one of the great channels by which used up, and therefore noxious, matters are cast out from the blood, a channel, too, which cannot be interfered with without its internal coadjutors, the kidneys, or the lungs, or indeed any one or all of the organic functions of the body, suffering in consequence.

Again, if it is reflected that every moment of our lives this exudation through the skin is going on, that while the watery fluid escapes, it leaves the more noxious particles behind, mingled with the scales and scurf of the epidermis, and added to this, the dust, and other foreign matter which must adhere to the skin, it will give some little idea of what there is to remove from the skin to keep it desirably clean, still more to preserve it in that state of healthy activity and freedom which is requisite for health.

The appendages of the skin are the hair and nails.

Refer to—*Ablution*— *Absorption* — *Baths*— *Hair*—*Nails*.

SKIN, DISEASES OF THE.—The diseases and disorders to which the skin is liable, must necessarily be numerous. It is exposed, not only to many influences from without, to atmospheric vicissitudes, to the effects of neglect and dirt, to contagion and accident, but it is also liable to influences from within, arising from those internal organs, with which it is so intimately connected, both sympathetically and in function, and it is excited by altered conditions of the blood, for which it performs such important offices.

Very various classifications of skin diseases have been made by different authorities on the subject, with the view of facilitating their distinction from one another, and their treatment. In the following slight sketch the author has adopted the divisions best calculated to give a clear general idea of the subject; to attempt more would be quite at variance with the character of this work.

The exanthemata, or eruptive fevers, measles, scarlet fever, small-pox, and chicken-pox are each marked by a specific eruption, and are noticed in separate articles. Many other eruptive diseases are accompanied with febrile symptoms, but not of such marked peculiarity and uniformity as those which characterise the above; some authors, however, include in the class of eruptive fevers, erysipelas and erythema, nettle-rash and rose-rash, and even typhus and typhoid fevers.

Skin diseases are very numerous and often perplexing, on account of their intractable nature, and tendency to partake of more than one type. They are best known from the anatomical character of the eruption, which may range from a slight blush or patch of redness to endless forms of alteration of the integument. The more important skin diseases are noticed in separate articles, but they may be all grouped under the following classes:—Erythema and erysipelas belong to simple inflammation of the skin; papular skin diseases are distinguished by minute and pointed elevations from the surface, terminating in scurf, of which prurigo, lichen, and prickly heat, referred to in a previous article, are examples. The latter are extremely troublesome, from the intense itching with which they are accompanied, and the obstinacy with which at times they resist treatment. The general directions as to diet, &c., given in the above articles may be useful when the affections occur. Tepid baths, with or without the addition of vinegar; or sponging with water, to each pint of which a drachm of diluted sulphuric acid has been added, may be tried as a temporary relief to the itching.

The vesicular class of skin diseases are also characterised by elevated points containing lymph or serum, clear and colourless at first, but afterwards opaque. They include chicken-pox, which may be classed with eruptive fevers, also shingles and similar herpetic eruptions (see *Shingles*). One of the vesicular eruptive diseases, eczema or crusta lactea, has its frequent site upon the scalp and face (see *Eczema*). The class of "pustular" eruptions (see *Pustule*) also comprises various scalp diseases. In many of the affections of this class, however, the pustular eruptions extend over various portions of the body.

The class of "bullæ" are characterised by the development of "blebs," or small blisters, which resemble those occasioned by a scald, or by the use of a common blister, and when broken, leave the skin red and inflamed. This form of skin disease is generally associated with great debility of constitution.

The "scaly" diseases of the skin are many of them extremely obstinate, and sometimes resist every form of treatment. Of these, lepra and psoriasis are characterised by elevated, scaly, circular patches, distributed in greater or less number over the skin. Lepra is a disease totally distinct from the leprosy of the Jews and other ancient nations. Tubercular diseases of the skin are equally difficult to get rid of, and often suppurate and ulcerate. Stains, mother-marks, or "nævi," freckles, &c., are all included in the category of skin affections: they are noticed under other articles.

Skin diseases are derived from various sources, some from the animal, some from the vegetable kingdom; some occur associated with contagious and epidemic disease, others are peculiar to well-known diseases, which are neither epidemic nor infectious; while the majority depend on the constitutional peculiarities of the individual.

No description could possibly enable an unprofessional person to distinguish one chronic skin disease from another, nor would it answer any good purpose if the knowledge could be imparted. These affections are, in a majority of instances, indicative of some peculiar disordered condition of the blood, or of the digestive processes, primary or secondary, which requires the strictest investigation of a medical man, and, probably, a long-continued course of treatment, whilst even under the best directed remedial measures they often prove intractable. Very many chronic skin diseases are connected with debility, and of course, when such is the case, tonic remedies are useful; a smaller proportion are owing to a plethoric state of the constitution; some appear hereditary, and others are connected with the venereal taint. Whatever the case be, however, those who suffer may be assured that their best course will be at once to put themselves under proper medical advice, and, if they can, under the advice of a practitioner who has made the skin a department of special study. Above all things, let sufferers beware of quack ointments, lotions, and the like; they may inflict upon themselves irreparable injury. In the event of any delay occurring before advice is procured, if the system is full, and inclined to fever, low diet is advisable, and one or two gentle mercurials, followed by a saline aperient, may be taken with advantage. If the system be debilitated, whilst all sources of heat and irritation are avoided, nourishing diet should be taken, and the bowels regulated. When milk diet agrees, it is very suitable in many chronic skin affections, and there are few in which tepid bathing does harm, it clears the skin of any irritating matter, whilst it soothes; it is, at all events, generally agreeable to the feelings of the patient. Another reason for the enforcement of tepid bathing is the fact that, although, as stated above, very many, perhaps the majority, of skin diseases, are connected with constitutional disorders, some are almost entirely due, and others much aggravated by, inattention to cleanliness, among certain classes. —See *Ablution—Bath—Skin.*

SKULL. — The skull (fig. 195) contains the brain, and forms the support for the face, and organs of the special senses. It is composed of twenty-two separate bones; of these, eight are devoted to the cranium or brain-case alone, the remaining fourteen are the bones of the face. These bones, with exception of the lower jaw, are united by means of joinings,

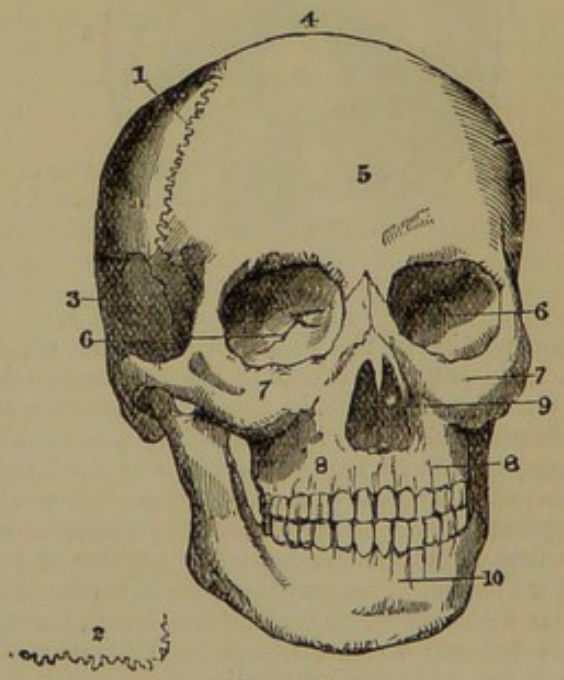


Fig. 195.

named "sutures." In one form of suture the margins of the different bones are, as it were, toothed (fig. 195—2), the toothed edge of one fitting into the indentations of another. At (1) is seen such a suture, which forms the junction between the frontal, or forehead bone, and one of the two "parietal" bones, which principally form the arched vertex, or crown, of the skull. At (3), where the parietal is joined to the temporal, or temple-bone, the suture is different, being formed by the thin margin of the latter bone overlapping the similarly formed edge of the former; where these bones overlap, their edges are roughened, so as to give greater adherence. In another form of suture, the adjoining edges of the bones are simply roughened. In fact, the form of the bones of the skull individually, their junction and the shape of the whole case, is constructed with reference to strength and lightness at the same time; indeed, so strong is the arch of the vertex, or crown of the head

(4), formed by the parietal and frontal bones, that in falls on the head, instead of this portion of the skull giving way, it is not uncommon to find that the fracture, if it occurs, is in the opposite portion of the skull where it is supported by the spine. When the skull is sawn through transversely, about its middle, it presents the oval form, as represented (fig. 196), and if the brain be removed, the in-

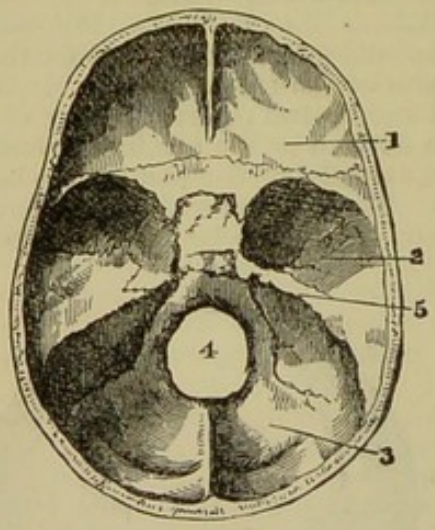


Fig. 196.

terior portion of the skull, or floor, on which the brain rests, is seen as in the cut, consisting of anterior (1), middle (2), and posterior (3) depressions or fossæ ; the anterior and middle being adapted to receive portions of the larger brain or cerebrum ; the posterior being the receptacle of the lesser brain or cerebellum, on the top of which the posterior portion of the larger brain is situated (see *Brain*). The larger opening (4) in the base of the skull gives passage to the spinal cord or marrow. There are a number of smaller openings in the base of the skull for the transmission of nerves, and for the passage of blood-vessels. Within the prominent portion of bone (5) is contained the internal auditory apparatus (see *Ear*). The interior surfaces of the skull are variously grooved and marked, more particularly for the accommodation of the blood-vessels, especially the large veins connected with the head circulation. The bones of the skull do not each consist of one solid piece of bone, but of an inner and outer "table" or plate of dense bone, separated by a lighter and more cellular portion, which is called the "diploe" (see *Diploe*). The depressions and hollows of the outer table do not entirely correspond with those of the inner.

The frontal or forehead bone (fig. 195—5), a bone of the cranium or brain case, is also a bone of the face, entering largely into the formation of the eye sockets (6, 6). These conical cavities (see *Eye*) are made up by the combination of other bones, such as the cheek bone (7), the upper jaw bone (8), &c. At (9) is seen the hollow for the nostrils, divided in the centre (see *Nose*). The lower jaw bone (fig. 195—10; fig. 197) of the figure represented, is jointed to the skull by means of the rounded heads (fig. 197—1, 1), which fit into corresponding hollows in the skull. This is a specimen of the hinge-joint. The shape of the lower jaw varies greatly during the different periods of life ; it also differs considerably in different races of human beings, exhibiting, as well as the upper jaw, a tendency to become more

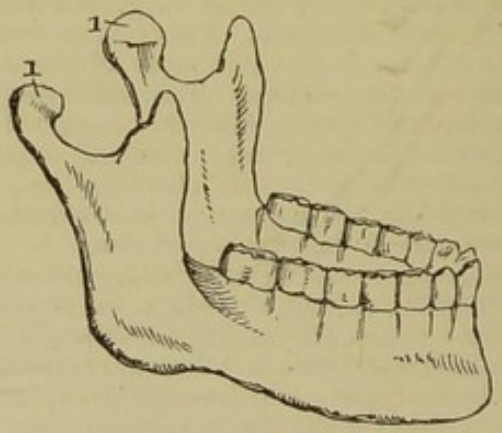


Fig 197.

projecting as the descent is made in the scale of civilization. The variations which are observed in the forms, and in the relative proportions of the different regions of skulls belonging to various tribes of the human family, form a study of the greatest interest. The bones of the skull and face are closely covered, like other bones, by a membrane or "periosteum," in this case called the "pericranium." The scalp is connected with the skull by means of a loose, easily torn connective tissue.—See *Scalp*.

Refer to—*Brain—Fractures—Nervous System.*

SLEEP.—The explanation of the actual physiological condition which constitutes this periodical phenomenon of life has often been attempted, but the *essential* nature of the condition remains unexplained. The external phenomena manifested during the state of sleep are familiar, and, in some measure, those that take place within the body during the state are known ; but there the knowledge stops.

Sleep may be defined as a state of natural unconsciousness, in which the motor and sensory powers are in a condition of suspension, whilst the organic functions of nutrition, including the movements of the heart, lungs, and bowels are going on, increased, diminished, or unaltered, according to circumstances. The cause of the sensorial inactivity of the voluntary system, and of the apparent disconnexion of the mind with outward things, and as it appears to us on awaking from sleep, disconnexion with thought generally, has been variously explained. A kind of congestion of blood in the head, caused by the compression

of the veins in the neck by certain muscles, was supposed to be the normal condition in sleep, but Mr. Durham has shown by experiment that the reverse of this is the case. The most general idea, is, that sleep is the consequence of exhaustion of the usual nervous stimulant in the services of the waking hours, along with waste of the tissues generally. As put by Liebig:—"Since in different individuals, according to the amount of force consumed in producing voluntary mechanical effects, unequal quantities of living tissue are wasted, there must occur in every individual, unless the phenomena of motion are to cease entirely, a condition in which all voluntary motions are completely checked, in which, therefore, these occasion no waste. This condition is called sleep." Dr. Carpenter puts the same ideas somewhat in a similar manner, saying: "The occasional suspension of sensorial activity is requisite for the reparation of the destructive effects of that activity; so that, however unfavourable may be the external circumstances, sleep will supervene as a necessary result of exhaustion, when this has been carried very far." That exhaustion is one, perhaps the one great condition of sleep, is unquestionable; but that it is not the only condition is no less true, unless, indeed, the statement of Liebig be adopted unreservedly, that wine, narcotics, and other sleep-inducing agents, produce a state of artificial exhaustion, by putting a stop to the regular changes of matter, especially its union with oxygen, which is constantly going on within the body. Moreover, there is a state of over-exhaustion, both of mind and body, which tends to keep off sleep, rather than to induce it. Further, there is a most undoubted connexion between the periodical revolution of the twenty-four hours which constitute our day, and the periodical requirements and renovations of sleep.

It is observed by Dr. Whewell, in his *Bridgewater Treatise*, that "man, in all nations and ages, has taken his principal rest once in twenty-four hours, and the regularity of this practice seems most suitable to his health, though the duration of the time allotted to repose is extremely different in different cases. So far as we can judge, this period is of a length beneficial to the human frame independently of the effect of external agents. In the voyages recently made into high northern latitudes, when the sun did not rise for three months, the crews of the ships were made to adhere with the utmost punctuality to the habit of retiring to rest at nine, and rising at a quarter before six; and they enjoyed, under circumstances apparently the most trying, a state of salubrity quite remarkable. This shows, that according to the common constitution of such men, the cycle of twenty-four hours is very commodious, though not imposed upon them by external circumstances. No one can maintain with any plausibility that the period may be lengthened or shortened without limit. We may be tolerably certain that a constantly recurring period of forty-eight hours would be too long for one day of employment, and one period of sleep, with our present faculties; and all whose bodies and minds are tolerably active will probably agree, that independently of habit, a perpetual alternation of eight hours up and four in bed, would employ the human powers less advantageously than alternations of sixteen and eight.

"The succession of exertion and repose in the muscular system, of excited and dormant sensibility in the nervous, appears to be fundamentally connected with the nervous and muscular powers, whatever the nature of these may be.

"The necessity of these alternations is one of the measures of the intensity of those vital energies; and it would seem that we cannot, without assuming the human powers to be altered, suppose the intervals of tranquillity which they require to be much changed."

The amount of sleep necessary for an individual depends greatly upon time of life, upon natural constitution, or upon acquired habits. The infant, it is well known, spends most of its early days in sleep; in adult life, the hours of repose are reduced to the moderate average of from six to eight hours; whilst in advanced life, that is before the period of decrepitude, the amount of sleep is still further diminished. By Liebig, this is reduced to a regular calculation. After giving the calculation, as computed in mechanics, of the force available for mechanical purposes in an adult man in a certain period, he says: "By the restoration of the original weight of his body, the man collects again a sum of force which allows him, next day, to produce, without exhaustion, the same amount of mechanical effects. This supply of force is furnished in a seven hours' sleep," provided, of course, sufficient nutriment has been given during the waking hours, from which the reparative powers can draw their supply of new material. Further, if the process of oxidation and waste goes on more briskly in the system than can be restored or repaired, during the seven hours, or whatever other amount of sleep is necessary, the strength must diminish. Practically, therefore, sleep is a periodical natural condition, in which the voluntary or exhausting powers, both of body and mind, being at rest, the involuntary or reparative powers have, or ought to have, time for restoring the material of the living body, which has been used up during the hours of wakeful activity. Such being the case, it is evidently most important, not only that a supply of sleep adequate to the reparative requirement of the system should be procured, but that the benefit derived from the sleep should not be impaired by contingencies likely to interfere with the processes which are actively carried on during the state of unconsciousness. These

processes—devoted to the repair of the structures—must evidently be more connected with the secondary assimilation of nutriment, that is, with changes in the nutriment after it has entered the blood, than with the primary assimilation in the stomach. This, probably, is one reason why nourishment is usually more beneficially taken some hours before the ordinary night's rest; it permits the result of the digestion of the meal, not only to enter the circulation, but to be ready for the processes of reparation which take place during repose. It would almost appear as if these reparative processes were carried on at the expense of others which are more active during waking hours; for, during sleep, the respiration is diminished in frequency, the pulse is slower, the action of the brain, as has been already observed, diminishes. At the same time the temperature sinks, and the nervous power is evidently lowered, and with it the power of resistance to morbific influences, such as malaria. Indeed, as observed elsewhere in this work, this diminished condition of nervous power is not recovered for some time after waking, and by the weak not until food has been taken (see *Breakfast—Early Rising, &c.*). The perspiration, for obvious causes, is generally increased during sleep.

The amount of sleep required by different individuals varies greatly; as already stated, the infant requires most, sleeping at least twenty hours out of the twenty-four. The hours of sleep which are requisite, diminish up to adult maturity, when from six to eight hours is the average requirement during the most active periods of life. There are, indeed, instances of persons who could do well with a much smaller average of sleep—four, three, two hours, or even less; but these are exceptional instances, and the individuals have generally been persons of strong constitutional powers. The extension of the hours of sleep beyond the term of eight, or at least nine hours, is generally the result of habitual indulgence. Moreover, when sleep is thus taken excessively, more is required, or thought to be required, on account of the debility which arises from consequent excessive action of the skin. Women, as a general rule, require rather longer sleep than men, and it is said that tall and bulky people need more than those who are short and thin.

Many of the external conditions requisite for sound and healthy sleep having been noticed under *Bed* and *Bed-room*, it is unnecessary to repeat them here; it may be added that no portion of clothing which tends, either in the way of the wristband or of neck fastening, to confine in the least degree, should be worn. Especial attention should be directed, especially in the case of children, to the injurious effects of sleeping with mouth or head covered over with the bed-clothes. The practice is a common but most hurtful one.

Some persons have been known to possess a remarkable aptitude to sleep at will, and an equal readiness to awake at the right moment, as was the case with the first Napoleon and of the Dutch Admiral, who was said to sleep with one eye open; and the faculty has been quoted to prove that sleep is an active state rather than a passive one. It would rather prove that the mind has so far power over the body as to restrain the tendency to sleep until it can be conveniently indulged in, and that as soon as the powers of body and mind are surrendered to its influence, it at once takes possession of them. The power of certain external agencies in inducing sleep are well known; absolute quiet and the recumbent position are in most cases sufficient; but every nurse and mother has recourse to soothing sounds to aid the repose of the child.

In the above remarks, sleep has been considered as a natural healthy process, either the result of exhaustion, nervous or general, or the consequence of a periodical condition of the body. It has been regarded as a process tending to health, to recruit the exhausted powers of body and mind. But sleep is often not a natural process: it may be occasioned by excessive use of alcohol, or by narcotic drugs, by the action of heat, or by the depression of extreme cold; it may result from over-fulness of blood, or from deterioration of the vital fluid; in the latter case, generally, it is probable, by the accumulation of carbonaceous materials, consequent upon imperfect aeration of blood in the lungs, or its imperfect elaboration in other organs (see *Biliary Disorder*). Again, heavy, very heavy sleep, is a common accompaniment of chlorotic or anæmic conditions of the system, producing a condition akin to coma (see *Anæmia*). In such cases, although the powers of the body are in some degree recruited by the sleep, it is not followed by the same feelings of health as the natural sleep of the properly but not over-fed—well-exercised, but not exhausted—worker of either mind or body, provided the mental worker neglect not the physical exercise.

Sleeplessness, technically termed *insomnia*, arises from various causes. It is often a distressing concomitant of old age (see *Old Age*), but mental causes, anxieties, excitements, distresses most frequently give rise to it, and especially intellectual exertion of the mind late in the evening, and just before retiring to rest. Want of due physical exercise also occasions sleeplessness; it is the result of dietetic errors, either eating heavy meals too late in the evening, or retiring to rest without sufficient nourishment, and especially is it caused by strong tea or coffee taken at a late hour, in some people at any hour (see *Tea*). If any of the above causes of habitual sleeplessness are suspected to be the origin of the evil, the most effectual mode of correction is of course to remove the cause; but except under the sanction of a medical man, who can discriminate how far

sleeplessness is dependent on disease, or likely to impair the constitution, artificial, that is medicinal, modes of procuring sleep should never be resorted to. Early rising, moderate attention to diet, and moderate exhaustion of both body and mind by exertion, ought to be employed to bring back the soft restorer. Sometimes the mere alteration in the hour of a meal, a biscuit before retiring to bed, instead of going with an empty stomach, or some apparently trifling alterations in habits, are all that are requisite as a corrective. Continued sleeplessness is a symptom of delirium tremens, and some fevers; it is also often the forerunner and concomitant of some forms of insanity. In both these phases it requires to be dealt with by a medical man.

Disturbed sleep is almost a constant attendant upon disorder of the digestive organs, either as exhibited in mere restlessness, or unpleasant dreams, or in the more aggravated form of nightmare, which is generally considered to depend upon impeded respiration and circulation within the chest, causing those disagreeable sensations connected with the condition, of which all must at times have been conscious. It is probable that the uncomfortable sensation in the chest, in the first place gives rise to the "suggestive dream" (see *Dreams*). Nightmare, if of frequent occurrence, may depend on disease connected with the heart or circulation, but more usually it is the result of causes much more easily removable, such as indulgence in heavy suppers, or excess of food generally—in fact, of indigestion. Disturbed sleep in children is very common, taking either the form of moaning or restlessness, with grating of the teeth, or talking; of awaking suddenly, frightened and screaming; or of getting out of bed, when it becomes somnambulism or sleep-walking. The excitability of the nervous system in children renders them liable to be thus affected by even slight disorders of the bowels, and especially by worms, &c. In such cases, therefore, it is always right to make sure that nothing offends in this way, by clearing out the canal by means of a smart purge; calomel and scammony is probably the best. If the affection does not seem to depend on disorder of the bowels, so much as upon general excitability, everything in the way of mental excitement which can increase this must be avoided; cold laving of the head every morning, and the cold douche to the back should be used, and the nervous system tired before bedtime by active but not exhausting exercise. Opium, especially in the form of chlorodyne, is frequently had recourse to, to produce sleep, but it is a narcotic which should not be rashly indulged in; chloral hydrate is another remedy much used for a similar object, and probably with less risk of injurious consequences, but neither drug should be used without medical sanction. The best remedies for sleeplessness are early hours, active exercise, and light suppers, if the latter meal must be indulged in.

Somnambulism, or sleeping-walking, in adults, belongs to the class of mental, or rather psychological, phenomena not yet generally understood; it evidently resembles, if it is not identical with, the mesmeric condition of which some, and generally the same class of persons, are susceptible. Where a tendency to sleep-walking does exist, it is perhaps scarcely requisite to remark, that every means of guarding the person so unfortunately affected from accident should be had recourse to.

Night is the natural season for rest; but in warm climates, a day sleep, both in man and animals, seems beneficial. In temperate climates, after the age of childhood, it is not an advisable custom. After any unusual fatigue, however, a short sleep before—not after—dinner, is often very serviceable.

Refer to — *Breakfast* — *Dreams* — *Early Rising*—*Night*, *&c.*

SLOUGH—a slough is a dead portion of tissue cast off from a living animal body. Bed-sores are usually the result of sloughing of the tegument and subjacent tissue. To assist the separation of the slough, and to destroy the fetor, it is generally necessary to dress the parts with antiseptics, such as the carbolic acid or chlorinated lime washes, or sanitas oil.—See *Bed-sores.*

SMALL-POX. — This dreaded disease belongs, like measles and scarlet fever, to the class of eruptive fevers; it is, too, like these diseases, characterized by its own special constitutional symptoms from the commencement, independent of the eruption which stamps its character.

Small-pox commences with shivering and languor, followed by heat, thirst, and headache; so far, these symptoms mark the beginning of most other severe febrile affections. Added to them, in the disease in question, there is usually either pain or great oppression at the pit of the stomach, and not unfrequently vomiting; there is severe pain in the back or loins, and in children not uncommonly, more rarely in adults, convulsions. On the third day after the setting in of the above symptoms, usually towards evening, minute red spots, somewhat resembling flea-bites, show themselves on the forehead, the neck, the wrists and arms, the chest and abdomen, and finally on the extremities; this, at least, is the course of the eruption, but it does not reach the lower extremities till at least the fourth day. If the eruption on the parts first mentioned is discovered over night, by morning it is much more distinct, and the spots are much more numerous than they first appeared to be; they are, too, slightly and conically elevated—are, in fact, "papular." From this they continue enlarging. On the third day after their appearance, they evidently contain a little fluid on their summits, which gradually increases in

quantity, giving either a globular form to the spot, or an umbilicated or wheel-like form, the centre of the vesicle or pustule being depressed, tied down, as it were, in the centre. Towards the fifth or sixth day of the eruption this peculiarity of form disappears; the pustules become real pustules; they contain pus or matter. About the seventh or eighth day of the eruption they begin to "crust," that is to break, allowing their contents to escape, and then to harden into a crust or scale. At this period of the disease, that of "maturation" (the eighth day of the eruption, the eleventh of the disease), what is called the secondary fever comes on; the febrile symptoms, which had more or less abated after the eruption appeared, become again aggravated, and continue so for a few days. At length, if the case has progressed favourably, towards the end of the third week from the first showing of the eruption, some of the pustule scabs begin to separate and fall off, leaving either a pit or a stain of a deep red colour.

Such are the most prominent characteristics of small-pox, as they show themselves upon the face to the eyes of an observer. The progress of the eruption on the body generally must be reckoned as twenty-four hours, and even more on the lower limbs, later than on the face. Much of the severity and danger of small-pox depends upon the amount and character of the eruption: whether it is what is called "discrete," that is, each separate spot distinct from another; confluent, when the spots all run into one another, forming one mass of eruption; semi-confluent, a medium between the two former, or the hæmorrhagic, in which the eruption is in a measure suppressed—a very dangerous form of the malady. There is of course every degree of severity. It need scarcely be added, that the regular confluent small-pox is a most dangerous disease. As a general rule, the eruption of small-pox is thickest on the face, and its variety, confluent or not, is generally reckoned from its amount in the above situation. The skin surrounding each pustule is inflamed and swollen; this inflammation and swelling being of course more severe according to the severity of the eruption. In consequence of it, the features are swollen and disfigured, and the eyelids closed. The eyes partake of the inflammation of the skin, and are apt to be much affected, discharge of matter taking place from beneath the eyelids. The nostrils, mouth, and throat are usually more or less affected with small-pox pustules; indeed, one of the most serious dangers apt to arise in the course of small-pox, is the throat affection, and any signs of impeded breathing are always to be most anxiously watched and cared for. Unless the attack of small-pox is extremely modified, as by previous vaccination, the pustules on the face almost all run through their regular course as above described; in many cases, however, they do not do so on the body; but on the eighth day, that is, when those on the face are discharging their contents, those on the trunk and lower limbs begin to "go back," as it is called, or wither up, without the formation or discharge of matter.

When an attack of small-pox comes on with great severity, and when the constitutional powers are, as it were, overwhelmed, a person may sink early in the disease, but more generally the chief danger is about the time of the secondary fever, either from the violence of the poison, which interferes with the maturation of the pustules, or from severe inflammatory complications, especially of the air passages. When modified by previous vaccination, small-pox is, as a rule, an extremely mild disease, the fatal cases not amounting to more than five per cent. of those attacked; while the susceptibility to infection is lessened in proportion to the means employed to protect the system by effectual and repeated vaccination.

In the early stages, small-pox may be confounded with other eruptive diseases, especially with measles and chicken-pox, which in the first stage it somewhat resembles; this mistake, however, can scarcely occur if the distinct characters of the constitutional symptoms of the diseases are kept in view; when the eruption has advanced a little way there can be no confusion.

It need scarcely be said, that an attack of small-pox, of even ordinary severity, is not for unprofessional management. If the disease be prevailing, and if an individual exhibits the symptoms above detailed, small-pox may fairly be suspected.

The appetite, probably, is totally gone from the first; but in such cases, food of the lightest kind only must be taken, and cooling drinks; a couple of drachms of diluted nitric acid or diluted sulphuric acid added to a pint of water, and sweetened with sugar, makes an agreeable drink. Sir Thomas Watson recommends a drachm of chlorate of potash dissolved in a pint of water for a like purpose. Soda or potash water, or the effervescing saline mixture, may be given occasionally; and as it is necessary to keep the bowels lax without purging, some mild aperient, such as the Seidlitz powder or castor oil, must be given if required. But although the bowels should be kept easy throughout the disease, when the eruption is coming out all attempts at purging should be dropped, cooling saline medicines being continued. If the surface is very hot and dry, sponging with tepid water is useful and agreeable. Olive oil or carbolic oil, or, better still, the liniment called carron oil, composed of equal parts of olive oil and lime-water, smeared over the surface with a paint-brush, will generally be found efficacious in allaying irritation, and in relieving the severe itching, especially if combined with one fifth part of sanitas oil. When the secondary fever comes on, it may be requisite both to act more freely on the bowels

by means of the aperients already mentioned, or by senna or Epsom salts, well diluted, or some of the aperient pills; while at the same time the distressing restlessness requires opium, twenty drops of sedative solution, or five-and-twenty of laudanum at bed-time. In some cases, if signs of sinking come on, with weak pulse, tardy eruption, and pustules not filling, all lowering measures are to be avoided, and good broths, wine, or brandy, may be administered, as the case may require. The principles of treatment are, in the onset of the disease, to moderate febrile action, and through it the eruption, by cooling aperients; when the eruption is coming out, to interfere but little beyond keeping the bowels easy, regulating the diet according to the strength; and again, in the stage of secondary fever, to purge moderately.

If much swelling and distress about the throat should result in the course of the disease, leeches ought to be applied, in number proportioned to the age and constitution of the patient. This treatment, employed in a case far distant from medical aid, might save life.

In any case, small-pox is a fearful disease, and should be under medical care when possible; circumstances, however, may occur in which the above directions will prove useful. The disfigurement which is apt to result in consequence of the marks left upon the face by small-pox, is an additional aggravation. Various methods for its prevention have been resorted to. The light, being supposed to exert some influence on the progress of the pustule, is often excluded from the room, and as the eyes are apt to be sensitive, the expedient is good in more ways than one. Opening each separate pustule with the point of a lancet, and touching the interior with a pointed stick of lunar caustic, has been supposed to be of use. The mercurial plaster, or the common mercurial ointment, a plasma made of starch and glycerine, collodion, sulphur ointment, and gutta-percha dissolved in chloroform, have each been spoken favourably of as methods of preventing pock marks, but it is doubtful whether any one of them is unattended with some objection. On the whole, it is better to trust to the ordinary method of inunction with olive oil, or the lime-water liniment, as previously recommended. It is generally some months before the stains of even a mild attack of small-pox disappear. Small-pox is highly contagious, and may even be communicated by the dead body. The attack generally comes on about ten or twelve days after exposure to contagion. As all, perhaps, are aware, until the discovery of vaccination by Jenner, the system of inoculating small-pox, as introduced into this country from Turkey by Lady Wortley Montagu, was generally followed, and certainly was a great boon; it substituted, in almost every case, a mild form of the disease for, to say the least, one of uncertain severity; and, moreover, the disease was imparted to a constitution which had by preparation been placed in a favourable condition for its reception, and for its development in a mild form. To counterbalance, however, these advantages, there was the serious consideration, that, although a case of inoculated small-pox might in itself be a trifling affection, devoid of danger, it was capable of originating the disease in another person in its most virulent form, and thus give rise to an epidemic. This drawback Jenner's discovery removed, and therefore, rightly, vaccination has taken the place of inoculation, and rightly, Government has put it out of the power of foolish people to do mischief, by imposing a heavy penalty upon the practice of inoculation for small-pox.

Small-pox is most fatal in early life. In the unvaccinated condition it is calculated that nearly fifty per cent. of those attacked die; and prior to the discovery of vaccination, one-tenth of the deaths among the population was attributed to this cause. For the history and protective character of vaccination, see article *Vaccination*.

SMELL.—See Nose.

SMOKE NUISANCE and **ABATEMENT.**—The dire effects of the volatile products from coal combustion, whether from private houses, factories, or public works, have long engaged the attention of sanitarians; and reiterated attempts, both legislative and voluntary, culminating in a recent Smoke-abatement Exhibition in London, have been made with the view of reducing to a minimum the vicious influences of the smoke-laden atmosphere of our towns. However much opinions may differ with respect to the origin of the fogs which periodically cast a pall over London and other large centres of population, there can be little doubt that smoke constitutes a main factor in their production, and any feasible method of getting rid of the nuisance, provided it does not interfere with our proverbial proclivities in favour of an open and cheerful fire, cannot fail to be accepted as a boon.

The difficulties in the way of smoke reform are, however, great, since the remedies in best repute strike at the root of our social customs, and would necessitate, on the part of occupiers or owners of property, an entire change in the construction of the ordinary grate, as well as in the nature of the fuel employed. Among the numerous substitutes for smoky fires are comprised the various methods of heating by steam, hot water, coal gas, coke and smokeless coal; but it cannot be said that any one of these, singly or combined, though they might mitigate the evil, would effectually remedy it. Even to give the best of these substitutes a fair trial, it would be necessary to render the method compulsory on the consumer, a condition that no Parliament would ever sanction, and it only remains to consider what may be best done by private enterprise.

For ordinary household purposes, preference has hitherto been given to one or other of the numerous varieties of bituminous coal which by virtue of its elements (hydrogen and other volatile gases) flares up readily when kindled, discharging its sooty products into the already murky atmosphere. On the other hand, it is visibly shown that the variety of coal known by the several names "blind," "hard," "welch," and "anthracite," when used, as is commonly the case, in furnaces for smelting or for generating steam, throws off very little volatile matter, and contains more carbon, the amount usually averaging more than 90 per cent., and attributable to geological changes which the more inflammable coal has not yet undergone. As experience has long since shown the practicability of smoke consumption in the combustion of all kinds of coal, Acts of Parliament have been passed rendering it compulsory, in London and in a few large towns, on owners of furnaces to consume their smoke. This object is best accomplished by such a construction of the furnace and arrangement of the fuel as will insure, in the first instance, a full draught, and next will enable the smoke created to pass from the front of the furnace over the surface of the intensely heated fuel behind, and be consumed in its passage. Of course such an arrangement is impracticable in the ordinary household grate, but an approach to it may be seen in the slow combustion stove, or in a frequent adaptation of the ordinary grate, made by fixing an iron plate over the bottom bars, and igniting the fuel from above, thus causing the smoke generated in the combustion of the lower strata of coal to be burned in its transmission through a layer of red-hot coals superimposed. This arrangement, or a modification of it (which is perhaps best realised in Edwards' slow combustion stove), has many advantages on the score of economy and cleanliness, but it is somewhat difficult to light the fire from above, and in the process of lighting, as well as in renewing, the fuel from time to time, there must necessarily be a considerable discharge of smoke.

The only agents we have ready at hand to make a smokeless fire, are coal-gas, coke, and anthracite. Coal-gas fires have many advocates, and for bed-room purposes are most convenient and cleanly; but they are expensive, and except perhaps for cooking on a large scale, coal-gas can scarcely be expected to take the place of coal. In numerous public places, in halls and waiting-rooms, where there may be a difficulty in getting the heating arrangements kept under control, or where there is a deficiency in the flues, the introduction of close gas-heating stoves has been attended with good results. Besides being smokeless, they have the effect of warming the apartment, and retaining it at a healthy temperature, without imparting any of the deleterious products of gas combustion to the atmosphere. When the supply of fresh air is introduced to the stove by a flue communicating with the outside, and warmed there before its escape into the room, the closed stove becomes an excellent ventilator, not the least of its advantages being that it can be kept so readily under control. George's Gas Calorigen (see *Stoves*) is fitted on this principle, so also is the Euthermic Ventilating Gas Stove, designed by Dr. Bond, the health officer for Gloucestershire, of which a section is depicted in fig. 198. This stove is described as consisting of a cylinder, A, of thin convoluted sheet-iron, within which is fixed a metal cone, B, the upper and broader margin

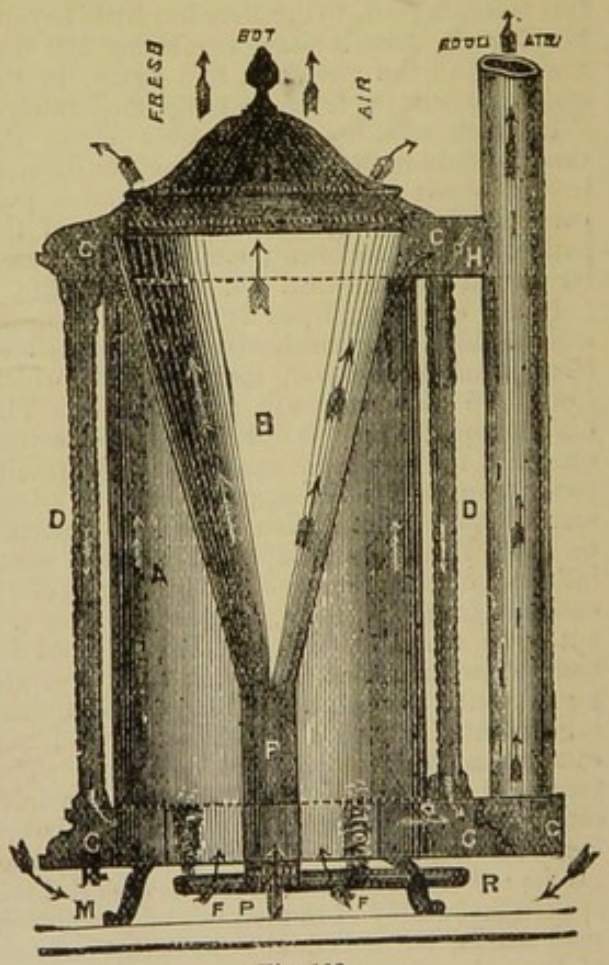


Fig. 198.

of which is attached in an air-tight manner to the upper part of the stove, whilst its lower and smaller aperture is connected by a tube, P, with the outer air. Around the cylinder a series of tubes, D D, in the form of columns, are fixed, the upper ends of which communicate by means of an annular chamber, C, with the space between the cylinder and the cone, and the lower ends open into a similar chamber which surrounds the base of the cylinder. From this chamber an outlet flue proceeds, which is also connected by a branch, near the top of the stove, with the upper annular chamber. In this upper branch tube is a throttle valve, H, by means of which the way through it can be closed. This flue may be carried directly into the outer air, or, which is a pre-

ferable arrangement, into an unused chimney flue, closed at the bottom to prevent reflux into the room. At the base of the lower annular chamber is a gas burner, F, which burns a mixture of air and gas, which is supplied by a pipe, R, connected with a gas supply.

The inlet of the cone may be supplied with fresh air, by connecting it with the outer air by means of a pipe running through the nearest outer wall of the room, or through the floor.

Whether the mass of the population accustomed to bituminous coal will ever be induced to employ, for ordinary household purposes, the smokeless anthracite, is a question which time alone can determine. Certain it is, that it has no lack of advocates, who assert that, by a little care and manipulation, anthracite gives all the cheerfulness, and possesses more heat and staying properties, than bituminous coal; but notwithstanding much said in its favour, cooks and housemaids, to whom most people are under a species of domestic thraldom, rebel stoutly against its employment. Their objections are of course founded on the difficulty of lighting, and to remedy this inconvenience, which is no doubt a serious one, numerous plans have been devised. In Siemens' grate, the smokeless fuel is ignited by means of coal-gas laid on to the fireplace, the flame being extinguished as soon as the combustion is perfected; while numerous grates and fireplaces having the same object, are designed on the principle of the double flue, with the intention

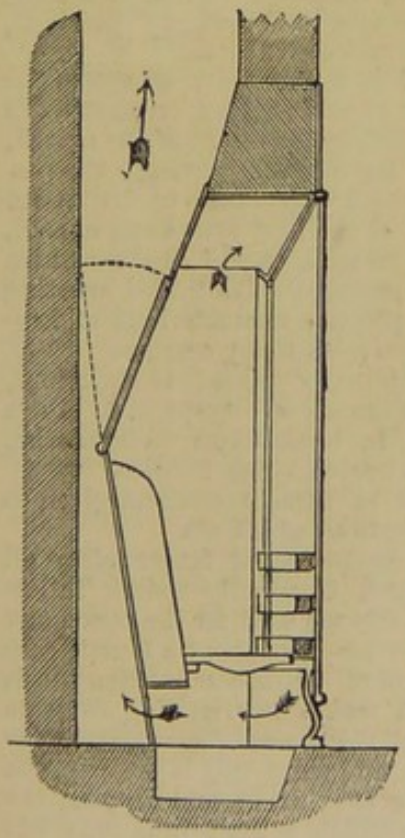


Fig. 199.

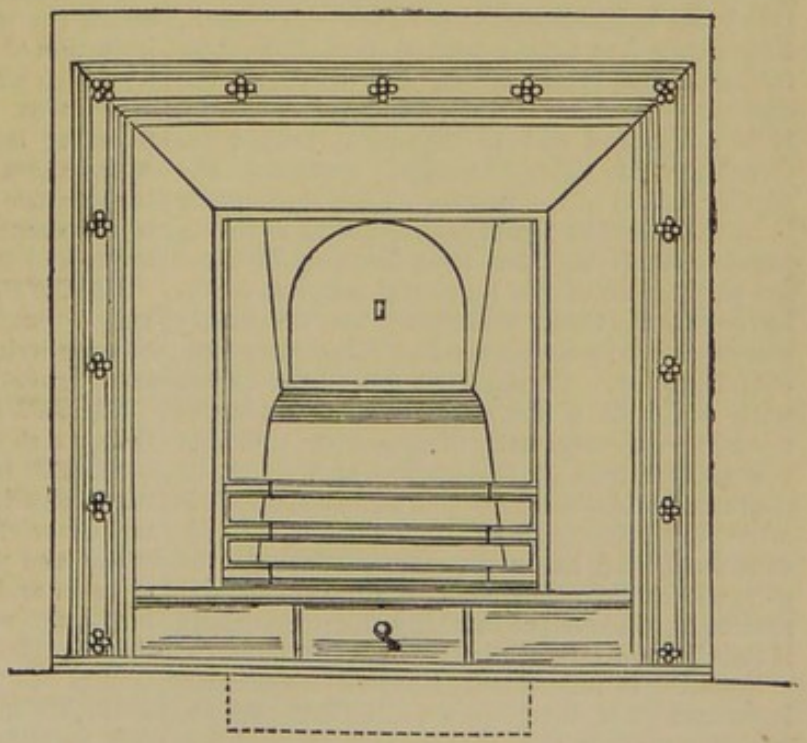


Fig. 200.

of directing the current of air downwards and backwards into the chimney, under and immediately behind the grate, when the lighting is attempted, and upwards in the ordinary way only when the fire is completed. Several grates of this description were exhibited at the late Smoke Abatement Exhibition, the best examples of which were manufactured by Messrs. Smith & Stevens, of Leicester Square, and Crane's patent register stove, shown by the well-known firm of Deane & Co., London Bridge. The advantages claimed for Crane's grate are, that it burns anthracite as easily as ordinary coal, that it gives a vast amount of heat with a reduced consumption of coal, and that the smokeless fuel is easily set light to. As will be seen by reference to the sectional and elevation illustrations (figs. 199, 200), the grate is fitted with a register door in the usual way, and a second opening, communicating with the flue, is made behind the ash-pit under the fire. The space on each side of the fireplace, usually filled up with brickwork, is occupied with side flues, which communicate with the bottom of the grate, and when the register door is closed, as it must be when the fire is being lighted, any products of combustion escaping in an upward direction are carried downwards through the side flues, and tend to increase the action of the flue behind the ash-pit. At the same time, the entrance door to the bottom flue is opened to a greater or less extent, the effect of which

is to create a strong draught through and under the fire from the apartment. This draught it is necessary to maintain until the fire is well lighted, when the ordinary register door can be opened, and the lower opening closed to check the otherwise unnecessary brisk combustion.

It may be considered foreign to the purposes of this work to refer in detail to the subject of smoke abatement, but the injurious effects on the respiratory organs, and on the body generally, from living in a smoke-laden atmosphere, as well as the fatal consequences of the fogs to which London and other great towns are periodically subjected (as shown by a marked increase on these occasions in the Registrar General's returns of mortality), are a sufficient reason why the subject should find a place in these columns.

SMOKING tobacco in moderation is a harmless luxury for most adults, while in some cases it is decidedly beneficial. It acts as a gentle stimulant to the brain, and as a sedative to an irritable and excited nervous system. Experience has amply proved that it enables fatigue to be better borne, and alleviates the distress of hunger. With many persons, also, it is a distinct aid to digestion, and, more especially in elderly people, promotes the regular action of the bowels. Like most other luxuries it can be taken to excess with resulting pernicious effects. The most frequent of these are palpitation of the heart and nervous irritability; and these symptoms are frequently accompanied by flatulence and other symptoms of indigestion. Chronic catarrh of the throat with cough is a common result of excessive smoking, more especially of cigarettes; probably the temperature of the smoke as well as its character contributes to this ailment, which is often very intractable so long as the smoking is continued, and has a depressing effect on the general health. Sleeplessness also occasionally results from excessive smoking, more especially if indulged in late at night.

Smoking is undoubtedly injurious for growing boys and girls, interfering with their growth, exciting unduly the nervous system, and impairing their digestive powers. As a rule, the practice should not be begun until at least eighteen years of age.

A form of cancer on the lower lip, known as "smokers' cancer," is occasionally met with in habitual smokers. It is the result of smoking a hot pipe, and of always keeping the pipe on exactly the same part of the lip. Clay pipes are most frequently the cause of this sore, which should always be removed by operation at an early stage. If this is done it very seldom returns.

SMOTHERING.—See SUFFOCATION.

SNAKE POISON.—When anyone has been bitten by a snake of known or of even doubtful poisonous character, either on the arm or leg, a cord should at once be tied tightly round the limb immediately above the seat of the punctures, which should then be excised with a sharp knife and encouraged to bleed freely. The wound should then be sucked either by the mouth, or by means of a cupping glass. When no more blood can be extracted in this way, the wound should be thoroughly cauterised with a white-hot piece of wire or the blade of a knife heated. The ligature should be retained until the cauterisation is completed. If the bite is on any part of the face or body the ligature cannot be applied, but, otherwise, the same treatment is indicated. The sufferer should be kept as warm as possible, and stimulants administered very freely. Whisky, brandy, wine, and ammonia are all useful, and may be given in quantities considerably larger than could be taken with safety in health.

The symptoms which precede a fatal termination are faintness, vomiting, hurried breathing, and unconsciousness, followed by paralysis, coma, and occasional convulsions.

SNEEZING is a convulsive or spasmodic effort, the result of reflex action, originating in irritation of the lining membrane of the nostril, by which air is forcibly sent through the passage so as to expel any cause of irritation. Sneezing is one of the first symptoms of cold, of influenza, of measles, and of diseases which involve the air-passages. Continued sneezing is a spasmodic affection characteristic of hay-fever, and is often relieved by emetics.

SNUFF, habitually taken, is injurious, and a common cause of dyspepsia. As a counter-irritant, in some forms of headache, snuff proves serviceable.—See *Tobacco.*

SNUFFLES—a name sometimes given to the catarrhal affections of infants.

SOAP is a compound of fat or olive oil with alkali, which is usually soda. Tallow and other cheap fats are used for the commoner soaps, and yellow soap has about a fourth part of resin and palm oil in its composition; it is the resin which makes it irritating to some skins. The best soaps sometimes irritate the skin of the face; and when this is the case, the irritation may be avoided by first dipping the face in water to which a little lime juice has been added. The writer has found Packer's American wood-tar soap admirable in the treatment of eczema, where other applications have failed to relieve. As a non-irritating, simple, cleansing soap, the well-known "Pears" is perhaps the best. For soft soaps potash is used instead of soda, the medicinal soft soap being composed of potash and pure olive oil. Soap of any kind is an antidote in poisoning by the mineral acids, and might be used in the absence of better remedies. Medicated soaps of various kinds are now employed in the treatment of disease, and soap is an ingredient in numerous plasters and liniments.

Refer to—*Castile Soap—Plaster, &c.*

SODA.—This well-known and extensively used alkali is now manufactured almost entirely from common salt, which is a chloride

of sodium (see *Salt*). Soda is best known in the form of its carbonate and bicarbonate; the former being largely used domestically, the latter medicinally, and for some domestic purposes. The carbonate of soda, or, as it is commonly known, "soda," being more irritant, and not so pleasant as the bicarbonate, the latter is generally employed in medicine, its antacid properties being similar to those of potash, but rather weaker. It is usually sold in the form of white powder.

Bicarbonate of soda is largely used for making effervescing mixtures along with citric or tartaric acid, and as an alterative remedy in combination with small doses of rhubarb. Many dyspeptic persons take it habitually, as an antacid. The habitual use of soda internally, even in comparatively small quantity, cannot be too strongly condemned; it undoubtedly exerts a most debilitating effect upon the stomach, and also upon the system at large; many persons injure themselves by its continuous use. The usual dose, as an antacid, is from ten to twenty grains in solution.

Soda-Water, properly so called, is water containing about thirty grains of bicarbonate of soda to the pint, and strongly impregnated with carbonic acid gas; but a good deal is made without the addition of soda at all. When used simply as a drink, this omission is unimportant, but not so when it is required as an antacid. As a drink in febrile diseases, soda-water is often beneficial, and much relished, but should not be given in too great quantities at once, otherwise the gas may cause injurious and uncomfortable distension (see *Effervescing*). The soda-water prepared by manufacturers in syphon bottles (and domestically in gazogenes), is simply water impregnated with carbonic acid gas. As the syphon principle permits of a small or larger quantity of the beverage being drawn off at intervals when required, it is infinitely preferable for the sick room, to the wire corked soda-water bottle, which is always liable to accident.

Milk and soda-water is thus made: "Heat nearly to boiling a tea-cupful of milk, and dissolve in it a tea-spoonful of refined sugar; put it into a large tumbler, and pour over it two-thirds of a bottle of soda-water. This is an excellent mode of taking milk when the stomach is charged with acid, and consequently is apt to feel oppressed by milk alone."

Chlorinated Soda Solution is made by passing chlorine gas through a solution of carbonate of soda. It acts as a disinfectant and deodorant, and in the latter capacity it is used as a lotion for fœtid wounds, and as a gargle for unhealthy sores in the mouth and throat.

Phosphate of Soda, or tasteless salt, is a mild aperient in large, and a diuretic in small doses. It possesses the advantage of having so little taste that it can be given in soup; the dose as an aperient is half an ounce, as a diuretic one drachm.

Sulphate of Soda, or Glauber salt, was for long the most common aperient in use, but has been displaced by Epsom salt, which much resembles it in action; the dose of Glauber salt is from half an ounce to an ounce, dissolved in water. The addition of a few drops of dilute sulphuric acid diminishes the nauseous bitterness.

Hyposulphite of Soda is a preparation often used in parasitic diseases of the skin, it possesses all the virtues of sulphur in this respect without its irritating effects.

There are other preparations of soda admitted into the Pharmacopœia but those named are the more important.

Refer to—*Borax—Rochelle Salt—Salt, Common.*

SOLANUM.—See Dulcamara.

SOLUTION, is a disappearance of a solid body in a liquid menstruum or solvent. The colour of the liquid may be changed, but if perfect solution has taken place its transparency is unaltered. The solubility of bodies, such as salts of various kind, in liquids, varies greatly, generally it is increased by heat, but not always. The minute state of division in which a body exists when in solution, renders this form especially favourable for the development of medicinal action.

SOMNAMBULISM.—See Sleep.

SORE-THROAT.—Quinsy.—Sore-throat is not only a concomitant of other affections, such as scarlet fever, croup, and diphtheria, but is one of the most frequent effects of common cold. Some persons are peculiarly liable to it. One of the simplest forms of throat affection from cold is relaxation of the uvula (see *Palate*). Perhaps on waking in the morning, the sensation of there being something in the throat which requires to be coughed up, is experienced, and along with this, tickling cough, from the uvula irritating the top of the windpipe. The condition is easily discovered by means of a looking-glass, the uvula appearing longer than usual. Frequently the affection passes off in the course of a few hours; if it does not, the use of an astringent gargle (see *Gargle*) will remove it.

Sore-throat may be simply inflammation of the mucous membrane of the throat; there is an uncomfortable feeling of roughness or rawness about the fauces and tonsils, with some pain in swallowing, probably accompanied with constitutional symptoms of cold, shivering, &c. This form of sore-throat may pass away in the course of a day or two without going further, or it may spread by extension into the air-passages, causing cough and catarrhal symptoms. It is this form of the affection which is often quickly relieved by the use of the sal prunelle balls, one or two being allowed gradually to dissolve in the mouth. It is generally best treated as a common cold (see *Cold*), with the addition of hot poultices up the angles of the jaws, and the use of hot gargles of simple warm

water or gruel, or inhaling steam from a jug of hot water, or from one of the numerous inhalers sold for the purpose. This treatment is better than the mustard-plaster and hartshorn and oil, resorted to by some; these, however, may be advantageously used at a later stage. The worst form of sore-throat, apart from what occurs in the course of scarlet fever and diphtheria, is that which is attended with ulceration and sloughing of the tonsils and fauces. This disease is, as a rule, the result of blood poisoning, and requires the most active treatment on the part of the medical man. Tonics, such as the perchloride of iron and quinine, require to be liberally administered, along with port wine and nourishing food, while antiseptic gargles, and the application of caustics and acids to the sloughing parts, are the best topical remedies.

The sore throats of croup and diphtheria are described under the respective articles.

In quinsy, the inflammatory action is usually deeper than in the above-mentioned forms of the disease, and affects the substance of the tonsils and surrounding tissues. It usually ends in the formation of abscess. Quinsy is sometimes a most distressing disease, the swelling caused both by the inflammation and by the matter, preventing the swallowing even of fluids, which, when the attempt is made, instead of passing down, regurgitate into the nose; in bad cases the breathing is impeded, and when this occurs the case must always be regarded seriously. The feeling attendant on quinsy is rather one of extreme distress than of acute pain, except when the attempt to swallow is made, at which time the pain is often greatly complained of as shooting up to the ears. In some cases the swelling extends down the neck, and completely under the jaws, affecting the tongue and the salivary glands. When this occurs, the flow of saliva is generally profuse, and in all cases there is formation of much stringy mucus about the tonsils. The voice is thick and husky, the tongue very much furred, and the breath offensive. Along with these local symptoms of quinsy, there is always more or less fever, and if the disease be long continued, considerable depression from the deprivation of nourishment. The treatment of quinsy in the first instance, is like that of common cold. If the symptoms are severe, and if the person has suffered from the disease previously, from four to six leeches may be placed under the jaws at the commencement of the attack, bran poultices, hot gargles, and steaming being used, with saline aperients combined with guaiacum. Dr. Aitken recommends the following:—Epsom salts, six drachms dissolved in eight ounces of water, to which is to be added a drachm and a half of powder of guaiacum, and two scruples of compound powder of tragacanth. One sixth part of this mixture may be given every four hours till the bowels are freely moved. Tincture of aconite, in doses of five minims, for an adult, repeated every three or four hours, quickly checks sore-throat in its inflammatory stage, and may, if necessary, be given for four or five times in succession, but with care and watching, lest it depress the patient too much. Of course, in the case of the young, though no less valuable, the dose must be proportionally less. A young child might have a quarter of a minim every two or three hours. If the patient can swallow it, medicine in the effervescing form always gives relief, by clearing the mouth and throat; nothing answers better than the common soda effervescing powder, with the addition of six or eight grains of nitre, in full habits; or of a tea-spoonful of nitrous ether in weak constitutions, in each dose. The above measures may be continued until the matter, if it forms, discharges. When this occurs, the distress, which has perhaps been great, disappears at once, and convalescence, generally rapid, commences. The discharged matter, which is usually offensive, may flow out in a perceptible gush, and be spat from the mouth, or it may be unnoticed, and ooze away, passing down the throat. The hot poultices and gargles should be continued to the throat for twelve or eighteen hours after the discharge of the matter, after that time an acid or astringent gargle will generally be most serviceable and grateful, and the poultices may be replaced by flannel, and perhaps by stimulant liniments. At this period, too, it is necessary to support the patient's strength by tonics and stimulants; good nourishment in the shape of beef-tea, eggs, and milk should be given freely, and wine if necessary.

Blisters are sometimes used in quinsy; at the very commencement they *may* be useful—the author prefers the poultice. It has been found that powdered guaiac, given in half-drachm doses every six hours, and even in the more agreeable form of lozenge, at the commencement of quinsy, will frequently cut short the disease.

A person who has suffered from, or is subject to, quinsy, should, after an attack has passed off, use every means of strengthening the throat; by this the attacks may be greatly prevented. Any of the astringent gargles may be used after quinsy, but none perhaps answers better, or is more accessible to the poor, than the decoction of oak-bark. This ought to be used night and morning for some weeks, and when its use is dropped, the person should acquire the habit of gargling the throat with cold water at the above times, *as a regular practice*, and at the same time should, *habitually*, lave freely with cold water, or salt water (at first at least) all around the throat. In this way a tendency to quinsy may be greatly overcome. Further, all unnecessary muffling, either by fur or otherwise, about the neck, should be avoided, for there is no more

fertile source of sore-throat (see *Fur*). Men who are liable to attacks of sore-throat may diminish and even eradicate the tendency by allowing the beard to grow all round. Should the disease owe its origin to frequently recurring enlargement of the tonsils, the erring parts may be snipped off by the surgeon. Doubtless, many cases of simple sore-throat may be well managed domestically; but the contingencies of erysipelatous or croupy sore-throat, or of quinsy, which *may* suffocate, must not be lost sight of. The attendance of a medical man gives the only chance for life in such cases.

Refer to—*Croup—Throat, &c.*

SOUND.—A surgical instrument for exploring cavities within the body.

SOUND.—See DEAFNESS.

SOUND.—See AUSCULTATION.

SOUP.—See BROTH—BEEF, &C.

SPASM is painful contraction of the involuntary muscular fibres, in contradistinction to cramp (see *Cramp*). There is cramp in the legs, spasm in the stomach or bowels, in the latter case constituting colic. Spasm of the stomach, owing to the presence of indigestible substances, is not unfrequent. It is characterised by sudden agonising pain in the region of the stomach, which, like other spasmodic pains, is relieved by pressure; there may be attempts at vomiting, and perhaps eructation of wind. The severity of the pain, in this form of spasm, makes speedy relief important, and for this, the general remedies noticed under *Colic* should be resorted to; in addition, if the presence of irritating matters in the stomach is suspected, an emetic should be given at once; and after it has acted, or in place of it, if it is not given, an antacid, magnesia, or soda, or potash, in combination with a stimulant, sal volatile or brandy, and also opium. Five grains of rhubarb, five of carbonate of soda, a tea-spoonful of sal volatile, and from ten to fifteen or twenty drops of laudanum, will form a dose, which may be repeated after half an hour, or at a longer or shorter interval if requisite. These measures may be followed out, and give great relief, before a medical man can be procured, which he ought to be if the attack does not yield at once, for it is possible that other disorders may be mixed up with it. After the immediate attack has passed away, the digestive functions will require attention.—See *Indigestion.*

Spasm in the bowels has already been considered under article *Colic.* Spasm of the heart is included under *Angina Pectoris.* Spasm of the urinary passages may occur as the result of gravel or urinary irritation. Medicines which relieve spasms are termed anti-spasmodics; but in all cases of spasm, it should be remembered that the application of heat by the hot bath or by hot fomentation is one of the best, and certainly is the safest remedy.

Refer to—*Colic—Cramp—Urine, &c.*

SPASMODIC DISEASES.— See LOCK-JAW—ST. VITUS' DANCE, &C.

SPATHULA (fig. 201) is a blunt flexible knife, used by the apothecary, and in the various medicinal manipulations. It is usually made of iron, but bone spathulas are also used for substances that act chemically on iron. The most convenient size of spathula for a domestic chest is one with the blade about three and a half inches, and the handle three inches in length.



Fig. 201.

SPECIFIC is a term applied to a medicine which is known from experience to cure a particular disease or set of symptoms, the action by which it does so being unexplained. Thus, quinine is specific in ague and other periodic diseases—specific, at least, within certain limits. That is, it is generally successful, though not always so. This applies to other specifics so called.

SPECTACLES.—See VISION.

SPECULUM.—A surgical appliance for conveying light into internal passages with the object of examining visually their condition. The most commonly used are those for the examination of the nose, of the ear, and of the womb.

SPEECH.—Distinctness of speech, or articulation, is so intimately connected with the full command and free movement of the tongue, that indistinctness is often a valuable leading symptom in the investigation of disease, especially of a nervous character. The "thick" articulation of the drunkard is an instance of the affection of the tongue from nervous disorder. The same thing occurs in paralysis and other diseases of the brain; in some cases, the articulation of particular letters and words is interfered with, and others substituted for them. To this affection, which has been proved to be associated with disease of the left posterior convolution of the brain, the term *Aphasia* has been given.

Stammering in the speech cannot be said to be a disease, being rather a functional disorder; this is evident from the fact, that, under certain circumstances, a habitual stammerer does not stammer, and that cases have occurred in which most inveterate stammering has been completely cured—as history tells us in the case of Demosthenes—by the exertion of the will. Moreover, stammering is often caused either by imitation in children, or by nervousness in both children and adults. This nervousness is often the result of debility, and of weak constitution—a fact which should not be lost sight of; for if such be the case, every means of strengthening should be used (see *Childhood, &c*). At the same time, whilst the general health is sustained, much may be done by checking children, and making them speak

at all times slowly. Much pains with children, and much perseverance and self-command in adults, is required in the efforts to overcome the defect in question, but there is the encouragement that it has been effected. When it can be done, a child should be placed under the care of a person experienced in the moral and intellectual training of children thus afflicted. Surgical operations on the tonsils and uvula have been proposed, even by high authorities, and practised largely for the cure of stammering, but it is doubtful whether they are of any practical value. Articulation is sometimes indistinct from the tongue being "tied," that is, too much confined in its motions by its natural bridle or "frænum" (see *Tongue*). When this is discovered in early life it is very easily rectified.—See *Childhood.*

SPERMACETI is a species of concrete oil found in the head of the sperm whale. Its appearance is sufficiently well known. It was formerly used internally, on account of its supposed healing properties; and according to this idea the "spermaceti draught" was a favourite lying-in-room remedy. Spermaceti is now used only as an ingredient in the ointment of that name, and in the preparation of blistering paper.—See *Ointment.*

SPHINCTER MUSCLES are muscles the office of which is to close the apertures round which their fibres run, usually in a circle.

SPICES.—See individual articles *Cinnamon—Pepper, &c.*

SPINACH.—This well-known vegetable is one of the most wholesome we possess, and less liable than most others to disagree. The leaves of either the common beet-root or of the mangel wurzel, when cooked like spinach, form a substitute in some respects even superior to the former vegetable. In some places the leaves of the common chenopodium, or "Good King Henry," are cooked and used as spinach.

SPINE, or Spinal or Vertebral Column, is a chain of twenty-four bones, called the *Vertebræ* (see *Skeleton*), so beautifully contrived and fitted to each other, that while they permit the most extensive motion of the trunk of the body, they at the same time preserve it—in man at least—firm and erect, and guard the spinal cord or marrow (see *Nerves*) against all but the most violent injury. The spinal cord, thus guarded, is enclosed in the spinal canal, which is continued through the vertebral chain, from the head downwards, to and into the "sacrum" bone of the pelvis. The twenty-four vertebræ are divided by anatomists into seven "cervical" or neck vertebræ, twelve "dorsal" or back vertebræ, and five "lumbar" or loin vertebræ; the vertebræ belonging to these divisions being distinguished by marks peculiar to each, while at the same time all the bones have certain characters in common. All the vertebræ, except the single one next the head, have what is called their body (fig. 202 A, B, C—1); on the bodies rests the main weight of the parts above them; they are also extensively subservient to the motions of the spine. The bodies form the inner portion of the spinal column (see *Chest—Skeleton*). Attached to the body, one on each side, are "laminæ," or projections (fig. A, B—2) which serve to enclose the

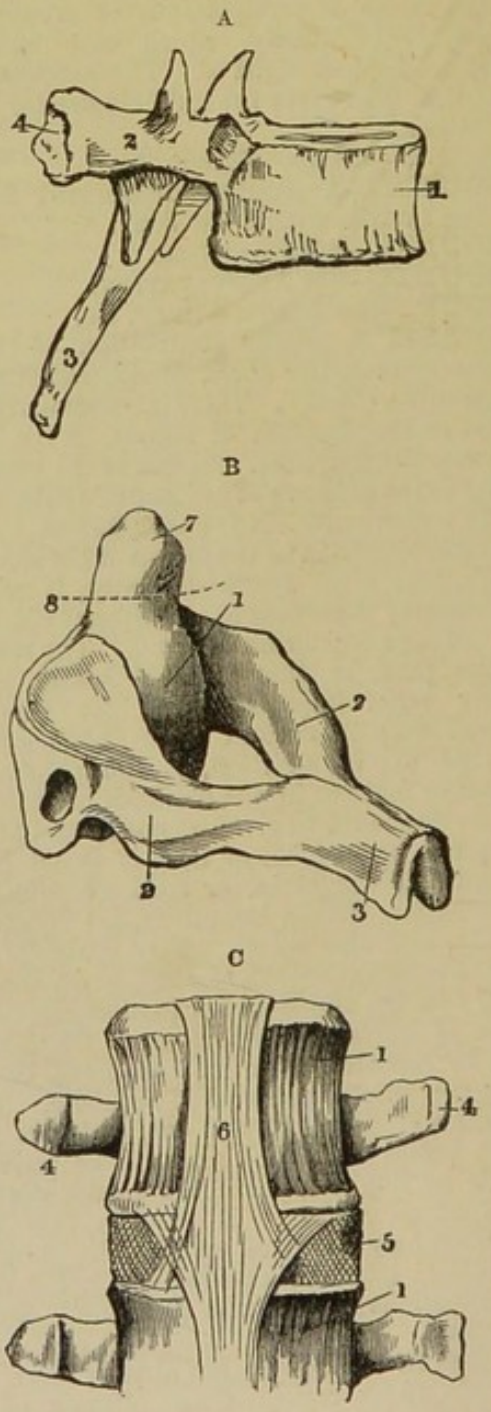


Fig. 202.

canal of the spinal cord; from the junction of these laminæ proceeds what is called the spine or process of the vetrebra (fig. A, B—3). These "spinous processes" projecting backward, give the peculiar character of the spinal column, when examined in a living, and especially a thin person. In addition to the

parts above named, there are what are called the "transverse processes" (fig. B, C—4). These processes are chiefly concerned in affording attachments to the muscles, and in the dorsal vertebræ, in giving firmness and support to the ribs (see *Ribs*). There are various other distinctions common to the vertebræ, which it is unnecessary to enter into here. The bodies of the vertebræ are separated from each other by what are called "inter-vertebral cartilages" (fig. C—5). These cartilages are endowed with remarkable elasticity, yielding with every

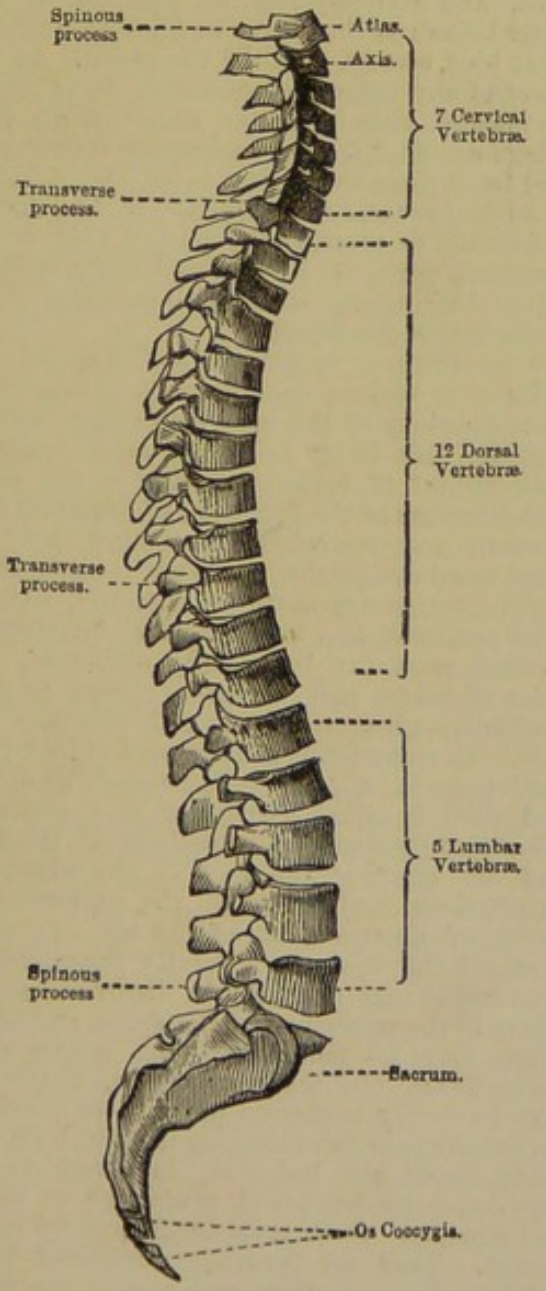


Fig. 203.

motion of the body, and breaking the effect of the shocks, which must have been communicated to the brain with every step, had the spinal column been all bone. Moreover, the variations in thickness of this component of the spinal column, contribute greatly to mould its different curves.

In addition to being fitted to one another in a most beautiful manner, the vertebræ are firmly braced together by a series of ligaments of various kinds, which permit, but yet restrain motion. One of these ligaments is shown (fig. C—6), which runs down the bodies of the vertebræ externally; a similar ligament runs down the interior of the spinal canal, and there are others (see *Ribs*).

The two upper cervical or neck vertebræ, which are more especially concerned in supporting the head, are peculiar. The uppermost one, named the "atlas" from its office (fig. 203), is little more than a ring of bone, with two lateral joint surfaces, on which the head moves in the performance of bowing motions. The second vertebra, called the axis (fig. 202 B), has, in addition to the ordinary body of a vertebra, a tooth-like process or projection (7), which, projecting upwards, rests within the bony ring of the first vertebra, and is kept in position by a strong "transverse" ligament, which, running across from one side of the ring of the first vertebra to the opposite, crosses the tooth-like process of the second vertebra, as at the dotted line. By this arrangement, as a moment's reflection will show, the side to side motion of the head is secured, which, in combination with the bowing motion exercised on the first or atlas vertebra, permits of that perfect capability of movement with which an all-wise Creator has endowed the noblest part of man. Should the above transverse ligament be broken by any chance, or by violence, as sometimes occurs in hanging, the tooth-like process, thus set at liberty, presses backwards upon the spinal cord, and instantaneously extinguishes life. It is the danger of this occurrence which the author adverts to in the article on *Lifting Children*.

The seventh or lowest cervical vertebra is remarkable for being more prominent than the others, and is by this easily recognisable in the living body. The dorsal vertebræ support the ribs; their spinous processes overlap one another like the tiles of a house (see *Ribs*), while the spines of the neck and loin vertebræ project outwards. The "lumbar" or loin vertebræ are the strongest in the body; the lowest of them rests upon the sacrum bone (see *Pelvis*); and, indeed, this bone is evidently a series of vertebræ consolidated to fulfil the functions of their position.

The spinal column, constructed as above described, is not straight, but has various natural curves; the principal of these is one outwards, which increases the capacity of the chest, and one inwards at the small of the back, which assists in maintaining the equilibrium of the body, and also in supporting the contents of the abdomen (see *Chest*). The canal which runs through the entire spine is continuous with the cavity of the skull by the opening in the base of the head (see *Skull*), and the membranes and nerve substance of the

spinal cord are, through the above opening, continuous with the brain and its membranes (see *Nervous System*). The equilibrium of the spine, and therefore of the body generally, and the motions of the trunk, are effected by means of the various muscles attached in a longitudinal direction, chiefly to the posterior portions of the vertebræ.

Diseases and Injuries of the Spine.—*Malformation.*—The spine is liable to be the seat of a peculiar malformation at birth. This consists in the deficiency of the posterior portions of a certain number of the vertebræ, generally those of the loins, by which the membranes lining the interior of the spinal canal are left uncovered, except by the skin, both membranes and skin being distended into a livid-looking semi-transparent bag containing fluid. This peculiar malformation, to which the name "spina bifida" is given, generally ends fatally, but not so invariably as to justify the child being left to its fate without an attempt to save it. Surgeons have sometimes sought to relieve the complaint by cautious evacuations of the fluid in the tumour, and natural cure has occurred in consequence of the fluid being allowed to escape through an ulcerated opening; but the majority of medical men prefer to use only simple pressure of the tumour by means of a hollow pad and elastic bandage, or by a concave shield of pliable metal, which ought to be well padded, and every precaution taken to avoid irritation of the tender skin.

Concussion of the Spinal Cord is not unfrequent, as a consequence of heavy falls on the feet, especially on the heels, or of direct blows on the back. The usual symptoms are depression of the system, with loss of sensation and power of motion of the lower portions of the body, which either passes off in the course of a few days, or remains permanently, perhaps passing into disease. Occasionally, very acute pain in the lower limbs comes on. In cases of concussion of the spinal cord, the power of evacuating the urine is sometimes lost, in which case the use of the catheter will have to be resorted to by the surgeon, whose speedy presence is requisite in every case of the accident in question. The best thing that can be done until aid is procured, is to place the patient as carefully as possible in the most easy position, and to keep him perfectly quiet. Any symptoms of inflammation following such an injury will require the usual treatment of leeches, fomentations, poultices, &c., the bowels being acted on by purgatives given by the mouth or by injection. In patients confined to bed after injuries of the spine, bed-sores are particularly to be guarded against; moreover, if sensation be much impaired, and *the case be neglected*, a sore may make considerable progress before it is discovered (see *Bed-sore*). Even if a case of injury of the spine does well, it is apt to be tedious, and the lost powers are very slowly regained. Gentle friction of the body, the hand being moistened with a little warm olive oil, will often relieve any tendency to constipation of the bowels; while warm saline bathing, the douche, and gentle exercise of the limbs, are most beneficial remedies. Displacement of vertebræ can rarely take place without extreme violence, and, even then, fracture generally accompanies the accident, except in the case of the upper vertebræ of the neck, alluded to in the last article. Displacement is accompanied to a greater or less extent by injury to the spinal cord, and consequently by paralysis of the parts below: if the injury be high up, instant, or at least speedy, death is the result. In the event of any individual surviving, for a longer or shorter time, such an accident, all that others can do, till proper assistance is procured, will be to place the person in an easy posture, to administer stimuli with due caution, and to endeavour to preserve the proper heat of the paralysed parts, by friction and warm applications, bearing in mind the cautions given under article *Paralysis*.

Irritation of the Spine.—The spinal cord is liable to various diseases, such as inflammation, apoplexy of the cord, hardening, softening, &c., the latter being not an unfrequent concomitant of epilepsy. Pain in the part, and disorders of the functions of sensation and motion, and convulsive twitching, are the most usual symptoms. It is not possible that, beyond temporary soothing measures, such as bran poultices, &c., unprofessional interference in such cases can be usefully employed. In cases of severe pain, however, opiates may be cautiously given till a medical man sees the case. In some forms of fever, and of lock-jaw, the spine is affected. Functional disorder, and what is called "irritation of the spine," are extremely common, especially in females, and are often at the root of the obstinate palpitations, and many of the nervous and hysterical derangements of the sex. In such cases, if the back be carefully examined, a tender spot may generally be discovered somewhere in the upper part of the spine, and often there may be more than one tender spot lower down. In these situations, the spine may be simply tender on pressure, or pressure may cause pain to radiate, as it were, from the point round the body, or, in severe cases, may bring on hysterical symptoms at once, and fainting. Such cases are frequently overlooked. They are generally connected with debility of constitution, and require the well-directed treatment of a medical attendant. The use of the tepid or cold douche down the spine, followed by friction with a rough towel or flesh-brush, does much to relieve in such cases, often more than counter-irritation. The general health requires attention, and, generally, tonics, quinine and iron, are called for. Exercise must be regular, but not carried to

fatigue, which is injurious. In severe cases, repeated *small* blisters applied over the spot are frequently serviceable.

Curvature of the Spine is far from being uncommon; it is of three varieties,—the angular curvature, lateral curvature, and curvature backwards. The first of these, angular curvature, or, to speak more correctly, angular deformity, is caused by disease (caries) of the bodies of some of the vertebræ themselves, which, permitting the bone to yield under the weight of the body, causes angular distortion at the seat of the affection. This disease, being sometimes at first accompanied with little pain, may be overlooked. It usually occurs in children, and in young people of delicate, and especially of scrofulous, constitution, and almost always follows an injury. Matter forms in connexion with the diseased bone, and, gravitating downwards, shows itself as abscess lower down, perhaps in the loins or groin. The first symptoms of this disease may be the child wincing or crying out from sudden pain in some movement of the spine. At the same time, a tender spot may be found in the back, and it will usually be discovered that an injury of some kind has been received here, often a blow, perhaps a strain; in other cases, the signs of the commencing disease are most obscure. The child is noticed to be stiff in its movements, to reach to the floor by resting one hand on the knee, or to walk in this position, or to bow for support upon the articles of furniture. In other cases, pain or uneasiness is complained of at a point far away from the disease; thus, sometimes, pain is felt in the chest, or in the stomach, or the child or even adult experiences a fulness after eating, or has a cough, with difficulty in breathing. All these symptoms disappear when the person affected is laid flat on the back, and by this the disease may be known. At other times, the child complains of pain in some part of the head or face, and at the same time of "stiff neck." Such complaints as the above, when persistent, should never be overlooked, for if the disease be taken in time, and strict rest enjoined, the hump-backs and other distressing results may be prevented, and the probability of the formation of abscesses and subsequent exhaustion lessened.

In the treatment much may be done by any intelligent person. Rest to the diseased part is the only method of doing good, and this is fortunately easily employed. It is necessary only to have a hard and even bed, to lay the child perfectly flat upon this, with a soft pillow, just large enough to fill up the hollow of the neck. In such a position the child should lie all day, as well as at night, if the case be severe. If the neck be the part affected, sandbags should be placed round the head to keep it immovable. It will not be found easy to keep any one, especially a child, in such a position; but as perhaps life depends upon its maintenance, means must be found for accomplishing it. In each particular case it will not be difficult to devise some plan, either by the use of splints or a broad band of cotton across the body, or by some other means to keep the child quiet.

Of late, a plaster of Paris jacket has been applied to the body by Professor Sayre of New York, to give support to the diseased spine. In applying this, a thin jersey is first put on the child, which must fit closely without wrinkle. Underneath this, over the belly, is placed a folded handkerchief, to allow of the enlargement of the stomach after a meal. Next, the child, if small, is held up under the arms, and bandages three inches wide, made of "crinoline" muslin, into which plaster of Paris has been rubbed dry, are, after being soaked in water for a short time, applied first round the hips, and then gradually upwards round the body. After about three layers have been applied, the child is laid down till the jacket is dry. Usually, immediate relief is thus afforded, and the patient may be allowed to walk about, at least part of the day. These jackets may be worn for three months. In older children and in adults, an apparatus is constructed for raising them from the ground during the application of the jacket.

Lateral curvature is not, like the above, the result of disease, but is the *mechanical* effect of repeated and continual malposition of the body. It is the form of spinal curvature from which nurse-girls who are put at too early an age to carry heavy children frequently suffer; it is also the affection met with among the pupils of injudiciously conducted female schools, where, from long standing, the habit of resting on one leg is engendered. It of course is most liable to occur in weakly subjects, but may take place in any young person who is compelled habitually to maintain the body, even without additional weight, in one position for any length of time (see *Education—School*), and, especially, if compelled to support a weight on, or to make undue exertion with, any one side of the body. The first thing, generally, which attracts attention in this form of curvature, is the appearance of the shoulder, which assumes the prominence popularly known as "growing out;" that is, it evidences the displacement from its symmetrical position, which it, in common with the ribs, experiences from the curvature of the spine. If the incipient curvature be neglected, as a matter of necessity, for the support of the head in an upright posture, a second curvature takes place in a direction opposite to the first, giving the spine the curves laterally in the form indicated (fig. 204), and distorting the body as represented. The causes of the above common deformity which have been pointed out, naturally indicate that the first step towards cure must be the removal of the producing cause. If a weight has been carried, if exertion made, if injudicious school

management, such as too long continued sitting or standing upright, has occasioned the deformity, it must be put a stop to at once. Such a course, with general tonic measures, rest of the body for a considerable portion of the day, equal exercise of the muscles connected with the upper extremities, and cold or tepid salt douche, with regular general exercise, will probably remove the tendency to curvature in incipient cases. The form of exercise most recommended is that of raising the body from the ground by the arms. For this purpose, a trapeze or horizontal bar trapeze is erected in the nursery,

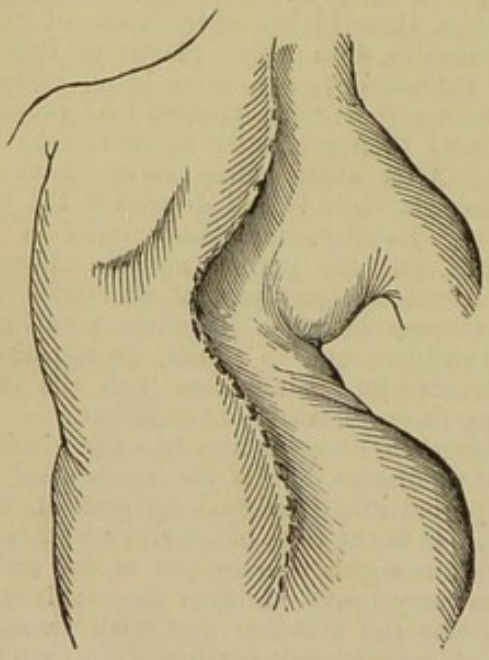


Fig. 204.

and daily practice enjoined. A trapeze is easily arranged, by suspending the side ropes from two hooks screwed into the top beam of the doorway, so that it may be removed at pleasure.

In this deformity also, Sayre's jackets are most useful. If any one will lift a child affected with lateral curvature by the arm-pits, or watch the spine as the child hangs on to the top of the door, he will see it perceptibly straighten. In this position a jacket is applied, with the immediate result of increasing the height by half an inch to one inch. Together with this appliance, the exercise is essential. Other mechanical appliances are made for the cure of this deformity, all more or less complicated, and not to be attempted without advice.

The curvature of the spine from before backwards occurs in weakly children, and constitutes the "stoop," or round-shoulder of the young. It is usually connected with general debility of constitution, which requires to be corrected by the ordinary means, the local deformity being relieved by the horizontal posture, by the moderate use of a "back-board" when the patient is of sufficient age, and by the douche, friction, &c.

Refer to—*Education—Gymnastics—Position—School.*

SPIRITS.—See Stimulants—Brandy—Gin, &c.

SPIRITS, LOW.—See Hypochondriasis—Indigestion.

SPITTING OF BLOOD.—See Hæmorrhage—Lungs, &c.

SPLEEN, or Milt, is a body of variable size, which is situated in the left hypochondriac region (see *Abdomen*). It is somewhat of a spongy texture, and is capable of containing blood so largely, that its office in the economy, which even now is not yet clearly made out, has been supposed to be that of a blood reservoir. Disease of the spleen, especially enlargement, to which the organ is prone, is attended with an enormous increase in the number of white corpuscles of the blood, and a consequent loss of colour in the skin. The spleen is liable to become greatly enlarged in cases of continued ague (see *Ague*).

SPLINT.—See Fractures.

SPONGE.—This well-known production of the animal kingdom is chiefly brought from Turkey and the Levant. The great uses of sponge in medical, and especially surgical matters, need not be dwelt on here; suffice it to remark, that sponges selected for such purposes should be free from the gritty particles which are often present in considerable quantity in inferior sponges. Burnt sponge was formerly the best remedy in cases of "bronchocele;" it is now known that its power of removing that disease depended on the presence of iodine.—See *Iodine—Bronchocele, &c.*

SPONGIO PILINE.—See Poultice.

SPORADIC DISEASES. — Diseases which show themselves in individual cases, in contradistinction to epidemic and contagious diseases.

SPRAIN, or Strain.—This painful injury is the result of forcible overstretching of the ligaments (see *Ligaments*) of a joint. In their natural state, the ligaments are but slightly sensitive, but when overstretched they are acutely so. There are few, perhaps, who have not, in a greater or less degree, experienced the sickening pain of a sprained wrist or ankle, the two joints which are most frequently the seat of the injury; their liability arising from their immobility, compared with such a joint as the shoulder, which is more liable to dislocation. A sprain is attended with pain, which, perhaps, causes faintness or vomiting; when this passes off, it is found that the joint cannot be employed as usual, every attempt renewing the suffering; shortly, swelling comes on, followed by the heat and pain of inflammation. An injury of this kind, it need hardly be said, should not be slighted; for should it be so, in some constitutions it may lay the foundation of irremediable disease. Few, perhaps, have

either the power or the will to neglect a strain at first; but very many are inclined to rebel against the rest and confinement necessary for its perfect cure, which ought to be effected before the joint is brought into active use. When a sprain has occurred, complete rest is the first necessity, accompanied by the soothing influences of fomentation and poultice, *well and thoroughly made use of*, from the very first; the early employment of the remedies doing much to alleviate the suffering. When, in the course of a few hours, inflammatory signs appear, six, eight, or ten leeches may be applied around the joint with advantage; and if the patient is of at all full habit, a few doses of purgative medicine should be given. To allay the pain, six or eight grains of Dover's powder, with a couple of grains of calomel, may be given at night, and followed in the morning by a Seidlitz powder, or some other purgative. After the joint has been soothed for some days by rest, with poultices, and fomentations, it will be advisable to change these applications for a bandage, which is to be kept wet with tepid water *lightly applied* to the injured part, which, if agreeable to the feelings of the patient, may be enveloped in some warm material. In such injuries, regulation of the temperature, the employment of heat or cold in the treatment, is always best ruled by the feelings of the patient. In some few cases, even from the beginning, cold lotions such as the lead or the spirit lotion, &c., are found most soothing, and then it is right to use them, at least as long as they prove agreeable; but more frequently warmth, with moisture, is preferred and preferable. The bandage, at first applied lightly, may gradually be used to exert more pressure, and to give more support, and the tepid applications may be exchanged for cold ones. As soon as it can be borne, friction night and morning, with the soap liniment, or soap and opium liniment, will be found agreeable and serviceable. Lastly, instead of the morning rubbing, the cold-water douche—the pump—is a common and very good form which may be used to give strength and tone. For the latter purpose, salt water or sea water is perhaps preferable to fresh: whatever is employed, it ought to be continued till the joint aches slightly, the after reaction being promoted by rubbing well with a towel. Should the swelling be long in subsiding, the application of a tight, and preferably an elastic bandage will hasten it. The tincture of iodine may also be applied with benefit, or a blister may be used. Should it be essential for the person to move about, the use of an elastic bandage, such as a knee-cap or anklet, will be found to relieve the aching pain, and to support the joint. It is repeated, too great caution cannot be used in bringing a joint which has been sprained into use, and especially if the subject of the accident is at all of a scrofulous habit. Although the treatment of a sprain is perhaps neither difficult nor complicated, the discrimination of the accident in the first instance is sometimes by no means easy even to a surgeon; for when much swelling has supervened, and when every slight movement is torture to a patient, there is much difficulty in coming to a decision respecting the exact nature of the injury, and in deciding whether or not the sprain is complicated with more or less fracture or displacement. On this account it is desirable that these accidents should be early examined by a medical man; for it is too late, after weeks of poulticing, and bandaging, and rubbing, to find out that the so-called sprain is a fracture or dislocation. The swelling of a sprain is sometimes colourless, but more generally it is coloured from the effusion of blood under the skin; as this is gradually absorbed in the process of cure, the variation from "black and blue" to greenish and to yellow, &c., takes place.

SPRUCE-BEER is a drink made from molasses or sugar fermented in water, and qualified by the extract from the spruce-fir; the saccharine, in fact, answering to the malt, and the spruce extract to the hop of common beer. Spruce-beer, when brisk in bottle, is not unpleasant, and is highly esteemed among some of the northern nations as a preventive of scurvy and other diseases. It probably owes any active properties to the presence of turpentine.

SQUILL.—This drug is the produce of the *Scilla* or *Squilla maritima*, the bulb, which weighs generally from one to three or four pounds, being the part used. It is chiefly brought from the shores of the Mediterranean.

Squill is met with in the shops in the form of yellowish-white, semi-transparent pieces, made by slicing the bulb, and then drying the slices. While perfectly dry, squill should be brittle; but from the readiness with which it attracts moisture, it is very often met with not quite dry and rather tough.

Squill is popularly known and used as an expectorant medicine, and when properly employed it is invaluable; too often it is improperly given, and does mischief. It also acts as a diuretic, and may cause sickness or purging, in large doses. As an expectorant, squill is irritant and stimulant; it is therefore inadmissible when anything like inflammatory action or active irritation is going on in the bronchi or air-passages; in such cases, it aggravates cough, instead of relieving. As an expectorant, squill is most serviceable in cases of chronic bronchitis, especially in the aged, but indeed in all cases when the phlegm or mucus is tough, viscid, and separates with difficulty from the air-passages, causing long and severe paroxysms of cough before it can be expelled. Squill is most advantageously combined with ipecacuanha and opium; the latter drug does not seem to impair its expectorant properties, whilst it modifies its tendency to irritate. From one to two drachms of pare-

goric, with twenty drops of tincture of squills in a wine-glassful of water, form a most excellent cough draught for night use; to which, if there is much debility, may be added one drachm of sal volatile. For diuretic purposes, squill is most generally given in powder, in from one to three grain doses, and usually in combination with mercury or digitalis. It is not adapted for domestic use with this view.

Squill vinegar is a frequently used preparation, made by macerating two and a half ounces of sliced squill root in a pint of distilled vinegar for a week. After straining and squeezing, an ounce and a half of proof spirit is added to ensure keeping, and the whole is filtered. Mixed with twice its quantity of honey, it forms the oxymel of squill, a favourite remedy for coughs, taken in doses of a tea-spoonful at a time. The syrup of squills is made by dissolving two and a half pounds of refined sugar in a pint of squill-vinegar by the aid of gentle heat. Its dose is from one to two drachms. Squill in powder is better purchased ready prepared; it requires to be very carefully secured in a well-stoppered bottle, and to be kept in a dry place, otherwise it quickly becomes useless from damp. The compound squill pill is often used, but in many cases irritates and increases cough instead of relieving. The author has found the expectorant pill, for which a prescription is given under article *Pill*, much more generally useful. In dropsy of the abdomen, a liniment composed of two parts of soap liniment, and one part of tincture of squills, rubbed into the skin to the extent of two drachms, twice or thrice in the twenty-four hours, is said to be serviceable.

Refer to—*Expectorants.*

SQUINT.—In the common form the eye is turned inward, both sometimes being affected. The affection usually begins between the second and sixth year. The cause lies in the fact, that the eye is too short for the lens, so that the rays of light are brought to a focus behind the retina, thus rendering the image of a near object blurred. In order to clear the sight, the lens, by the power of a muscle situated within the globe, is rendered more convex and so the rays are focussed more forward on to the retina. When this power is exerted, the eyes are at the same time turned inwards. So that if a child be watched when examining anything intently, both eyes will be seen to converge. Next, from constantly employing the eyes, they are always turned inwards, and then the child finds that it manages easier by using one eye only, the other becoming permanently turned inward, so that the child uses but one eye. This can be proved by holding the hand before the "working" eye, when the squinting eye will move outwards to fix any chosen object, while the good or working eye will be found to squint.

The remedy first consists, when the child is young, in employing spectacles to correct the faulty vision; these should have convex lenses. After the use of these for some time, the muscles may regain power, and the glasses be used for close work or reading only. If the squint be permanent, the only way of curing the deformity is by dividing some of the muscles which move the globe. This operation requires great skill, and before the cure is complete has usually to be repeated once or twice.

There are other forms of squint, in which one eye is turned outwards or upwards, or in some other direction. This may arise in childhood, from convulsions during teething and from other causes, and in the adult from paralysis of the nerve supplying the muscles. In children, also, any form of squint may indicate the existence of grave disease of the brain; at the same time, however, there will be other symptoms present.—See *Eye—Vision.*

STAB.—See Wounds.

STAMMERING.—See Speech.

STARCH.—See Fecula.

STARVATION — deprivation of food, either total or partial. Under article *Food*, it has been pointed out that nourishment has, or ought to have, reference in its composition to two distinct ends—the nourishment of the bodily tissues, and the maintenance of animal temperature; moreover, in the above and other articles, *Debility &c.*, it has been shown that to the latter, the support of the heat of the body, all other considerations must give way, for *that* fuel must be found, and if it be not furnished by periodical supplies of food, it will be taken from the component tissues of the body as long as these are capable of affording it. Every inspiration of the starving man, imparts to his blood the oxygen which is to be hurried to the consumption of his wasted and momentarily wasting tissues, every expiration gives out the carbonic acid and vapour, the smoke of the furnace within, which, like a steamer at sea run short of coal, is forced to consume its internal framework, in the effort to carry the hull to the haven of safety. The animal temperature must be maintained, or the person dies; hour by hour, tissue after tissue is used up for this end (see *Animal Heat, &c.*), and hour by hour the slow wasting of starvation goes on, till either relief comes in the shape of nourishment, or till the last available tissues have been exhausted, and the person dies, chiefly of cold. The fat, in the above process, goes first—its oxygen and hydrogen furnish the readiest fuel, the most easily burned material; the muscles next yield, and become soft and wasted; the nervous system falls before the pressure of necessity, and with it mental power; delirium ensues, and the vital power of resisting the ordinary processes of decay is lost.

A little consideration of the above will show that the process of starvation must be modified by various contingent circumstances, more particularly the condition of the body as

regards fat, &c. This internal supply of fuel, so to speak—were the simple chemical changes incurred in maintaining heat only to be considered—would make the fattest man the best resistant to, and longest liver under, circumstances of starvation. This, however, will scarcely hold good; for there seems to be a power of endurance in the constitution—in the nervous system—of some, apparently a less susceptibility in the tissues to give way, that enables them to withstand a greater extent of privation than those who, according to the chemical theory alone, ought to last the longest. Again, external temperature influences greatly the effects of privation of food upon man. As shown under *Cold* and other articles, a man exposed to low temperature requires food, not only more abundantly, but of a more nutrient character, to preserve him in health, than an individual surrounded by and breathing a warm atmosphere: it follows, therefore, that a man exposed to cold, breathing a cold air, and especially if ill-clad, will be much more quickly starved to death than under the reverse circumstances. The above observations, especially if taken in connexion with the articles referred to, must make it clear that starvation is, in fact, the chemical union of the component particles of the tissues of the animal body, with the oxygen of the atmosphere carried through that body by the blood, and that the process is accelerated by whatever increases the amount of oxygen taken in by the lungs, whether it be cold, which gives a greater amount of oxygen in a given volume of the atmosphere, or exercise, which increases the rapidity of the respiratory process, and at the same time the oxidation of the tissues involved in the creation of force and performance of motion.—See *Motion and Motor Change.*

Happily, cases of starvation, from actual inability to procure food, are not frequent in this country; but medical men often witness an approach to a state of starvation in the progress of diseases, of fever especially, when patients lie for a great length of time without taking food. In such cases it occurs, that at last the patient is actually in danger of perishing from starvation, or rather from cold; the animal temperature begins to sink in consequence of the fuel tissues of the frame being all used up. Much, indeed, may be done to ward off this condition by the employment of strong broths and of gelatinous materials, which, by entering the blood, furnish materials for heating, and so protect the tissues; but, after a certain point, these are insufficient, and nothing but alcohol will do; nothing but spirit, with its readily combustible carbon and hydrogen, will give a chance of life to "him who is ready to perish" from the starvation of disease.

Starvation has to be viewed as it takes place under total deprivation of food, and as it occurs under an inadequate supply. In the first of these, Dr. Taylor says "there is pain at the stomach, relieved by pressure, the countenance is pale and cadaverous, the eyes wild and glistening, the breath hot, the mouth parched and dry, and the strength prostrated. After a time the body exhales a fœtid odour, the mucous membranes at the outlets inflame, and life closes in delirium or convulsions."

In that gradual starvation produced by deficiency of food, the symptoms seem to be chiefly referable to depression of the nervous system, both the ordinary sensations and mental powers being in some respects blunted, although at the same time nervous irritability is present, and perhaps mental disorder. Dr. B. Holland, who has written on the subject, thus describes the condition resulting from continued deficiency of food: "The state is indicated by a sallow and dingy appearance of the skin, a soft and flabby feeling of the flesh, more or less emaciation, general debility, feebleness of the circulation, and swelling of the ankles. The stomach becomes disordered, the appetite defective, the digestion impaired. The individual feels languid and desponding, is soon fatigued, incapable of exertion, and has an irresistible disposition to fall asleep, from which he is apt to wake suddenly and in a fright. The body is easily chilled, breathlessness and palpitation are experienced after slight exertion, attacks of giddiness, noise in the ears, and transient blindness, are common, and there is a peculiar forlorn and dejected aspect of countenance which is very characteristic." The above symptoms in a severe form occur in those who are so unfortunately placed as actually to want bread; in a minor form they are met with in those who for some reason accustom themselves to take too little nourishment, either as regards quantity or quality.

When total deprivation of food has extended even to twenty-four hours—when partial deprivation has gone so far as to produce pain at the stomach, and marked debility—return to a proper supply of nourishing food must be very gradual; the stomach and its sources of nervous stimulation partake of the general depression, and are no more fit for much exertion than the rest of the body; consequently, food must be given in small quantity, and in such a form as will most easily enter the circulation, such as broths along with a small proportion of alcoholic stimulant, very carefully given, and warmed. When partial starvation or continued deficiency of food has been in operation for some time, it lays the individual open to the attacks of epidemic and endemic disease, and, indeed, seems to be the exciting cause of disease, as observed in the "Irish fever" which followed the famine. This condition is apparently induced by the retention in the system of the effete materials of assimilation, and accounts for the tendency to putrefaction which is apt to supervene in the body even prior to death.

STAYS.—See EDUCATION.

STEAM. — See HEAT — INHALATION — POULTICE, &c.

STEEL.—See IRON.

STERNUM, the breast-bone, to which the collar-bone and ribs are attached anteriorly (see *Chest, Ribs, &c.*). It consists of three separate pieces.

STERTOR, or STERTOROUS BREATHING, is very similar to snoring. It occurs in apoplexy, and on the approach of death from other diseases.

STETHOSCOPE.—See AUSCULTATION.

STEWING, which is the slow cooking of food by heat which does not reach the boiling point, renders meat peculiarly digestible; and, moreover, as the juice of the meat, or gravy, is most usually eaten with the meat, the whole nutriment is preserved. Stewing may, of course, be rendered injurious to some invalids by the addition of much fatty matter, or by that of vegetables.

STICKING PLASTER, also called ADHESIVE or DIACHYLON PLASTER. — See DRESSING—PLASTER, &c.

STIFF JOINT.—See ANCHYLOSIS.

STILL-BORN.—See CHILD-BED.

STIMULANTS, ALCOHOLIC.—Alcoholic stimulants are classed as Fermented and Distilled. The principal fermented liquors in use in this country are grape wines, domestic or home-made wines, liquors from the fermented juice of the apple or pear, cider and perry; and malt liquors from various grains, principally barley. To these might be added many more made and used among different nations according to the materials within their reach. Distilled liquors are not less numerous than the fermented; for man in every quarter of the globe has taxed his ingenuity, and generally with success, to find the means for their manufacture. The distilled liquors most commonly in use in Britain are brandy, whisky, gin, and rum, or preparations from these; but, like the fermented liquors, many other alcoholic products of distillation are used in different countries, according as their natural products offer facilities for their formation. Distilled liquors contain a much larger proportion of alcohol than those which are simply fermented; indeed, alcohol and water make up their constitution, the peculiar flavour of each depending chiefly on the essential oils, or ethers, derived from the materials from which they are distilled. As the special characters of the various alcoholic liquors in use are entered into under their separate articles, the following observations are directed to the action of alcoholic stimulants, *generally*, upon man, and to their employment by him—their "use and abuse." Pure alcohol itself (see *Alcohol*) is ranked among the narcotico-acrid poisons. If a large quantity of strong spirit, or of alcohol, be quickly taken into the stomach, it may cause immediate death; indeed, many deaths from this cause are on record, and are frequently noticed in the public prints, as the result of foolish attempts to drink a large amount of strong liquor in a given time. If, in such cases, death does not immediately ensue, total insensibility generally supervenes, lasting for a longer or shorter time, either terminating in recovery, or passing into apoplectic stupor. In these cases of poisoning, the alcohol undoubtedly acts in the first instance by giving a shock to the nervous system through the stomach, similar to that which is produced by a blow on the pit of the stomach, or by a draught of cold water taken by a person in a state of heat and exhaustion. And, secondly, it acts upon the system generally, and especially upon the brain, in consequence of its absorption into the circulation. When this absorption occurs, it produces the phenomena observed in aggravated intoxication. To the article *Intoxication* the reader is referred for further information. There can be no question that in the form above stated, of concentrated or of pure alcohol, this agent acts as a poison; but to deduce from this, as is frequently done, the assumption, that under all forms, and in any dilutions or combinations, alcohol is a poison, is so illogical that it scarce deserves refutation.

Stimulants in Moderation.—The effect of a moderate quantity of diluted spirit, or of wine or malt liquor, is very different from that of poisonous irritant doses of alcohol, as different as the scorching flame is from gentle heat. When a moderate quantity of diluted alcoholic fluid, such as wine or malt liquor, is swallowed by a person in health, there generally ensues a feeling of warmth in and around the stomach, which is gradually diffused over the whole body, and is accompanied with slight increase of muscular and nervous energy, the functions generally being more actively performed, and the mental power increased. Such may be called the salutary effects of a moderate quantity of the stimulant. If the bounds of moderation be passed, the stimulation is increased, the pulse quickened, the cheek flushed, and the mind excited in excess; if the quantity of stimulant is still further increased, "a degree of torpor is induced, both mental and bodily"; perception is blunted, there is a general languor, giddiness, and obscurity of vision, incoherence of ideas, and incapability of exercising volition; the person is "drunk," and either sinks into a state of somnolence, half sleep, half stupor, or, by becoming sick and vomiting, recovers his senses quickly, sometimes at once. The amount of stimulation caused by alcoholic fluids varies, of course, according to the strength of the dose, but also in some degree according to the habits of the individual; for there is no question that those who habitually drink strong wines or spirits, derive little if any stimulation from the weaker alcoholic drinks; moreover, some conditions of the

system modify greatly the stimulant power of alcohol. In spasm, in fainting, in depressed states of the system, from fever or other such causes, persons often take with scarcely perceptible effect, doses of wine or spirit, which at other times would put them in a state of intense intoxication. Although, however, habit enables individuals to consume alcoholic drinks in greater quantity, and of greater strength, it by no means follows that this is done with impunity; if excess is habitually indulged in, the mucous membrane of the stomach becomes diseased, as the effect of a continued low state of inflammation, and even the other coats of the organ undergo changes of structure and indurations, while more important alterations take place in distant organs, notably in the various nerve centres, in the liver, in the heart and arteries, in the kidneys and in the alimentary canal; in fact, no organ of the body is exempt from the pernicious influence of the poison.

Effect of Alcohol on the Blood.—There can be no doubt that most of the effects of alcoholic excitement, intoxication, and stupefaction depend upon absorption of the fluid into the blood, this having been found to take place very rapidly: that is to say, the alcohol passes as alcohol into the blood, and circulates as alcohol in the vital fluid, till it is got rid of by the usual processes of chemical change and of excretion. During this circulation, the most evident effects of alcohol are exerted on the nervous system; nor can this be matter of surprise, considering that after death from drinking spirit—gin—largely, there has been found within the brain "a quantity of limpid fluid distinctly impregnated with gin, both to the sense of smell and taste, and even to the test of inflammability." Moreover, there appears to be some special relation existing between the nerve tissues and alcohol.

With regard to the effect of alcohol upon the blood, it is unnecessary here to detail the various observations which have been made. One thing, however, appears to be well confirmed, which is, that the effect of intermixture of alcohol tends to keep up a venous condition (see *Aeration—Blood*) of the circulating fluid for a considerable time. According to Dr. Prout, after taking alcohol, the excretion of carbonic acid from the lungs is at *first* diminished; languor, yawning, and drowsiness being the consequence. There can be no doubt that the above effect of alcohol is in great measure owing to the elements of the spirit combining with oxygen in the body, and that its carbon and hydrogen are given off ultimately as carbonic acid and water. "The oxygen which has accomplished this change must have been taken from the arterial blood; for we know of no channel, save the circulation of the blood, by which oxygen can penetrate into the interior of the body." The oxygen thus abstracted from the arterial blood to combine with the elements of alcohol, would under other circumstances have combined with the atoms of the muscular and other tissues, giving rise to development of muscular force, consequently, in this way, muscular power is rather diminished; there is languor. This statement may seem at variance with a former one, that alcoholic stimulants give rise to increased muscular energy. Both statements are true, it is circumstances only which alter the effects. This is proved by practical experience, thus: if an individual in good health, making active exertion in the open air, especially if it be cold, or, on the other hand, if he be perspiring freely in warm air, and consumes in either case a moderate quantity of alcoholic fluid, he experiences the excitant effect; that is to say, the special stimulation of the alcohol upon the nervous system is felt; but the activity of both the respiratory and circulating systems, and the consequent increased supply of oxygen throughout the body generally, counteract the chemical effect of the spirit elements on the blood, they do not permit the venous state above mentioned to be formed. On the other hand, if a person keeping quiet in the house, especially if the air be warm and ventilation deficient, takes but a small proportion of alcoholic fluid, how quickly does he become languid, sleepy, and unfit for exertion, either mental or bodily! In this case, even without alcohol, the circumstances are such as to favour carbonic accumulation in the blood, and with it muscular inactivity and mental hebetude; it is, therefore, much more likely that these symptoms will occur when the alcoholic influence is added. A clear understanding of the foregoing remarks will explain much of the usual effect of alcoholic fluid, observed either in one's own person, or in that of others. It is only necessary to keep in mind, that the first effects are those of special excitement of the nervous system, giving increased though temporary activity through that system to every function of the living body; but that this special excitement is apt to be interfered with by the chemical effect exerted by the elements of the spirit on the blood as above described, more or less, according as circumstances facilitate or not the introduction of oxygen into the vital fluid, and its transmission throughout the frame. Here attention may be drawn, as it has in other articles in this work, to the importance of this substitution of the alcoholic elements for those of the bodily tissues in exhausted states of the frame, as in fever, &c. (see *Starvation*), the animal temperature being maintained by the artificial "alcoholic fuel," so to speak, when the ordinary tissues are exhausted.

The less palpable effects exerted by alcohol upon men who work out of doors, than upon those whose employment is of a more confining nature, probably influences in some degree the statistics of its consumption, and for this

reason Dr. Guy states "that men who work out of doors are more addicted to drinking than men who are employed within doors." If the palpable general effects are not so great in the former as in the latter, it, however, by no means holds good that excess may not give rise to an equal amount of local injury to the digestive and other organs.

Effect of Alcohol on the Organs of Digestion.— The effect of alcoholic fluids upon the digestive organs and their functions has been the subject of much discussion and observation. In the case of St. Martin (see *Digestion*), Dr. Beaumont observed that even under the stimulation of ordinary food, but in greatly increased intensity if extra stimuli were taken, "the colour of the lining membrane of the stomach changed from a pale pink to a deep red." The actual effects of alcohol upon the digestive functions probably vary according to the amount and strength of the fluid taken, and upon the habits of the individual. That immoderate doses of strong wine or spirit interfere with digestion is, perhaps, correct; but that the moderate employment of alcoholic beverages with their meals, is often beneficial in enabling many persons to digest their food properly, is perfectly certain, and in accordance with the experience of medical men generally (see *Digestion*). The requirement may not, perhaps, be that of a person in the full vigour of health, and placed in healthy circumstances; it is, however, one which we find closely linked with the every-day life and constitution of a large number of persons in this civilised, artificial, community of Britain; such being the case, it is folly to ignore its existence.

At the same time, although the admissibility, and in some cases the propriety of a moderate allowance of alcoholic beverage, is contended for as necessary to perfect digestion under the circumstances named, it ought never to be forgotten that the immoderate use, the abuse of these stimuli, exerts the most serious effects upon organs with which they come so immediately in contact, the effects, moreover, being aggravated rather by the concentration of the spirit in the fluid usually drunk, than by its gross amount. Ardent spirits, drunk regularly to excess, exemplify the baneful influence most strikingly; the most usual consequences being, as already mentioned, a low degree of inflammation of the stomach, followed by thickening of its coats, and great impairment of its digestive power; and along with these, a disrelish for food and a morbid condition of the system known as drunkard's cachexia. The close connexion of the liver with the stomach, both in situation, function, and vascular communication, renders it liable to be affected equally with the latter organ, and, in fact, the liver-affection of drunkards, the "gin-drinker's liver" (see *Liver*), is matter of popular information. This affection, moreover, is liable to be increased by a warm climate; and a most remarkable diminution in the occurrence and fatality of liver complaints among the troops in India has been proved, statistically, to follow the abridgment of the allowance of spirits. Again, disease of the kidneys is a frequent consequence of the abuse of alcoholic fluids, and with the kidneys the other urinary organs are usually implicated. The lungs, the heart, the arterial system generally, are not exempt from the evil influence. Sir James Clark remarks, that "the abuse of spirituous liquors among the lower classes in this country is productive of tubercular disease—consumption—to an extent far beyond what is usually imagined," and that not only is the tainted constitution acquired by the individual, but that it is transmitted with great certainty to the offspring. Not only, however, is the physical effect transmitted, but the mental and moral taint are so likewise; too often there is an inborn love of intemperance, which, if indulged, adds immensely increased power to the physical evil—the drunken child of a drunken parent is generally much the shortest lived of the two. Moreover, the child of a drunkard is very apt to suffer mentally as well as bodily from the vice of the parent.

Alcoholism and Insanity.— If the abuse of alcoholic liquors is injurious to the body, equally so is it to the manifestations and tendencies of the mind. Passing over the milder forms of excitement, we find, under the influence of excess, that faculty which keeps the will subordinate to the judgment weakened, or for the time destroyed; there is produced, in fact, a state of temporary insanity; and so close is the resemblance, that, as remarked by Dr. Robinson, there is simulated "the raving delirium, the maudlin sensibility and groundless apprehensions of the melancholic, the bloodthirstiness of the homicidal, the cunning desperation of the suicidal maniac; the prostration of the moral feelings; the inflation of the mind with delusions as to dignity, wealth, and knowledge; and finally, in the last state of intoxication, may be noticed, the gradual disappearance of every manifestation of reason, until the vacant gaze and drivelling smile have for the moment stamped upon the countenance the fearful inanity of idiocy. Since, then, a single dose of an intoxicating substance possesses the power of temporarily disordering the intellect, perverting the moral sentiments, and even wholly suppressing the operations of the mind, it is not wonderful that the continued use of such agents should frequently induce permanent mental derangement. Continuance in that habit may occasion this effect either directly or indirectly. We possess no data by which to estimate its influence in predisposing to insanity; we can, however, readily conceive that it must be very considerable. It is found that the minds of persons who have once laboured under an

attack of mania, are ever afterwards more liable to excitement, and less capable of preserving their equilibrium whilst exposed to disturbing influences, than those which have never deviated from a healthy state. We have seen that each fit of intoxication is, in fact, a temporary attack of insanity. We notice in every-day life how frequently the intellects of habitual drunkards become impaired, and knowing these things, we cannot avoid the conclusion, that an excessive use of intoxicating substances will in time so enfeeble the mind as to render it incapable of bearing ordinary sources of disturbance, and thus act as a powerful predisposing cause of insanity."

Dr. Joseph Williams gives the following table as the proportion of cases of insanity caused by the "abuse of spirits," admitted into various asylums :—

	Total admissions.	Proportion caused by intemperance.
Charenton, . . .	855	134
Bicetre and Salpêtrière, .	2012	414
Bordeaux, . . .	156	20
Turin, ...	548	93
Gard, ...	209	4
United States, .	551	146
Palermo, . .	189	9
Caen, ...	60	16
Dundee, . . .	14	4
M. Parchappe, . .	167	46
M. Bottex, . . .	288	54
	5049	940

Dr. Robinson has drawn up a table, showing the proportion which intemperance bears to other causes of insanity, as exhibited in the returns from ninety-eight asylums in England and Wales. From the table we find that intemperance constitutes the immediate cause of one-seventh of the cases contained in the English asylums. Dr. Robinson, however, considers the proportion estimated much below the real amount, which is marked by various contingent circumstances. Accordingly, another table is given, drawn up from the returns of twenty-five asylums. From the second table we learn that one-fourth of the cases of insanity admitted are referred to intemperance alone, and to it, in conjunction with vice and sensuality, nearly one-third. It is further remarked, that many of those cases entered in the tables as unknown might be added to the list.

Were it needful, much additional evidence on this point might be adduced.

Dipsomania.— There is no doubt, when habits of intemperance have reached a certain point, that the unfortunate victim becomes partly insane, at least so much as to become affected with the species of monomania to which the term dipsomania has been applied. All writers on insanity describe it as a morbid craving for drink, which generally occurs at intervals, in which persons are seized with an irresistible propensity to drink to excess, although conscious at the time of their misconduct, but are unable to control themselves. Change of scene, restraint, and moral management, effect a cure, but relapses are very likely to occur.

Alcohol and Crime : their Connexion.—It is under the temporary insane excitement produced by abuse of alcoholic liquor, whether purposely or accidentally, that a large proportion of the petty, and many of the most fearful crimes are perpetrated by man. M. Quetelet, in his chapter on the *Development of the Propensity to Crime*, assigns to the excessive use of intoxicating drinks the increase of crimes against property and person in certain provinces of France. But we need not go out of Britain to find evidences of the effect of the insane excitement of drink in stimulating to crime; every newspaper, every prison report, tells the same tale; but perhaps the most conclusive evidence on this subject—indeed, we need no other—is the collection of opinions expressed by many of our eminent judges on this head, who have publicly from the Bench declared as their deliberate opinion, individually, that drinking alone gave origin to by far the largest proportion of crimes that came before them for trial—crimes from which the perpetrators would have shrunk, but for the short-lived insanity of intoxication.

Forms of Alcoholic Stimuli.—In considering the effect of alcoholic stimuli upon the system, due attention must always be given to the form in which they are taken. It is certain that ardent spirits—which, it may be remarked, should never be taken but as medicine—will exert a much more narcotic effect upon the nervous system, both locally in the stomach and generally, than the fermented liquors. It is well ascertained that a certain amount of wine exerts less intoxicating effect than the spirit in the same quantity of wine would do, were it separated by distillation and then diluted with water; and, moreover, that "different wines, although containing the same absolute proportion of spirit, will be found to vary very considerably in their intoxicating powers."

There is no doubt that the lighter wines of the continent, those which contain no more spirit than is yielded by the simple fermentation of the grape juice, are quite the most wholesome, and that the action upon the system of those stronger wines, such as port and sherry, to which spirit has been added, must in some degree resemble the action of distilled or ardent spirits—at least, it has been proved that spirit artificially added to a wine is not united with it in the same manner as

the spirit formed in it by the natural process of fermentation, which does not yield above eight per cent. In considering the action of the various kinds of wine, however, the influence of habit must not be lost sight of; for many who are accustomed to the use of the strong, dry wines, cannot change to the lighter and more acescent kind, such as the hocks and clarets, without risk of inducing disordered digestion, a tendency to gravel, and other similar complaints, which, however, does not prevail among those who *regularly* make use of these wines. The brisk sparkling wines affect the nervous system so rapidly, considering their small amount of spirit, that their effects have been in part attributed to the carbonic acid they contain, which renders their absorption more speedy, and their influence on the nerve centres more direct. Home-made wines are apt to disagree with many persons, in consequence of the amount of sugar they often contain, or from the presence of lactic and other acids. Many of the remarks on wine apply also to the malt liquors, to the articles on which the reader is referred for further information (see *Beer—Porter*). Attention has hitherto been confined to the actions of alcohol, and of its various preparations, on the system, without reference to external circumstances, and at the same time occasion has been taken to advert to the serious physical and mental evils which inevitably result from the abuse of the agent. It will now be pointed out under what external conditions and circumstances, and under what peculiar conditions of mind and body, the use of alcoholic stimulants is either serviceable or necessary.

Is Alcohol Necessary?—If the question be asked, whether alcoholic liquors form a necessary part of the sustenance of *healthy* men generally, it must be answered, certainly not; that they are not necessary is proved, not only by the history of many nations, both ancient and modern, but by the results of the total abstinence movement: numbers are well and active in mind and body who never touch an alcoholic fluid. But what is a rule for some, or even for many, is by no means universal, and the experience of medical men generally, including those whose names stand highest at the present time—and they, it is presumed, are the most proper judges of the case—goes to prove, that there are numbers under the present artificial positions and modes of life, in this country at least, who cannot eschew the use of alcoholic stimuli without the risk, or rather the certainty, of detriment to health. Probably there are few medical men who cannot reckon among their patients—the author certainly can—individuals who have seriously injured themselves by the unadvised adoption of, and rigid adherence to, total abstinence principles. In such cases, the nervous system, the digestive organs, and bodily and mental vigour, gradually become weakened, and there is often great depression of spirits. It may be said that persons who require alcoholic stimulants to maintain their digestive and other powers, are not in a proper healthy condition, and possibly they are not; but they are in the state of numbers in this country at the present time—a state fostered by circumstances, by the debilitating effects of the deficient sanitary arrangements of our large cities, by the wear and tear of mental anxiety and overwork, by the struggle in the perpetual battle of life, in which most are engaged in the throng of competition—these influences and others, including perhaps deficient natural constitution, render the moderate employment of alcoholic stimulants often requisite for the preservation of the energies on which their livelihood and usefulness depend. The requirement may be artificial, but we cannot change the circumstances; at least, not quickly; and until they are changed, it is folly, and worse than folly, to refuse a beneficent provision. There can be no question—indeed, it has been proved—that the depressing influences of deficient sanitary arrangements are among the most powerful incentives to intemperance among the workmen of our large towns, who, unfortunately, instead of wholesome moderation, too often indulge in excesses, especially in the use of spirits, which entail upon them many diseases. Better is it, certainly, that a man should risk health, even if that should suffer by his becoming a total abstainer, rather than ruin both body and soul by intemperance; but better still, that he should be exposed to neither risk, by being placed beyond the influences of depression, and within the influence of those natural stimuli (see *Excitement*), which our Creator has made necessary to our healthful existence in this world.

There are accidental circumstances in which all may at times be placed, in which the question arises, whether the assistance of alcoholic stimulation may be had recourse to with benefit or not. Exhaustion by long exertion in extreme of heat is one of these—the skin acting powerfully, discharges immense quantities of fluid, which must be compensated for. As long as the energies remain unimpaired, the compensation should be made by unstimulating drinks; by these, the strength is in every way better preserved; but when the energies flag, if *exertion must still be made*, a small quantity of diluted alcoholic stimulant may be taken with advantage. Under continued exposure to the effects of intense cold, especially if symptoms of torpidity supervene, the use of *undiluted* spirit may save, and has saved, many a life. In such cases, however, the caution must not be forgot, that the spirit should not be had recourse to early, and not, if possible, till it is used to stimulate to the last effort to gain the place of safety. Other cases occur, in which persons are compelled by circumstances to make continued exertions,

involving loss of the usual rest; in these, after a time, the moderate use of the stimulant is highly beneficial.

The necessity for the use of alcoholic stimuli, under the various external circumstances which tend to depress or exhaust the bodily powers, is of course immensely modified by the constitution, hereditary or acquired, of the individual. Some individuals there are, who from birth upwards are always below par, who have no power of endurance. Such persons generally require stimulants habitually to enable them to keep up to life's duties at all, still more so, when exposed to conditions of depression or exhaustion.

The above have been considered irrespective of those cases in which long habit has rendered the use of alcoholic stimulants an acquired necessity, especially if excess has debilitated the constitution. There are, undoubtedly, many individuals of strong constitution and nervous power, who can at once lay aside the use of these stimulants without inconvenience; but there are others who quickly become depressed. This is especially the case if other depressing effects, such as an accident and its necessary pains and confinement, are in operation. Such cases, in hospital practice, are very common; the continued allowance of the alcoholic stimulant is necessary, not only for the reparation of the accident, such as a fracture, but even for the continuance of the functions of life.

The question of the propriety and benefit of alcoholic stimulation in the treatment of certain phases of disease is one which it is matter of surprise could ever be mooted in the face of the approval and enunciation of the highest authorities, past and present, in practical medicine—ignorance alone could ever have raised the doubt. As the use of alcoholic stimuli is noticed under the heads of the various diseases, it is unnecessary to enter upon its consideration again.

Few subjects, perhaps, included in the present work, are more important than that which has just been discussed, briefly of necessity, but much too briefly to do it justice. The evils of intemperance in Britain are so deplorable, that every man who wishes well to his kind or to his country must earnestly desire to see them checked; and, when it is looked upon as a matter of *temporary benefit and expediency*, must regard the total abstinence movement as one fraught with immense benefit to numbers; at the same time, medical men, especially, are aware that its uncompromising dogmas are the source of evil as well as good; evil, not to individuals only, but to the community generally, by turning the attention from the great incentives to the abuse of alcoholic stimuli, the depressing influences to which all classes of the community are exposed, by deficient sanitary arrangements, by the exhausting effects of competition in the vocations of life, and by the great absence of provision for, and relish of, the harmless excitements. Excitement of some kind is necessary, and if men, uneducated, or partly educated, have not the natural stimuli of the light and air of heaven, and proper relaxation afforded them, if they have no mental stimulus presented to them as a change after the physical toils of the day, no object of interest with which to fill the vacuity of the mind, and no attraction, save that of a squalid home, most surely will they, in numberless instances, when they can, seek the artificial stimulus of alcohol, and the comfortable fire and comparative cleanliness of the tap-room. For such reasons all right-minded persons must welcome the attempt now being made to substitute for the gin-palace and the beer shop, the coffee-palace or restaurant, replete with social comforts, where the working-man may obtain, at a small cost, the necessities of life, without being allured into vice and folly through the agency of drink.

STIMULANTS, GENERAL. — See Excitement and Excitants.

STINGS of Bees, Wasps, Hornets, &c., are punctured, and at the same time poisoned wounds, the intense pain being caused by the acrid poisonous fluid, which is pressed through the tube of the sting at the moment it is inserted in the skin. The poison is contained in a bag at the base of the sting, and the latter is barbed on one side. After the first acute pain of a sting subsides, a severe tingling smarting remains, and the part begins to swell. The amount of swelling varies greatly in different persons; in some it is trifling, in others it is very great, and in a few individuals it extends over the entire body, whilst at the same time there is much sick faintness, &c., requiring the administration of sal volatile and other stimulants. If the sting has been inflicted about the throat, the swelling has been known to prove fatal. The domestic local applications to stings are very numerous. Oil is frequently applied, and gives relief; but alkaline preparations certainly appear to be most serviceable; the popular remedy of the "blue bag" is probably useful for this reason; soda is also employed; but ammonia or hartshorn, the weaker solution, is the best form of alkaline application; it may be used alone or mingled with oil. However, before any remedy is used, care should be taken to ascertain that the sting does not remain in the wound, if it does, it must be extracted by tweezers or by squeezing. If the pain and swelling remain severe, the common lead lotion, or a tepid poultice, will relieve.—See *Jelly-Fish—Wounds, Poisoned.*

STITCHES.—The transient pains which all persons are apt to experience at times, are probably of a neuralgic character. A stitch in the left side, such as occurs in consequence of exertion, quick walking or running, is ascribed to congestion of the spleen; it has also been

attributed to affection of the diaphragm. It is relieved by pressure.—See *Side, Pain in.*

STOMACH.—The form and position of this important organ have been sufficiently indicated in articles *Alimentary Canal* and *Abdomen*: to these the reader is referred, and at the same time to article *Digestion* for an account of the latter process. The stomach is made up of three different coats or layers, the outer one, being the "peritoneal" coat, which covers the contents of the abdomen generally (see *Peritoneum*). The middle layer is the muscular coat by which the churning and wavy motions of the stomach are performed during the process of digestion. The innermost layer is the mucous coat, which is continuous with the lining of the gullet and mouth upwards, and with that of the intestines downwards. In the stomach, the mucous coat is thrown into folds or wrinkles, called in anatomical language "rugæ," which extend longitudinally along the organ. When at rest, the lining membrane of the stomach is of a pale pink colour, but whenever its peculiar functions are called into exercise by the presence of food, it becomes much reddened by the increased determination of blood towards it.

The chief disorders to which the stomach is liable have already been entered into under the head of *Indigestion;* and such affections as cancer, perforating ulcer, spasm, &c., have been sufficiently considered in the general articles on these subjects. Blows over the region of the stomach are often serious, and may be immediately fatal.—See *Blows—Shock, &c.*

Gastritis.—Inflammation of the stomach is not a common disease in its acute form, and when it does occur, is usually the result of irritant agents, such as strong spirits, or poisons applied directly to the stomach itself. Fever, thirst, severe pain at the pit of the stomach, increased by pressure or by the presence of food, vomiting, especially after food has been taken, hiccup, red tongue, followed by extreme depression of the system, are the usual symptoms. Leeches and poultices to the pit of the stomach—cold, sometimes iced water, or barley or gum water, to allay thirst, and injections, either aperient or opiate—will be the most useful remedies; but the disease is so serious in its nature, and so rapid in its progress, that it should at once, if possible, be put under regular medical treatment.—See *Alimentary Canal—Poison.*

STOMACH-PUMP.—See Pump.

STONE.—See Gall-stone—Urine, &c.

STONE-FRUIT, generally speaking, is less digestible when eaten raw than the other descriptions of fruit; to healthy persons, however, when ripe, and consumed in moderation, it is not injurious. Plums have acquired a character for causing disorder and diarrhœa, which they scarcely deserve. Undoubtedly, with some persons they disagree, and, indeed, with all, if they are eaten immoderately or in bad condition; but that they, or fruits generally, are the cause of the regular autumnal or British cholera, is a fallacy which has been established in the popular mind, in consequence of the season at which plums are ripe, the "plum season" being coincident with that at which people in this country, who have been exposed to the effects of the summer's heat, are most liable to that outbreak of diarrhœa best known in this country by the name of British, or summer cholera. The fallacy is principally mischievous, because it closes the eyes of people generally to the real causes of a disease, which, with more or less severity, so regularly makes its appearance in this country, and thus prevents their adopting those measures of precaution which would insure them against its attacks.

Refer to—*Biliary Disorder, &c.*

STONE POCK—a name applied to hard pimples.

STOOLS. — The evacuations from the bowels always afford important indications of the state of the health; they are, therefore, generally watched by medical men in cases of illness, and as a general rule should be saved for their inspection.

In infancy, the discharges from the bowels are generally lighter coloured than they are as life advances; this, perhaps, being partly, but not altogether, due to the usual milk nourishment, which, even in adults, if taken largely, tends to give a lighter colour to the stools. In infancy, moreover, the appearance of the natural evacuations is liable to vary greatly in colour, and, especially when there is disorder, acidity, &c., to assume a green tinge, either as directly passed from the bowels, or soon after exposure to the air, even if the motion has, in the first instance, been of a yellow or orange hue. The nature of these green evacuations is scarcely satisfactorily explained; they generally, however, follow attacks of pain, with superabundant acid. As children get beyond infant life, the stools, particularly in those with light hair and complexion, are apt to become either entirely or partially of a clay colour, evidently from deficiency of bile. In such cases, it is not uncommon for grey powder or calomel to be given, with a view of increasing the flow of bile, which these medicines certainly do, and for a few days the motions are improved in appearance, but only for a few days; they soon become as unhealthy looking as ever, the benefit derived from the mercurials being only fallacious, or worse—causing injury rather than benefit. The true cause of these clay-coloured stools, in most instances, is the inability of the blood to furnish an adequate supply of the healthy bile; consequently, to stimulate the liver to secrete an increased quantity under these circumstances, is to impoverish the blood. A course of iron tonics, with a good supply of animal food, and, if need

be, a little wine or malt liquor, is much more likely to bring the motions to the colour of health, permanently and beneficially. Not that an occasional dose of grey powder may not be useful, but it is not *the* remedy. In adult life, the stools become clay-coloured, or chalky, from a different cause or causes, the most usual being obstruction to the flow of bile (see *Jaundice*), but also from deficient secretion consequent upon disease of the liver, such as occurs in drunkards. The stools may vary in consistence, being either too hard or too liquid; the former is the case in persons of costive habit, in whom the fæcal contents pass so slowly through the bowels, that their liquid components are too much absorbed (see *Constipation*). In the latter case, the too liquid condition of the motions is associated, generally, with tendency to diarrhœa (see *Diarrhœa*). The form of the motions may, by its peculiarity, convey important information: thus, in an enlarged state of the "prostate" gland at the neck of the male bladder, they assume a flattened form, or they may be diminished in size by narrowing of the gut (see *Stricture*). The general bulk of the stools must of course depend much upon the amount and quality of the food; inattention to this fact sometimes misleads. It is not uncommon for persons to imagine that, so that the bowels are regularly moved once a day, they must be in a perfectly free state, forgetting, that though they may discharge a portion of their contents, they do not necessarily discharge all; and such is really the case. In old people especially, enormous accumulations of fæcal matter are apt to take place, whilst the person is under the impression that, because there is a daily stool, the bowels are periodically fully relieved. On the other hand, again, the popular impression seems to be that the bowels fulfil no other office than that of a passage for the food refuse. This fallacy has already been alluded to under articles *Alimentary Canal—Digestion*, &c.

Various articles of food, such as the seeds and skins of fruits, will, as mentioned above, affect the appearance of the stools, and medicines do so more especially; iron, in particular, forms an inky black with the colouring matter of the bile, and as persons are often unnecessarily alarmed at the appearance, when iron is prescribed, the circumstance should be made known. Rhubarb, senna, &c., in some degree impart their colour to the stools. Mercurials modify them, causing an olive or deep-green appearance, which may be kept up for a length of time, if mercurials are too continuously given. Persons are thus deceived at times, and under the idea that the motions do not become healthy, go on purging with the mercurials, which are themselves the cause of the unhealthy appearance. Other purgatives may have the same effect in a lesser degree. In unhealthy states of the system, and especially in some febrile affections, the stools become much more offensive than in health. When such is the case, the bowels generally require purging. The stools may contain blood. If this comes from the stomach, or high up in the intestinal canal, it is usually black and pitchy in appearance, and often highly offensive; stools of this kind often occur after severe bleeding at the nose when the blood has been swallowed. The blood may be fresh and clotted, and either dark or florid (see *Piles*). In some cases the stools contain large quantities of mucus, simple or gelatinous-looking, or they contain matter. In all such cases the motions should be kept for inspection, and a medical man sent for as soon as possible. In Asiatic Cholera, and sometimes in its British simulator, the stools resemble thin gruel or "rice-water." Straining at stool may arise simply from costiveness, and therefore is probably habitual; it is, moreover, one of the chief evils of costiveness, for not only is it apt to induce rupture in the predisposed, but, in the aged, it may bring on head attacks. Straining, or, as it is called medically, "tenesmus," occurs as a consequence of an inflamed and swollen condition of the lining membrane of the rectum (see *Rectum*), such as occurs in diarrhœa, &c.; there is the sensation as if the bowel was still unrelieved, and constant instinctive efforts are made to free it; they only increase the evil, and should, by an effort of the will, be desisted from, if possible. In children, straining and sitting too long when the bowels are evacuated may cause falling down of the bowel. The custom should be corrected.—See *Prolapsus—Rectum*.

STOVES, as distinguished from open fire places, are less agreeable and wholesome on account of the dry atmosphere they cause, and the unpleasant odour which is apt to arise when the iron plates of which they are constructed become over-heated. As a rule they are defective ventilators, and ought not to be used in preference to open fire grates in sleeping or sitting rooms. In halls, in churches, and in public buildings generally, close stoves are much employed on account of their slow combustion, and the large amount of heat they give off at a comparatively small cost for fuel. One of the best of the close stoves is that known as the "calorigen," which is made to burn either gas or coke. George's gas calorigen (fig. 205) consists of a cylinder, the interior of which is occupied by a coil of iron pipe (D) communicating at one end (G) with the external air, while the other extremity (H) opens into the apartment, into which it conveys a continuous stream of warm air. The products of combustion are carried away by the chimney, or by a channel communicating directly with the external air. The slow combustion calorigen, which burns fuel instead of gas, is constructed with a fresh air chamber corresponding in its action to the tubular arrangement of the gas-stove and the heat is increased and

retained by the fuel chamber being lined with fireclay. The slow combustion calorigen is intended to burn anthracite coal or coke, and its promoters maintain that the fuel will keep

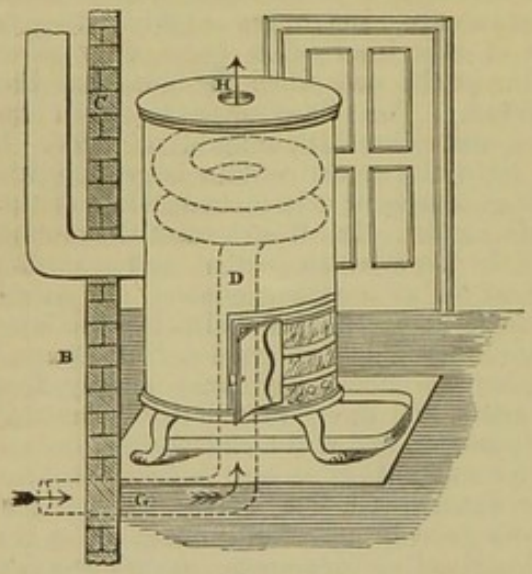


Fig. 235.

alive for twelve hours or longer, without attention, at the cost of a penny.—See *Smoke Abatement — Chimney — Warming — Ventilation.*

STRAINING.—See STOOLS.

STRAMONIUM.—See THORN APPLE.

STRANGULATION. — See SUFFOCATION—RUPTURE.

STRANGURY.—See BLADDER.

STRAWBERRY— This delicious fruit must be classed with the most wholesome productions of the vegetable kingdom. It is recorded of Fontenelle that he attributed his longevity to them, in consequence of their having regularly cooled a fever which he had every spring; and that he used to say, "If I can but reach the season of strawberries!" Boerhaave looked upon their continual use as one of the principal remedies in cases of obstruction and viscidity, and in putrid disorders. Hoffman furnished instances of obstinate disorders cured by them, even consumption; and Linnæus says, that by eating plentifully of them he kept himself free from gout. They are good even for the teeth.

STRICTURE.—See URETHRA—URINE.

STRUMA—SCROFULA.—See SCROFULA.

STRYCHNINE.—See NUX VOMICA.

STUN.—See BRAIN, CONCUSSION OF.

STUPOR—COMA.—See COMA.

STYE.—See EYE.

STYPTICS are applications, usually of an astringent character, which possess the power of arresting hæmorrhage. The remedies classed under astringents may all be used as styptics, but many of them are not generally had recourse to as such—that is, as external arresters of bleeding: it is to these that the term styptic is applied in this article.

A most effective styptic solution, and one which causes no pain, is made by dissolving pure tannin in its own weight of water. The solution should be clear, dark brown, and of treacly consistency. It may be used freely to a bleeding wound.

Oak-bark decoction, and gall-nuts in powder or infusion, which owe their efficacy to the tannin they contain, are used as external styptics, and "Ruspini's Styptic," formerly much in vogue, is said to be a solution of tannin in spirit (see *Oak*). In addition to these, matico and turpentine are styptics derived from the vegetable kingdom; also the agaric fungus popularly known as the "fuz-ball," which is frequently applied to bleeding wounds, and with apparent benefit. From the mineral kingdom many styptic applications may be derived, such as the salts of iron, especially the perchloride, the sulphates of copper and zinc, the acetate of lead, and the nitrate of silver. Cold, the actual cautery, or red hot iron, &c., are all styptic applications. See the various articles.

Refer to—*Hæmorrhage.*

SUBSULTUS.—Spasmodic jerkings of the muscles, which occur in various diseases of debility, such as fever, &c.

SUCKLING.—See *Child-bed — Childhood —Nurse, &c.*

SUDDEN DEATH.—See *Death.*

SUDORIFIC—a promoter of perspiration or diaphoretic.—See *Diaphoretic.*

SUFFOCATION is the term usually applied to the condition in which air is prevented from entering the lungs by agents which do not compress the windpipe, as they do in hanging or strangulation. The distinction is, that in the latter case the vessels of the neck by being compressed offer an obstruction to the flow and return of the blood from the brain, and at the same time the free exchange of carbonic acid for oxygen in the lungs is partly or wholly suspended. To both conditions the term "asphyxia" is applied, death being caused by a failure of the heart to propel blood through the lungs, which become engorged with venous blood from the want of their accustomed stimulus. From this cause the respiration is suspended, and the heart's action ceases; at the same time the skin becomes pale and anæmic, except in the more vascular parts, such as the face and lips, and extremities of the fingers, which become blue from the venous congestion. In all cases of apparent death from suffocation, it is imperative that measures of restoration should be attempted, and persevered in for some considerable time; the most important of these is artificial respiration, which should be carried out in the manner recommended under the article *Drowning.*

Suffocation is the result of such accidents as immersion in an atmosphere of carbonic acid gas or "choke damp," of drowning, of

foreign bodies becoming lodged in the gullet or windpipe, of spasm (see *Larynx, &c.*). As these causes of the accident are all treated of respectively, it is unnecessary to enlarge upon them here.

It is requisite, however, by way of caution, to notice some causes of accidental suffocation, which are sometimes fatal.

People who eat greedily, or who, as in the aged, are unable to chew their food properly, are sometimes suffocated (see *Gullet*) the accident, too, has sometimes followed vomiting in intoxication. A curious case of the kind is recorded in which a man, who, after vomiting, was put to bed drunk, was shortly after found dead—suffocation having been caused by a small piece of potato skin, so fixed over the opening of the larynx as perfectly to stop the passage of air. In children, a small body like a pea or cherry stone, accidentally drawn into the air-passages, has caused suffocation; and, very recently, a case was recorded in which a young man was killed by being forcibly pushed into a sack containing bran. The bran drawn into the windpipe caused suffocation.

Infants may be suffocated, oftener perhaps than comes to light, by the very reprehensible practice followed by some ignorant nurses, of giving them a bag of wash-leather, or cloth, filled with sugar, to suck, in order to keep them quiet; if this happens to get too far into the mouth it will certainly suffocate. Death by suffocation in infants "overlaid," by heavy-sleeping nurses, is far from being a rare occurrence; and, indeed, it may happen simply from too great an accumulation of clothes over the mouth and nose.

Other causes might be cited—the above are perhaps sufficient to excite caution.

Refer to—*Death—Hanging—Inquest.*

SUFFUSION is a medical term usually applied to the eyes, when they are blood-shot and watery.

SUGAR.—This important article of food is for the most part a product of the vegetable kingdom, but not entirely so, for it occurs in milk, and in eggs in small quantity, and is also produced by the animal body under conditions to be hereafter noticed.

Sugar is formed principally of two distinct varieties,—cane, or ordinary sugar, and sugar of fruits, or grape sugar. Both are composed of the elements, carbon, oxygen, and hydrogen, but differ somewhat in the proportions in which these are combined. In addition to the above sugars, Liebig enumerates a third, a non-crystallisable variety; and milk or manna sugar—also differing from them slightly in composition. Cane, or ordinary sugar, is produced by the sugar maple, by the birch, by beet-root, carrots, &c.; but its chief source is the sugar-cane, from which it is most easily and abundantly extracted. To effect this the canes are crushed between heavy rollers, and the expressed juice, after undergoing certain operations of heating, is left to crystallise, the dark uncrystallisable portion known as treacle or molasses being permitted to drain off. The crystallised sugar which remains is the brown or Muscovada sugar of commerce. As may be expected, it contains many impurities; moreover, the treacle which drains from it is rather the result of bad preparation, especially in the application of heat, than a necessary product. It is, in fact, grape sugar, which has been formed from the cane sugar by the decomposing influence of heat. In order to produce the refined sugars of the shops, other processes of re-solution, filtration, and crystallisation, require to be gone through.

Cane and grape sugar differ from each other in some important particulars. The former is only produced naturally, "it is crystallisable," "and, when pure, not prone to deliquesce, or to alter when exposed to moisture or to a moderate temperature."

Grape sugar is also a natural production, but can be formed by art from starch, dextrin, and even from cane sugar, by the action of weak acids (see *Fermentation*), it does not crystallise regularly, and the aggregations into which it forms are very prone to attract moisture. Pure cane sugar ought, therefore, to be crystalline and free from moisture; when it contains grape sugar, which it frequently seems to do, either by natural formation or by designed adulteration, it is liable to become clammy and moist. According to the investigations of the *Lancet* Sanitary Commission, from which much of the information contained in this article is derived, experiments show clearly that cane and grape sugars coexist in most, if not all, the colonial brown sugars, and even in some of the lump sugars, and that they even exist together in the cane itself. The amount of the admixture of grape sugar is important, not only from the tendency which it imparts to the whole to become moist (it is to be feared, however, that *all* the moisture in many of the sugars retailed is not attracted from the atmosphere), but because it possesses a much lower sweetening power, and is much more prone to fermentation than the cane sugar. The latter, when purified, is generally free from grape sugar, and from many of the other impurities with which the ordinary brown sugars are intermingled—considerations which render the purchase of coarse sugars a very doubtful piece of economy.

The chief impurities found in brown sugars, as imported into this country, are portions of the cane and vegetable albumen, which imparts a strong tendency to fermentation, and also assists to nourish the sugar acarus or insect (fig. 206), which, as shown by Dr. Hassall, exists in greater or less proportion in nearly all the brown sugars sold to the public. This disgusting impurity in food is said to be so considerable in size "that it is plainly visible to the unaided sight." When present in sugar,

it may be detected by dissolving a couple of tea-spoonfuls of the sugar in a large wine-glassful of tepid water, the solution being permitted to remain at rest for an hour; "at the end of that time the animalcules will be found, some on the surface of the liquid, some adhering to the sides of the glass, and others at the bottom, mixed up with the copious and dark sediment, formed of fragments of cane, woody fibre, grit, dirt, and starch granules, which usually subside on the solution of even a small quantity of sugar in water." The idea has been suggested that the disease known as "grocers' itch," to which those who handle sugar much are liable, may be caused by this insect, which closely resembles the itch acarus in form. A minute species of fungus is also generally met with in the moist sugars.

The refined sugars sometimes retain traces of the albuminous matters, serum of blood or

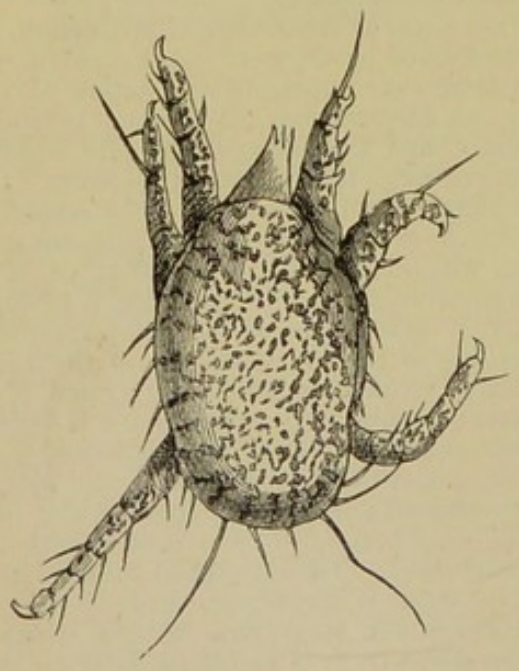


Fig. 206.

white of egg, &c., used in their purification, also traces of lime, lead, iron, &c., acquired in the preparation. According to the *Lancet* reports, an examination of fifteen samples of lump sugar gave the following results:—That in nine were fragments of cane, of sugar insects, or fungi, to be detected; that in three there were traces of grape sugar; in ten, of animal matter; and in all, of flour.

According to the same report, an examination of thirty-six samples of moist sugar showed —That the sugar insect was present in the whole of the samples, and in many of them in great numbers; that fungi were also present in all, and besides these, the fragments of cane, grit, &c., already mentioned. It is evident that pleasure in food, health, and economy, are more consulted by purchasing the refined than the moist sugars. It is but fair, however, to mention, that Mr. Wynter Blyth, in his recent excellent work on *Foods*, states that, since the operation of the Sale of Food and Drugs Act, he is not aware of a single conviction having been obtained in England for selling sugar which had been adulterated, and that, according to his experience, the above series of impurities represents "rather the stereotyped list enumerated by various authors in different countries, showing more what is possible than what actually exists."

As an article of nutriment, sugar is of course the representative of the saccharine principles, which include starch, gum, &c.; the position which these principles hold, and the part they fulfil in the processes of nutrition generally, having been sufficiently entered into under the article *Food*, it is unnecessary to repeat them here.

With regard to the digestibility of sugar by different individuals there is considerable variation. Some persons cannot consume it, even in small quantity, without being disordered and suffering from acidity, whilst others seem actually to digest their food better when an amount of saccharine matter is mingled with it. In the West Indies, and other countries where sugar is cultivated, the inhabitants, the negroes especially, are said to improve in health and appearance during the sugar season, when they consume it plentifully; and, undoubtedly, a moderate proportion of this pleasant aliment is a wholesome article of nutriment for people generally, except under those peculiar states of constitution, or rather of disease, when the tendency of the assimilative powers generally is to form sugar even from dietetic principles which could scarcely be expected to yield it. This animal sugar has not only been detected in the blood, but in the stomach, after a person had been fed for days upon animal food alone. Moreover, it is now fully established that a substance akin to sugar is formed, naturally, in the liver. In medical practice sugar is used principally to cover the nauseous taste of drugs, and the British Pharmacopœia admits not less than seventeen preparations of syrups, some of which as the syrup of poppies, senna, and the syrups of the phosphates and iodides of iron, are usually administered separately, while the greater number are employed to sweeten mixtures and draughts. Sugar is a powerful antiseptic.—See *Diabetes.*

Milk sugar, which differs from the sugars already noticed, "occurs in commerce in thick crystalline crusts, which are usually yellowish, yellowish-brown, or dirty, from want of care and cleanliness in its preparation;" when purified, however, it becomes very white and hard. Its sweetening power is weak, and it is capable of undergoing the vinous fermentation.

Refer to — *Fermentation — Food — Syrup — Milk.*

SUGAR OF LEAD.—See LEAD.

SUICIDE.—Suicidal Tendency.—The distressing state of mind which seems to impel individuals to self-destruction has too exclusively been viewed in its metaphysical light alone, without reference to those states of bodily disorder which unquestionably induce great changes upon the views and feelings, particularly in persons naturally disposed to melancholy. The following observations of Dr. Forbes Winslow are most pertinent to the question. He says: "It is the prevalent opinion, even among persons otherwise well educated and intelligent, that this desire of self-destruction is, in the majority of cases, a mental act, unconnected with a disturbed condition of the bodily functions, and incurable by any process of medical treatment; that the mental depression which is so generally associated with the invisible tendency, is an affection of the mind *per se;* the physical organisation having no direct connexion with what is termed the *spiritual* impulse. This metaphysical view of the matter is fraught with much mischief, and, I have no doubt, has led to the sacrifice of many valuable lives. It is a matter of the highest moment that the public mind should be undeceived upon this point. Right views on this subject ought to be generally diffused. It is of consequence to establish the belief that the suicidal idea is *almost generally* connected with a morbid condition of the body, and is often the only existing evidence of such an affection; that it is, with a few exceptions, universally associated with physical disorder, disturbing the healthy balance of the understanding; and that this bodily affection, which is in nine cases out of ten *the cause* of mental irregularity, is easily curable by the judicious application of remedial means. The tendency of the spiritual or metaphysical view of the question is to create a distrust in remedial measures, and the poor man, who is struggling against an almost overwhelming desire to destroy himself, is induced to neglect entirely his lamentable condition, under the belief that he is literally placed beyond the reach of curative agents, and that the only remedy for his mental suffering is death!

"If a person in this unhappy state of mind is induced to believe that his mental despondency is but a *consequence* or effect of a disturbed bodily condition, influencing, either directly or indirectly, the natural and healthy operation of the brain and nervous system, and giving rise to perverted ideas, that his malady is curable, he may be induced to avail himself of the means which science has placed at the disposal of the physician, and thus be protected against his own insane impulses.

"Where no disease is suspected, no remedy will be sought. Tell a man who has attempted to destroy himself that he is perfectly sane, that his judgment is sound, that his will is not perverted, that the impulse which urges him to the commission of suicide is not associated with any deviation from corporeal health, and you inculcate ideas not only fallacious but most pernicious in their character and tendency. We might, with as much truth, tell a person playing with a lighted taper at the edge of a barrel of gunpowder that his life is not in jeopardy, as say to a person disposed to suicide that he is in the perfect enjoyment of health, and requires no moral or medical treatment. It may be laid down as an indisputable axiom, that in every case of this kind, bodily disease may, upon a careful examination, be detected. I never yet saw a case where a desire to commit suicide was present, in which there was not corporeal indisposition."

While it is of the highest importance that the connexion which exists between the tendency to suicide and derangements of the general health, or any condition of disease, should be well attended to, it would perhaps be dangerous to lead persons to the idea that all depended upon physical derangement; this there may be, perhaps is, in the majority of cases, at times giving rise to irresistible impulses, at least apparently irresistible, for how far they are so man cannot judge; but to base too much upon the bodily condition may hold out inducements to those who are afflicted with the suicidal tendency, to abandon that moral and religious control of their actions which is so powerful, and which in so many cases will overcome in the end. The subject of suicide is one which it is impossible to separate from religious considerations, when it is considered among Christian men; and if these men truly believe that God does assist those who look for his aid in the hour of trial and temptation, they cannot think that in such an hour as that, when one of His creatures contemplates the violent destruction of the life which He has given him, that God will not aid if His help is sought, and strengthen the combat of the higher powers of the mind against the lower principles; for suicide is selfish and cowardly. If an elevated religious and moral tone had nothing to do with controlling the propensity to crimes, and to that of suicide among the number, statistics would not furnish the evidence of the preponderance of these crimes amid people who notoriously cast aside the practical regulation of religion in their lives, individually or socially.

By these remarks the author does not intend in any way to weaken the force of the previous ones of Dr. Winslow, but to caution the reader, lest the consideration of the physical should obscure that of the spiritual. Nevertheless, it is probable, that, in the first instance, more benefit will be derived by treating the affection as a physical disorder. When an individual afflicted with a suicidal tendency can be thoroughly kept under surveillance in private, the effect of well directed medical

treatment may be tried; otherwise, the best and safest plan is to commit the sufferer to a well regulated asylum.—See *Insanity.*

The subject of human responsibility, where, overcome by the evil tendencies originating in physical derangement, it ceases to be responsibility, is perhaps one which man can never fathom, but it is one which ought to be upheld to the utmost in such conditions as a tendency to suicide; whilst giving every attention to the medical treatment of the physical condition, there should at the same time be given every encouragement to those who show the least tendency to this derangement, to keep, if they can, and as long as they can, the reins of reason. The mind can, and often will, overcome mental depression from physical causes, but it must be exerted. The reader is referred to some observations under article *Habit.* The tendency to suicide is found to be least in persons who are occupied out of doors.—See *Insanity.*

SULPHATES are salts in which the base, such as an alkali, or a metallic oxide, is united with sulphuric acid.—See *Copper—Magnesia—Zinc, &c.*

SULPHUR belongs to the elementary bodies. It is found in large quantities in some volcanic countries, such as Sicily, from whence, hitherto, the chief supply has been obtained. It also occurs in the form of metallic sulphurates, such as those of iron, usually called pyrites, from which, in Sweden and other places, sulphur is procured. In the combination of sulphuric acid with different bases, such as lime, magnesia, &c., sulphur is again found, so that in one way or other it it one of the most abundant constituents of the globe. In the vegetable kingdom sulphur occurs, as in the mustard tribes, in the grains, &c.; in the animal kingdom it forms a constant element of the albuminous and fibrinous tissues, and in the hair, saliva, bile, &c.

The pale "sulphur yellow" colour of sulphur, and its brittle crystalline texture, are sufficiently familiar in the form of stick or roll sulphur. The "flowers of sulphur" is made by "sublimation," that is by exposing crude sulphur to heat sufficient to cause it to rise in the form of vapour, the latter being condensed in a cool receptacle, when it takes the form of the well known "flowers of sulphur." Roll sulphur is now made by simply fusing the sublimed sulphur, and casting it in the form of sticks. In medical practice the flowers of sulphur is the preparation most in use—combined with lard in the proportion of one to four parts, it is the familiar remedy for itch and other skin diseases of a parasitic origin (see *Itch*). It is also used as a mild laxative in pregnancy, in cases of piles, and in most affections of the rectum. For the latter purposes it is advantageously mingled with three or four times its weight of cream of tartar, or with its own weight of magnesia. The sulphur confection of the Pharmacopœia is a combination of four ounces of sublimed sulphur, one ounce of cream of tartar, and four fluid ounces of syrup of orange peel. One very serious objection to the use of sulphur is the abominable odour which it imparts to the person, particularly to the insensible perspiration. There is no doubt that it passes off by the skin in the form of sulphuretted hydrogen in considerable quantity, so freely, indeed, as to blacken silver which the individual taking it may happen to carry about with him.

The dose of sulphur as a laxative is, alone, two drachms; of the confection, two tea-spoonfuls; when mixed with cream of tartar or magnesia in powder, from half a drachm to a drachm. It is best given in a little milk.

SULPHURIC ACID, or OIL OF VITRIOL, belongs to the class of mineral acids. It is a compound of sulphur and oxygen gas, in the proportion of one of the former to three of the latter. As usually met with, it contains a certain amount of water, but it may be obtained pure, and in the form of a crystalline solid, "glacial sulphuric acid." Sulphuric acid was formerly procured solely by distillation from the sulphate of iron, or green vitriol, and indeed is so yet in some places. It is now made in Britain on a large scale, by decomposing sulphur along with saltpetre in immense lead-lined chambers. As usually met with, sulphuric acid is a liquid of oily consistence—hence its name, oil of vitriol. It ought to be colourless, or nearly so, but frequently it has a brownish tinge from the presence of impurities. It is highly corrosive, destroying with great rapidity whatever textures, living or dead, it may happen to come in contact with. When mingled with water, a great development of latent heat takes place; in some proportions, indeed, so great as to raise the temperature of the mixture as high as 300° Fahr. After cooling, the bulk of the mixed fluids is considerably less than that which they occupied separately. For medicinal purposes, sulphuric acid is used diluted in the proportion of one part and a half of acid to fourteen and a half of water, and it is better for unprofessional persons to buy it thus prepared; indeed, unless absolutely required in a concentrated form for some special object, sulphuric acid should never be kept in a private house otherwise than diluted. Some lamentable poisonings have happened in consequence of neglect of this precaution. When concentrated sulphuric acid is mingled with water, the development of heat which occurs must be borne in mind, otherwise, the vessel, especially a glass one, may be cracked, and injury to clothes or person be the result. The mixture is best made by adding the acid to the water in small quantities at a time, and mixing each by agitation before more is added. Indeed, the water ought to be in a state of agitation when the acid is added, for if not, the extreme weight of

the latter will carry it to the bottom of the vessel, and there cause heat to be so strongly developed as to crack it.

As a medicine, *diluted* sulphuric acid is extremely valuable. In relaxed states of the system it is one of our best tonics, given in doses of from ten to twenty drops in a large wine-glassful, or two ounces of water. In this way it preserves tone, and checks the perspirations in pulmonary consumption, and, when the case is suitable, improves both appetite and digestion. It also exerts considerable astringent properties, and is much in favour for checking mucous discharges of all kinds, especially from the bowels in cases of chronic diarrhœa. Sulphuric acid is a powerful controller of internal hæmorrhage (see *Abortion*), it is also one of the commonest additions to gargles. Some persons find this medicine gripe a good deal, and if taken by nurses it is almost certain to disorder the infant. In other cases, however, ten drops added to small well-diluted doses of Epsom salts are serviceable. When sulphuric acid is taken medicinally, it ought, like the other mineral acids, to be sucked through a quill, or small glass tube, to prevent injury to the teeth, on which it acts powerfully; it is well to rinse the mouth with water containing a small proportion of soda immediately after taking the dose. In consequence of its employment for various household purposes—

Poisoning by Sulphuric Acid is not very uncommon, and if the acid be strong, is one of the most distressing accidents of this nature which can happen. The person is generally conscious of the description of poison which has been swallowed. According to the strength of the acid, there is intense burning pain in all the parts, from the mouth to the stomach, with which it has come in contact, and if it be of corrosive strength, these parts look white and shrivelled. There is also vomiting of shreddy and bloody mucus, great constitutional depression, and, probably, if the acid has been strong, speedy death.

In such cases, the first thing to be done is to neutralise the action of the poison by alkaline and demulcent remedies. Magnesia, chalk, lime-water, potash, soda, soap-water, wood-ashes, milk, and oil, are all remedial; and in such a case, that which is first to be procured is the best; if there is power of choice, magnesia or chalk is generally preferable. In the absence of either of these antidotes, a portion of wall plaster, or mortar, rubbed up with milk or water, may be used. At the same time fluids must be given very copiously. When injury has resulted from the application of corrosive sulphuric acid externally, the best proceeding is to wash the parts freely with water alone, or with water containing an alkali, as soap-water does.

Aromatic Sulphuric Acid is a pleasant form of medicine, flavoured as it is with cinnamon and ginger, which might with advantage be more used in England than it is at present: the dose is from ten to twenty drops in a wine-glassful of water.

Sulphuric Ether, now more generally known as ether, is procured by the action of sulphuric acid on alcohol, and by distillation. It is a perfectly colourless limpid fluid, of very light specific gravity, and very volatile: its odour, peculiar and penetrating, is usually called the ethereal odour. It is chiefly employed in medicine as a diffusible stimulant and antispasmodic, that is, it acts very rapidly and energetically as a stimulant when taken into the stomach, and on that account is peculiarly valuable in some diseases, such as angina pectoris, spasmodic affections, such as asthma and hysteria, attended with sudden violent symptoms; it is also a powerful restorer in the depressed conditions of the system, such as faintness, &c. For the above purposes ether is given in doses of twenty drops in water. A more convenient form, however, is the spirit of ether, which consists of one part of the ether mixed with two parts of alcohol; it acts in the same way as sulphuric ether—the dose about forty or fifty drops in water. The transient effect of ether renders it in many cases less valuable than sal volatile, or than spirits, such as brandy. Its antispasmodic power is increased by the addition of opium. When bottles containing this ether are opened at night, its highly inflammable character, even in liquid, but especially in vapour, ought to be borne in mind, and care taken that lighted candles are not too nearly approached. In giving ether, it is not to be forgotten that it floats on the top of the water, and thus, that if a bottle containing three or four doses of medicine, of which ether forms an ingredient, be not shaken before each dose is poured out, more than the proper proportion of ether is likely to be poured out first.

Ether, from its extreme volatility, evaporates rapidly in the ordinary atmosphere, and in doing so occasions a considerable amount of cold; of this, advantage is sometimes taken in medical practice when such an effect is required. The power of ether when inhaled, to cause anæsthesia, or insensibility to pain, is the characteristic which has excited most attention of late years; and has given rise to considerable controversy with respect to its merits, when compared with those of chloroform. In America ether is almost universally preferred to chloroform, and in this country there is a profound impression in the minds of the leading surgeons that ether is attended with fewer fatal consequences than chloroform. A mixture of ether, chloroform, and spirits is perhaps the safer anæsthetic, although opinions are greatly divided on this very important matter. Inhalation of ether is a proceeding which should never be tampered with by unprofessional persons.

Sulphurous Acid, properly speaking, is a

gas, a compound of one part of sulphur and two parts of oxygen; but, as known in medicine, sulphurous acid is a solution of a definite proportion of the gas in water, the solution having a pungent sulphurous odour, and, unless kept in well-stoppered bottles, tending to get weaker by the giving off of the gas; it should therefore, if possible, always be used fresh. Sulphurous acid ranks as a disinfectant and deodorizer, and in its gaseous state is perhaps the best we possess. It is very destructive also of animal life, and a gaseous bath of sulphurous acid made by burning sulphur is recommended as a certain and speedy cure for itch; the solution is useful in other parasitic diseases, when mixed with an equal amount of glycerine. In the form of spray, sulphurous acid solution was specially introduced by Dr. Dewar, who also recommends its employment in a number of other ailments, internal and external.—See *Disinfectants—Itch.*

SUMBUL is a stimulant, anti-hysteric remedy, of considerable value. The tincture has a powerful, pungent, musky odour, and a bitter aromatic taste. When added to water, the mixture becomes milky in appearance. Dose, half a drachm to a drachm in water. This remedy was introduced into practice by Dr. Granville, in 1850.

The author has administered sumbul in combination with opium, in cases of hysterical nervous excitement with sleeplessness, and has found it act extremely well in allaying the irritable condition of such nervous patients.

SUMMER.—See *Seasons—Heat, &c.*

SUNSTROKE.—Coup de Soleil, Insolation, and Heat Apoplexy, are all names given to what is best known in this country by the name of Sunstroke, an affection of the nervous system very fatal to the European soldier in tropical climates, and induced by protracted exposure to heat and exertion in a dry and suffocating atmosphere, together with anything which prevents the proper amount of rest and sleep being taken. It has been observed that people of intemperate habits are much more likely to be attacked than others, and to avoid the liability, it is of imperative importance that alcoholic drinks should be avoided, and others substituted more suitable to the climate, and better adapted in every way to further the moral and physical well-being of the young soldier. Those whose general health is not good may be said to be predisposed to the disease, and ought on no account to undertake a fatiguing journey in India, or any other tropical climate, without every precaution; that is to say, an ample supply of good water should be provided, the best tents should be used, frequent halts in shady places should be made, and an efficient covering, such as a wetted towel, should be worn over the head, to protect it from the rays of the sun. Cold bathing, and exercise in the cool of the evening, are good preventive measures. Flannel should be worn next the skin to prevent sudden chills, and the dress should be of a colour that does not readily absorb heat.

The affection often comes on so insidiously, that it is very difficult to say at the outset whether the patient is the subject of sunstroke or not. Headache is common, but not always present, while there is almost always a certain amount of giddiness. The skin is hot and dry, and there is marked prostration of strength. The pulse is quick, and sometimes full, but is more frequently so small and feeble that it can scarcely be felt by the finger. The bowels are confined, and the urine so copious, that the patient has frequent calls to make water, while the thirst is excessive. After these symptoms have continued for some time, the breathing becomes rapid, the action of the heart tumultuous, and the patient may become suddenly, or, in some cases, gradually insensible. In this state the eyes are frequently bloodshot, with contracted pupils, the face is pallid, and the surface of the body very hot and dry. Convulsions not unfrequently occur about this period of the disease, the patient soon passing, however, into complete stupor, in which he dies. The approach of death is heralded by intermittent pulse, difficult and stertorous breathing, and, just before death, by dilatation of the contracted pupils. Patients who recover are apt to be troubled by some affection of the nervous system, either in the form of temporary paralysis, convulsions, or some form of insanity more or less severe.

The greatest variability exists as to the duration of the disease. In some cases, where numbers of our troops were attacked, death took place generally in two or three hours after the attack, while, in other cases, a longer interval elapses.

An examination of the brain and nervous centres after death does not throw much light upon the nature of this affection, seeing that the condition of these parts has been found to be very different in cases affected by the same symptoms. Congestion of the membranes of the brain, or effusion of serum at the base of the brain, are the true morbid phenomena most frequently met with.

Cases of apparent sunstroke due to the same causes as the above, but which eventually recover, occur in most countries, but most frequently to Europeans in hot climates. The treatment to be adopted is similar to that recommended in the more serious forms of the accident.

In the treatment of the disease it is to be remembered that, as the patients usually die from exhaustion, all depressing remedies are to be avoided; hence nothing could be more insane than to let blood in this affection. If the patient will bear it, the cold douche should be applied to the head, neck, and chest; if

not, these parts should be sponged and bathed with cold water and vinegar. The hair should at once be cut short, a blister applied to the nape of the neck, or blistering fluid pencilled over it. Mustard poultices should be applied to the calves of the legs, and an injection given, containing two table-spoonfuls of turpentine, with the same quantity of castor oil in a pint of gruel. Good strong tea given frequently, with brandy and ammonia, according to the state of depression, are the remedies on which most reliance is to be placed, and if the patient is unable to swallow, these may be given by means of injections.

It is a curious fact that sunstroke is rare in mid ocean, though it occurs frequently in a narrow sea; it is rare also at great elevations, and this is probably to be accounted for by the fact, that although the effect of the sun's rays is greater in such situations than elsewhere, yet the temperature is not correspondingly high, nor is the atmosphere so suffocating. The occurrence of sunstroke has been ascribed, by Drs. Crawford and Barclay, to the effect of an atmosphere highly charged with electricity. The thermometer has been noted at 96° to 120° Fahr. in the shade, in the parts where sunstroke prevailed, such as Central India, Scinde, the Punjaub, Egypt, and the Coromandel Coast. Dr. Livingstone states that sunstroke is unknown in the interior of Africa.

Isolated cases occur in this country during the heat of summer, but they are generally met with in those who have been much exposed to depressing causes of other kinds. Intemperate persons, those who are recovering from illness, or those of a weak and excitable nervous temperament, are most likely to be attacked.

SUPPER.—The last meal of the day is properly supper, and some of the modern dinners would more aptly fall under the former designation. Much has been said respecting the unwholesomeness of eating suppers — much depends on circumstances. Generally speaking, animal food once a day is sufficient for most; if, therefore, an individual for whom it is enough, after a sufficiently good meat dinner, adds a superfluous meat supper shortly before retiring to rest, there can be little wonder if he pays the penalty in sleep disturbed by dreams and nightmare, and by a furred tongue and unrefreshed waking in the morning. This is especially the case if the superfluity is indulged in after a dinner made in the latter part of the day. If dinner is early, if much exercise is taken between that and the evening meal, and if supper is not eaten at too late an hour, many persons can take with benefit a moderate proportion of animal food.

It certainly is better not to eat a meal heavy, either in quantity or quality, before a period of inactivity and sleep so prolonged as that of the night; but there is no doubt that much of the bad character of supper as a meal, has arisen from its being too often one of superfluity. Those to whom suppers are most injurious are the plethoric, or such as suffer from head symptoms. Some persons, however, especially dyspeptic invalids, do themselves harm by abstaining from suppers of every kind, even after the principal meal has been taken early in the day. They do this under the idea that all suppers are bad, and suffer, in consequence, from uneasy sensations in the stomach during the night, and from a sense of exhaustion in the morning, both of which may be prevented by a moderate supper of light food, such as is found to agree best; many a dyspeptic will find his morning meal better digested after a light supper than without.

Refer to—*Breakfast—Dinner—Food—Diet.*

SUPPOSITORY is a medicine in a solid form passed up into the rectum. In some cases this mode of administering remedies is very convenient, especially when the stomach cannot receive them readily. Generally, it is most suitable in painful diseases—such as those of the bladder, womb, and other parts, situated in the vicinity of the lower bowel. In such cases, the suppository may be made with an anodyne or an astringent. The suppositories introduced into the British Pharmacopœia are separately composed of tannic acid, mercury, morphia, lead and opium, belladonna, and carbolic acid, and are variously made up with oil of theobroma, lard, and wax, or with curd soap. A suppository may be introduced into the bowel on the point of the finger, both being well greased; the operation is, however, better and more conveniently done by the suppository tube made for the purpose. Glycerin suppositories are useful in Constipation, and can be easily passed up by the patient himself.

SUPPRESSION.—The cessation, or non-development of an ordinary secretion, or excretion.

SUPPURATION.—The formation of pus, or matter.—See *Inflammation—Pus—Abscess.*

SURGEON AND SURGERY.—Literally, by the word surgeon is meant an individual who employs his hands in the treatment of diseases, and, by consequence, one whose practice is limited to the external treatment of external affections, and such as require manual interference for their removal. Practically, no such distinction can exist.

Refer to—*Physician—Practitioner, General, &c.*

SUSPENDED ANIMATION.—See *Carbonic Acid—Death—Drowning—Hanging—Suffocation, &c.*

SUTURE—in surgery, means a joining, by means of threads or stitches, of the edges of a wound.—See *Wounds.*

In anatomy, the term is applied to the junctions of the bones of the skull.—See *Skull.*

SWALLOWING.—See *Alimentary Canal—Gullet—Throat, &c.*

SWEAT, or PERSPIRATION—is the fluid

thrown off from the blood, "excreted," through the agency of the skin, or rather of the glands contained within the texture of the skin.—See *Skin.*

Refer to—*Diaphoretics.*

SWEETMEATS.—See CONFECTIONERY.

SWEET SPIRIT OF NITRE.—See NITROUS ÆTHER.

SWELLED LEG.—See LEG.

SWELLING.—Increase of size of different portions of the textures of the living body may arise from a variety of causes. The swelling may be either of a fluid or of a solid character. In the former case, it may be caused by increased accumulation or determination of blood in or to the part, the blood being still contained within the blood-vessels; more usually, however, fluid swelling is caused by blood or other fluid not contained within the vessels, but effused into the textures where the swelling occurs. Of this nature is the swelling which occurs after violence; it is, in fact, the result of the effusion of blood—inward bleeding—or of serum into the tissues. The formation of matter also causes swelling. Fluid swellings are in many cases of rapid formation; solid swellings, from their nature, are in general necessarily of slow increase. In rupture, of course, the presence of gas in the protruded bowel renders that a cause of swelling, though comparatively an unfrequent one. As the different forms of swelling are noticed under other articles, it is unnecessary to reiterate them here.—See *Tumour.*

SWINE-POX is a variety of chicken-pox, characterised by the globate form of its vesicles, vulgarly termed "the hives."—See *Chicken-pox.*

SWING SPLINT FOR FRACTURED LEG.—See *Fractures.*

SWOON.—See FAINTING.

SYMMETRY.—The term, as applied to the human form, includes that proportionate adaptation of the various parts of the body to one another, which gives not only grace and beauty, but strength, and, it may be added, in some degree, health. The latter observation is especially applicable to the symmetrical development of the trunk of the body, which can scarcely be unsymmetrical, and still less, deformed, without the contained vital organs being injuriously impeded in their functions. Deformed persons suffer more than others from bad health, aud if they are subjected to an attack of acute disease affecting the impeded organs, they are more liable to succumb. Thus an individual in whom spinal curvature, by distorting the ribs and trunk, injures the symmetrical development and proper capacity of the chest, is more liable to chronic affection of the lungs and heart, and such attacks as bronchitis, and the like, are more severely felt. Want of symmetry, or deformity of the limbs, is less important than when the trunk is affected, the importance varying, of course, with the nature of the case; it may, however, and does occur, that unsymmetrical development, of the lower limbs especially, leads ultimately to greater or less distortion of the trunk also. Moreover, in many cases, want of symmetry must be regarded as the sign of a constitution hereditarily weak, or as the result of sickliness in childhood.

The subject of symmetry is an extensive one, embracing, as it does, the theories of ideal beauty, and the standards of measurement proportional and otherwise; into these we need not enter here; but it may be adopted as a general rule, that the symmetrical development of a race or nation must in some degree be commensurate with their general sanitary condition, the means of obtaining proper nourishment, and their free exposure to light and air. Under article *Light*, it was stated that Humboldt has attributed the absence of deformity among the Caribs, Mexicans, Peruvians, &c., to the constant exposure of the body at large to strong light; and, under the same article, the effect of a diminished supply of light in giving a tendency to the production of deformed children, was also alluded to. Analogous effects will be found to follow, according to the fulfilment or not of the other sanitary conditions; there is no surer sign of a people advancing higher in the scale of comfortable subsistence than the improvement of their physical development and symmetry. The reverse of this is seen in the degeneracy of some of the Irish in the more remote districts on the west coast, in the Indians of the Rocky Mountains, and among the hard-worked population of large towns, especially such as are employed in-doors. Although comparative symmetry is to be met with among many nations, and in the persons of individuals, absolute symmetry, in the sense of perfect balance and correspondence of the two halves of the body, is probably not to be found, and exact measurements go to prove that there always exists some disparity between the corresponding degrees of different sides.

Symmetry is not, however, confined to the actual development of healthy tissues; it extends to and influences many forms of disease, such as often occur in the symmetrical distortions, so to speak, of gout, rheumatism, &c.

Refer to—*Deformity—Spine, &c.*

SYMPATHETIC NERVE.—See NERVOUS SYSTEM.

SYMPATHY.—In man, probably in the higher animal tribes, there exists between certain different portions and organs of the same living body, a bond of connexion, or at least of relative action, through which excited or diseased action in the one is excited in the other, "sympathetically," as it is called, or by "sympathy." It is evident, however, that what are called sympathetic actions arise, apparently at least, in very different ways. Some which are classed as such are evidently

the result of contiguity, others of reflex action (see *Nervous System*), or at least of nervous communication, others of derivative action.—See *Derivative*.

SYMPTOMS.—In a state of perfect health, all the functions of the living body are performed in regular series, and according to certain modes of action, which we recognise as those of health. When, however, these series or modes become deranged or altered, there arise certain signs, or, as they are generally called, "symptoms," which, as they vary according to the nature of the cause that produced them as effects, afford to the medical man a clue to the detection of the cause, more or less perfect, according to the state of his knowledge, experience, and means of investigation; they in fact furnish the means by which he forms his "diagnosis" in the first instance, and which guide his opinion as to the treatment and ultimate issue of the case.

There are certain symptoms, both general and special, which are too marked to escape detection; some, indeed, are forced upon the attention by the complaints of the sufferer, and others are too palpable not to attract the notice even of the unobservant. Beyond these plain and palpable symptoms of disease, however, which "he who runs may read," there are others which lie deeply hidden from ordinary eyes, which it requires all the advantages of knowledge and experience, of educated ear and eye, and of patient attention, to discover, and when discovered to read. There are many signs and characters brought to light in the explorations of the physician, both in the living and in the dead body which he may see, but cannot read correctly, if he can read them at all. Again, there are symptoms which one man can see as symptoms, but which another cannot, and therefore passes them by unheeded; and further, there are other symptoms which one man can not only see, but interpret, but of which another, if he sees them at all, can make no use. In this lies the difference, in one department of practical medicine at least, between the skilled and unskilled practitioner. It does not follow of *necessity* that the man who, from his knowledge of symptoms and of what they indicate, is most successful in the investigation of disease, is so likewise in its treatment, but the chances are greatly in his favour.

If many symptoms pass before the eyes even of the most skilful, which either cannot be seen, or, if they are seen, cannot be correctly interpreted, how superficial must that knowledge of disease be which unprofessional persons can gather from the comparatively few symptoms they are capable of observing or appreciating! How cautious, then, ought such persons to be when circumstances call for their management, temporary or permanent, of even the most trivial ailments! In observing and forming deductions from symptoms, the first questions ought to be—Do they indicate an acute attack? have they supervened suddenly? and if so, to what can the attack be traced? Has there been exposure to cold and wet, or to checked perspiration—those fruitful sources of inflammatory and rheumatic affections? Has there been exposure to contagion in any form, or to malaria of any kind; or is there any prevailing epidemic? Can any violence, at no very distant date, account for the attack? Careful consideration of the "history" of the affection will often throw much light upon its nature. Again, if the usual symptoms of fever indicate inflammatory affection, it is to be considered whether pain or uneasiness in any part, or disordered function of any organ, indicate that the disease has localized itself. If inflammatory symptoms are absent, the spasmodic character of pain—(see *Spasm*)—or the nervous character of the general disorder, become questions for consideration. Should the symptoms of ailment be chronic, the same consideration of the history and of the hereditary tendencies ought to be entered into, and attention particularly directed to the fact of there having been progressive loss of flesh, habitual complaint of cold, unusual lassitude, alteration in the complexion, difference in sleeping, &c.

By systematizing inquiries and observations, a much clearer idea will be gained of the state of an individual who is an object of care and solicitude, than by making them at random. Thus, beginning at the head, attention should be directed to any usual sensations complained of by the person, or any unusual manifestations apparent to others. These are pain, giddiness, affection of the senses, confusion of thought, or impairment of mental power; flushings, twitchings, drawing of the features to one side; disturbed sleep; moaning; grating of the teeth; sleeplessness, or too great somnolency. Passing downwards to the organs of respiration—alterations in the character of the voice; in the respiration, as to the frequency or otherwise; in the power of lying in any or every posture, are all matters for observations; also any habitual cough, and its character. When the digestive organs are affected, the times of their chief disorder, as connected with taking food, is an important symptom; whether the uneasiness comes on quickly after a meal, or not for some hours; whether it is worse after long fasting, or the reverse; whether there is habitual vomiting, &c. With respect to the bowels, the nature of the motions or stools is to be inquired into, and especially the fact of thorough daily relief. In inquiry into the state of the urinary organs, the amount of the secretion, whether it contains albumen, or sugar, its nature as to colour, or its tendency to deposit sediments immediately after being passed, or when it becomes cool, are principal objects. If the calls are too frequent, it is to be noticed whether this depends on increased quantity or on diminu-

tion, which causes irritation from greater concentration. In this way, by carefully and systematically considering a case, even an unprofessional person may acquire very considerable knowledge of its leading features, sufficient probably to enable him to refer to those articles in this work from which he will derive proper information; in many cases, sufficient to open the eyes to a condition of health that calls for the prompt submission to proper medical advice; and when this is determined on, the observation of symptoms, either in his own case or in that of another, such as a child, will enable an individual to furnish a medical man, even at a first interview, with such a history as will afford him much assistance in forming his opinion.

Refer to—*Diagnosis*, &c.

SYNCOPE.—A state of swoon or fainting. —See *Fainting*.

SYNOVIA, or Synovial Fluid, is the fluid which is secreted within the joints by the lining or synovial membrane, for the purpose of lubricating the opposed cartilaginous surfaces of the bones, and facilitating their movements upon one another. It contains a considerable amount of albumen, and from its unctuous quality is known popularly as "joint-oil." When, from any cause, a joint becomes the seat of irritation, there is apt to be a greatly increased secretion of the synovial fluid. This takes place in chronic synovitis, or, as it is often called, "white swelling" of the knee.—See *Knee*.

SYPHILIS, or the Venereal Disease, is disease contracted in consequence of impure connexion. The fearful constitutional consequences which may result from this affection,—consequences, the fear of which may haunt the mind for years, which may taint the whole springs of health, and be transmitted to circulate in the young blood of innocent offspring,—are indeed terrible considerations, too terrible not to render the disease one of those which must unhesitatingly be placed under medical care. In the meantime, if any delay must occur, the pustule sores which may be observable should be well touched with caustic, the diet should be reduced and deprived of stimulant, and the bowels acted upon by moderately active aperients; violent exercise being at the same time avoided.

Whatever the circumstances may be, once and for all the author would warn against any trust being placed in the specious advertisements in connexion with the disease in question, which are so perseveringly and disgustingly paraded before the public eye by quacks, who endeavour to fleece the silly dupes who resort to them, by first exciting their fears.

SYRINGE.—This well-known instrument is useful domestically for many purposes, and its employment is recommended in various articles in the present work. Generally speaking, the ordinary pewter syringes are procured too small to be of much use. Instruments made of glass or vulcanite, capable of holding an ounce or more of fluid, will be found more serviceable.

Refer to—*Ear*.

SYRUP.—A saturated solution of sugar in water. A great variety of medicinal syrups are made, but many of them are comparatively little used. The ordinary simple syrup is made by dissolving, with the aid of gentle heat, five pounds of refined sugar in thirty ounces of water. Syrups made with unrefined sugar are much more liable to ferment than those made with it purified (see *Sugar*). A syrup should always, if possible, be kept in a situation with the temperature up to 55° Fahr.

SYSTOLE is the contractile action of the heart, by which the blood is expelled from the cavities. It is the reverse of diastole.—See *Diastole—Heart*, &c.

TABES—or Tabes Mesenterica—means a disease characterised by wasting or atrophy (see *Atrophy*). The term, however, is applied to a special diseased condition which causes atrophy, the essential nature of which is scrofulous or tuberculous affection of the "mesenteric glands" (see *Digestion*) through which the chyle or nutrient fluid, extracted from the digested food, passes on its way to the blood. The disease, in fact, may be called consumption in the belly; for, though differing in many respects from consumption in the lungs, there are many points of analogy between the two maladies.

Mesenteric tabes is a disease almost peculiar to the scrofulous constitution, whether hereditary or engendered, and it usually occurs previous to the completion of the twelfth year, most frequently previous to the ninth; some consider that children, nursed at the breast, are less liable to be affected by this form of scrofula, but the rule is by no means absolute.

Probably the first symptom which attracts attention in a child becoming the subject of tabes is the progressive emaciation, coincident with undiminished, and often greatly increased appetite, sometimes with depraved appetite, the child evincing a strong desire for such indigestible food as cheese more especially. Along with these symptoms there has generally been complaint at different periods, perhaps two or three times in the day, of pains in the belly, which probably were attributed to griping. The stools, if attention is or has been directed to them, are found to be unnatural, irregularly costive or relaxed, often frothy, and the colour, especially, much lighter than in health, apparently from deficiency of bile, the evacuations look clayey or chalky. If the disease has made some little advance, there may or may not be some amount of tenderness of the belly on some amount of pressure. There is usually fretfulness and irritability of temper, and tendency to flushing

in the evening, and to perspiration, which smells heavy and disagreeable, at night. As time advances, the emaciation becomes more marked, and the attenuated limbs contrast strongly with the abdomen, which probably, but not always, becomes tumid; the features lose their plumpness, the skin of the face is wrinkled, and the whole countenance often approaches in appearance that of an aged person; the veins are prominently marked on the white skin, and with the latter the preternatural redness of the lips often strongly contrasts. When the disease reaches an advanced stage, hectic fever is regularly established, and the patient dies exhausted, if not cut off previously by some acute attack of inflammation. The predisposing cause of this disease is, certainly, in the first place, the scrofulous constitution; its development, however, is greatly favoured by those deficient sanitary arrangements to which the poorer classes are exposed, especially the influence of damp and ill-ventilated rooms, combined with deficient food.

There is a prevailing popular idea that a naturally large or prominent belly is an indication of a tendency to the disease in question; this, however, does not appear to be the case, neither is the prominence of the abdomen always a marked symptom (unless, indeed, it be occasioned by flatulence), until the later stages of the disease, and then the enlarged glands can frequently be felt through the thinned walls of the abdomen, which, moreover, are covered with enlarged, often tortuous veins.

Mesenteric tabes is so fatal a disease, especially if it is allowed to make any progress before treatment is adopted, that its first symptoms cannot be too soon detected and attended to; and those who have under their care children who exhibit scrofulous tendencies (see *Scrofula*), ought to be alive to the possibility of its taking place. Should its occurrence be suspected, the safest and best plan will be to place the patient under proper medical care at once. Medicine, however, is not more requisite than strict attention to the sanitary surroundings, to the ventilation, dryness of the sleeping and other apartments, to exercise in the open air, to due clothing, with flannel next the skin, and to the food, which ought to be nourishing, and to consist of well-cooked fresh meat, mutton especially, at least once a day, or well made nourishing animal broth, nourishing puddings, &c., but with avoidance of all cheese, pastry, &c. A little port wine, or porter, may be useful in some cases, but of this a medical attendant can only safely judge. With regard to medicine, the paleness of the motions, suggesting the idea of deficient secretion of bile, often gives rise to undue perseverance in mercurial remedies. For remedies in this disease the reader is referred to article *Scrofula;* indeed the general treatment of that state of constitution is so similar to what is required in the mesenteric affection that it is superfluous to repeat it, with exception of noticing the almost specific powers of cod-liver oil in many cases of this disease; the following may serve as illustration. A child eight months old was shown to the author, very reluctantly, by its mother, who, as well as her relatives generally, had abandoned all idea of its living beyond a few days. It was a complete specimen of the advanced stage of mesenteric disease; the limbs were shrunk till they resembled sticks covered with parchment, the features withered and old looking, the prominent belly was hard, knotty, and covered with enlarged veins, and, as if in constant pain, the infant screamed almost perpetually. With some persuasion the parents consented to try cod-liver oil given in tea-spoonful doses twice a day, and rubbed into the belly in the same quantity twice a day. Under this treatment the child at once began to improve, and in the course of three or four months had lost every appearance of disease. He is now a fine healthy boy. Similar treatment checked the disease in an early stage in a younger brother of the above patient.

TABES DORSALIS is a disease of the spinal cord, more commonly known as Locomotor Ataxy, characterised by progressive loss of control over the movements of the legs, with some loss of sensation, and not unfrequently some paroxysms of pain. Skilled medical advice is essential for its treatment.

Refer to *Atrophy—Digestion—Scrofula, &c.*

TAMARINDS are produced by a tree which belongs to the leguminous or pea tribe, a native of India, &c., and also cultivated largely in the West Indies for the sake of the acid pulp of the pods, which resemble somewhat those of the common field bean. Tamarinds are brought to this country, either simply dried or preserved in sugar, in jars or casks. The appearance of the pods mingled with fibrous substance and seeds, and immersed in syrup, liquid or partly crystallized, is sufficiently well known. Preserved tamarinds are cooling and aperient, and a welcome addition to the sick-room dietary in many febrile diseases. They are most beneficially employed in the form of infusion made with hot water, and permitted to become cold. A pleasant aperient whey is made by boiling an ounce of tamarind pulp in a pint of milk. The acids of the tamarinds are chiefly the citric and tartaric.

TANNIN and **GALLIC ACID.**—Tannin is the active astringent principle of the nut-gall.—See *Gall—Nut.*—When exposed to the atmosphere in a state of moisture, it appears to attract oxygen, and to be converted into gallic acid. Both tannin and gallic acid are powerful astringents, and are widely diffused as the astringent principle throughout the vegetable kingdom. The former is met with in the form of a yellowish powder, the latter

in fine, white, silky-looking crystals. Both are soluble in water, and in solution are used externally for the same purposes as astringents generally; from half a drachm to a drachm in half a pint of water forming an astringent lotion. Tannin or gallic acid is generally given internally in the form of pill, in hæmorrhage and other similar affections, in doses of three to six grains every two or three hours if requisite. Lozenges and suppositories containing tannic acid are introduced into the British Pharmacopœia.

Pure tannin may be dissolved in its own weight of water by the aid of heat, and in this form is an admirable astringent. Strips of calico dipped in the solution may be well applied over a cut or wound, the dissolved tannin drying into a kind of varnish.

TAPEWORM, also called TÆNIA.—See WORMS.

TAPIOCA is a starchy substance, or fecula, like sago; it is procured from the root of a shrub, which is cultivated chiefly in the West Indies. The root which is known as the "bitter cassava," contains a juice possessed of highly narcotic poisonous qualities; this juice is thoroughly removed by washing, and the starch, or tapioca, dried in the form of grains, resembling, but two or three times the size of, the sago grain. Tapioca is used in sick-room cookery for the same purposes as arrow-root and sago. Dr Christison remarks of tapioca, "no amylaceous substance is so much relished by infants about the time of weaning; and in them it is less apt to become sour during digestion than any other farinaceous food, even arrow-root not excepted."

An imitation, "British tapioca," is made from potatoes, and is very wholesome.

Refer to *Fecula.*

TAPPING, in medical practice, is the withdrawal of fluid which has collected in unnatural quantity in any of the natural cavities of the body. The operation can only be performed by a medical man.

TAR and **PITCH.**—The well known black viscid substance, tar, is obtained from the wood chiefly of the Scotch fir, by the agency of heat. The process, which varies in detail according to the situation, is essentially what is called "distillation per descensum," that is to say, the wood being placed in a hollow of the ground, or in a pot, is kindled, and being covered up, is allowed to burn with a smothered combustion; by this means the tar is formed, and is collected by suitable arrangements at the bottom of the receptacle in which the process is carried on. For medical purposes tar has been used from the most ancient times, and its employment both as an external and internal stimulant is still strongly advocated. It possesses much the same properties as creasote and carbolic acid, and is often used in chest affections, especially in bronchitis and incipient consumption, where it appears to check the expectoration and cough, and to relieve the breathing. It is best given in the form of pills, containing each two or three grains of tar, and administered every three or four hours. Tar is often administered in the form of tar-water, which is best made by digesting—stirring occasionally—one ounce of tar in thirty-two ounces of water for seven or eight days, and then straining. The dose is half a pint twice a day mixed with milk. The vapour of tar has also been recommended, but has not been so generally employed. Tar is now chiefly used as an external application in some cases of skin disease, especially in eczema and psoriasis, and is best applied in the form of ointment composed of five ounces of tar with two ounces of yellow wax, melted together by heat. Pitch is the hard black brittle residue left after tar has been exposed to heat. It is little used. Pills made of pitch were formerly a popular remedy for bleeding piles, but they are now superseded by the preparations of tar. Packer's American tar soap is a specially good preparation.

Refer to *Piles.*

TARANTULA is a species of large spider, common in Southern Europe, the venomous bite of which produces effects similar to those of the scorpion sting. Many fabulous tales of the effect of the tarantula bite were formerly currently believed.

TARAXACUM.—See DANDELION.

TARTAR ON THE TEETH.—See TEETH.

TARTAR EMETIC, or TARTARIZED ANTIMONY.—See ANTIMONY.

TARTARIC ACID belongs to the class of vegetable acids. It is the characteristic acid of the grape, from which source it is procured. In the fruit it exists in combination with potash, as bitartrate of potash, or cream of tartar, the acid when prepared being separated from the alkali by chemical process. For an account of the mode in which cream of tartar is obtained, the reader is referred to article *Potash.*

Tartaric acid is met with both in crystal and powder, generally the latter. Its principal use is to form the acid ingredient for effervescing mixtures of various kinds—and for this purpose it is well adapted, wholesome, and cheap. It is also a good solvent for quinine.

Refer to *Effervescing.*

TASTE.—See TONGUE.

TAXIS.—See RUPTURE.

TEA.—Few articles consumed by man as food require more careful consideration in every point of view than this important and widely used product of the vegetable kingdom; which, as we shall see, is not only a luxury, a cheering but not inebriating stimulant, but a valuable addition to the essentials of healthy nutrition. The tea plant is a native of China, Japan, and Tonquin; and, until late years,

the supplies to this country were all brought from China; its cultivation, however, in the province of Assam, in India, has opened up a new source, and one which promises eventually to be advantageous in every way.

The varieties of teas employed in commerce are very numerous; those most consumed in this country are the black teas, Congo, Souchong, Oolong, and Pekoe, the special characters of which are variously modified by the soil, mode of growth, and by the periods at which the leaves are cut. Green teas comprise not only the gunpowder and Hyson sorts, but are also prepared from the black teas by subjecting them to a process of facing or colouring by means of Prussian blue, turmeric, gypsum, and other deleterious substances, their natural colour really depending on the time occupied in drying the leaves, the green teas being dried much more rapidly than the black. Good tea, when infused, possesses an aroma and natural fragrance impossible to imitate; it should be neither harsh nor bitter to the taste, and the leaves should be free from sand and dust, and unbroken. The infusion ought to be made with soft, in preference to hard, water, and if the former cannot be had in its natural state, it ought to be prepared by boiling it beforehand with a few grains of carbonate of soda. Tea, like coffee and cocoa, owes its peculiar properties to the presence of the alkaloid, theine, and is further modified in action by an essential oil and an astringent principle. Good average black tea, as imported, contains the following ingredients in one hundred parts:—

Water,	8·0
Theine,	2·5
Tannin,	14·0
Essential oil,	0·4
Minor extractives,	15·0
Insoluble organic matter,	54·4
Mineral matter,	5·7

Tea is well known to be subject to numerous adulterations, either by the addition of old and damaged leaves, or by the mixture of the leaves of other plants with the genuine tea leaf, a composition known by the name of "lie tea." To these are sometimes added powdered catechu, gum, and starch, and other more or less deleterious ingredients, especially in the manufacture of green teas; these sophistications, however, as a result of the Adulteration Acts, have been nearly driven from the market. Probably there is no substance, not strictly medical, which exerts so powerful an influence on the nervous system as tea—especially the green variety, of which some people cannot partake without experiencing the most disagreeable effects. Where individuals have a tendency to dyspepsia, the symptoms are apt to be aggravated by the use of tea. Many cases of hypochondriasis may be traced to its abuse, and most people have had experience of the extreme wakefulness induced by drinking tea before bed-time. Nevertheless, as an article of diet, or as a beverage, tea is most useful. When taken in moderation it produces effects at once agreeable and beneficial, its action on the system being both stimulant and restorative, by gently accelerating the pulse and increasing to a moderate extent the action of the skin, and it is unattended by any subsequent symptoms of depression. Taken towards the close of a meal or shortly after it, tea certainly favours digestion, and removes the drowsiness which so often accompanies the process; and lastly, it appears to meet a want in the alimentary requirements of the system which no other beverage, except, perhaps, coffee, is able to supply.

A writer on the effects of green tea on the system says:—"There are some females upon whom green tea produces nearly the same effect as digitalis; and it has been medicinally employed in the diseases for which that herb has so decidedly obtained a high reputation. Desbois of Rochfort has, by the use of it, cured many nervous diseases which have arisen from accelerated circulation. Dr. Percival had an idea that green tea possessed nearly the same power as does digitalis, of controlling and abating the action of the heart." "It is upon the nervous system that the effects of tea are chiefly manifested; green tea, especially, is distinguished by this property. It is said that a strong solution of it, applied to the sciatic nerve for half an hour has caused death. Introduced in only a small quantity beneath the abdominal integuments of a frog, it produced complete paralysis of the hind legs, lasting for some hours." "Administered as an injection to a dog, it caused a perfect paralysis of the bladder and intestinal sphincters, a partial loss of power in the hind legs, and a total loss in the tail." "A poultice of green tea leaves, applied over the human stomach, has caused sickness and vomiting; over the abdomen, colicky pains and purgings; over the heart, faintness and irregularity of pulsation: over the kidneys, diuresis." Were it requisite here, many more instances of the poisonous effects of this herb might be cited. True, these are chiefly the results of green tea, but in some, black tea will produce nearly similar symptoms. Where individuals have any tendency to dyspeptic affections, these are very apt to be aggravated by the use of tea, which occasions severe gastralgia; these cases are familiar to every medical man; they are frequently cured solely by enforcing the disuse of the beverage, which, indeed, ought to be done in all such cases.

Mr. Corfe, in his lectures on the *Physiognomy of Diseases*, mentions a case very closely imitating cancer of the stomach, which completely and rapidly recovered as soon as the tea was given up; and in the *Lancet* very many cases are recorded to the same effect. The action of tea, in exciting mental phenomena,

is equally remarkable with its influences upon the body. Most students are familiar with its power of clearing the mind, and facilitating its working; many, too, have experienced its baneful effect in preventing sleep and occasioning mental irritability. At times, however, the disorder of the faculties of the mind, under the influence of strong tea, amounts nearly to insanity.

The stimulant properties of tea are not so strongly exhibited when it is taken with a solid meal as when taken with a small quantity of light food. When taken in excess at any time, or too soon after a full meal, the warm liquid is apt to debilitate the stomach, and to interfere with the regular process of digestion. Notwithstanding, however, the evils resulting from the abuse of tea-drinking by some, or its deleterious effects upon a few peculiarly constituted individuals, there can be no doubt that the salubrity of the infusion to the general mass of the community is established on sufficient testimony to outweigh any argument founded on individual cases.

The moderate use of the beverage is of course alluded to. In cases where it evidently disagrees, it ought to be given up altogether; and it may be taken as a rule for most, that two cups of moderately strong tea, morning and evening, are sufficient, and not too much, for health. If this quantity is exceeded, not only is it apt to cause nervousness, but the amount of warm fluid debilitates the stomach.

Refer to—*Breakfast—Coffee—Opium*, &c.

TEARS.—The watery saline secretion named the tears is formed by the "lachrymal gland" (see *Eye*), which is situated in the outer and upper corner of the socket or orbit. The secretion is continually passing over the fore-part of the eye-ball, keeping it clear, bright, and free from dirt, and facilitating the movements of the eyelids, any superfluity of moisture being taken up at the inner angle of the lids, and conveyed into the nose (see *Eye*). The increased secretion of tears is a remarkable instance of mental influence over the body, still more so, when it is reflected that infants do not shed tears in their crying. It would seem that mere crying from physical causes is not sufficient to cause increased secretion, and that some amount of intelligent mental emotion must be conjoined.—See *Eye*.

TEETH are hard substances placed generally at the entrance of the alimentary canal of animals, for the purpose of comminuting the food. True bony teeth are met with only in the higher or vertebrated classes of animals, and in the highest class, the mammalia, to which man himself belongs, they are found to be placed in single rows in each jaw. Even a superficial examination of the teeth of different animals makes evident how specially they are constructed with reference to the habits and food of the being whose purposes they subserve. There are the sharp-edged chisel-like *incisor* teeth of the rabbit or hare; the sharp-pointed, conical *canine* teeth of the dog, and of other carnivora; the broad crushing *molar* or back-teeth of the graminivora and grain-feeding animals. In the case of man, who is calculated to subsist on a mixed diet, we find all the above forms of teeth, but in a modified degree. The teeth of the human adult are thirty-two in number, arranged in two arched rows, containing sixteen in each. The teeth in each of the arches correspond to one another, but those of the upper arch in most jaws overlap the lower. Fig. 207 represents the teeth of one half of the adult lower jaw. Of these—(1) marks the two incisors; (2) the canine teeth; (3) the two "bicuspid" or two-pointed or false molar teeth; and (4) the true molars, three in number; that is, eight teeth in all on one side of the

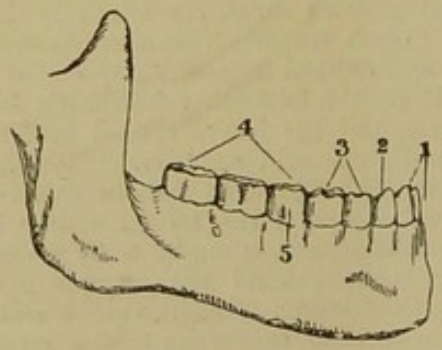


Fig. 207.

one jaw, giving, of course, sixteen for the single jaw, or thirty-two for both upper and lower jaws. The larger illustration (fig. 209) gives a better view of the separate teeth. It represents the teeth of one half of the upper and the corresponding half of the lower jaw, with their roots or fangs. The numbers beginning with (1, 2) the incisors, refer to the positions in which the teeth are set in the jaws. In the child, the number of the first temporary, or "milk teeth," is not so great as in the adult, by twelve. There are the four incisor, and two canine teeth in each jaw, but the true molars (fig. 207—4), are entirely absent, their place being supplied by four temporary molar teeth, two on each side, which occupy the situation of the bicuspid teeth (fig. 207—2), in the adult. About the seventh year of age, when the shedding of the first teeth is commencing (but it may be later), the child cuts the first of the true or permanent molars. These teeth appear without direct reference to the shedding of the first set of teeth, as they do not occupy the site of any of the latter, but, so to speak, break new ground for themselves.

Every tooth is divided externally into a crown (fig. 210—1), and into a fang or root (3). At the point where the gum ceases the tooth is slightly contracted (2), and this, which marks the division between the two other portions, is called the neck of the tooth. When a tooth is divided vertically, as shown in the magnified

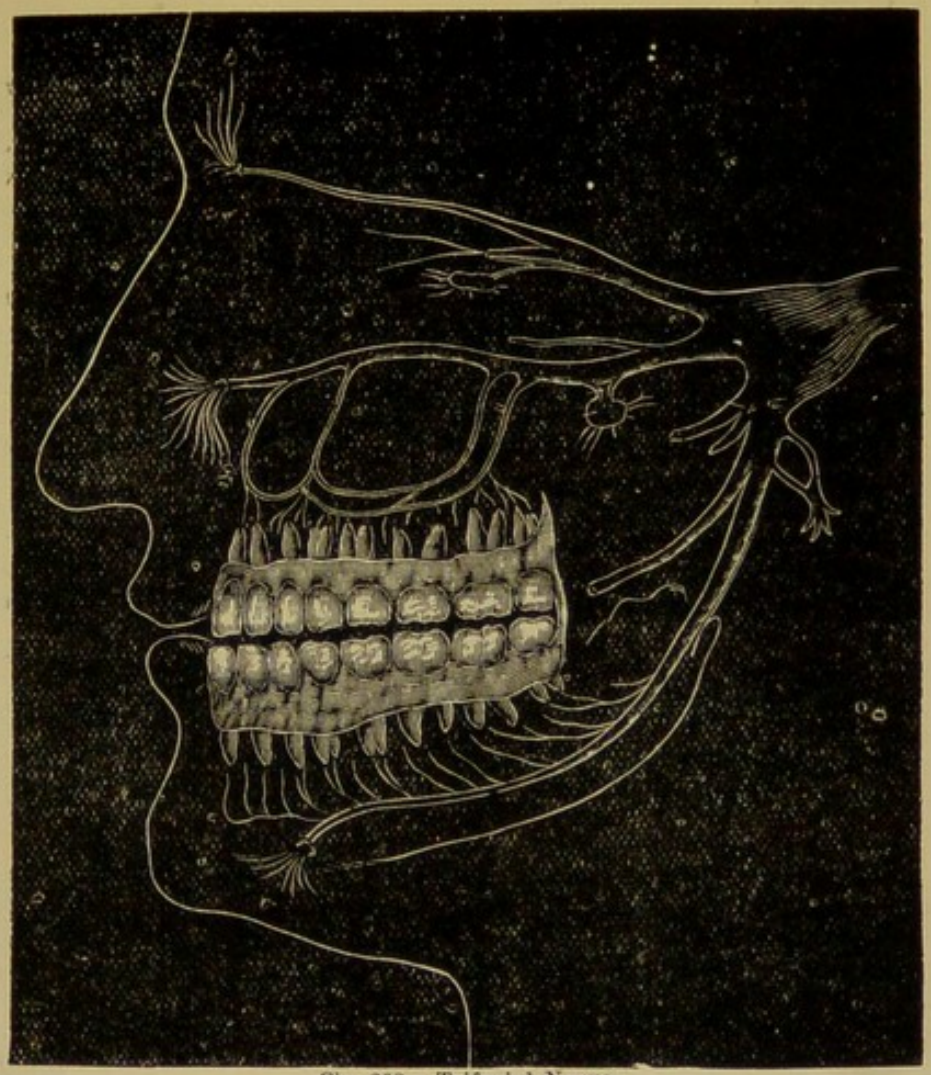


Fig. 208.—Trifacial Nerve.

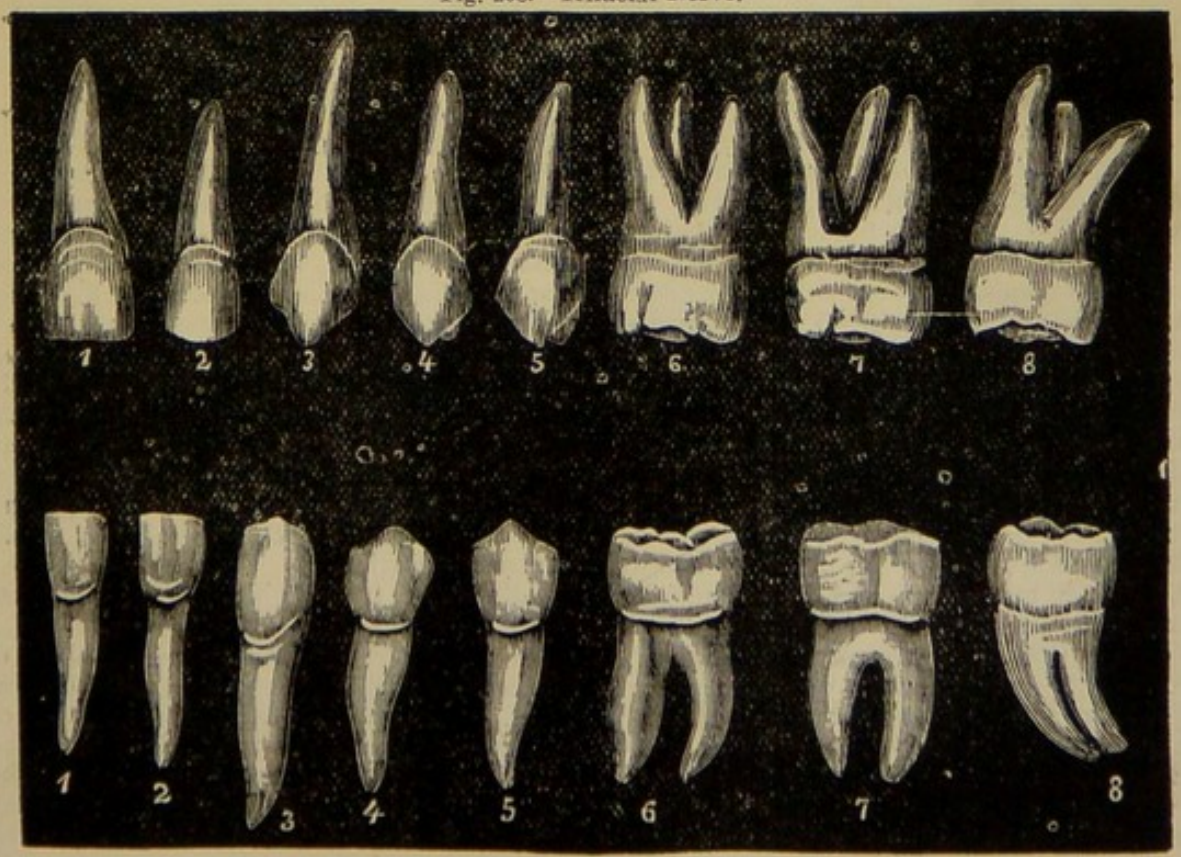


Fig. 209.

From *The Teeth: How to preserve them and prevent their Decay*, by S H Linn, M.D., D.D.S., Dentist to the Imperial Academy of St. Petersburg. .

section of an incisor tooth (fig. 210), there is seen covering its exposed portion or crown, the "enamel" (4), which, thickest at the superior part, gradually thins off towards the neck, where it ceases. At this point, however, begins another substance; the "cementum" or "crusta petrosa" (6), which gradually increases in thickness towards the extremity of the fang, where it leaves a perforation, through which

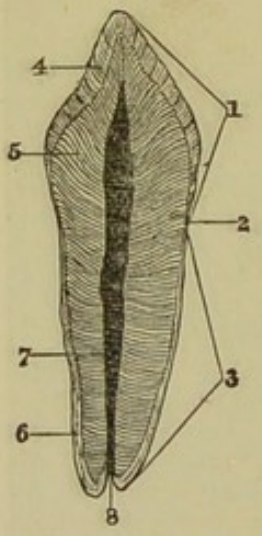


Fig. 210.

the vessels and nerve pass to the interior or pulp cavity (7), which occupies the centre of the tooth. Between this pulp cavity and the enamel on the crown, and between it and the outer bony casing or cementum on the fang, lies the tooth bone, dentine, or ivory (5), which constitutes the great bulk of the tooth.

Nerves of the Teeth.—The teeth derive their nerve supply from two great branches of that important sensory and motor nerve, termed the trifacial (fig. 208), which, originating in the substance of the brain, sends branches to the eye and to the upper and lower jaw, from which also filaments are furnished to the skin of the face, the ears, forehead, and scalp, to the muscles of mastication, and to the tongue. From the upper and lower maxillary branches, each tooth is furnished with a nerve filament, which enters at the roots of the separate fangs with the blood vessels through the dental canal. From its extensive sympathetic connexions with all parts of the head and face, irritation, due primarily to the teeth, is conveyed by the nerve to distant parts, causing much pain and inconvenience, without the origin of the evil being always discovered. Convulsions in young children are mostly due to the irritation of the nervous system from the process of teething; facial neuralgia, frontal headache, earache, and neuralgia of the scalp, may continue for a long time without the cause being discovered, in the absence of a close inspection of the state of the teeth. Some diseases which even partake of a constitutional character, such as debility, sleeplessness, and mental disturbance, have been known to be occasioned by a diseased tooth, and relieved by its extraction.

Composition and Development of the Teeth.—Probably no structure in the animal body, not even the eye itself, evinces more striking evidence of wise design, than there is to be found in a completely developed tooth, still more when the processes of its development are traced, as they have been, from the first papilla or appearance of preparation for the future structure. These, indeed, are wonderful and beautiful, but how much more wonderful to find that before an infant has yet breathed the air of this world, the preparation is made in its jaws for the development of its future permanent teeth, not to be made apparent for eight or nine years after, when the enlargement of the bones permits this development and renders it necessary.

The calcareous enamel of the teeth is composed almost entirely of earthy or mineral constituent, the animal matter not constituting more than two per cent. of the whole. It covers the entire exposed portion, or crown of the teeth (fig. 210). The enamel is not, as

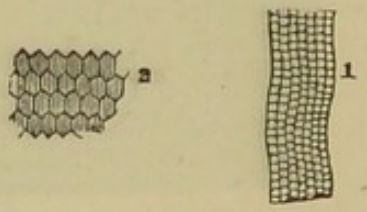


Fig. 211.

might be supposed, a homogeneous structure, but is composed of numbers of minute hexagonal fibres or rods, as shown when magnified (fig. 211—1), placed side by side; a transverse section of these fibres, presenting the hexagonal divisions (fig. 211—2). The diameter of these fibres is about the $\frac{1}{4000}$ of an inch. They are not straight, but as represented, have a wavy appearance; their inner extremities rest in shallow depressions on the surface of the tooth-bone or ivory, their outer ends forming the surface of the crown of the tooth. By this arrangement of its structure, the enamel is evidently most perfectly adapted for sustaining the pressure, to which it must be liable, in the process of mastication. The "tooth-bone," "dentine" or ivory, which constitutes the great bulk of the tooth (fig. 210), and on which the enamel rests, is composed of numbers of branched tubes, which radiate from the central cavity. Through these tubes, the branches of which intercommunicate in all directions, the fluids of the tooth permeate; moreover, the firmness of their walls, and of the surrounding fibrous substance, and the radiating and waved course of the tubes give the entire mass of dentine or ivory the greatest possible power of resistance. The cementum, or crusta, which

forms the thin bony covering of the fang or root of the tooth (fig. 210—6), resembles ordinary bone in structure. It is the enlargement of this bony crust which is sometimes found upon the fangs of teeth. The pulp (fig. 210—7) contained in the tooth cavity, is largely supplied both with blood-vessels and nerves, which enter at the perforation in the extremity of the fang (8).

The separate sockets or "alveoli," into which the teeth are so firmly fitted, correspond to the shape and directions of the fangs, to which they are united by a somewhat elastic "periosteum," and by communicating blood-vessels.

The bicuspid or false molar teeth frequently have a fang forked at the extremity, each division being perforated. The true molar teeth have two, three, and sometimes four fangs each (fig. 209).

In infancy, the period of teething, or the coming forward of the first set, the temporary or milk teeth, always occasions some amount of disturbance in the susceptible young constitution.—See *Childhood*.

The order in which the teeth are successively developed varies considerably; the following table gives the average time, the teeth of the lower jaw generally appearing before the corresponding ones of the upper:—

TEMPORARY TEETH.

7th month, two middle incisors.
9th ,, two lateral incisors.
12th ,, first molars.
18th ,, canine.
24th ,, last molars.

PERMANENT TEETH.

6½ year, first permanent molars (fig. 209—6, 6).
7th ,, two middle incisors (1, 1).
8th ,, two lateral incisors (2, 2).
9th ,, first bicuspids (4, 4).
10th ,, second bicuspids (5, 5).
11th, 12th, canine (3, 3).
12th, 13th, second permanent molars (7, 7).
17th, 25th, third, or last permanent molars or "wisdom teeth" (8, 8).

The first teething in infancy is always somewhat critical (see *Childhood*), but even the second is not always free from irritant effects upon the constitution, and epileptic and other attacks have dated from this cause and period.

There are a few instances on record of a third partial teething even in old age.

Decay of the Teeth.—The carelessness or neglect in the preservation of the teeth, which prevails among all classes, and especially among the lower orders, can result only from ignorance of the important purposes they subserve in the animal economy, and of how closely their perfection and efficiency are linked with health; there is no question that the possession of a good set of teeth may make all the difference between a hale and prolonged old age, and premature decay of the powers of life (see *Digestion*). Moreover, the disorder of the stomach produced by the insufficient mastication and comminution of the food, which must be the consequence of deficient teeth, tends still more to increase the evil; for since the teeth may, as nails and hair on the skin, be considered as developments from the mucous membrane which lines the digestive organs, they sympathise with, and suffer from, whatever affects that lining membrane; consequently, there is no more certain cause of decay in teeth than indigestion, and particularly if the saliva becomes acid.

There is no question, however, that although chronic indigestion is very liable to assist decay in teeth, the process takes place much more quickly, from any cause, in some persons, than it does in others. There certainly is hereditary tendency in this as in other peculiarities of constitution; for the members of one family preserve their teeth sound much longer than those of another, though equal care is bestowed on them. At the same time proper attention to the teeth will do much to preserve a naturally deficient set, and *vice versâ*.

The teeth being constantly moistened with the saliva, are continually liable to become encrusted with the animal matter and earthy salts contained in that fluid, forming what is popularly known as the "tartar" upon the teeth. This formation would accumulate much more rapidly than it does in those who neglect their teeth, were it not partially removed at each meal by the friction of the food in course of mastication; this is seen when persons, as in fevers and paralysis, lie long without food; the teeth become at times quite crusted over. The author met with a strong example of the kind in the case of a girl of bad constitution, in whom, from avoiding eating on one side of the mouth in consequence of a tender decayed tooth, an accumulation of tartar of considerable thickness entirely covered not only the decayed tooth itself, but those next it, requiring considerable force and chiselling to detach. It formed, in fact, a calcareous case over the tooth. Although partly removed by the food during mastication, the tartar cannot be so entirely, consequently it tends to accumulate around the necks of the teeth at the margin of the gum, and in time drives back, as it were, the gum, exposing the parts of the tooth which are not protected by the hard and resisting enamel, to the action of the influences which speedily induce decay. Besides the tartar, there has been observed to accumulate from neglect, especially between the teeth, a filiform fungoid-like growth. In no way is it possible to remove these continually forming incrustations but by the brush, or at least by some substitute for the brush, by which tolerably active friction can be employed. Neither is it well

to trust too much to dentifrices, or tooth powders, the brush and plain water is amply sufficient for most purposes; a small addition of fine white soap is found to facilitate the cleaning of teeth in some cases, but never should rough or acid tooth-powders be used; they may, it is true, clean the teeth more quickly, but they do this at the expense of the enamel, which in the first instance is gradually worn away mechanically, and in the case of the acid, chemically dissolved. If a tooth-powder is perfectly impalpable, it is difficult to see how it can assist the cleaning of the teeth at all; and is, therefore, just as well dispensed with. A good dentifrice may be prepared by mixing—

Prepared chalk, . .	6 ounces.
Orris root, . . .	1 ounce.
Cassia powder, . .	½ ounce.

When, however, the gums become spongy, and the teeth inclined to loosen, it may be well to use some astringent application for the purpose of strengthening the gums; tincture of camphor dropped into water is commonly used, but, although not fully proved, it has been thought to injure the integrity of the teeth themselves; it is, therefore, as well avoided, especially as a few drops of tincture of myrrh on the tooth-brush is equally efficacious, and is free from suspicion. The powder or tincture of rhatany-root may be used for the same purpose. The following is a tooth powder which might be useful to persons with weak spongy gums:—

Orris root, . . .	3 ounces.
Powdered cinchona bark,	2 ounces.
Powdered Castile soap, .	1 ounce.
Loaf sugar, . . .	4 ounces.
Gum myrrh (powdered),	1 ounce.
Prepared chalk, . .	18 ounces.

Rub well together. Or one of the "quinine tooth-powders," by which the bacteria which infest the teeth are destroyed. As a general rule, however, the use of a tolerably firm brush twice a day, or after each meal, and with water alone, is quite sufficient to preserve most teeth in purity and soundness. It is really surprising to what an extent cleaning the teeth is neglected even by persons in respectable stations in life, and among the majority of the lower classes it seems never to be thought of. Putting comfort, cleanliness, and refinement aside, on the score of health alone the habit ought to be practised, and among all classes ought to be taught to children. There is no doubt that where the food is simple, and health and digestion good, there is much less tendency to the accumulation of tartar about the teeth; but this immunity is certainly not enjoyed by the lower classes in Britain, who suffer greatly from decayed teeth. It has been thought that the hot food and fluids used by civilised man tend to promote the decay of the teeth, and probably they do, if the habit is acquired, as it is by some, of taking these very hot. The use of the teeth to crack nuts, to bite hard substances, and the like, is apt to chip off the enamel, and thus to expose the tooth to certain decay. Some medicines have an undoubted tendency to injure the teeth, certainly mercury given to affect the gums does so, and this should always be a serious consideration with a medical man in using the drug to this extent, in the case of the young especially. The mineral acids act chemically, by dissolving the enamel; they ought, therefore, always to be sucked through a quill or glass tube, and the mouth rinsed with water afterwards. Prussic acid given medicinally has been thought to injure the teeth; iron medicines discolour them if the teeth are not brushed after the dose. Under article *Grape*, the author has noticed a singular effect of the acid of that fruit in dissolving off the enamel. Another cause of decay is the lodgment of particles of food in the interstices between them; these the brush will remove, but the use of tooth-picks of any kind is most injurious.

Stopping the Teeth.—As the calcareous, almost crystalline, enamel is the great protection of the inner and more easily acted on structures of the tooth, its removal quickly gives a tendency to decay, which, once begun, tends to spread, unless means are used to stop it. This is best done by means of the "stopping" process with gold or other material, as practised by dentists. To be thoroughly done, stopping requires considerable care, the removal —scraping out—of the decayed portions of the tooth, &c., it therefore requires to be effected by the dentist, who should always be resorted to for the purpose, care being taken to ascertain that the stoppage is not—as has occurred—of such a metallic nature as will injure the constitution. As a temporary stopping, which any one may insert for himself, nothing answers better than a piece of gutta-percha, softened in water, and pressed well into the cavity, which it should fill: it will thus often retain its place for months. Care must be taken, however, that this or any other stopping does not press injuriously upon the nerve, otherwise severe suffering may ensue.

Toothache.—When, in the course of decay, the cavity of the tooth, which contains the nerve pulp, is opened into, toothache begins; the nerve becomes highly sensitive, probably inflamed, and not only is extreme pain excited by the slightest cause, a crumb lodging in the cavity, or a draught of hot or cold fluid, but the slightest jar upon any portion of the tooth is most acutely felt. The pain of toothache may continue with more or less severity and intermission for a long time, till either the sufferer is driven to the permanent cure of having the tooth extracted, or, as often happens, the pain ceases of itself, or under the use of some application. Undoubtedly, extraction is the only certain cure for toothache, and when a tooth is so utterly decayed that it cannot be

stopped, and is of no use, its removal cannot too soon be submitted to; at the same time, it is worth while to suffer a little pain to save a tooth that is likely to do after-service, and that will bear stopping after the irritation of the nerve has subsided or been subdued. The aching of a decayed tooth is very often excited by cold, or by disorder of the digestive organs; when, therefore, the pain commences, the possibility of such causes should be investigated, and if they exist, they should be rectified (see *Cold*, *Indigestion*, &c.). If, however, after this has been done, the neuralgic irritation still continues, it may be advisable to give quinine, and also opium, as recommended under the article "Neuralgia:" counter-irritation, in the form of blister or mustard plaster behind the ear, being also used. The agonising ache of the tooth itself requires to be quickly relieved, if possible, independent of the above remedies, which are to remove the tendency. The applications used to cure toothache would make a long list; one of the best is made by dissolving a drachm of gum mastic in chloroform, and adding to that half a drachm of pure carbolic acid; among the others, chloroform, creasote, and opium are the most useful. Even when tooth pain of a neuralgic character is associated with decay, the tincture of gelseminum will frequently relieve (see *Neuralgia*). Strong ammonia is also sometimes used with success; it probably acts partly by neutralising acid matters within the decaying tooth. The most effectual application which the author has ever used, is composed of creasote and strong solution of ammonia, of each one part, tincture of myrrh two parts. In some cases the ammonia and myrrh are effectual without the creasote. All these liquid applications are best introduced into the decayed tooth by means of a small pellet of cotton wool, soaked in them, and *lightly* laid in the cavity. If pressed in, its mechanical pressure on the nerve may counteract the good effects of the remedy, or even aggravate the pain. If the first use of an application does not relieve, the piece of cotton should be removed, and a fresh charged portion introduced; this is often successful. The applications which are most generally serviceable in toothache, are stimulants, which seem to act by destroying the sensibility of the nerve. This is now generally effected by dentists by means of a paste containing arsenic. It is sometimes difficult to find the opening into the pulp cavity of a tooth when small; not unfrequently it is situated at the neck of the tooth, where both enamel and cementum are thinnest.

The wisdom teeth, or last molars, are peculiarly susceptible of this species of decay. When the gums are much inflamed in toothache, much relief is sometimes given by lancing them freely around the tooth.

Extraction of Teeth.—To extract a tooth, being merely a mechanical operation, certainly requires no great amount of knowledge, and is one performed in some villages still by the blacksmith or barber; some of these amateurs, by practice, tact, and strength of arm, perform it very well, though perhaps not so easily as the professed dentist, who uses improved instruments. The fact, however, is sufficient to show that any one, such as an emigrant, inclined to render himself useful, and perhaps make a little odd money, in an out-of-the-way place, may acquire the art. At the same time, perhaps, few would willingly trust themselves in the hands of an amateur, except from dire necessity; but as that necessity is not an uncommon one, the accomplishment of tooth drawing may be found not at all a useless one in some situations. It can scarcely be acquired properly, however, without a few practical lessons, which there can be little difficulty in obtaining, in this country at least. Various forms of forceps adapted to grasp each separate tooth are now employed by surgeons and dentists in tooth extraction, being preferred to the old fashioned instrument called the "key," on account of their less liability to injure the gums and jaw of the patient. Possibly an unprofessional person might find it necessary under certain circumstances to use either of these instruments, and it may be found advisable to add a few practical instructions as to their employment.

The key (fig. 212) is of the form represented,

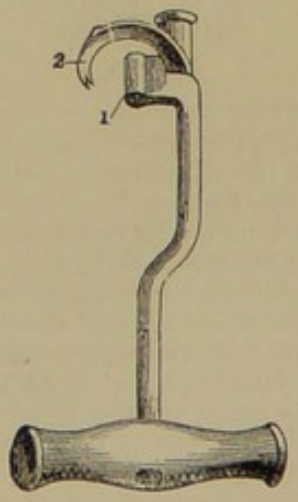


Fig. 212.

with the handle placed crosswise. The bolster (1) acts as a fulcrum; the claw (2) is fixed to the neck of the tooth, inside or outside, as may be most convenient for drawing, and the bolster made to press against the gum on the other side. The head of the patient being fixed by an assistant if the operation is on the lower jaw, the tooth is twisted out by the force of the leverage of the bolster against the gum or jaw. When the upper jaw is dealt with, it is most convenient to seat the patient on the floor, or on a very low stool. The bolster

should be padded by a piece of lint wrapped round, otherwise it bruises the gum unnecessarily. It is better with a gum-lancet to separate the gum from the tooth previously to drawing, otherwise the former may be torn.

Tooth forceps are much preferred to the key by dentists, and by medical practitioners generally, for the extraction of teeth. These are made by the chief instrument makers, with the claws varying in shape to fit the peculiarities of nearly every tooth of the upper as well as of the lower jaw. The pair figured represents the shape of the instrument commonly

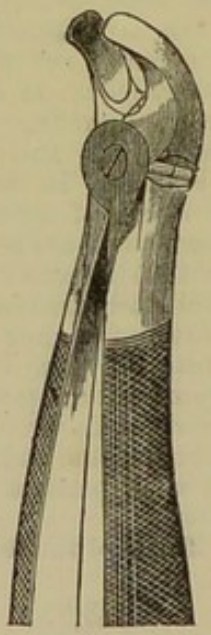


Fig. 213.

used for molar teeth of the lower jaw, although they might also prove serviceable in extracting others. For the front teeth, both lower and upper, straight forceps, that is, forceps with the claws on a line with the handle of the instrument, are more generally used. Whatever forceps are obtained, they should be selected by some professional friend, and should not be so close or sharp as to risk cutting the tooth through. When used, one blade is to be fixed on the outer and the other on the inner side of the tooth, just within the gum margin, and the head being fixed, the tooth is drawn straight out of its socket by the force of traction, accompanied with a slight rotary and lateral motion.

It is impossible in the space of this work to enter as fully into this subject as might be; for those who desire more information, there are popular works published upon it at a moderate price.—See *Gum Boil.*

Refer to — *Cold* — *Indigestion* — *Nervous System.*

TEETOTALISM.—See Intoxication—Stimulants.

TEMPER.—See Passion.

TEMPERAMENT is a term which took its origin in the earlier stages of medical science, when the constitution of the body was supposed to depend upon the proportional mixture or "tempering" of the four principal fluids or humours—the blood, the phlegm or lymph, the yellow, and the black bile. Hence, corresponding with these, there was the "sanguine," or blood temperament, the "phlegmatic" or "lymphathic," the "bilious" and the "atrabilious" or "melancholic." As these distinctions are applicable to certain recognised types of constitution, they are still retained, with the addition of the "nervous" temperament. The sanguine temperament is usually distinguished by the ruddy complexion, blue eyes, and brown hair, and generally full large habit of body, with vigorous performance of the functions of life. The phlegmatic, sometimes called lymphatic temperament, is almost the reverse of the first. The functions of life are usually more feebly performed, the circulation is languid, the skin is pale, the hair light in colour. The choleric or bilious temperament is characterised by black often curling hair and beard, the latter being generally thick and strong; the eyes dark, the complexion ruddy though dark, and the circulation good. In the melancholic temperament the hair is black but straight, the skin is dark, but wants the red tinge of the true bilious; the circulation and the functions are slow and languid. The above temperaments are not unfrequently met with strongly defined in individuals, but in the majority they are mixed up with one another.

Refer to—*Complexion—Diathesis.*

TEMPERANCE.—See Stimulants.

TEMPORAL, connected with the temples.

TENACULUM is a slender hook (fig. 214) to which a handle is attached, used by



Fig. 214.

surgeons for laying hold of and pulling forward a bleeding artery, so as to permit of its being secured. The instrument may be made to shut up into a handle or not, as convenient. It might be found useful in emigrant life.—See *Artery—Instruments.*

TENDERNESS, on pressure of any portion of the body, is a symptom which is always much regarded in the investigation of disease, seeing that it is in most instances, if it

is not in all, indicative of irritation or acute inflammation. In making pressure, however, to ascertain the existence of tenderness, care must be taken, if possible, to bear upon the part examined with a sufficiently extended surface of the hand, and not to press too quickly or forcibly, otherwise the mere roughness of the examination may cause pain, and give the appearness of tenderness.

TENDO ACHILLIS is the remarkably strong tendon which connects the muscles of the calf of the leg with the heel. Any one may feel it in his own person. It is chiefly to be noticed here, on account of the not very uncommon accident of rupture, to which it is liable, particularly in heavy individuals. Perhaps, in making some unusual exertion, there is felt the sensation as of a violent blow upon the tendon, and if the person does not fall to the ground, he at once finds the power over the foot is lost. If the place is examined, the space left between the ruptured ends of the tendon may be distinctly felt. It is, of course, important that the injury to a part on which locomotion so greatly depends should be efficiently repaired; the case, therefore, should always, when possible, be treated by a medical man. The accident, however, is one liable to happen in out-of-the-way places; with a little care, its treatment may be efficiently managed even by an unprofessional person, at all events till skilled assistance is obtained. The principle of treatment is by relaxing the muscles of the calf, to permit the ruptured ends of the tendon to approach one another. To effect this, the palpable proceeding is to bend the knee and the foot as represented (fig. 215).

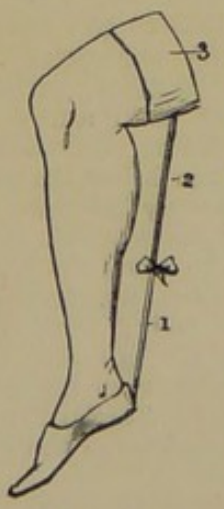


Fig 215.

To attain the position, it is sufficient to attach a strong cord or tape (1) to the heel of a slipper placed upon the foot; to attach a corresponding cord (2) to a band of some stout material, (3) stout calico will do, put round the lower part of the thigh; and this being done, to tie the two cords together, so as to preserve the requisite amount of the flexure, which must be kept up for at least four or five weeks, at the end of which period gentle and gradual extension of the heel may be tried, but no attempt at walking should be made for a considerably longer period. Ultimately, if the case is properly treated, perfect recovery takes place. For some time after the above accident, it is advisable for the person to wear a high-heeled laced boot. Some apply a light bandage in addition to the apparatus described above

Refer to—*Wounds.*

TENDONS, popularly called leaders, are the strong fibrous extensions by means of which the muscles are attached to the bones. All tendons are liable to be divided by wound or by rupture; in these cases the nature of the accident is indicated by the loss of power over the limb or members. The treatment required is similar in principle to that for ruptured Achillis tendon—the relaxation of all the muscles which are connected with the injured part for a sufficient period to permit union.

Refer to—*Ganglion.*

TENESMUS is the sensation in the rectum (see *Rectum*) which causes involuntary straining, or effort to empty the bowels. It is a frequent symptom in diarrhœa, dysentery, &c.

Refer to—*Diarrhœa—Dysentery—Stool.*

TENT.—A piece of lint, sponge, or other material used for dilating openings, or for keeping open wounds.

TEREBENE is a colourless volatile oil, derived from oil of turpentine by the action of heat and sulphuric acid. It is much used as an antiseptic dressing for wounds, many preferring it to carbolic acid on account of its pleasant pine-like odour. It may be applied in its pure state, but it is better to have it mixed with five or six times its quantity of olive oil. The preparation called "Sanitas," so extensively advertised, as a disinfecting agent, is an allied product to terebene.—See *Sanitas.*

TERTIAN.—See AGUE.

TESTICLES, the male organs, are liable to various affections. Inflammation is accompanied with severe pain and swelling; it requires the treatment of inflammation generally; leeching, fomentation, poultices, calomel, and Dover's powder, and aperients, with perfect rest in bed and low diet. Enlargement of the veins—varicocele—accumulation of fluid (see *Hydrocele*), and various chronic enlargements and diseases, occur in connexion with these glands, but for all a medical man's attendance is absolutely necessary. In the meantime, if the symptoms are urgent and painful, perfect rest in bed, avoidance of all stimuli, and attention to the state of the bowels, are the best measures. If circumstances prevent absolute rest, support should be given by a bag-truss or suspender, or by some such contrivance as that recommended in article *Prolapsus.*

TETANUS, Lock-Jaw.—See Lock-Jaw.

TETTER.—A term applied to various forms of skin disease.—See *Skin, Diseases of.*

THEINE.—The active principle of tea.—See *Tea.*

THEOBROMINE.—The active principle of cocoa, resembling theine and caffeine in composition.—See *Cocoa.*

THERAPEUTICS is the art and science of the application of remedies for the cure of disease.—See *Medicine,* and *Medicine, Practice of.*

THERMOMETER, or Measurer of Heat.—The principle upon which this instrument depends is the expansion or contraction of a fluid according to the increase or diminution of sensible heat. The fluid used is sometimes spirit, but more generally it is mercury, on account of the equable manner in which this fluid metal alters its volume with change of temperature. For the purposes of the measurement of heat, a thermometer is constructed by enclosing the mercury, or spirit, in a perfectly closed or hermetically sealed glass tube, with a bulb or expansion at one end; to this tube a regularly marked or graduated scale is attached, which indicates the changes undergone by the mercury within the tube in accordance with the changes in temperature. These scales may be, and are, differently graduated; it is here sufficient to notice the scale of "Fahrenheit," which is universally used in this country. In the Fahrenheit scale, or thermometer, the zero or starting point, or 0°, is placed 32 degrees below the temperature at which water freezes; consequently the freezing point of water is placed at 32°. Between this and the boiling point of water there are 180°, the latter, consequently, is marked on the scale 212°. Between these points there are other temperatures recognised, and usually marked on most thermometers; they are "temperate" at 55°; "summer-heat" about 76°; animal or "blood-heat," 98°·4; and "fever-heat" about 109°. A thermometer is an instrument which ought now, considering its low price, to be found in every house. For practical purposes, such as ascertaining the temperature of baths, &c., it is best to have the tube fixed to a metallic scale.

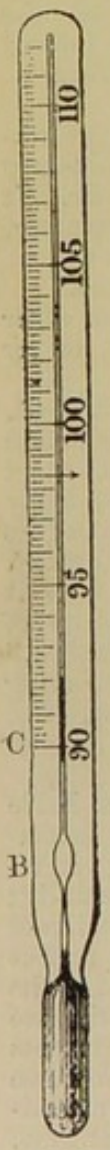


Fig. 216.

Clinical Thermometers are now universally made use of by medical men and others for testing the heat of the body. These instruments are usually made about five inches long, with a break in the column of mercury to allow a portion to remain when the thermometer is removed from the body, and with a contraction in the stem to prevent the registering portion of mercury from descending into the bulb. They are usually graduated from 90 to 112 degrees Fahr., and are made delicate enough to indicate tenths of a degree. It is customary, when using the instrument, to place it either in the armpit or in the mouth, and to allow the bulb to rest there for a few minutes, or till the observation can be taken with accuracy. The normal temperature of the blood is 98°·4, while in fevers and in other inflammatory states, it may rise to 106°, or even higher. In the collapse stage of cholera the body temperature diminishes, and has been registered as low as 82°, and in one case 73°. The accompanying illustration gives a view of Casella's clinical thermometer, with a patent arrangement for setting the index, and preventing it from being disarranged after an observation is taken. The arrangement is effected by means of a contraction below an expansion of the bore of the tube. The index C expands on reaching the chamber B, nearly filling the space, while by aid of the contraction below, the index is prevented from being lost in the mercury of the bulb.

Refer to *Bath—Bed-room, &c.*

THIGH.—The portion of the body which extends from the hip to the knee is composed principally of a mass of fleshy powerful muscles. The fold of the groin, at the junction of the thigh with the trunk, is one of the most important regions of the body in a surgical point of view, for close to it is the most usual seat of rupture (see *Rupture*); and at this point, towards the lower end, the large vessels which pass to and from the lower extremity lie very superficially. Wounds of the groin are, therefore, particularly dangerous, and if the main artery is injured, life is placed in the most immediate peril (see *Artery*). A little below the groin, the vessel becomes more deeply imbedded in the muscles, and ultimately passes round the inner side of the thigh bone to reach the ham. The thigh bones (see *Skeleton*, fig. 190) are the longest bones of the body; from their ball and socket-joint at the hip they incline inwards towards one another at the knees. This inclination is more especially marked in the female, in consequence of the greater width of the pelvic bones.

Refer to—*Hip—Knee—Pelvis—Fractures, &c.*

THIRST—See Diluents.

THORAX.—The Chest—See Chest.

THORN-APPLE or Datura Stramonium. — Thorn-apple is naturalised in Britain. It is an annual plant, and grows about four feet in height. The leaves (fig. 217) are much toothed, of a light green, and the flowers white and trumpet-shaped. The thorn, which is the most conspicuous part of

the plant, is about the size of a walnut, and is covered with prickles or thorns, whence the name. In the shops, the leaves are sold, cut up together for smoking, the mode in which the drug is principally used in this country. There is also an extract and a tincture made from the seeds. Stramonium relieves the paroxysms of asthma, and other affections of the breathing dependent upon spasmodic causes; it is also now made up in the form of



Fig. 217.

cigars for the same purpose, but, being a somewhat powerful narcotic, in either way must be used with caution. At first, not more than ten grains weight of the leaves should be smoked, the dose being gradually increased to thrice that quantity. The plant owes its virtues to the presence of an alkaloid, named *daturine*, a powerful narcotic poison, identical with atropine, the active principle of belladonna.

THREAD-WORM.—See WORMS.

THROAT. — The throat comprises the parts situated at the back of the mouth, and includes the uvula and soft palate, with its arches, and the tonsils; also the pharynx or funnel-like muscular expansion at the top of the gullet (fig. 218). The appearance of the throat, looking through the mouth, any one may verify in his own person; in the illustration the view is supposed to be from behind, the pharnyx or upper portion of the gullet being laid open. The openings of the nostrils are seen at (1). At (2) is the uvula with the arches of the soft palate on each side; (3) is the back part of the tongue, just behind which is situated (4) the glottis or opening of the windpipe. These parts are attached above the skull (7). At (5) is represented a portion of the gullet-tube not laid open, and at (6) the tube of the trachea or windpipe, which lies in front of the gullet (see *Neck*). A little consideration of the figure will enable any one to get a tolerably clear idea of the parts, and their relative positions, of this most important region of the

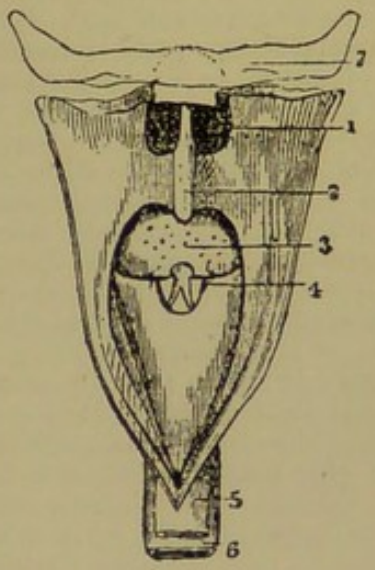


Fig. 218.

body. For further information the reader is referred to articles *Cut-Throat—Digestion—Gullet*, which includes choking—*Larynx—Laryngoscope — Mouth — Neck — Palate — Sore Throat—Tongue—Tonsils.*

THROMBUS.—A clot of coagulated blood filling up the interior of a vein or artery, or occurring within the auricles or ventricles of the heart.

THRUSH.—See APHTHA.

THYMOL is obtained by distillation from oil of thyme, the distilled product being afterwards treated with a solution of soda, and the thymol set free by hydrochloric acid. Thymol is a crystalline substance of a strong aromatic odour, sparingly soluble in water, but readily dissolved in alcohol or ether. It is an excellent substitute for carbolic acid, and may be employed for all purposes for which the former agent has been so extensively used, possessing at the same time the advantage of an agreeable odour, and of not irritating the skin, or corroding instruments. For surgical dressings the following solution is recommended:—one part of thymol, ten of alcohol, twenty of glycerine, with 1000 parts of water. As a ready antiseptic agent, a spirit of thymol, made with an ounce of thymol dissolved in three ounces of alcohol, may be kept in the sick room. A table-spoonful of the spirit added to half a gallon of water makes an excellent and agreeable wash for the hands, face, and hair, after exposure to infection.—See *Disinfectants.*

THYMUS GLAND — a glandular body situated behind the upper portion of the breast-bone; it is larger at birth, and during the first year of infancy, than at any subsequent period of life.

TIC DOULOUREUX.—See NEURALGIA.

TIGHT LACING.—See EDUCATION.

TINCTURES are solutions of medicinal substances in alcoholic spirit, either rectified or proof. Rectified spirit, which consists of eight parts of alcohol to one of water, ought to have a specific gravity of 838°. Proof spirit, which consists of five parts of rectified spirit to three of water, ought to have a specific gravity of 920°. The above different strengths are employed according to the solubility in spirit of the active principles of the drug from which the tincture is made. Some drugs, such as camphor, are entirely dissolved in rectified spirit. The general directions for making tinctures are, that the drug, if it is in solid substance, should be divided into small fragments, or into coarse or fine powder, as the case may be; it is then to be macerated in the spirit in a closed bottle for a certain period—generally from seven days to a fortnight, and after that strained through a cloth, or filtered through paper, or both (see *Filter*). During the maceration, the bottle is to be frequently shaken, and when the straining takes place, the solid is to be freed from the fluid as thoroughly as possible by pressure in a cloth. This may be done by hand, but much more effectually by means of a "tincture press" made for the purpose. Indeed, some substances, such as squill, cannot be at all properly exhausted without the aid of a press. Many tinctures are made by the process of percolation, that is, by transferring the ingredients for maceration to a percolator, and when the fluid ceases to pass through the percolating filter, adding the portion of spirit reserved for the purpose, from the first step of the process; afterwards subjecting the contents of the percolator to pressure, filtering the products and mixing the liquids.

As medical preparations, tinctures possess many special advantages, not the least being their keeping properties; moreover, the form of tincture often facilitates the use of a drug in a state of solubility, and therefore of activity, which could not be attained in any other way. Except in those cases, when the stimulant action of the spirit is desirable, tinctures are best adapted as vehicles for medicines which act in small doses; if the action required from medicine be not stimulant, or rather the reverse, the form of tincture cannot be employed with advantage, that is, if such a dose is required that the stimulant properties of the spirit will be sensibly manifested. For instance, although rhubarb is an aperient medicine, which may safely be given alone, even when fever exists, it would be very injurious under such circumstances to give it for its aperient action in the form of tincture, in which case the dose must be from half an ounce to an ounce or more. Even in the case of the comparatively mild antimonial wine, the author has frequently had to point out the injury which may result from dosing children suffering from inflammatory attacks, or head affection, with this preparation, in quantity certainly sufficient to injure. Of course, when tinctures, such as those of rhubarb, ginger, orange peel, &c., are avowedly stimulant, and given for stimulant purposes, the presence of the spirit is rather an assistance than otherwise, but the rule should be borne in mind, that unless stimulant action is required, or at least admissible, a *medicine ought never to be given in tincture, if the dose which must be administered involves an amount of spirit which will be felt by the system.*

The list of tinctures is a very long one; the following will be found most useful for domestic use:—

Tincture of Arnica.
Calumba.
Camphor.
Cardamoms, compound.
Catechu.
Ginger.
Henbane.
Perchloride of Iron.
Lavender, compound.
Myrrh.
Opium or Laudanum.
Opium, ammoniated.
Orange Peel.
Rhubarb.
Squill.

To the individual articles the reader is referred: in a few, directions for preparing the tincture are given; but, generally speaking, it is both more convenient and economical for domestic purpose to purchase the tinctures ready prepared.

TOAD.—The poisonous properties of this reptile have at times been doubted, but it seems well ascertained that the follicles of the skin do contain an extremely acrid fluid, capable of acting on the body like the poison of the wasp, or of snakes.—See *Wounds, Poisoned—Stings.*

TOASTED BREAD, if not cut too thick, and if toasted slowly, is probably somewhat more digestible than simple bread—it is more thoroughly cooked. Toast, when soaked with melted butter, is one of the most unwholesome and irritating articles of diet that an invalid can take.

TOAST WATER.—See COOKERY FOR THE SICK.

TOBACCO.—This article, a luxury, a drug, or a poison, is the leaf of the *Nicotiana tabacum*, a native of America, both Northern and Southern, but now cultivated extensively throughout the world, and even capable of being so in the climate of Britain. The leaf is large and oval shaped. Very many kinds of tobacco are met with; the Virginia, which is one of the strongest, is used in medical practice in the form of infusion, but is no remedy for domestic employment. Tobacco, however, requires consideration on account of its too widely extended use, as a stimulant or sedative as the case may be, by so many individuals in every quarter of the globe. The effects of tobacco

upon the human system vary according to the mode in which it is taken into the body. Applied locally, as in the familiar form of snuff, it acts as a powerful irritant; taken into the stomach, or injected into the bowels—as it sometimes is by medical men—in the form of infusion, it depresses powerfully the action of the heart, causing fluttering, and a sense of sinking about that vital organ, with deadly faintness, and a tendency to relaxation of the bowels. and if the dose be large, death. Taken into the system by the lungs, in the form of smoke, for the first time, its narcotic rather than its sedative action is exhibited; it acts upon the brain, causing giddiness, inclination to vomit, &c., and at the same time it depresses. The effects of tobacco, especially as it is usually employed, vary of course according to the strength and nature of the variety used, and also according to the *original constitution* and acquired habits of the individual. Few, perhaps, if any, there are, who on first commencing the use of tobacco, escape unpleasant effects from its narcotic and sedative properties, and some individuals never lose their susceptibility to be affected thereby, others become so far habituated to the use of the drug, that these effects are not developed, and others seem to become capable of deriving peculiar restorative influences from its use, experiencing, especially under conditions of exhaustion or irritability, a mixture of stimulant and sedative action which is described as peculiarly grateful.

A drug which is capable of acting so powerfully upon the system as tobacco, cannot, certainly, be habitually made use of without its influencing the functions of the body more or less; much more, probably, in some than in others, but to a considerable extent in all. Opinions vary greatly as to the actual influence which tobacco, when habitually used, exerts upon the constitution; this may perhaps be accounted for by the fact that some, from whom the opinions have proceeded, have themselves been lovers of the "weed," and naturally prejudiced in its favour; few, however, are found to defend it as entirely innocuous, and medical men generally are agreed that, in some constitutions at least, it is highly injurious. Upon those of the melancholic temperament it seems to exert peculiarly injurious effects.

When the habit of "snuffing" causes injury, it is more usually to the digestive organs, and in some persons it certainly gives rise to dyspepsia: indeed, according to Dr. Prout, it may occasion malignant disease of the stomach and liver. Chewing tobacco acts as an excitant upon the salivary glands; if the saliva is swallowed, the narcotic properties of the drug are called into action.

The most obvious injury which is apt to result from smoking, more or less, according to the extent in which it is indulged, is disorder and irritation of the digestive organs, frequently accompanied with depression of spirits, and at times with extreme nervous irritability, the latter being more especially manifested in an inveterate smoker, if, from illness or any cause, his habitual indulgence is interfered with. Very recently, the author saw this well exemplified in the case of a strong countryman, a constant smoker, but otherwise not intemperate. He was attacked with fever; in the course of a few days, in consequence, apparently, of the interrupted use of the tobacco, for by no other reason could they be accounted for, nervous symptoms set in with extreme violence, threatening a speedy fatal termination, and requiring the continual use of opium to keep them in any way under control. In many persons addicted to smoking, especially in those who naturally possess the "melancholic" complexion, the skin seems to acquire a darker, and somewhat of a greenish hue. According to Dr. Prout, a tendency to urinary disorder—oxaluria—is excited. The local injury caused by tobacco smoking is well ascertained; the bad effects, doubtless, are partly due to the heat of the process. Under article *Lip*, the occurrence of cancer in those who habitually smoke from a short pipe was noticed; the injury to the teeth from smoking, and especially their discoloration, is notorious, and, further, we have the valuable authority of Dr. Green of New York, to prove that disease of the throat and air passages is apt to follow indulgence in this useless petty vice. He remarks: "As an exciting cause, the use of tobacco, in my experience, has proved a powerful agent in the production of follicular disease of the throat. Acting as a stimulant directly and constantly upon the mucous follicles of the fauces and throat, and greatly increasing, as it does, the secretion of these glands, its employment, as we should conclude, *à priori*, must have a direct tendency to develop the disease, especially if a predisposition to the affection exists; hence it has occurred to me to notice that of a great number of cases of throat-evil, which during the last year or two have come under my observation, a large proportion of them have taken place in individuals who had been, or were at the time, in the habitual use of tobacco. My attention has been called more particularly to this subject from having noticed, several years ago, some observations on the use of tobacco, in laryngeal and bronchial affections, by an eminent surgeon of this city. After having alluded to the almost universal use of tobacco in the countries of northern Europe, he observes: 'In one very fatal and distressing form of disease, to wit, laryngeal phthisis and bronchitis, among public speakers, the fact is very clearly established, that the moderate habit of smoking, by the drain it accomplishes, and its anodyne qualities, has been eminently useful, at least as a preventive of that peculiar malady so frequent in the United States, especially among the clergy.' From this opinion of my

distinguished countryman and friend, I am compelled to differ entirely, by the statistical facts which I have obtained on this subject. Not only has the use of tobacco, in any and all its forms, proved to my experience an exciting cause of laryngeal disease, but where its employment has been persisted in during the treatment of any case, I have found it impossible to restore such to perfect health."

Enough, perhaps, has now been said to convince that, although the use of tobacco may be indulged in by some, perhaps by many, and to a considerable extent, without very evident injury, there is a large proportion of constitutions in which it is almost a direct poison, sapping the whole foundations of health. The wide extension of the use of tobacco by man since its introduction from the "new world," in the middle of the sixteenth century, is one of the most singular facts of human history; for it is to all, perhaps, at first, a nauseous, acrid, disagreeable drug, which causes uncomfortable sensations in whatever form it is used.

The objections to smoking tobacco as a mere habit do not, of course, extend to its employment as a remedy in disease, particularly of an asthmatic character, in which some persons derive the greatest benefit from its moderate use.

In any case in which the use of tobacco has produced the symptoms described at the commencement of this article in alarming degree, general treatment, somewhat similar to that pointed out under article *Belladonna*, may be employed.—See *Smoking*.

TOES.—See Bunion — Corn—Fracture, &c.

TOLU.—See Balsam.

TONGUE.—The organ of speech and taste (fig. 219) is composed of muscular fibres running

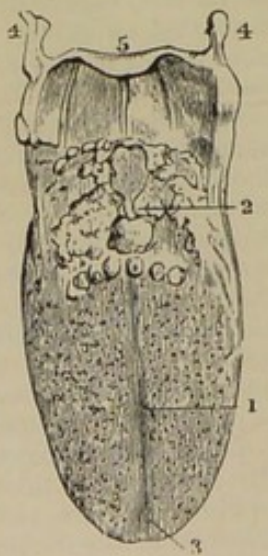


Fig. 219.

through it in different directions, mingled with a considerable amount of cellular and fatty matter, it is abundantly supplied with vessels and nerves. The tongue is divided in the centre by a depressed line, the "raphe" (fig. 219—3). It is covered by a dense mucous membrane, continuous with that of the mouth, on which are numerous "papillæ," small towards the tip, but becoming much enlarged (fig. 219—2) towards the back part of the tongue. At the tip, underneath, the tongue, as any one may see in his own person, is confined by a bridle or tie, or "frænum;" at its root, the tongue is connected with a curved bone, the "hyoid," the extremities of which are represented (4, 4); between these also, at the root, is the "epiglottis" (5).—See *Throat—Larynx—Skeleton*.

It is superfluous here to dwell upon the well-known facility of motion and acute sensation by which the tongue is enabled to perform its well-known functions of speech (see *Speech*). Taste may be regarded as similar in kind to the sense of touch, but as more exalted in degree: some amount of solubility in the substance placed in the mouth appears requisite for its development. Taste, like other sensations, is liable to alteration and perversion in disordered states of the system.

In a medical point of view, the tongue has to be regarded both with reference to its own disorders, and to the indications it affords of disorder in other parts of the system. The tongue is liable to inflammation, although cases of it are rare. When it occurs, the most prominent symptom, in addition to the constitutional affection, is the enormous swelling, which causes the organ to protrude from the mouth, and at the same time threatens suffocation; it is therefore, a very serious affection, and one which requires the immediate attention of a medical man. The remedial measure which gives most relief is to make two free longitudinal incisions down each side of the tongue; these, of course, admit of copious bleeding, but as the tongue diminishes in size, the cuts and the flow of blood also diminish. The remedy is one which might be practised by an unprofessional person in a case of *urgent necessity*; at least it would be better to do it, even at some risk, than to permit an individual to die of suffocation whilst medical assistance was being procured. Ulceration of the tongue may occur as a symptom of digestive disorder, as a consequence of mercurial salivation, or from local causes, such as the presence of decayed teeth, especially with ragged or sharp edges (see *Aphtha—Indigestion—Mercury*, &c.). Of course, when teeth stumps are the exciting cause, they should at once be removed. In many cases of ulceration, the local treatment recommended under *Aphtha* may be pursued with advantage.

Cancer of the tongue is one of the most distressing maladies to which humanity is liable; it may in some cases be removed with advantage by operation; at all events, any persistent sore upon the organ should be submitted *without delay* to the examination of a medical man, in case it should be necessary to excise a

portion, which is only successful when performed at an early stage of the growth. For the affection known as *Tongue-tie*, see *Childhood—Speech*.

As all are aware, the condition and appearance of the tongue are indications almost always consulted by a medical man in investigating a case of disease, and most valuable guides they are at times, when experience and observation have given the power of reading them aright. When the appearances of the tongue, however, are admitted as evidence, consideration must always be given to the natural state of the organ in the individual, for some never have a clean tongue, whilst in others it scarcely becomes furred, even when considerable disorder is going on in the system. In chronic disorders, especially of the digestive organs, the most valuable indications are often afforded by the tongue, immediately after the night's sleep, before food has been taken. Persons who sleep with their mouths open generally have a dry tongue in consequence, but in most persons in health, the mouth should be pleasantly moist on awakening in the morning; if it is the reverse, if the tongue is dry, or clammy, or viscid, and covered with fur, there is usually disorder of the digestive organs, permanent or temporary, from some indiscretion in food, and especially in the use of stimulants. In feverish conditions of the system generally, the tongue is liable to become dry. The appearance of the fur on the tongue varies greatly; it may be thick and dirty white, as it is in stomach and febrile disorders, and especially in sore throat; it may be a thin creamy looking white, as in inflammatory disease within the abdomen; or it may be yellow, as in biliary disorder. It may be patchy, as in scarlatina; or, the centre and sides of the tongue being preternaturally red, as in some forms of intestinal irritation, may contrast with the white fur in other parts. Further, the tongue may be morbidly clean and red also in intestinal irritation and in hæmorrhage; in the former case, perhaps, feeling sore as if scalded; or the papillæ may be elongated as in scarlatina. Again, partaking of the general anæmic condition of the system, the tongue may be pale, when it is also usually broad and flat, indicating general want of tone and flaccidity of fibre. The motions of the tongue, moreover, when it is protruded, give a clue to the state of the nervous system especially; thus, in paralysis of one side of the body, it is protruded towards the paralysed side; in delirium tremens and nervous affections it is tremulous; in the low stages of fever it perhaps cannot be protruded at all.

Such are a few indications afforded by the tongue. As the appearances in each particular disease are adverted to under the individual articles, it is unnecessary to pursue the subject here.

TONICS are remedies which improve the health, muscular tone, or vigour of the system; many medicines, properly so called, possess this power, and are therefore classed as tonics; but other means of health, both mental and physical, are included in the category.

When an individual is in good health, the muscular fibre throughout the body, both voluntary and involuntary, possesses a certain amount of tone, or tonicity, the flesh feels firm, and the actions performed in obedience to the will are effected regularly and decidedly. When, on the other hand, the health becomes impaired, the muscles and fibres generally become "flabby and incapable of continued exertion, but are sometimes irritable, with the tremulousness of debility." These changes in tone are most strikingly manifested in children, in whom they take place with great rapidity; every mother or nurse is practically aware of the fact, and judges greatly and rightly of the health of her young charges by the firmness of the flesh. The connexion between a state of proper tone or the reverse, with the actual physical condition of the muscular fibre, may be "demonstrated by detaching a muscle from the bodies of two animals in these opposite conditions, and ascertaining its strength by appending weights to it; the muscle taken from the healthy animal, or that in a state of tone, will sustain a much greater weight than that which is in the opposite state." Tonics, therefore, are remedies which tend to correct the want of the tone above described by exciting the reverse or tonic condition. In this way food of particular kinds may be regarded as tonic. The "condition" of the horse, as all know, is a state in which the muscular power and endurance is augmented to a high pitch by means of the stimulant power of dry corn food, in contrast to the comparatively weak muscular tone which can be obtained from green food.

Indeed, if the word tonic be taken in its widest sense, it would include a vast number of agents; medically, however, it is used more restrictedly.

The medicinal tonics may be classed as—

Tonics which act directly by influencing the stomach, and increasing its digestive powers.

Tonics which act indirectly, by passing into, and exerting their influence through the blood.

The first, or stomachic tonics, are chiefly the vegetable bitters; of these the most important, at least in a domestic point of view, are—

Calumba.	Hops.
Chamomile.	Quassia.
Cinchona Bark.	Salicine.
Gentian.	

To which are to be added the mineral acids. The second, or indirect tonics, including nervine and vascular tonics, comprise iron in its various preparations, animal and vegetable oils, preparations of zinc and copper, quinine, nux vomica,

and arsenical salts, to which, perhaps, may be added the vegetable acids.

The non-medicinal tonics are—

Cold in its various forms and applications.

Exercise and fresh air.

Mental emotions of a pleasing and stimulating character.

From the above, it may be seen that the action of a tonic is of a stimulant or excitant character; it is, however, distinguished by its permanency, in contradistinction to the transient action of stimulants proper. In order, therefore, to insure the proper action of a tonic, it is requisite to administer it in small doses, which do not cause appreciable stimulation, and at short intervals, once, twice, or three times, according to circumstances, in the twenty-four hours. At the same time, there is a limit to the use of tonics; some, such as iron, if too long continued, are apt to occasion uncomfortable sensations in the head and elsewhere, and bitter tonics, if given regularly for a length of time, at last tend rather to weaken than to strengthen the digestive powers. On this account, it is to be feared that the now fashionable "bitter beer," although a most excellent beverage and tonic in some states of the system, may, if taken *too continuously*, tend rather to mischief than benefit. As the employment of tonics in different affections and states of the body is entered into in the individual articles, it is unnecessary to pursue the subject further here.—Refer to—*Excitants—Stimulants.*

TONSILS are the almond-shaped bodies situated on each side of the "fauces" (see *Throat*), and between the folds or "pillars" of the soft palate (see *Palate*). They are glands which secrete a mucous fluid.

The tonsils are liable to inflammation, constituting "sore throat," or quinsy (see *Sore Throat*). They may also be the seat of ulcerations, and often become enlarged. In the former case — ulceration — astringent gargles may be used, and any disorder of the general health attended to. Enlargement of the tonsils is a very common affection, particularly in scrofulous constitutions, and may come on very early in life. When considerable, it may occasion some difficulty in swallowing, and always gives rise to thickness of speech; the subjects of it, too, are more than usually subject to attacks of sore throat or quinsy. When the enlargement is great, and causes much inconvenience, it is remedied by the simple and not very painful operation of slicing off the most prominent portion of each gland; this, of course, must be done by a surgeon. When, however, the operation is not required, or is objected to, much may be done to reduce the size of the glands, by the persevering use of astringent gargles (see *Gargles, Caustics*), and by attention to any deficiency, as want of tone, in the general health.—See *Scrofula—Sore Throat—Debility, &c.*

TOOTH-ACHE.—See TEETH.

TORMENTIL, or TORMENTILLA OFFICINALIS, is a plant native to Britain, and common on moor ground or hill pastures. It bears a small yellow flower, with four, rarely five, petals, and the stems are straggling. The root of the tormentil is so powerfully astringent that it is used in various places for tanning, and the same property gives it active remedial powers, which have been, perhaps, too much overlooked. There is no reason why tormentil should not be used in place of more expensive and further fetched astringents. The root, which is the part used, is short, and thick for the size of the plant; dark brown externally, and reddish within. When powdered, it is given in from half drachm to drachm doses. The decoction is made by boiling two ounces of the bruised root in thirty ounces of water, till it is reduced one-third, and straining. The dose of the decoction is an ounce and a half. It may also be used as an astringent gargle or lotion. Tormentil root, as an officinal remedy, has been expunged from the British Pharmacopœia.

TORPOR.—See DEBILITY, &c.

TORQUAY—One of the best known, and probably the most beautiful, of the southern health resorts of Britain, presents many, it may be said unequalled, advantages. Although Torbay has a south-eastern aspect, the town faces for the most part due south, being protected from the north and east by limestone hills of greater or less elevation up to 450 feet; the hills being intersected by "combes" or valleys, sloping down to the sea in diverse directions, and both hills and valleys being profusely clothed with shrubs and trees, mostly evergreen, the winter shelter is very complete. Torquay, of course, being in Devonshire, has a considerable rain-fall; in flat and heavy soiled localities a great drawback, but in a place situated like Torquay a decided advantage. It is not the rain that falls, but the wet that remains, which is injurious; in Torquay it cannot remain, indeed the combination of slope and limestone subsoil carries off the water almost too quickly. Falling rain washes the air, the roads, and the drains, and adds greatly to the salubrity of a town, especially when the main drainage is in the perfect condition in which it is in Torquay, where, in the absence of rain, the water supply is abundant, few towns enjoying a freer and purer supply than Torquay, which obtains its water from the granite hills of Dartmoor, where no contaminations can reach it, and where mineral ingredients cannot impair its natural softness, which equals that of the Loch Katrine water supplied to Glasgow.

We have here, then, a combination which tends to make a Health Resort as complete as possible—a southern aspect, variety of elevation, dry subsoil, a sufficient rainfall to keep all, air included, well washed and purified; a perfect

system of main-drainage, and an ample supply of pure fresh water; whilst to these must be added the sea, not merely forming, but almost surrounding, the peninsula upon which Torquay is situated. One more advantage (and that not a light one for invalids): there is the great natural beauty, not surrounding only, but interweaving this town of villas, and the ever varying aspects of the country around, embracing sea-coast, cliffs, inland pasture, wood and orchard, gradually rising into the heathy uplands, wild moors, and rugged "Tors" of Dartmoor. As a winter health resort, Torquay has long since made its reputation, and has maintained it, spite of the rivalry of less favoured spots. As a summer resort, it has of late come more into notice, and deservedly so. When Torquay consisted only of a few villas and terraces under the cliffs, it was said to be a "hot place in summer," but now that it has spread itself far and wide over the foliaged hills, it is as cool as, perhaps cooler in summer than, most southern places; the sea breeze which is ever passing over the Torquay peninsula keeps down the general temperature to a very moderate level in summer, and in winter the same cause has the very opposite effect of raising the temperature above the inland level. In summer the sea is cooler than the air; in winter, on the south coast at all events, it is warmer.

Of course neither Torquay nor any southern health resort can boast of the continued winter sunshine of the shores of the Mediterranean; but offering many climatic advantages, it can also supply the requirements of a well-ordered, beautiful English town, with the comforts and amenities of English home life, within reach of friends and all that is therein implied.

The merits of Torquay as a winter residence for invalids generally, and especially for those suffering from chest affections, are too well known to require comment here; how far they are to be taken advantage of depends greatly upon the medical adviser at home and his knowledge of the subject.

TOTAL ABSTINENCE.—See STIMULANTS.

TOURNIQUET—from the French, to turn, is an instrument (fig. 220) used by surgeons to stop the flow of blood in a limb during operations, or after accidents. For the latter purpose, the tourniquet might be found of great service in out-of-the-way places, and might well form an addition to the outfit of the emigrant. The instrument consists, essentially, of an upper and lower plate (1 and 2), which can be separated from each other by means of a strong screw (3). Connected with the plates are rollers (4, 4), and through these rollers is run a strong band of webbing or other material (5), with a buckle (6) at one end, and a movable pad (7). When the tourniquet is applied, the band (5) is buckled round the limb, and the pad (7) is so adjusted as to press upon the course of the main vessel (see *Artery*). A moment's consideration will make it evident how a turn of the screw (3) will, by shortening or lengthening the band round the limb, either tighten or relax the pressure exerted by the pad (7), and so control the flow of blood through any vessel over which the latter may be placed. The size of the pad may of course be increased, if desirable.

The above remarks will probably make evident the invaluable assistance which may be derived from the tourniquet, in cases of wound or accident; as, however, the instrument may

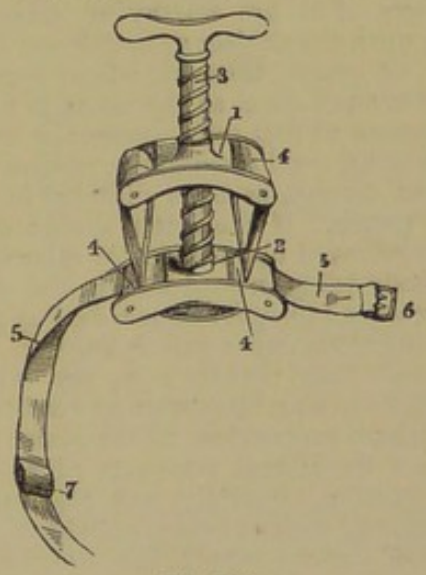


Fig. 220.

not be always forthcoming, it is to be borne in mind that its principle of application is pressure on the course of a bleeding vessel, by means of a pad secured by a band round the limb, which can be tightened or relaxed at pleasure, and that these effects may be brought to bear by means of a pad of the first convenient material at hand, a folded stocking will do, a pocket-handkerchief tied round the limb, and a short stick to tighten the latter by twisting.

Refer to—*Artery—Arterial Hæmorrhage—Emergencies.*

TOUS-LES-MOIS.—A substitute for arrow-root, now imported into this country from the West Indies, where it is said to be equally esteemed with the latter for dietetic purposes. The starch granules (see *Fecula*) are considerably larger than those of arrow-root.

TOW is a valuable appliance in the sick-room, and may be used as a substitute for cotton wool in padding splints and in bathing wounds. When spread out to the required size, it forms an excellent support, instead of rag or lint, for the basis of a poultice, the outer edges of the tow being rolled round with the fingers to form a border, to prevent the material of the poultice from escaping or slipping. Carbolised tow and finely carded oakum are the best appliances for soaking up offensive matters from wounds.

TOWN.—See Houses, Life, and the various articles referred to under *Sanitation.*

TOXICOLOGY—the study of poisons. See *Poisons.*

TRACHEA.—The windpipe. See *Lungs.*

TRAGACANTH GUM.—See Gum.

TRAINING is a system which has been practised, both in ancient and modern times, for bringing the animal body up to as high a pitch of health, tone, and muscular power as possible. If the ulterior purposes for which training is practised in these days are neither desirable nor elevated, the system itself and the effects of it are worthy of attention as bearing upon the subject of health and development. Of course, those in whom great muscular power is desired as the result of training, must possess at first some amount of constitutional vigour, good assimilative powers, and be free from disease, or even disorder of a temporary nature; if the latter should exist, it must be removed by medicine or otherwise.

The body being in good health, the object in training must be to get as much food as possible containing albuminous principles, well assimilated (see *Food*); that is to say, although saccharine and starchy substances must be taken in sufficient proportion to maintain health, it is upon the animal muscular fibre, that of beef or mutton especially, and also upon the dry farinacea, such as bread, on which reliance must be placed to supply the albuminous or plastic elements of muscular development and power. Animal food, therefore—beef and mutton especially, as being most easily digested, —must be freely allowed, and must, moreover, be well digested. In order to insure proper assimilation and health, coincident with the consumption of a large allowance of animal food, abundant exercise is absolutely requisite. This, it is true, must exhaust a greater amount of muscular tissue than if the individual kept at rest; but by the stimulus it imparts to all the functions, and to those of digestion and circulation in particular, it seems to confer the power of assimilating strong nourishment in greater proportion than is requisite to repair the loss by the waste arising from increased muscular movement. Thus there are the two first principles of training, the healthy assimilation of abundant strong nourishment — lean animal food—and the working up, so to speak, of that nourishment into the system by the aid of regular exercise, not carried to that stage of excess in which the stomach and other assimilative organs partake of the exhaustion, and fail in their functions. In order, however, that the assimilative processes may work to full advantage, the other functions must be in healthy working order: the capacity of the lungs should be good where great strength is required, and the air drawn in pure and dry; the skin should be clear of all impediments to its important fulfilments; sleep should be sufficient to thoroughly recruit the frame (see *Sleep*), and should be taken on a tolerably hard bed, with light covering, which will not tend to cause perspiration, or to relax. Much fluid is to be avoided; and if stimulants are taken, table beer is perhaps the best; wine mingled with water, next; but spirits never. As above stated, where muscular development is the object, animal food, with bread, must be the staple; vegetables being used only in sufficient quantity to preserve health; but all puddings, pastry, or soft food of any kind, are incompatible with the end in view.

In fact, training, being the endeavour to bring the physical power and endurance up to the highest possible pitch, is a system of hygiene, from which all may derive information respecting the management and improvement of health, without their object being the cultivation of brute force.

It must not, however, be imagined that it is laid down as a principle, that animal food in large quantity, or even at all, is absolutely requisite for the development of great muscular power; this experience tells us it is not. Some of the most powerful and hardy nations of old subsisted solely on vegetable food, and many modern tribes, noted for strength and endurance, do so. These facts, and many others which might be cited, prove that great muscular power is quite compatible with a vegetable diet, if *combined with habitual muscular exertion.* There can be no question, however, that by means of animal food the system may be more quickly worked up to a state of high tone and condition, but for temporary purposes only; the state is one, in fact, of artificial excitement, and cannot be maintained for any great length of time. It is now generally understood that many of the fanciful restrictions as to diet among trainers are quite unnecessary, and that common sense, after all, is the best guide as to the quantity and quality of the food and exercise which ought to be taken to bring the body into the athletic condition.

Refer to—*Food—Dietaries, &c.*

TRANCE.—Catalepsy.—See *Catalepsy.*

TRAPS.—The function of traps has already been mentioned under the section devoted to *Drainage.* There are certain conditions with which all traps must comply in order to be effective. They should be self-cleansing, otherwise solid matter will collect in them which will soon begin to decompose and give rise to a nuisance. To avoid this it is essential that they should be quite free from angles, projections, or cavities. The water-seal must also be of sufficient depth, 1½ inches being the least which is compatible with safety. Again, as it is the water in a trap which constitutes the seal, in the case of drains which are only in use at intervals it is necessary to guard against the lowering of the water from evaporation by replenishing it from time to time, although it is well, if possible, to avoid making any connection with a drain which is not

likely to be regularly in use. A bend in a pipe, sufficient to form a syphon, gives the best example of a trap when made of lead (as represented in fig. 221), with a cap and screw attached to it for unstopping or cleansing. It is most useful for sink-wastes, &c., and has superseded the old and objectionable bell trap.

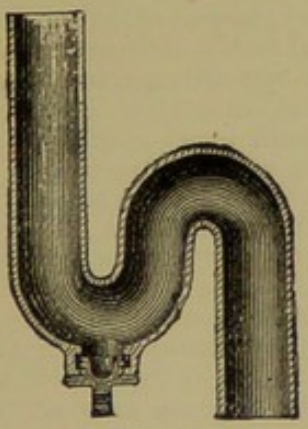


Fig. 221.

Traps are very liable to become unsealed by syphon action, particularly when more than one trap is connected with a waste-pipe, an arrangement which is frequently met with in the case of baths and lavatory basins, or where a series of lavatory basins are connected with one waste-pipe. To avoid this danger it is necessary to connect an air-pipe with the top of the trap beyond the water-seal, as is shown in the drawing (fig. 222, A A).

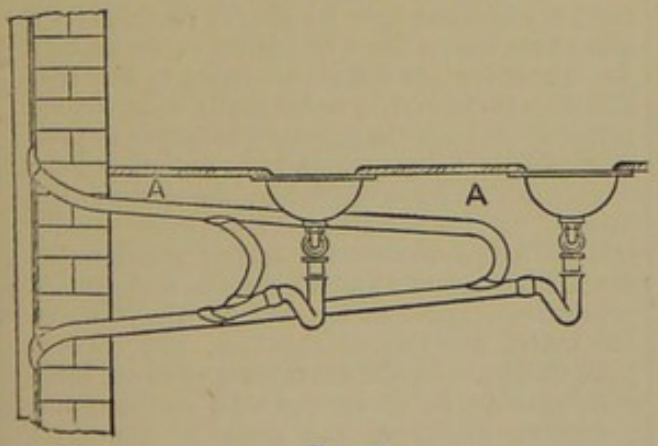


Fig. 222.

Pressure of foul gas within the drain is not an uncommon cause of foul smells being given off from traps by the water-seal being forced —a risk which can be guarded against by the proper ventilation of drains and sewers. Foul gases may also be absorbed by the surface of the water on the far side of the trap, and be given off from the surface of the water on the house side.

An improved syphon trap (fig. 223), called the anti-D-trap, as it is designed to take the place of the highly objectionable D-trap, which invariably used to be fixed in connection with water-closets, has been introduced comparatively recently by Mr. Hellyer, of the firm of Dent & Hellyer, Newcastle Street, Strand, and is designed to meet all the conditions already mentioned. It will be noticed that the diameter of the throat or bend is smaller than that of the mouth and out-go, and that the latter, in place of being round in shape, is square. Both these peculiarities tend to diminish the risk of syphonage, besides which the narrowing of the throat facilitates the displacement of the contents, in other words, improves the self-cleansing property, a requirement which in the case of water-closets especially is all important.

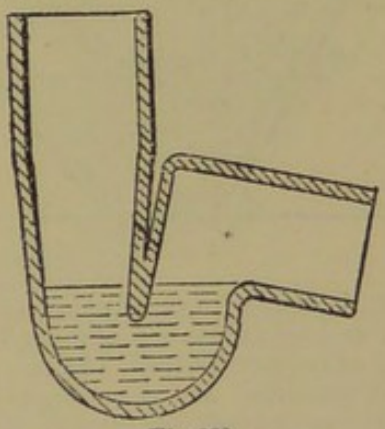


Fig. 223.

Dean's traps are excellent examples of open air traps available for any purpose except the passage of soil, and for any situation. The trap (fig. 224), which is in most use, consists

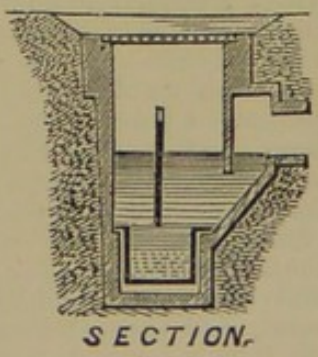


Fig. 224.

of a round or square trough covered with a grating for the admission of waste and surface water, and half way up the side of the tank is an exit opening communicating with the drain.

As an example of a trap fitted alike for house drains or sewers, and available for waste water or soil, that suggested by Mr. Hellyer is among the best and most used. It is made of stone-ware in different sizes (fig. 225), and consists of an interceptor C, D, shaped like the letter V, with a water dip of not less than 3 inches, to check any reflux of gas from the sewer. In the size represented, the calibre of the tube is six inches, but smaller and larger sizes are made to suit special requirements. The soil or waste water from the house drain B, falls with

considerable force on the water in the trap G, and displaces it with a comparatively small flush, while the upper part of the syphon, or air

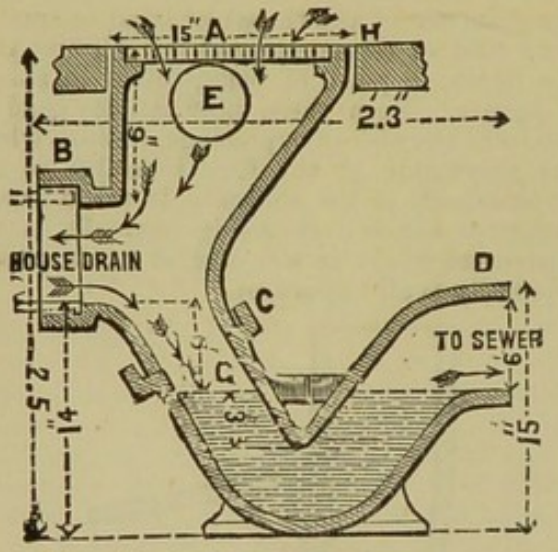


Fig. 225.

chamber, is made large to allow of free ventilation, and to afford a ready ingress to the currents of surface water. The circular opening E is intended for the reception of any other rain or waste pipe, which it might be thought desirable to empty into the syphon.

Besides the hydraulic traps, there is also the flap or hinge trap, which consists of a circular iron plate suspended over the mouth of the drain; this is only suitable for fixing at the outlet of a sewer into which sewage is likely to backpound, as, for example, when it discharges into the sea.

Cautions!—One word of caution—as all drain traps have a tendency to obstruct the flow of sewage, discretion must be exercised in making use of them. It is a popular fallacy to suppose that traps will correct all drainage evils, and that wherever a smell is experienced they are the necessary remedy. Again, as a rule, too little attention is paid to the ventilation of drains, and their disconnection from houses, and it is a common mistake on the part of inexperienced plumbers to suppose that the disconnection of a house waste-pipe from the drain by means of a gully trap does away with the necessity of trapping the waste-pipe itself. All waste-pipes should be trapped within the house as well as disconnected from the drain without.

It is a common practice to introduce a trap at the point where the soil-pipe joins the drain, but this is not the proper position for it. It should be introduced at the furthest point in the course of the drain before it joins the sewer or cesspool, as the case may be. When it is placed near to the house, any smell which may issue from the air-opening of the trap when the closet is used may enter the house through open windows. Besides, by introducing a trap in the course of a drain near to the house, the soil-pipe ventilator cannot then serve the useful purpose of a drain ventilator.

TRAVELLING is both an excitant and a tonic, and, as a remedial measure, in some cases, offers advantages by no other mode attainable (see *Recreation*). Most persons, when undergoing continued travelling, suffer from slight irritable feverishness of the system, particularly if the usual rest be interfered with; the effects of this are best counteracted by spare diet and avoidance of stimulants. Animal food, if taken at all, should be so sparingly, and the best restorative, except, of course, in real debility, when wine is required, is a cup of tea or coffee. A warm bath at about 92° is an excellent soother of the system after travelling.

TREMOR, or TREMBLING, is a symptom and accompaniment of nervous debility and exhaustion, as exemplified in those who exhaust the system by the abuse of ardent spirits. In some diseases, such as fever, the occurrence of tremor is a grave symptom, indicative of giving way of the vital power.

Refer to—*Nervous Disease—Delirium Tremens.*

TREPHINE.—A circular saw used by surgeons for removing portions of the skull.

TRICHINIASIS.—This disease, which has excited much attention and alarm, derives its name and origin from the presence of a minute worm, the *Trichina spiralis*, in the flesh of certain animals used as human food, particularly in that of the pig. There is no doubt that cases of poisoning have frequently occurred from this cause before the true nature of the malady was discovered, and there is reason to fear that the disease may still occasionally arise among persons who have incautiously indulged in pork or smoked sausages which have not undergone a cooking process sufficient to destroy the vitality of the parasite. The disease usually sets in a few days after eating the infected meat, with loss of appetite, nausea, and general prostration, followed by fever, with pains in the limbs, swelling of the face, and copious perspiration. In the worst class of cases, these symptoms are supplemented with vomiting and persistent diarrhœa, and some of the most alarming signs of typhoid fever, with which disease it has no doubt been often confounded. Trichiniasis, though at all times to be dreaded, is not necessarily a fatal complaint, as the minute worms, after finding their way into the fleshy parts, their natural habitat, become encapsuled or embedded in the muscle and remain quietly at rest, causing little or no further disturbance. Numerous remedies have been suggested for the disease, the most feasible being the attempt to remove the trichinæ from the bowels by active purgation; but on the first alarm or suspicion of the disease the case, or cases, should be at once submitted to the advice of a medical man.

Considering the gravity of the distemper, and

its insidious origin, it becomes even a more important question as to what steps should be taken to prevent its occurrence among the population. In the first place, it is obviously necessary to guard against the feeding of pigs, which are notoriously foul feeders, with flesh or offal of any kind which has not been boiled; and in the second, it is equally imperative that the greatest care be exercised in the cooking of meat, especially of pork, so as to destroy all vitality in the parasite, should it happen to be present. Salting, smoking, or toasting are not sufficient for this purpose; it is essential that every particle of the meat should be subjected to a temperature not less than 212°, the temperature of boiling water.

Many deplorable accidents, almost approaching epidemics in the extent of their virulence, have arisen from the cause in question. It is related that in the year 1863, in a small town in the Hartz Mountains, on some festive occasion, 103 persons dined on sausage meat unwittingly derived from a trichinous pig, and within a month 20 died, while the remainder suffered more or less from the same cause. From America we have more recently had accounts of a similar character, and it is now pretty well understood that numerous anomalous fevers described by the older writers long before the true character of the parasite was established might have been directly traced to its ravages.

It will appear, from what has been already said, that this is a matter which not only sanitary authorities but the public generally, and, in fact, each private individual for himself, should guard against, seeing that we do not know how soon accidents might take place. No subject of the present day, perhaps, has assumed a greater importance than the occurrence of the parastic diseases; and we may confidently hope that our knowledge of the causes, and of the means of cure, and still better, of prevention, will be every day increased.

The small white specks formed by the capsules of trichinæ disappear at once when they are touched with dilute hydrochloric acid. This is a very simple test. Trichinæ which are not in their little shell-like capsules can only be seen by the microscope. An instrument should be used which magnifies fifty diameters. The part of the muscle next



Fig. 226.

the tendon is said to be most often inhabited by the trichinæ.

The annexed illustration (fig. 226) from Dr. Aitken's "Practice of Medicine," shows the trichina lying coiled up in his cyst in the muscle; and the next (fig. 227) shows him partially uncoiled, removed from the cyst, and further magnified :—

The trichina was first minutely described by Professor Owen in 1835, although it had

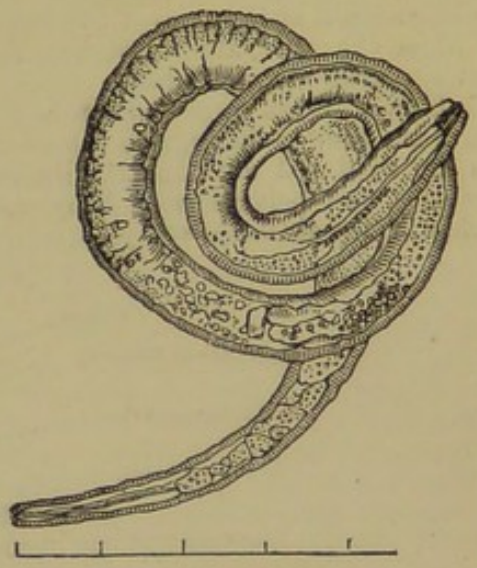


Fig. 227.

been previously noticed by others, especially by Mr. Hilton and Dr. Hodgkin of Guy's Hospital. *Perhaps the best description of the worm is given by Dr. Cobbold in his work on Helminthology.

TROCAR is an instrument used for piercing cavities of the body, such as the abdomen or chest, for the purpose of giving exit to fluid. The trocar is usually so fitted inside a metallic tube or "canula," that when it pierces the body, it carries the latter along with it; the trocar being then withdrawn from the tube, leaves a clear passage for the fluid.

TROCHES—Lozenges.—See Lozenge.

TROPICS AND TROPICAL DISEASES.—As might be expected, the forms and types of disease which occur in hot, tropical climates are frequently very different from those which are met with in this and other temperate regions. Under articles *Acclimation*, *Bile*, *Cholera*, *Dysentery*, *Fever*, *Heat*, *Liver*, *&c.*, the reader will find information illustrative of the effects of a residence in a warm climate upon the system; a special article in the Appendix deals systematically with the subject. The author would strongly advise all individuals about to proceed to a warm climate to consult some medical man of repute, who (and there are many such to be met with), from practical experience and residence in such climates, are competent to advise upon the subject, and to point out, in writing if required, the peculiar causes and symptoms of disease to be guarded against and attended to. Beri-Beri is an obscure and very fatal disease common to the Tropics, though practically unknown in this country. It exists also in

China and Japan, and is endemic in some parts of India, especially in the provinces lying to the west of the Bay of Bengal. The disease is entirely constitutional, and is attended with stiffness and numbness of the limbs, and sometimes with paralysis of the lower extremities. Like many other tropical diseases in India, it is most common at the close of the wet season, and when the alternations between day and night temperature are greatest.

TRUNK.—This name is given to the large mass of the body to distinguish it anatomically from the head and neck and the limbs. The spine, ribs, and pelvis form a bony casement, which, with the aid of the soft parts, constitutes the walls of a large cavity, in which the organs of nutrition are situated. This cavity above its middle part is divided into two, by means of a septum or partition of muscular substance called the diaphragm, which forms the floor of the thorax or upper cavity, and the roof of the the lower or abdomen (fig. 228). The chest, or thorax, contains the lungs and heart with large blood-vessels, is conical in shape, from which circumstance it is often likened to a bee-hive, and its contents occupy the internal area to the fullest extent. In the abdominal cavity are lodged the alimentary or blood-producing organs, the spleen, kidneys, and other urinary organs, as well as the organs of development.

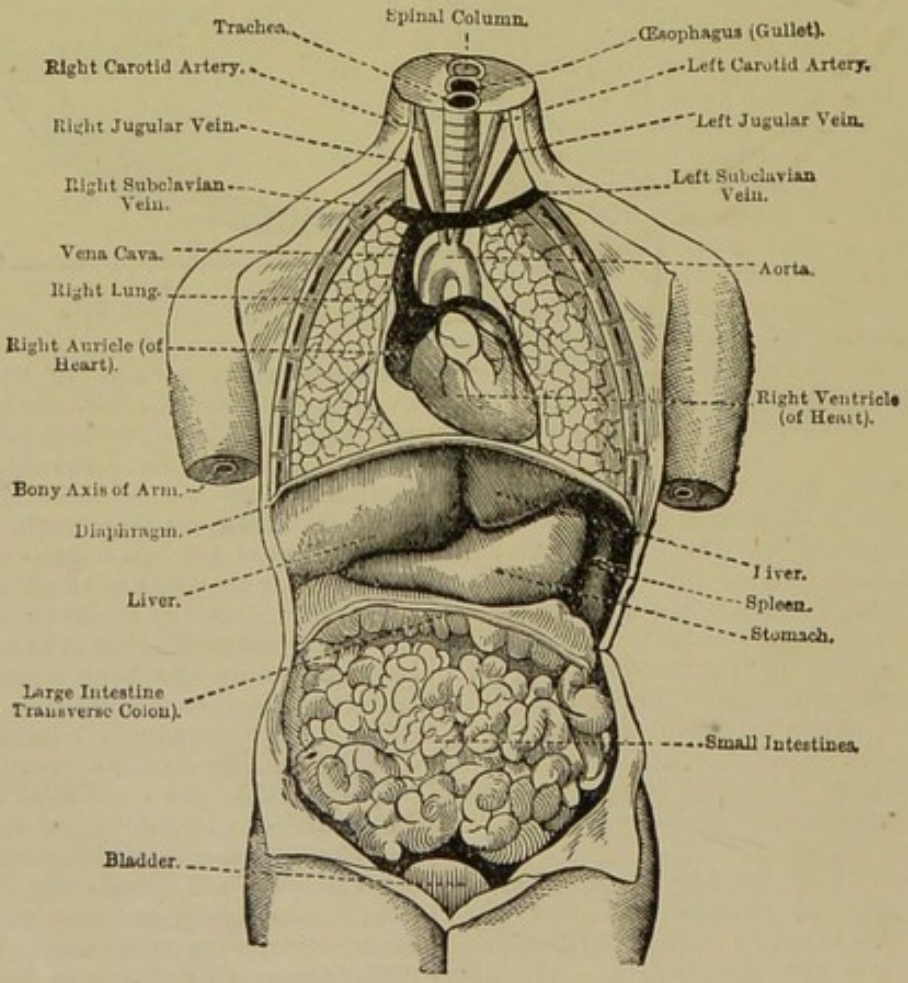


Fig. 228.

In addition to these, and common to both cavities, are the sympathetic ganglia of the nervous system, and piercing the diaphragm downwards are the œsophagus and the aorta, and from below upwards the large vein which returns the blood from the lower parts of the body to the heart (inferior vena cava) and the thoracic duct. The accompanying figure (228) presents a front view of the organs of the trunk nearly in their normal position. The section at the neck where the latter joins the trunk shows the relative position of the three canals formed by the spinal column, the œsophagus or gullet, and the trachea or windpipe. In their immediate vicinity, and on either side, are the large blood-vessels, comprising the right and left carotid arteries and arteria innominata, which carry the blood from the aorta to supply the head also the returning veins, the right and left jugular, which conduct the blood back to the heart by the subclavian veins and superior vena cava. If the chest were laid open, the heart would be found lying immediately under the breast bone and ribs, the lower part or apex resting on the curve of the diaphragm in the manner represented in the figure, with the lungs on either side filling the cavity. The chest cavity being air-

tight, the alternate contraction and relaxation of the muscles between the ribs, and engaged in the act of respiration, increase and diminish its capacity, to permit first, the pressure of the outside air to inflate the lungs, in the act of inspiration, and afterwards by an equivalent pressure from within, to cause the lungs to contract in the process of expiration, an equilibrium between the outside and inside pressure being established in each instance. The average amount of air inspired and expelled in each act of respiration is calculated at 30 cubic inches, and what is termed the vital capacity of the lungs, that is to say, when the organs are fully distended, the amount of air which they are capable of accommodating, is usually estimated at from 200 to 250 cubic inches, tall men and women having a greater capacity than those of smaller stature. In forced inspiration, or indeed under ordinary circumstances, the diaphragm contracts and descends more into the abdominal cavity, pressing down the liver and stomach, and pushing forward these organs; while in the act of expiration it returns to its natural curved position.—See *Chest—Respiration.*

The larger cavity of the trunk contains in its upper part the liver, which extends from the right to the left side, the stomach resting its cardiac or left end against the convex side of the spleen and the small and large intestines, which occupy the greater part of the cavity in front. The other organs, with the exception of the bladder, are too deep-seated to be shown in the diagram.—See *Abdomen—Alimentary Canal—Digestion.*

TRUSS.—See RUPTURE.

TUBERCLE.—See SCROFULA.

TUMOUR—a swelling of any kind in the widest sense of the word, but the term is usually restricted to a permanent swelling. Tumours are met with in every situation in the body, and differ greatly in their characters and tendencies. Of these, it would be perfectly impossible for inexperienced and unprofessional persons to judge; as an invariable rule, therefore, whenever a tumour is discovered to exist, it should be submitted to the examination of a medical man without delay, and all rubbings and the like avoided; they are not likely to do good, and may do much harm by irritating, and thereby causing increased growth. Tumours are dangerous from their nature, or from their situation. In some parts of the body, simple unmalignant tumours may attain a very large —an enormous—size, without threatening life, or, indeed, causing inconvenience, except from their bulk. Rapid and great increase of bulk is most usual in tumours which are pendant. Of all tumours, those of a malignant or cancerous nature are most dreaded, and generally cause the most pain.—See *Cancer.*

A tumour, however, may give rise to many painful symptoms, particularly if its growth be rapid, simply from the stretching of the parts around it, or of the nerves which pass over it; this often occurs in tumours in the neck.

If, after a tumour has been discovered, any delay must necessarily arise before it can be examined by a medical man, and if it exhibits signs of irritation or inflammation, the best remedies are perfect rest, low diet free from stimulants, the regulation of the bowels, and the application of cloths wet with cold or tepid water, or, if need be, a few leeches. If a tumour is inconvenient from its weight, it should be supported.

Refer to—Cancer—Cyst—Swelling, &c.

TUNBRIDGE WELLS "is one of the most agreeable summer retreats in England." "But it is in the absence of humidity, as deduced from hydrometric observations, the rain gauge, &c., that the climate of Tunbridge Wells surpasses that of most places;" "its true distinctive character and pre-eminence 'consisting' in the momentous element of atmospheric dryness." "The nature and medicinal qualities of the Tunbridge Wells mineral spring are well calculated to aid this very salubrious property of the air, as it holds iron in solution in its purest and simplest state of combination, that of a carbonate, with very little foreign ingredient, and with a sufficient quantity of carbonic gas to render it a grateful and wholesome stimulant to the stomach. The water from this spring proves highly beneficial in all cases of simple debility, and in such debility as is complicated with sluggish movements in the glandular system, where no inflammatory action or serious obstructions exist."

"People troubled with any fulness about the head should avoid Tunbridge or its wells."—See *Health Resorts.*

Refer to—Chalybeates—Iron, &c.

TURMERIC—is procured from the root of a plant—the *Curcuma longa*—cultivated in Hindostan, China, &c. It is usually sold in powder of a dark lemon yellow colour. Turmeric is a warm aromatic, and is used chiefly for its colour, and as a condiment, especially in the formation of curry powder.

TURN OF LIFE.—See MENSTRUATION.

TURNIP.—The turnip belongs to the cruciferous plants, or mustard tribes. It is nutritious, combining one part of flesh-forming element to eight parts of carbonaceous or heat givers reckoned as starch; these, however, are combined with from 90 to 96 per cent. of water. The turnip is somewhat laxative and diuretic; it is, however, liable to disagree and cause flatulence in persons of weak digestion. A turnip poultice is sometimes used, but is disagreeable from its smell.

TURPENTINE—of various kinds, is an exudation, chiefly from different species of pines. Common turpentine is the fluid resinous exudation from the *Pinus sylvestris*, or Scotch fir, and others of the pine tribe. From

this the volatile oil of turpentine, or spirits of turpentine, as it is often called, is obtained by distillation, the dry substance which remains constituting resin (see *Resin*). Oil or spirits of turpentine is a valuable remedy, either externally or internally. In the former case, if applied to the skin, by means of cloths soaked in it, it is a powerful counter-irritant, acting like mustard, and sometimes even blistering. It is often employed for purposes of counter-irritation in inflammatory diseases of the abdomen, sprinkled on hot fomentation cloths. Turpentine may be warmed, by placing the pot or bottle containing the turpentine in hot water. In rheumatic affections, lumbago, sciatica, and chronic inflammations, turpentine is a valuable addition to liniments. One part to two of the ordinary soap liniment may be used, or the turpentine liniment of the Pharmacopœia, which is composed of sixteen parts of oil of turpentine, one of camphor, and two of soft soap. There is also an officinal liniment composed of turpentine, camphor, and acetic acid, which is supposed to be analagous to St. John Long's Liniment, at one time in high favour as a remedy for diseases of the joints.

Internally, in small doses, turpentine acts chiefly upon the kidneys, increasing the flow of urine considerably, and giving it at the same time the odour of sweet violets. In larger doses, turpentine acts as a purgative, and has chiefly been used in this way in half-ounce doses, combined with an equal portion of castor oil, to destroy and carry off worms in the intestinal canal (see *Worms*). As an internal remedy in rheumatic cases, turpentine often proves of much service, in fifteen-drop doses given twice or three times a day in milk. It may also be given in similar doses in cases of hæmorrhage, as from the bowels, or in purpura.—See *Purpura*.

When a large dose of turpentine is taken internally, it is apt to cause sickness, with a feeling of giddiness resembling intoxication; after this it usually purges freely, especially if combined with another purgative, such as castor oil. If the purgative action of turpentine is not freely developed, it will, in some persons, affect the kidneys severely, causing symptoms of strangury, similar to those which occasionally follow a blister, and to be alleviated in the same way.—See *Blister*.

Various methods of taking oil of turpentine are recommended, one of the most usual being that of emulsion, made with the yolk of one egg for every two drachms of the oil, and distilled or soft water. The author generally gives it, and finds it well taken in milk, the oil being added to the milk just before it is swallowed. It may also be given to conceal the taste in capsules of gelatine.

As an addition to enemas in stoppage of the bowels, in worms, in hæmorrhage, and in mucous discharges, turpentine is frequently used in the proportion of from half an ounce to an ounce and a half to the pint of gruel or barley-water. After turpentine has been used in an enema syringe, the latter should be well cleansed by warm soap water being passed through it.

Refer to—*Enema—Terebene.*

TYMPANITES is unusual distension of the stomach and intestines with gas. This is apt to occur in fever and in acute inflammation within the abdomen. In such cases it is a symptom which must often be seriously regarded. Tympanites, however, sometimes occurs as a chronic affection. In any case, it may proceed to a great extent, distending enormously the whole abdomen and impeding the breathing. Injections of assafœtida, rue, turpentine, or other stimulant aromatics give relief; and aromatics, sal volatile, tincture of cardamoms, &c., are often given internally, but many cases derive more benefit from the mineral acids.

Refer to—*Enema—Rue—Mineral Acids.*

TYMPANUM.—See Ear.

TYPE of a **DISEASE** is the combination of characteristic and prominent symptoms which marks all the cases of a prevailing disease, such as fever, &c.

TYPHOID.—See Enteric Fever.

TYPHUS.—See Fever.

ULCER and **ULCERATION.**—An ulcer is a sore which discharges matter, and which arises from loss of substance, or separation of continuity in any of the living structures. When a wound, instead of healing up at once by the first intention, remains open, discharges healthy pus or matter, and presents upon the surface small red points or granulations, it is a specimen of a healthy ulcer, or one tending to heal. But though some ulcers, whether healthy or the reverse, may be the result of external violence or wound, in others the cause is more obscure, occasionally it is due to prolonged irritation as that caused by the sharp edge of a tooth, or a nail in a shoe, or large veins, in others it follows a little pustule which may arise in the skin, and into which dirt may have been rubbed. Many others arise from constitutional diseases, such as scrofula, and in some a feeble circulation determines the formation of the sore. Ulceration may occur both within and on the surface of the body; under article *Bone*, caries was described as an ulceration of bone. Ulcers also occur in the mouth and throat, and, indeed, on any portion of the membrane lining either the respiratory or digestive passages. Respecting these forms of ulceration, whatever is requisite has been entered into in other articles; in this place, external ulceration of the skin is only treated of.

Ulcers may occur on any portion of the surface, but their most frequent site, out of all proportion, is upon the legs, and upon the left oftener than upon the right: they are, moreover,

much more common in the aged than in the young. In the majority of these ulcers, large veins will be found in the surrounding skin, and to their existence the ulcer is due; these ulcers exist in the lower half of the leg, where the irritation from the large veins is greatest. Under normal circumstances the valves which the veins contain distribute the pressure of the column of blood upon the venous walls. In some people, either from prolonged standing, from too tight gartering, from habitual constipation, or from a predisposition, the veins become dilated or "varicose," the valves are now unable to close, and so the pressure is felt chiefly in the lower part of the vein: at the same time the dilated vein irritates the tissues around, producing there a thickening, which can always be felt, the vein appearing to run in a gutter (see *Veins*). In this condition of the veins there exists the commonest cause of ulcer: the blood in the large vessels being retarded, reacts upon the circulation in the smaller, or "capillary" branches, and sooner or later ulceration is the result. This ulceration may arise spontaneously, without obvious cause, but very often it is determined by some slight injury; a scratch, a bruise, or an abrasion causes slight inflammation, and gives the first start to the ulcerative process, which extends with greater or less rapidity, according to circumstances, and gives rise to ulcers presenting very different appearances. Into the minutiæ of these appearances it would be useless to enter here; some ulcers present an angry inflamed appearance, with a blush of inflammation extending for a considerable distance around; some are surrounded with hard swelling without much apparent inflammation; and the sore appears to lie deep, surrounded by thick edges. In some the surface of the sore seems glazed and smooth, in others the granulations are large, prominent, and pale, constituting what is called proud flesh. Some of the sores are but little felt, others are intensely painful and irritable. Although it has been said that a large proportion of ulcers depend upon a "varicose" condition of the veins, all do not; many are occasioned by constitutional or other causes. Indeed, the existence and appearance of an ulcer will often afford to a medical man a good index to the state of the system generally.

There are cases of ulceration which require all the skill and patience which a medical man can bring to bear upon their treatment, and where an ulcer is continued, and appears to extend, it should always be placed under proper medical superintendence. There are, however, certain general rules of management which may be adopted with advantage by unprofessional persons, either in their own persons or on those of others.

The great requisite in the treatment of ulcers of the lower extremity is rest, and rest in bed, or at least in the horizontal posture, so that the circulation of the affected limb may become properly balanced. It is often surprising how quickly, under this proceeding alone, and without other treatment, the swelling around an ulcer subsides, and the sore itself alters to a more healthy character. Indeed, there are cases which only require rest to get well. In many cases, however, especially of old standing, further treatment is requisite. If there is angry-looking inflammation and a foul sore, the one has to be subdued and the other cleansed, in the first instance by poultices continued for two or three days, after which, water dressing (see *Dressing*) may be substituted, and if the ulcer improves under its use, continued till the cure is complete; it may be necessary, however, if the surface of the ulcer appears pale, and the granulations large and flabby, to substitute for the water, an astringent lotion of lead, zinc, tincture of myrrh, or to touch the surface of the sore lightly with lunar caustic, or sulphate of copper (bluestone). These liquid dressings of water or lotion are far preferable in every way to ointments. It is desirable, even while the patient is confined to bed, to support the limb and retain the dressings by means of a roller bandage applied from the toes upwards, and this is especially requisite if, or when, the rest of the recumbent posture is abandoned. In many cases of ulcer, however, it occurs that rest cannot possibly be taken; in such, the treatment by strapping with plaster, and by the use of a supporting well applied bandage, offers the most benefit, and best chance of cure; even in these cases, however, it is desirable, if possible, to procure the subsidence of the inflammation and swelling by a few days' rest. When strapping is used, the leg ought in the first instance to be well washed, and the hairs shaved off; a roller bandage (see *Bandage*, fig. 16—C) is then to be applied from the toes to a little below the sore; strips of plaster rather more than an inch broad, and long enough to go once and a third round the

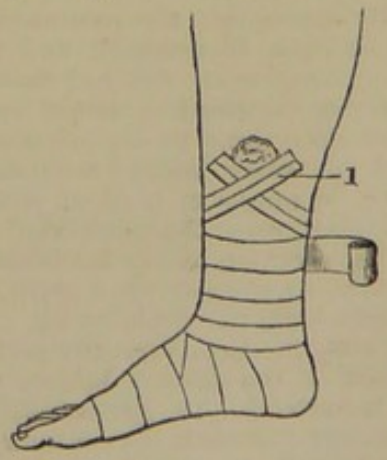


Fig. 229.

limb (fig. 229—1) are applied piece by piece, each one overlapping slightly the preceding, from an inch below to an inch above the sore.

The mode of application is this—the strip being heated, its centre is applied to the side of the limb opposite the sore, and the ends are brought round to overlap as represented, care being taken in the application of both strapping and bandage that they lie evenly, so as to afford equable and sufficient support to the limb, and especially to the veins. The heating may be effected quickly and easily by simply passing the slip of plaster through a basin of hot water, holding one end in each hand. With such a dressing as the above, an individual may be permitted to take a considerable amount of exercise. The dressing will require changing every two, three, or four days, according to circumstances; if the discharge is very profuse, it is well to cut a piece out of the plaster directly over the sore. Diachylon plaster is commonly used for strapping, but for irritable skins soap plaster is preferable; in some cases even this cannot be borne. A new bandage has been invented for ulcer of the leg, and called after its originator "Martin's." It is made of finely perforated india rubber, and with it the leg and foot are bandaged to the knee, the ulcer being covered by the bandage only. At night it is removed and placed in cold water. With this support, many people are enabled to perform their daily duties, the ulcer either remaining stationary or healing. These bandages are sold by instrument makers and chemists. Of course the rules as to position, support, and rest, apply more especially to ulcers situated on the lower extremities. When large, the healing process may be hastened by "grafting" (see *Wounds*). Various lotions are employed for the relief and cure of ulcers. None answer better, on the whole, than the carbolic lotion, in the proportion of one of acid to forty of water. Carbolic oil forms the best application for those large ulcers of the leg, where the person must move about. The proportion is one in ten. When the pain is severe, the lead and opium lotion will often relieve; and when the ulcer is inflamed, or is rapidly increasing, the recumbent position should at once be assumed, and a poultice applied to remove all the foul material, after which any of the dressings named may be used. When an ulcer seems to depend upon enlargement of the veins leading towards it, it is necessary, by means of a small pad of folded cloth applied over the portion of the vein nearest the ulcer, to relieve the blood pressure, the pad being secured by a strip of plaster partly encircling the limb or leg. When an ulcer appears to depend on any particular derangement of the general health, the latter should be attended to, the bowels especially must be kept unloaded, the contrary condition tending greatly to cause and keep up the varicose condition of the veins. In the aged, in whom the functions and circulation generally are torpid, much benefit often results from the use of moderate doses of opium, this is a point, however, which ought to be regulated by a medical man.

In some cases, in which an ulcer has been in existence so long that it has become as it were an established excretory outlet for the system, it cannot be healed up without danger of some other disease, such as apoplexy, &c., supervening. As circumstances may, however, render the healing of even an old sore both safe and desirable, a medical man should be consulted. Serious accidents occasionally occur in consequence of an ulcer on the leg opening into one of the veins; when this occurs, a large, or even fatal quantity of blood may be lost in a short time, unless the individual, or some other person, has sense enough to elevate the limb above the level of the body (see *Hæmorrhage—Veins, &c.*). In dressing ulcers, the mistake is often committed of being too assiduous in cleansing their surface, washing off the pus or matter which lies upon it, and which in some measure is a protection against irritation. This should not be done. The pain of an ulcer underneath either bandage, or plaster and bandage, may often be alleviated by simply soaking the dressings with cold or tepid water, without removing them.

Refer to—*Bandages—Veins, &c.*

UMBILICUS.—The Navel.—See *Childbed—Childhood—Rupture, &c.*

URETER.—The tube which conveys the urine from the kidney into the bladder.—See *Kidney.*

URETHRA is the passage for the urine from the bladder (see *Bladder*). This passage is liable to be affected in various ways, especially in males; sometimes it is injured by violence, at others, small stones or calculi are apt to be impacted in it, and cause much suffering (see *Urine*). The most frequent affection, however, of the urethra is stricture, or diminution of its calibre. This painful disorder in males generally takes it origin from diseases contracted in the irregularities of early life, especially, but may continue to afflict, or punish, even in old age. Stricture is, of course, of every degree, but sometimes proceeds so far as to occasion complete impediment to the discharge of urine, causing much distress and suffering, and requiring the instrumental interference of the surgeon (see *Catheter*). If there is any necessary delay in procuring assistance, the measures recommended in article *Bladder, Stoppage of Urine*, will give relief in the meanwhile. In this disease, as well as in others which affect the urinary organs, it is again repeated—*avoid the quacks.*

URINE.—This most important excretion is purely an excretion; that is to say, it does not, after its formation, fulfil any purpose connected with the living system before it is thrown out of the body; in this respect, it differs from such an excretion as the bile, which, although it is constituted of elements filtered off from the blood, to the purification

of the vital fluid, yet certainly fulfils important ends in the digestive processes.

The minute structural arrangements in the kidney, whereby the separation of the urine from the blood is affected, have already been sufficiently entered into: to article *Kidney* the reader is referred.

The urine being separated or excreted solely from the blood, and being thrown out without serving any purpose in the living economy, must, by simple reasoning, be supposed to contain ingredients from which the body ought necessarily to be freed, and which could not be retained without injury; such proves to be the case, for complete suppression of the fluid cannot continue above a few days without symptoms of narcotic poisoning being developed, and death ensuing if the function be not restored. Urine consists of water holding in solution certain animal principles, and a proportion of saline constituents. The principal and most characteristic ingredient of the urine, however, is its urea, a substance which acts as a base to, or combines with acids; it is the retention of this compound in the blood which causes the symptoms of narcotic poisoning already alluded to, when the urinary excretion is suppressed. Above half an ounce, on the average, of urea is excreted in the urine of an adult in the twenty-four hours; but in some cases, when rapid emaciation goes on, the proportion is greater, the urea being in fact a product formed from the used-up tissues of the body. Next in importance to the urea of the urine is its peculiar acid, generally known as uric or lithic acid. It is this acid which, when in excess, constitutes the yellow or red crystalline gravel, or "sand," which is so frequent in many persons. This acid exists partly in combination with ammonia, forming what is known as the "lithate," or "urate of ammonia."

In addition to these two principal and characteristic constituents, urine contains various animal and colouring matters, also hydrochloric, sulphuric, and phosphoric acids, in combination with lime, magnesia, and soda, all these being derived from the blood. Further, there is always mixed with the urine a certain proportion of "mucus" derived from the bladder and urinary passages. Moreover, other ingredients not natural to it, are apt to be intruded into this fluid, such as the albumen of the blood, or blood itself, pus or matter, oxalic acid, &c. The average quantity of urine secreted by the kidneys of a healthy man in the twenty hours is from forty to fifty ounces, containing from seven hundred to a thousand grains of solid matter. Both fluid and solid matters, as already stated, are derived solely from the blood; not, however, we have every reason to believe, from the healthy constituents of the blood, but from those which have become "effete," which, having served their purpose in the economy, have been taken into the current of the circulation, probably for the sole purpose of being brought under the power of the excreting organs. Not only, however, do the kidneys separate the used up materials which have formed part of the organised frame, they also lay hold of, so to speak, and throw out from the blood, many ill-digested and useless matters which have been derived from the food.

From the above account of the sources of the urine constituents, it cannot excite surprise to find the fluid varying, as all know it does, at different times. Even within the limits of health, the variations are regular, almost periodic. Thus, after a fluid meal, such as breakfast, or after much fluid has been taken, the kidneys secrete largely, the urine is plentiful, but generally pale in colour—it is the *urine from fluids*. Again, after a solid meal, such as dinner, the urine is less abundant, it is darker in colour, and probably has the odour of some ingredient of the previous meal—this is the *urine of solids*. Lastly, if no heavy meal has been taken just before retiring to rest, the urine is probably a mean between that of the fluids and that of the solids—it is the *urine of the blood*—and, being less likely to be influenced either by solids or fluids which have been taken into the system, affords the best index, as far as the urine is concerned, of the bodily condition. This is the reason why the "morning urine" is so often examined, in preference to that passed during other periods of the twenty-four hours. Although exposed to the above sources of variation, urine, if perfectly healthy, ought to be transparent, not only when passed, but when it becomes cool, a just perceptible cloud, composed of healthy mucus, being only visible at the bottom of the vessel; the colour ought not to be too dark, and the fluid should be acid when examined by means of litmus. The specific gravity ought not to vary greatly from the healthy average of 1·018—that is to say, for any length of time, or except from some obvious cause. In hot weather, in this climate, and in hot climates generally, when the action of the skin is so much increased, it of course leaves less fluid to be drained from the blood by the kidneys, and as the solids to be carried off by these glands still remain the same, or nearly so, the specific gravity of the smaller amount of fluid must be proportionally increased; here we have an obvious cause for the change, no less obvious than that which gives a large quantity of pale urine of low gravity if an individual indulges in fluids. Further, we know that nervous individuals of both sexes, and especially hysterical females, will occasionally secrete very large quantities of colourless urine. Such variations, therefore, cannot be considered to be the result of disease, but when permanent increase or diminution of the quantity of urine (see *Diabetes—Dropsy—Bright's Disease*) occurs, without being accounted for,

and especially if symptoms of constitutional disorder or debility, or of dropsy, show themselves, a medical man should at once be consulted.

Uric Acid—Gravel.—Perhaps the most common change to which the urine is liable, is excess of its usual constituents, the lithic or uric acid. That is, in such excess, that instead of remaining dissolved, as in healthy urine, it becomes "precipitated;" in other words, there is so much of it that the urine cannot hold it dissolved. Thus, uric acid may exist uncombined, in which case it is deposited in the form of crystalline sand, of a yellow or red hue; very commonly, however, it exists in the combination with ammonia, as a "urate of ammonia," in which case it does not crystallise, but takes the form of a cloudy precipitate. This urate of ammonia forms the fawn-coloured sediment, with which most are familiar, as a consequence of a chill or of a common cold; it also assumes a pink, sometimes a deep red or purple hue, especially in affections of the liver; indeed, whatever colouring matter exists in the urine, the urate seems to attract it strongly. Urate of ammonia is extremely soluble in warm water or urine, and much less so in cold, so that, although when the urine is passed, it may contain it abundantly, the secretion is perfectly transparent, and it is only as it cools, and can no longer hold the urate in solution, that the latter becomes visible. This excess of lithic acid, alone or combined, in the urine, may arise from a variety of causes. One of the most frequent temporary causes of excess is suppressed perspiration. The skin is constantly excreting acid—lactic acid—along with the perspiration, so that when the latter is checked, the acid is thrown back upon the system. Here, the wonderful power by which one organ "compensates" for the deficiencies of another is brought into action: the kidneys assume in some measure the office of the temporarily disordered skin, and cast out the acid, not as lactic, but as uric acid, from the system. Another frequent cause of excess of uric acid is the introduction of injurious—probably often lactic—acid into the system, in food or drinks. The malt liquors, especially when in the least "hard," or old and acid, are most fertile sources of uric acid, from which brewery men and labourers, who often drink largely of old and acid beer, are extremely apt to suffer.—See *Beer*. A third source of uric acid, or red or pink gravel, is disorder of the digestive organs, especially if too full a diet of animal food be indulged in. There are other causes of uric acid excess, such as extra fatigue, especially if it gives rise to feverishness, &c. Moreover, uric acid may exist in excess in the blood, and yet may not be manifested in the urine; such is the case in gout.—See *Gout*.

The white sand or gravel is by no means so common as the red, and is usually connected with an alkaline condition of the urine; it, and indeed the white sediments generally, are more usually met with in the aged, and in states of debility. Oxalic acid occurs frequently in the urine of dyspeptic persons, but may be occasioned by food which contains the acid naturally, such as rhubarb. Its presence cannot be detected without the aid of the microscope. Albumen in the urine has been already alluded to.—See *Bright's Disease*. Blood may occur in the urine in small quantity, giving the fluid merely a dark smoky tinge, or it may be discharged in larger quantity resembling nearly pure blood. In some cases, matter and thick glairy mucus are discharged with the urine. In pregnancy, occasionally, a thin creamy like scum forms on the urine, if it be allowed to stand for a day or two. Deviations from the healthy character of the urine are important, first, as indicative of deranged states of the system, and, second, from their own local effects. Some individuals are much more liable to have the urine disordered than others but in none can the condition be permitted to continue without risk, nor ought it to be without the cause being investigated. Such temporary disorders as that produced by cold, are in themselves comparatively unimportant, and the best remedy is to restore the functions of the skin, by warm baths, diaphoretics, &c.

When red, or pink, or fawn-coloured gravel appears to be permanent, and to be connected with derangement of the digestive organs, the symptoms should not be neglected. If food has been taken at all in excess, it should be reduced, and the allowance of animal food especially, moderated, *malt liquor of every kind being sedulously avoided*. If stimulants are necessary, a little sound sherry, or brandy, or gin with water, are the best. Exercise should be taken freely, but not so as to exhaust; the skin should be well cared for by frequent ablution. As regards medicine, the alkalies at once naturally suggest themselves as remedies, and most valuable they are.—See *Potash—Soda*. They quickly cause the acid to disappear, and were the disappearance of the acid all that is required, they alone might suffice; but the cause of the gravel, especially of the pink variety, is generally some derangement of the digestive processes, which must be rectified, if permanent amendment is desired. On this account, quite the safest plan is to consult a medical man on the subject, but if this is not done, along with the alkalies, some one of the tonic bitters should be combined; in fact, the digestive organs should be attended to as recommended in article *Indigestion*.

One caution is here requisite. Persons who have been the subject of red gravel, are very apt to continue too long the use of alkaline remedies, and thus seriously to injure the constitution and the digestive powers, and in the end to induce a permanent alkaline condition of the urine, which is a more serious and intractable malady than the opposite acid state.

The presence of white gravel is often so indicative of serious disease, that as soon as its presence is suspected, a medical man ought to be consulted. The tendency to its formation is frequently difficult to remove. One of the best remedies in alkaline urine is the nitro-hydrochloric acid; it is likewise a most valuable remedy in the oxalic acid urine. Oxalic acid is itself very soluble, but occurs in urine in a comparatively insoluble form, in combination with lime, in the shape, as seen under the microscope, of beautiful eight-sided crystals. This form of gravel is far from being uncommon, but, when abundant and persistent, it is often associated with hypochondriac indigestion in the melancholic temperament. Whatever the form of the gravel, the skin and the digestive organs require especial attention. It is always desirable to keep the flow of urine free, and for this purpose sweet nitre, or infusion of broom or dandelion are well adapted. Many find gin, used in moderation, of much service. When, however, the symptoms of gravel are constant, a medical man ought to be consulted, for it is not solely the immediate inconvenience which is to be obviated, but the liability of the gravel, whatever its nature, to accumulate, either in kidney or bladder, in which case the result is either a most painful attack, a "fit of the gravel," or the formation of "stone."

"A fit of the gravel" is caused by a small gravelly concretion, or stone, passing either from the kidney down the ureter into the bladder, or through the passage—the urethra—from the bladder; in either case giving rise to intense suffering. When the passage is from the kidney to the bladder, the pain often comes on suddenly, is felt chiefly in the groins and down the thighs, sometimes occasioning cramp; it remits, and if pressure be made deep in the groin, there is tenderness. The symptoms of the passage of a small stone from the bladder, are somewhat similar, varied of course by situation; there is often sickness and vomiting. In such cases, the best means of relief, till a medical man sees the case, are the warm bath, hip or general, and hot applications generally. Opiates in tolerably large doses, equal to twenty or thirty drops of the tincture, are required at intervals to allay pain, given either by the mouth, or in warm enemas of tolerable bulk, which give relief by acting as an internal fomentation. Copious draughts of demulcent drinks, barley-water, and the like, are advisable. Sweet nitre may be given, and if the acid is known to be red habitually, the alkalies will be useful. Solution of potash, in twenty drop doses, is perhaps the best. Should great tenderness at the seat of pain come on, leeches may be required, but the above measures will suffice to give much relief, till the case is visited by a medical man.

Stone, that is, a concretion of gravel so large that it cannot pass by the natural outlets, may form either in the cavity of the kidney, or in that of the bladder. This affection is more common either before puberty or after middle age.

When a stone forms in the kidney, it gives rise to a constant sense of uneasiness, or of pain, in the back and loins, extending down the thighs. These uneasy sensations are always aggravated by motion, especially that of riding, either on horseback or in a carriage, and after such exercise the urine is apt to be tinged more or less with blood, or to contain small blood-clots. When the pain is severe, sickness may be produced. The stone in the kidney may continue without change of situation, and with but little enlargement, for an indefinite time, but if it descends into the ureter, it then gives rise to the painful symptoms, a fit of the gravel, above described. When a stone has descended into the bladder, the symptoms it occasions are in some respects similar to those caused by one lodged in the kidney, but are more severe. The calls to empty the bladder are increased in frequency, the attempt causes pain more or less, and the stream of urine is apt to be suddenly checked, probably by the stone falling against the opening. In such cases, if long continued, the urine is apt to become loaded with thick mucus, or with pus or matter. The suspicion of such a malady as stone ought at once to be the signal for the case being properly examined. In the meanwhile, as little movement as possible should be made; demulcents (see *Demulcents*) taken freely will be found useful, and if there is much pain, it may be soothed by opiates, given either by the mouth, or in the form of injection.

Incontinence of urine in the aged, stoppage of the urine and strangury, are sufficiently entered into in article *Bladder*, to which the reader is referred.

Incontinence of urine in the young, wetting the bed, is frequently a most annoying habit, and one, moreover, which is often not to be overcome without much difficulty; it may even continue up to the time of puberty, or beyond it. Various methods of treatment are employed—nitrate of potash (saltpetre), given for some time to the amount of half a drachm in the twenty-four hours, to a child of seven or eight years of age, is said to be sometimes successful. The quantity may be given in three doses of ten grains each, dissolved in barley-water. Benzoic acid, in six grain doses, in the form of pill, given twice a day, is used by some; the author has found the tincture of muriate of iron, "tincture of steel," answer well, in doses of ten drops, twice or thrice a day, in conjunction with which cod liver oil may be employed with advantage. This remedy is peculiarly adapted for weakly children; another remedy recently introduced and found often successful is the tincture of Belladonna, from five to ten drops in water three times a day. In all such cases, it is extremely important that, without

being purged, the bowels should be kept lax. The quantity of fluid permitted should be kept at a medium, but the amount taken in the afternoon and evening must be curtailed as much as possible. In addition to the above remedies, either the cold douche to the lower part of the back, or the cold hip bath at night or in the morning, whichever is found most beneficial, may be employed. It is of importance that the child should be waked once in the night to pass its water.

Dribbling of urine, either in the aged or in those confined to bed by some continued and exhausting diseases, is a not unfrequent occurrence, which occasions much discomfort both to the patient and others, in consequence of the offensive ammoniacal odour. This is in most instances due to an over-distended and insensitive bladder, from which the urine overflows instead of being properly expelled at intervals. Medical aid should be sought, and the bladder emptied once or twice daily by means of a clean and aseptic catheter.

Refer to—*Bladder—Oxaluria—Urethra, &c.*

UTERUS.—See WOMB.

UVA URSI.—Bearberry is a low creeping shrub, which grows in rocky heath ground throughout Northern Europe, including Britain. Its leaves, which are used in medicine for their astringent properties, are deep green in colour, and somewhat resemble those of the box, but are thicker and more leathery. As an astringent, particularly in urinary affections, the uva ursi might be advantageously used in localities where it is found. The dose of the dried powdered leaves is from ten to forty grains. The infusion is the only preparation entered in the Pharmacopœia, and is made by infusing an ounce of the leaves in a pint of boiling water. Dose from one to two ounces.

UVULA.—See PALATE—THROAT, &C.

VACCINATION. — The name of Dr. Jenner, who discovered this inestimable boon, and introduced the practice of vaccination—as the inoculation of cow-pox matter is termed, must be known to all. His attention was first directed to the subject from the known circumstance, that when the cow-pox had prevailed among the cows of a particular district or farm, many of those connected with the management of the animals likewise became affected with the disease, and in consequence a certain number were protected against small-pox. The value of this circumstance seemed at first to be materially impaired by the fact that the protection was neither universal nor certain, until the investigations of Dr. Jenner made it clear that the protection or nonprotection depended upon the stage which the disease had attained in the animal at the time it was contracted by the human attendant; that is to say, if the vaccine disease advanced into the stage of maturation, or that in which the contents of the vesicle, which forms its outward manifestation, had become converted from a limpid-looking fluid into matter, although sores were produced upon the hands of the milkers, that certain protection was not afforded which ensued when the sores were produced by the fluid from the vesicle in an earlier stage.

Following up his investigations, Dr. Jenner clearly *demonstrated, that when the human subject was properly inoculated with virus taken from the cow-pox vesicle, at the proper stage of its progress, and when, in consequence of that inoculation, the disease was regularly produced, and went through its proper stages, both locally and constitutionally, the individual thus affected was thenceforth all but certainly protected from the contagion of small-pox.* These inferences have been the subject of much discussion, and in the interval between Jenner's discovery and the present time, extending as it does over a period of a century, much new light has been thrown on the matter, modifying to some extent Jenner's conclusions, but confirmatory of the blessings which the practice of vaccination has conferred on humanity. A thorough appreciation of the protective influence of vaccination was, however, long in taking root in this country, and it was not till the year 1853 that a Vaccination Act was passed by the legislature, rendering vaccination compulsory among the infant population. For some years, on account of the unsatisfactory working of this act, much disappointment was felt as to its feeble influence in checking the mortality from small-pox, and the Privy Council was forced by subsequent enactments to enforce compliance with its provisions. From the very full inquiries made at the time, at the instance of the Board of Health, it was clearly demonstrated that the protection afforded by vaccination diminished the mortality of the disease in direct proportion to the efficiency of the means adopted in carrying it out. The following figures, tabulated by Mr. Simon, were the result of an investigation into the history of not less than 6000 persons, who had contracted small-pox after vaccination, and are compared with the mortality among others who had not been vaccinated. The cases are classified in the order of their vaccination-marks, and the numbers refer to the proportion of deaths in every hundred attacked with the disease.

Stated to have been vaccinated, but without cicatrix, - -	21¾
Having but one cicatrix, - -	7½
Having two cicatrices, - -	4½
Having three cicatrices, - -	1¾
Having four or more cicatrices, -	¾
Unvaccinated cases, - -	35½

These statistics are confirmed by others from numerous sources, and it may be laid down as a rule, that while the mortality in small-pox epidemics amounts to thirty-five per cent. amongst the unvaccinated, amongst those

sufficiently protected by vaccination it does not amount to more than one per cent. It is frequently argued that the protecting power of the vaccine virus is impaired by transmission, and that it is limited to a shorter period of the life-time of an individual than the period during which it was orginally supposed to grant immunity. Our leading authorities in vaccination are of opinion that the lymph is not deteriorated by transmission from one generation to another, but there can be no doubt that even what is recognised as efficient vaccination does not always insure a lifelong immunity from small-pox, and the remedy which we have always in our power to employ is found in re-vaccination, a practice which has become pretty general of late years among nearly all classes. Its importance is recognised by the Government among soldiers and sailors, and by local authorities in colleges and public schools. About twelve is the best age for re-vaccination, and as it is not attended with any hazard, it may be renewed a third time, especially to allay fears on the approach, or during the progress, of an epidemic of small-pox.

With regard to infant, or what is often termed *primary* vaccination, the law requires that every child born should have the operation performed within three months of the birth. If the infant is in ordinary health it ought to be done while it is a month or six weeks old. Of late years the Vaccination Act has not been so diligently enforced in England as formerly, and the Government appointed a Commission some years ago to enquire into the whole question. Having sat for several years, the Commission reported strongly in favour of vaccination as a preventive of small-pox and made certain recommendations, upon some of which the Vaccination Act of 1897 was framed. This Act, which in the first instance came far short of the expectations of the medical profession, was mutilated still further by Parliament by the introduction of the celebrated conscience clause, which enables parents and guardians to obtain exemption from the Act on making a statutory declaration. The new Act provides for the use of calf lymph, mixed with glycerine, as a substitute for arm-to-arm vaccination, the glycerine having the effect not only of preserving the lymph but also of rendering it more safe from the point of view of specific inflammatory ailments following the operation. The Act also provides for the vaccination of children at their own homes instead of at vaccination stations.

Requisites for Vaccination.—It is but right that the public should be well advised on this point, for it is one on which much misconception has prevailed (and will continue to do so) among the ignorant. Three factors are requisite for the success of this important operation: (1) the infant should be in tolerably good health; (2) the lymph employed ought to be of good quality; and (3) the operation must be efficiently performed. The official instructions issued to public vaccinators require them to make four or five separate punctures, so as to produce an equal number of good-sized vesicles; or a similar result may be arrived at by inserting the lymph through a series of scratches, made on a limited portion of skin. The part of the body on which vaccination is usually performed is the outside of the arm, half-way between the shoulder and the elbow, a point not of much importance in males, but to be attended to in females, who sometimes wear low dresses, and who will not thank the doctor for a scar on a visible part. In choosing the arm in a child, it should be done with reference to that on which the nurse or mother habitually nurses it, attention to this point may save the child much uneasiness, and even prevent failure of the operation by the vesicles being rubbed or broken. As under special circumstances a non-professional person may be so situated as to be obliged to perform the operation himself, we may summarise the directions for its performance from the Fourth Report on Public Health. The part of the arm to be operated on should be grasped with the left hand, and the skin should be drawn tight enough between the fingers and thumb to facilitate the introduction of the point of the lancet with the other hand, and four punctures should be made about half an inch distant from each other for each intended vesicle. The punctures should penetrate the cuticle in an oblique direction, and should not be deep enough to impinge on the true skin. The lancet employed should be charged with lymph taken from a calf or a child on the eighth day after vaccination, never from a re-vaccinated child or adult, as it is now pretty well understood that lymph taken from the vesicles of re-vaccinated persons is less certain to produce satisfactory results. The lancet should be allowed to remain in the punctures for several seconds, and in the course of its removal the site of puncture is to be compressed with the flat side of the instrument, partly to prevent bleeding, and partly to detach any lymph which may still adhere near the point of the lancet. Equally serviceable is the process adopted by many vaccinators of introducing the lymph by scratching the skin with a clean lancet, and afterwards charging it with lymph, and inserting the virus over the scratched surface, care being taken that the scratches are not deep enough to cause bleeding. Sometimes simple abrasion of the cuticle is had recourse to. This is managed by means of a scraper or knife over a limited area of skin, about a square inch in extent, and the wet lymph is smeared over the abraded surface. Any of these processes will suffice, so long as the virus is brought into contact with the surface of the true skin, and each may be effected without pain sufficient to make a child cry, and without unnecessary bleeding, though it is requisite that a small

quantity of exuded serum from the blood should mingle with the vaccine matter. Numerous instruments are made for the purpose of vaccination, but none answer so well as the ordinary lancet used also for bleeding. Of course any thing that will abrade or puncture the skin in the manner described above will do; a large needle will answer the purpose if nothing better is at hand, but a lancet is always preferable.

If calf lymph is not used, what is termed "arm-to-arm" vaccination, that is to say the immediate transference of lymph from the mature vesicle of a child recently vaccinated, to one about to undergo the process, is to be preferred, but this may not always be convenient, and it is frequently necessary to employ lymph for the purpose of vaccination which has been preserved on ivory points, between pieces of glass, or in its liquid form of thin capillary tubes sealed at both ends, the latter form being infinitely the best. When intended to be used, the ends of the tube are snipped off with the fingers, and its content blown with the mouth on the point of the lancet.

As a rule, the process of vaccination is a regular one. By the end of the second, or in the course of the third day, small spots appear, slightly elevated and inflamed, over the site of the punctures or scratches, and on the fourth day they become redder and more perceptible. On the fifth day, each pimple is surmounted with a vesicle which continues enlarging till the eighth day, when it is fully developed and distended with clear lymph. At the same time, the skin surrounding the vesicles becomes gradually swollen and greatly inflamed, causing a rose-coloured ring or areola round the part, giving the whole a fancied resemblance to "the pearl on the top of the rose." By the tenth day, the vesicles change colour, becoming darker and more opaque, while the signs of inflammation in the skin are still more marked. After this time, the areola or red circle begins to fade, the vesicles become still darker in colour, are drier, and begin to shrivel, and finally assume the forms of chocolate-brown coloured scabs, with a tendency to become detached and fall off, which they usually do from the twenty-first to the twenty-fifth day from the commencement of the process, leaving behind cicatrices upon the arm, which permanently mark the person, and are afterwards recognised as signs of successful vaccination. It occasionally happens that the process does not follow the above regular steps; four, five, or six days may elapse before the pimples are perceptible, and it may be the tenth or eleventh day before the vesicles are fully formed; while, on the other hand, the maturation may advance so quickly as to be well over by the seventh day. In a weakly child, the process is liable to be delayed, and in a strong child to be hastened, but it observes no general law. The constitutional symptoms also vary in different children, but are generally most marked about the eighth day, the child continuing fretful and feverish for three or four days, and without this evidence of bodily disturbance the protection afforded by the process cannot be calculated as completely satisfactory.

The management during the progress of the vaccine disease is very simple, the principal point being the protection of the vesicles from injury, either by rubbing or by the dress. A piece of soft linen should be placed upon them on the fifth day, or what is better, some cotton wool kept in its place by a turn of a bandage. If the inflammation of the arm is severe, as sometimes happens, a cold poultice of bread and water should be applied. A little goulard water will allay the after-irritation, if troublesome. A dose of some simple aperient, castor oil or senna, should be given on the tenth or eleventh day, and repeated once or twice afterwards. Care should be taken that the scabs are not forcibly detached, otherwise a sore, sometimes difficult to heal, may be the consequence. Sometimes this will happen in spite of all precaution, in children of a scrofulous habit, and a troublesome ulcer form. This is best treated by dusting well once or twice daily with a powder made of equal parts of boracic acid and oxide of zinc; or it may be dressed with an astrigent lotion composed of two grains of sulphate of zinc to an ounce of water.

Occasionally, an eruption of vaccine vesicles comes out all over the body; it is of no importance, and the treatment is the same.

Lymph taken direct from vaccinated calves and diluted with glycerine, which acts as a preservative and purifying agent, has recently been largely used as a substitute for lymph derived from a child's arm. It is equally effective as a prophylactic against small-pox; and meets the objections of those who feared contamination from human lymph.

Re-vaccination.—When re-vaccination is performed in adults, the results are, as a rule, much modified, although instances are not wanting to prove that the effects cannot be distinguished from those consequent on primary vaccination. After re-vaccination, the vesicles usually vary in shape, and are unlike primary vesicles in reaching maturity sooner, usually on or before the sixth day, while the rose-coloured blush, more widely diffused than in the infant, declines about the eighth day, and the scabbing process is terminated by the twelfth or fifteenth day. These various stages are accompanied with considerable itching and irritation of the skin, and some constitutional fever which is at its height about the fourth or fifth day, and which it may be necessary to relieve by one or two doses of a saline aperient. —See *Skin—Small-pox.*

VALERIAN.—The root of the *Valeriana officinalis,* or common valerian, is one of the most useful and generally used remedies in

hysteria, and in spasmodic attacks generally. This plant grows commonly in Britain, usually about moist hedge-bottoms, woods, &c., showing its heads of lilac-coloured flowers in the month of August. The root, which has a powerful peculiar odour, consists of a number of rootlets, about the thickness of a crowquill, which proceed from a central stock. Valerian is given internally in various forms, but the preparation generally employed is the ammoniated tincture, in drachm or drachm and half doses, in an ounce and a half of water; this preparation ought to be purchased ready-made. The common tincture, of which the dose is the same as the above, is made by macerating five ounces of the bruised root in two pints of proof spirit. The dose of the powdered root is half a drachm.

Combinations of valerianic acid with zinc, quinine, &c., are now much prescribed in functional disturbances of the nervous system.

VALETUDINARIAN—one who is the subject of frequent illness, and is constantly in search of health.

VALVES.—These mechanical agents are found connected with the circulating system.

Refer to—*Heart—Veins.*

VAPOUR BATH.—See BATH.

VARIOLA, SMALL-POX. — See **SMALL-POX.**

VEAL, like young meats generally, is **not** so digestible as the flesh of the adult animal, but it is rendered more injurious to persons of weak digestion by the conventional modes of cooking with melted butter, &c. The objection to veal, as invalid diet, does not extend to the broth made from it, which is often peculiarly adapted to the requirements of convalescence and illness, from the amount of gelatine it contains. The knuckle of veal stewed so as to be very tender affords food which agrees remarkably well with weak, and especially with irritable stomachs.

VEGETABLES.—See FOOD—GRAINS—and articles on individual vegetables.

VEINS. — The veins are the vessels or membranous canals through which the blood is conducted back to the heart (see *Circulation*) after it has passed through the capillary vessels, and been brought into intimate contact with the tissues of the body. Whilst passing through the capillaries, the blood undergoes the change from arterial or red blood to venous or black, or rather dark purple blood;

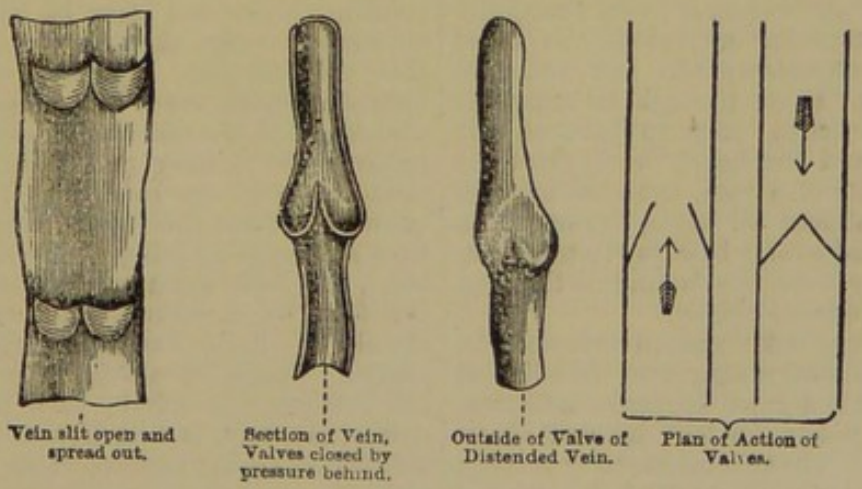


Fig. 230.

its mode of progression is at the same time altered; instead of the forcible, intermittent, propulsion which attended its passage through the arteries, it moves through the veins more equably, and without pulsation, except occasionally in the large veins of the neck. Its progress, however, is accelerated by muscular movements. Moreover, as the aggregate calibre of the branches of the veins distributed throughout the body is considerably greater than that of the large trunks into which the blood is collected as it approaches the heart, the current of the venous blood must be accelerated as it enters these large vessels. Like the arteries, the veins have three coats, an external or protective, an inner or lining, and a middle or fibrous coat. It is in the latter that the principal difference as to thickness between the two sets of vessels principally exists, the middle coat of the vein wanting the elastic fibre of the artery; consequently, when veins are emptied of their blood they become flat and collapsed, whereas arteries preserve their cylindrical form. A further difference exists in the interior of the two vessels—the veins, particularly of the extremities, are furnished with valves, distributed at intervals. These valves (fig. 230) are so arranged, that whilst they permit the free flow of the blood towards the heart, they do not permit its retrocedence. A moment's reflection will make evident how greatly this valvular arrangement must assist the, for the most part upward, current of the blood in its return towards the heart; how great the inconvenience attendant upon its impaired efficiency will be shown

presently. The illustration shows the peculiar formation and plan of action of the valves of the veins. They resemble in appearance somewhat the valves of the large arteries nearest the heart, and consist of pouches or semilunar folds of the inner and middle coats of the vessels.

The veins generally are divided into those which lie deep and accompany the arteries, and into the superficial veins. The most important of the latter, so far as a work like the present is concerned, are the external jugular veins of the neck, generally so evident in thin people, the veins at the bend of the arm (see *Blood-letting*), the veins of the lower extremity, and those of the rectum (the hæmorrhoidal veins); moreover, in addition to the veins properly so called, there are the venous sinuses (see *Sinus*). When a vein is wounded, either by accident or design, the blood flows from it in a continuous stream, with much less force than from an artery, and dark in colour; moreover, the bleeding from a vein is generally more easily arrested than it is from the elastic, muscular, arterial tube, assisted by the pulsation of the heart; comparatively slight pressure by a pad, or otherwise, being sufficient to restrain the flow from the former (see *Hæmorrhage*). A wounded vein generally heals quickly, and the current of the blood through it is uninterrupted. In order to arrest the flow of blood through an artery, it is necessary to make pressure between the bleeding point and the heart, or trunk of the body; in the case of a vein, the reverse must be done. In almost all cases, however, in which it is desired to stop bleeding from a vein, pressure directly over the wound is the best remedy.—See *Ulcer—Varicose*.

Veins are liable to inflammation from wounds, from inflammation extending from the adjacent parts, &c. This is a most dangerous affection, and frequently resists the best directed efforts of medical skill. The affected vessel is painful, feels hard, and the skin covering it, and the parts around, are red and inflamed; there is much constitutional fever, which tends quickly to a low or typhoid form. The most that could be done by an unprofessional person in such a case would be to use repeated fomentations to the inflamed parts, and to administer from quarter to half grain doses of opium with two grain doses of calomel, every three, four, or five hours, according to circumstances, until the arrival of a medical man.

"*Varicose*" *Veins.*—A "varicose" condition of the veins is chiefly met with on the lower extremities. The affection consists, essentially, in the veins becoming elongated, so as to permit of their assuming a tortuous knotted condition, while they are at the same time enlarged. The state is usually associated with obliteration or deficiency, more or less, of the valves within the veins, so that the weight of the entire superincumbent column of blood bears with distensive force upon the vessels, and upon those parts of them which are most dependent. The most frequent causes of the varicose veins are such as cause impediment to the upward flow of the blood through the large veins of the abdomen. In this way, pregnancy, if frequent, is a most common exciter of the condition, habitual costiveness, diseases of the liver, tumours of any kind within the abdomen, act in a similar manner. The truss worn on account of rupture, or garters too tightly tied, likewise excite the varicose condition, which is usually more common in persons whose occupations require much standing, especially if they are of tall stature. The inconveniences which ultimately result from a varicose condition of the veins of the leg have been sufficiently pointed out under article *Ulcer*. The causes of it, which have been just alluded to, naturally suggest the best means of alleviation and cure. that is, the removal as far as possible of all interruptions to the upward flow of the blood, and the horizontal posture of the body or limb. As these conditions, however, cannot in all probability be perfectly carried out, it is desirable that in all cases of varix the veins and limbs generally should be supported by some one of the forms of elastic stocking; these can now be obtained at so moderate a price, that none need be without their valuable aid. It is often surprising how immediately the use of well applied mechanical support, such as the elastic stocking affords, removes the uneasy and painful sensations connected with the condition of the veins in question. Some individuals cannot, however, wear an elastic stocking of any kind; for such cases, an elastic india rubber bandage fixed to the foot by a stirrup, and wound spirally round the limb, has been successfully employed. Spaces of about three inches being left between the spirals, each time the band crosses the vein, it acts like a valve. Other methods of curing varicose veins, such as tying and cutting out small portions of the veins under carbolic spray, are had recourse to by surgeons, but as long as sufficient comfort and relief can be obtained by the use of elastic supports, these methods are perhaps better avoided.

VENEREAL.—See SYPHILIS.

VENESECTION.—See BLOOD-LETTING.

VENISON.—The flesh of the deer, like that of other wild or hunted animals, is particularly digestible, and is probably rendered more so by the custom of long keeping. In Dr. Beaumont's table of the digestibility of various articles of food, "venison-steak" is noted as taking but one hour and thirty-five minutes for digestion; beef-steak being noted in the same table as requiring three hours.

VENTILATION AND WARMING.—Ventilation is the renewal of the air contained in enclosed spaces. The object is to provide, in the first place, for the escape or withdrawal of air which has

become deteriorated from any cause, such as animal respiration; and in the second, to supply the place of the deteriorated air withdrawn by that which is fresh and pure. Under the head of ventilation, moreover, the heating and cooling of air may perhaps be included. Under such articles as *Air*, *Aëration*, *Blood*, *Lungs, and Respiration*, the requirements of the animal constitution, which render a regular supply of pure air necessary for health, have been sufficiently entered into, and need not be repeated; and under article *Bed-room*, information on the subject itself will be found—to these the reader is referred. The entire surface of earth is subject to a vast system of ventilation, effected by means of the currents of air, or winds, which are continually passing over it, especially by those which, like the trade, and other winds, blow continuously in one direction for months together.

In some respect, ventilation is the necessity of a nation living in a variable and cool climate, and of a people who have attained proficiency in architecture, and particularly in domestic architecture. In hot climates, where the breezes from without are rather courted than shunned at all times, ventilation, except in the way of cooling, is uncalled for as a systematic arrangement. In the ruder ages of our own country, when shuttered instead of glazed windows prevailed, and when buildings and fittings generally were defective, ventilation was abundantly, though unintentionally, provided for, and especially as long as the wide lofty chimney-place remained (see *Chimney*). But at length, when the art of building attained greater perfection, when doors and windows were made to fit tight and well, the ventilation was interfered with by the very perfection of the work, and as practical scientific knowledge of sanitary matters was but little diffused or cultivated, we have the fact of a community suffering evil in consequence of an art being more rapidly advanced than the practical science which ought necessarily to accompany it. Now, however, not only are scientific and professional men well aware of the necessity for providing proper ventilation of all enclosed places occupied by man or animals, but most educated people, generally, are alive to the fact, and have some idea, at least, of the principles on which the necessity is based. We cannot return to the old unintentional ventilation of badly built dwellings, and old-fashioned chimneys, consequently, the desideratum has been to find those systems of ventilation which shall combine efficiency with comfort and economy, and which in many instances can be most easily adapted to buildings already constructed, without reference to any plan of ventilation at all.

The methods employed are very numerous, and for convenience of description may be divided into (1) such as are applicable for ordinary dwelling houses, and (2) to those which are best suited for public halls and large buildings where people are in the habit of congregating.

Ventilation of Dwelling Houses.—A dwelling house, whether small or large, ought at all times to contain within itself sufficient provision for keeping up a continuous change in its atmosphere. The first desideratum is a ready means of ventilating the staircase, which may be regarded as a central shaft, communicating with the habitable apartments, up which both fresh and vitiated air make their way, but as vitiated air is also, as a rule, heated air, it ascends more rapidly, and unless suitable means are provided for its escape at the top of the shaft, by an open window or skylight, it is liable to accumulate and permeate the rooms, especially on the upper floors. For the renewal of the air in the rooms, no system suggested or employed has been found so serviceable in obtaining good natural ventilation as the properly constructed window and fire-place. In mild climates and in fine summer weather, open doors and windows are at once the readiest and best means of renewing the air of dwellings; but in cold weather considerable difficulty is experienced in opening windows on account of the draughts. Cold air, by virtue of its greater specific gravity, displaces deteriorated air as it enters a room, and on this account it is of importance that its point of entrance should be considerably above the heads of the occupants, to cause more perfect diffusion. This is practically done by lowering the upper sash of the window in preference to raising the lower, and can be effected to a greater or less extent in all but the coldest weather, without producing inconvenience save to some sensitive individuals, whose sensations may be considered, and possibly relieved, by some means of directing the current of incoming air upwards before it enters the room. The insertion of "louvre" panes in the window will, in such cases, obviate the necessity of opening it at all, but a board fitted to the upper part of the window, and so contrived as to form an angle when the sash is lowered, will divert the current upwards to the ceiling before it mingles with the air of the room. A simple plan of diverting the incoming air-current, applicable to any window, and within the reach of every one, was long ago suggested by Mr. Hinckes Bird; but it is far from being generally adopted. In place of admitting the air directly by the lower or upper sash, Mr. Bird recommends that it should enter alone by the space between the sashes which must always be open when the lower sash is raised, and that a block of wood, corresponding in size to the lower part of the sash frame, should be placed underneath it to exclude the usual current from this, the ordinary inlet. By such an arrangement (which by a little ingenuity in the primary construction of all windows could easily be rendered permanent), the air, instead

of being directed forwards and downwards, as is usually the case, is directed upwards, and has its current broken in transmission by the top bar of the lower sash.

To supplement the action of the windows (for they can hardly be said to form a substitute for them), are the numerous contrivances employed to admit air through openings in the walls by means of gratings, tubes, valves, and perforated bricks. In all these cases it is usual to make provision against down draughts by first dividing the currents at the external openings, and afterwards by diverting them upwards as they enter the room. What is known as the "Sherringham valve" is among the best apparatus of this kind. It consists of an iron box let into the wall near the ceiling with a hinged door in front, and with cheeks which form, when the ventilator is in action, a kind of hopper-mouthed opening with the mouth facing the ceiling. By means of a string and pulley, delicately adjusted inside the ventilator, it may be easily closed or opened to any extent, from the floor, and will remain in a fixed position until it is interfered with. A plan of tubular ventilation, often spoken of as "Tobin's" system, has numerous advocates, and is frequently found advantageous when the windows are at fault. This consists in the admission of air through gratings in the external walls communicating with horizontal shafts placed under the floor, and terminating in upright tubes about five or six feet in height inside the room, and usually placed along the walls. These may be put out of action by shutting up their inlet openings, and when in use dust and dirt may be prevented from entering the room by protecting the mouths of the flues with wire gauze or similar material. Jennings' air-brick system of ventilation has the advantage (and, in some respects, the disadvantage) of being permanent in its action, and is certainly beyond the reach of interference by meddlesome employés. The air is introduced through a brick opening in the external wall (fig. 231), first into

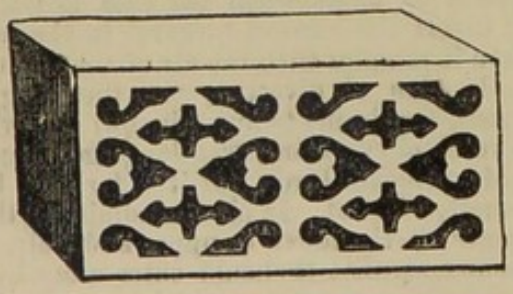


Fig. 231

a chamber inside the wall, and afterwards it ascends through another series of perforated bricks in a sloping direction towards the ceiling. The arrangement answers well in barracks and dormitories, and has been introduced into the construction of many private houses.

What we have already said applies only to the admission of air, and it is self-evident that the problem how to ventilate cannot be solved unless we have equal facilities for aiding the escape of air which has become vitiated and unfitted for respiration. It is true that counter currents may be established inside a dwelling by freely opening the windows until the temperature of the air inside is reduced to a level with that outside, but efficient ventilation requires warmth with the renewal of the air, and how to obtain this warmth in an equable and agreeable manner is the main difficulty to be encountered. In ordinary dwelling houses, the necessary degree of warmth is furnished by the coal fire; in large buildings by hot air from closed stoves, hot water pipes, and open fire places, while the chimney flues, which are continually absorbing more of the heat, act as extraction shafts for the removal of the air which has already served its purpose. Under ordinary circumstances the coal fire is alone used in dwelling houses for obtaining this exchange of air, but as the extraction force of the fire and chimney is mainly exerted on that part of the room in front of and adjoining it, it follows that the upper strata of air become more and more charged with the products of respiration, this condition being greatly favoured by the combustion of gas in the room, which often renders the apartment unfitted for occupation. Various remedies are employed to meet this inconvenience, among the most obvious of which are ventilating openings in the ceilings, communicating with horizontal shafts which have their outlet in the chimney, or by vertical shafts which carry the products of combustion upwards through the separate floors to make their escape through the roof. A simpler method of carrying away the vitiated air is furnished by Arnott's valve, or rather by a modification of it, as the original balance valve invented by Arnott is now nearly superseded by simple gratings fixed in the wall near the ceiling above the fire-place, and communicating directly with the chimney, the smoke being excluded from entering the apartment through the channel by means of a movable diaphragm of oil silk or talc, which acts as a valve inside the grating. To economise heat, as well as to assist ventilation, many ingenious grates have been constructed, furnished with an air-chamber at the back, and communicating through a channel with the outside, in which chamber the air, after being warmed, is led through separate channels into the room. The best of these contrivances is that known as the Galton stove, which has been so much employed in barracks and hospitals, and a front elevation of which is given below (fig. 232). The grate in this instance is ingeniously contrived so as to economise fuel and consume smoke, as well as to utilise the warm air from the warm air-chamber at the back of the grate, which passes by a channel almost directly upwards to the

aperture, and from thence flows into the apartment, while the smoke is carried away by means of an iron tube into the chimney.

While, however, every care is taken to renew the air in the interior of dwelling houses, the measure will be a useless one unless the air introduced from without is itself pure. In this way the system of ventilation becomes more or less connected with the local sanitary arrangements, especially with the drainage

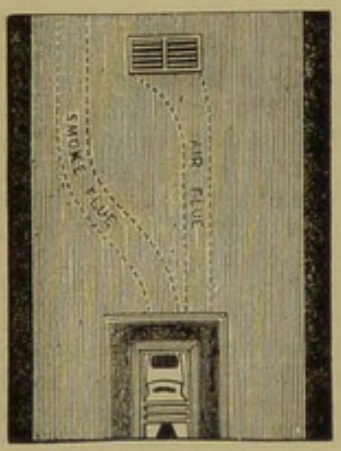


Fig. 232.

both inside and outside of the house, and indeed with whatever tends to render the atmosphere unwholesome. Whatever the condition of the outside air, it is of the utmost importance that that admitted for purposes of ventilation ought not to be taken from too near the level of the soil, for not only is it liable to be more damp, but also to be impregnated with any malarious agencies which may possibly exist there.—See *Ague.*

Ventilation of Public Buildings.—For the ventilation of large buildings an infinite variety of appliances have been employed to secure a constant supply of fresh air at an equable and agreeable temperature. Windows on both sides, though scarcely applicable to an ordinary room, are almost a necessity in connexion with a large assembly hall or hospital ward, to enable the air to pass readily from one side to the other, according to the direction of the wind's current; but it is only in certain conditions of the weather and during summer that it is possible to obtain this desideratum. As a step towards it, and provided the place to be ventilated is either a one-floor building or an apartment on the upper floor, advantage is often taken of the natural tendency of vitiated, which is also heated air, to ascend, and then to further its exit through the roof of the building. For this purpose what is termed "ridge" ventilation is often employed; that is, the highest point or angle formed by the two sloping sides of the roof is detached from the rest, and the foul air from the interior makes its escape through the louvres or lattice work, inserted between the two parts. More frequently, recourse is had to round or square ventilators placed at intervals apart along the roof. These are often made movable, and surmounted with cowls and wind-guards, to aid the aspiratory force of the external air; but if cowls are employed, they had better be fixed and motionless. It is no uncommon practice to place a circular row or series of gas burners, called sunlights, in the mouths of tubes communicating with these ventilators, for the lighting of halls and churches, thus carrying away the products of combustion at once, and greatly aiding the ventilation of the buildings. A similar method of removing the heated air from gaslights is sometimes had recourse to in private houses, the lights in this case being enclosed in a globe attached to a tube fixed to the ceiling, and communicating with a channel between the joists, ultimately terminating in the open air; but the plan, in consequence of occasional accidents, has not met with general acceptance.

The interchange of air currents by means of ventilators is facilitated in large rooms, occasionally occupied by great numbers, where advantage is taken of the greater or less specific gravity of the external and internal current, to promote their natural flow by some mechanical contrivance. Thus a cylindrical ventilator with a semi-detached cover placed

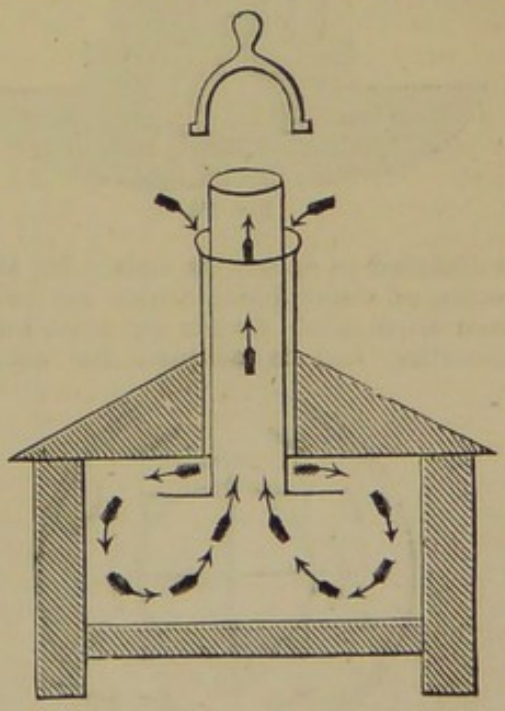


Fig. 233.

on the roof of a building, and communicating with a room to be ventilated underneath, can be made doubly serviceable (that is, for the escape of vitiated and the admission of fresh air) by dividing the external and internal currents, which must otherwise necessarily come into antagonism. This may be done in various ways, but best, perhaps, by means of the double-tube ventilator originated by M'Kinnell (fig. 233). This apparatus consists, as shown in the drawing, of two cylinders placed

one within the other; the inner tube, which is made considerably taller than the other, forms the outlet; while the outer tube, which has a sectional area equal to the inner, is provided with a flange at its base, to direct the fresh air current towards the ceiling, from which it gradually descends into the apartment. For the most part double-action ventilators answer their object well, but it often happens that their action is seriously deranged by various eccentric causes, such as open doors or windows or by fires in the apartment, which have sometimes the effect of reversing the outlet-action, and of flooding the apartment with cold air from above. To obviate this objection, Mr. Boyle of Holborn Viaduct

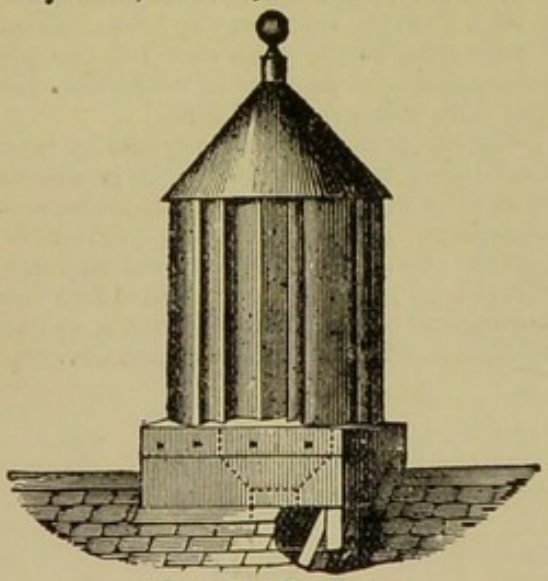


Fig. 234.

has designed an apparatus mainly for the extraction of vitiated air, which has been received with much favour by most sanitary authorities, and is adapted for churches,

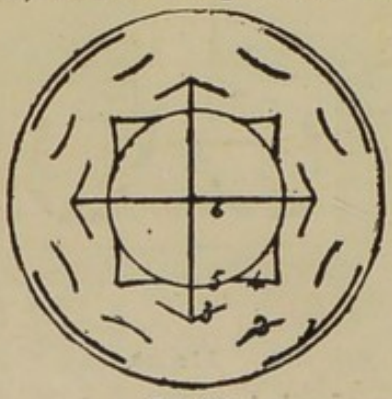


Fig. 235.

schools, and other public buildings into which it has been extensively introduced. Mr. Boyle has given the name of the "Self-acting air-pump ventilator" to his invention, which consists of four sections, each acting independently and designed to meet the ever-varying directions of the wind. The annexed illustrations (figs. 234 and 235), give explanatory views of the construction of the ventilator. The sectional drawing (fig. 235)—(1) represents a curved plate or guard to concentrate the current, and prevent the wind blowing through the slits opposite; (2) a smaller curved plate to take pressure off the vertical slits communicating with the internal chamber, and to prevent down-draughts. The external air impinging on the diaphragm (3) is deflected on the central radial plate (4), establishing an induced current, and in its passage drawing the air from the vertical chamber, and expelling it at the opposite opening. The heated air from the apartment passes upwards through the shaft communicating with the ventilator, and thus the apparatus secures a continuous exhausting force. (6) represents the partitions which separate the four chambers of the ventilator, and which prevent the outside air from being drawn through the slits upon which the wind is not directly acting. From the fact of there being no down-draught to contend with, and the extraction force operating a long way from the occupants of the apartment, in all conditions of weather, and irrespective of adverse currents of wind, there can be small doubt of the efficiency of this contrivance, so long as other means are at work to introduce fresh air into the building so ventilated. Ceiling outlet openings should invariably be connected with an air-tight shaft, which should pass through the roof and terminate in a cowl of this description. Even with this arrangement, down-draught will occasionally occur, and to overcome the effect of this it is well to fix a circular disc under the opening, and of larger diameter than it, within a few inches of the ceiling, as is represented in the sketch (fig. 236).

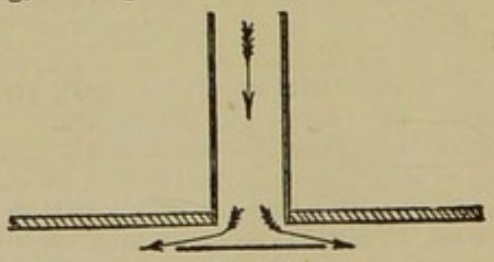


Fig. 236.

A common practice, and one which is to be condemned, is to cover outlet openings with wire-gauze or perforated zinc, with the view of checking down-draught. It is true this plan may have the effect of correcting the evil, but it can only do so by permanently interfering with the extracting power of the shaft on account of the diminution of its calibre.

In most public buildings it is now found necessary to supplement the natural ventilation by numerous mechanical expedients, with the object of introducing fresh and warm air, (with or without ordinary fire-places), or of withdrawing the vitiated air by means of shafts heated by coils of steam or hot-water pipes, or in combining both systems together. Occasionally pumps and fanners, worked by

steam machinery, are employed for the double purpose of admission and extraction of the air; but although this method of ventilation has many advocates, its trials have not, in all cases, been particularly successful.

To discuss the various appliances for mechanical ventilation would hardly serve any useful purpose in such a book as this, and the subject at present has not been sufficiently investigated to warrant any definite opinion being expressed regarding it. In some instances, particularly in factories, its introduction has proved successful, but experts still differ very much in opinion regarding its general application. The question is often asked, "What is the best system of ventilation?" The reply must be the same as in the case of sewage disposal: "it depends entirely upon the circumstances of the case." That which will answer the purpose for private rooms will fail utterly in the case of large public rooms and theatres, which are habitually overcrowded, and, for this reason, require a more frequent change of atmosphere than is attainable, without causing draughts, by the simple process of natural ventilation, upon which we have to depend as a rule in most houses.

Warming. — It is impossible to discuss the subject of ventilation without dealing at the same time with the system of warming now in use. When hot-water pipes were first made use of in houses for this purpose, ventilation suffered greatly in consequence, for, the extracting power of the open fireplace, which is by far the most effective available means of house ventilation, was then lost, and the resulting stuffiness was intensified by the dryness of the air, which heating by hot-water pipes and stoves gives rise to. Now, however, the objection on the ground of ventilation has been overcome both in the case of hot water heating and stoves. In the former case this has been accomplished by arranging the pipes in the form of coils enclosed in a casing which has an opening at the top into the room, and another at the bottom communicating with the outside air. The result of this arrangement is that the fresh air which enters at the lower opening is warmed as it passes over the heated pipes, and enters the room fresh and warm without giving rise to the feeling of draught which is experienced from so many inlet ventilators. There is no simple plan of ventilation and warming so effective and healthy as a combination of this method with open fireplaces, provided the extracting power of the open fire is made fully available by introducing a mica-flap ventilator into the flue near the ceiling, as is described on page 626. With such a system of ventilation, however, it is desirable to provide other inlets which may be made use of at times when the hot-water pipes are not in action, or in conjunction with the hot-air inlets at any time when the room may be overcrowded; the inlets themselves are too near the floor level to allow of their being left open when the pipes are not heated.

The pipes employed in heating by hot water may be large or small in diameter. In the former case they are of cast iron, 4 inches in diameter, and, the circulation not being conducted under pressure, the temperature attained by the pipes rarely exceeds 200° F. Twelve feet of such piping for every 1,000 cubic feet of air-space will maintain the temperature of a room in cold weather at about 50° F. A circulating boiler connected with a

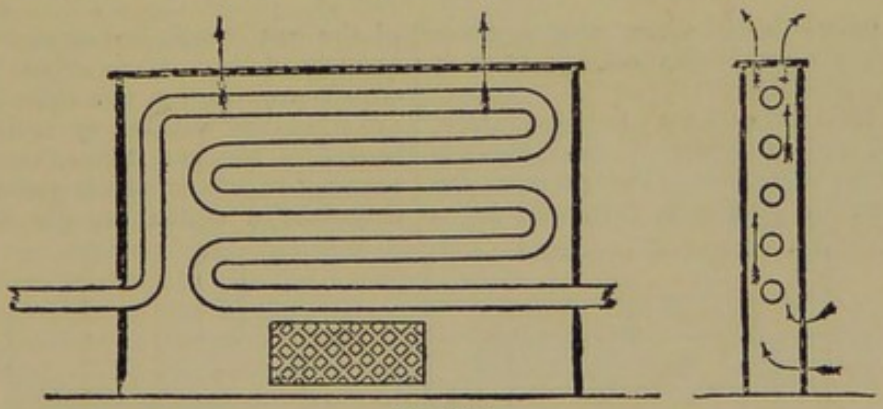


Fig. 236a.

stove is necessary in this case, and a vent pipe must be connected to the highest point of the circuit and carried to the outside to allow of the escape of air or steam. In the system of warming by small pipes (Perkins), wrought-iron pipes with an internal diameter of $\frac{3}{8}$ inch only, and an external diameter of $1\frac{5}{16}$ inch are used. In this case no escape pipe is provided, and the pipes are not connected with a boiler, but are simply coiled within the furnace, the length of coil being regulated by the length of circuit travelled, the usual proportion within the furnace being one-tenth of that outside. It is necessary to fix a series of tubes at the top of the circuit, of larger diameter than the pipes themselves, and filled only half full with water, the rest of the space being occupied with air to allow of expansion. It is possible with this system to obtain a pipe temperature of over 300° F.

The diagram (fig. 236*a*) represents, in section, the ventilating arrangement described above applied to this form of heating. It is essential that every portion of the air inlet and the coil it contains should be easily accessible to allow of thorough cleansing from time to time, and particularly after the summer months when the apparatus has not been in use for a long period.

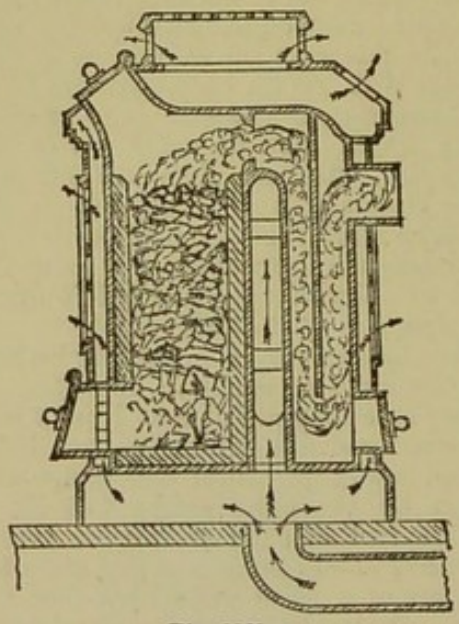


Fig. 236*b*.

Gas Stoves have become very popular lately, and provided they are properly fixed, there is no objection to their use. The practice too often followed by gasfitters, however, is to cover over the ordinary fireplace with sheet iron, in front of which the stove is placed, and through which the gas fumes are conducted to the chimney by a pipe 2 or 3 inches in diameter. The result of such an arrangement is, that at times when the stove is not actually in use, the natural ventilation which the chimney is the means of producing, is almost entirely abolished, and the air of the room, which is usually a bedroom, becomes horribly foul in consequence. Of course it is quite inadmissible to fix a gas stove in a room without providing means for the removal of the gas fumes, but even this is not infrequently done. Gas stoves are now made which provide for the introduction of fresh air from the outside, in addition to the removal of the gas fumes, the cold air being warmed in a tube which passes up within the chamber in which the gas is burning, and opens at the top end into the room. In principle, such a stove corresponds with the one shown on page 578 (fig. 205).

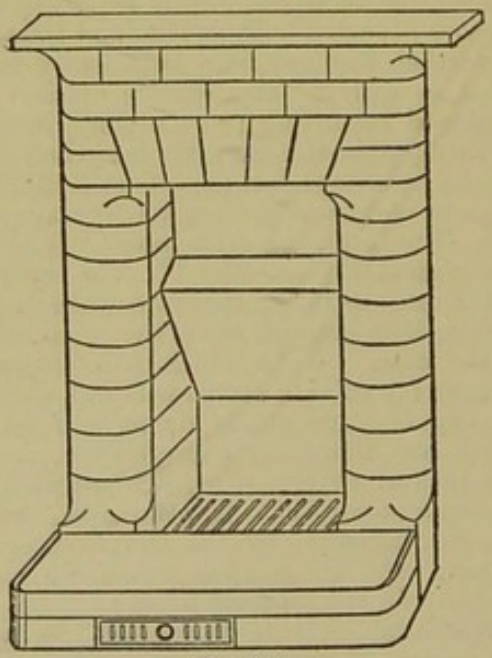


Fig. 236*c*.

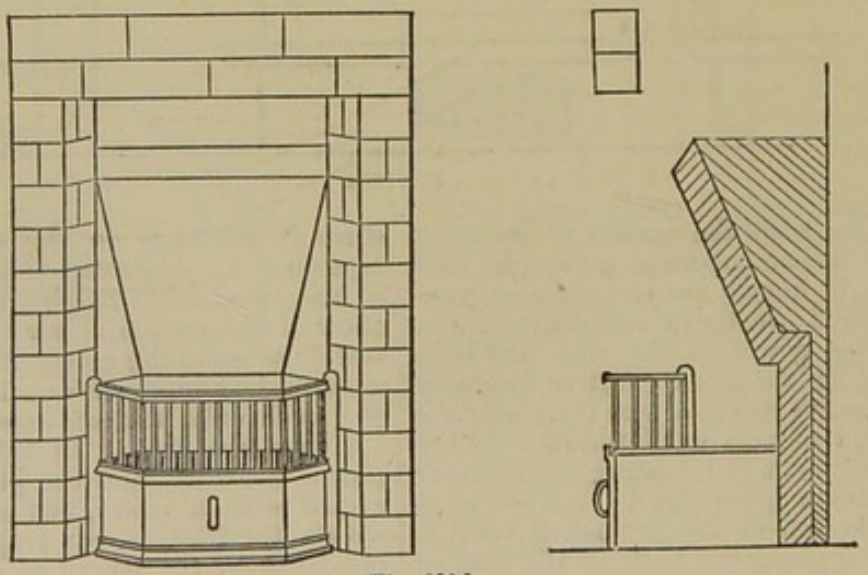


Fig. 236*d*.

Stoves are often used for warming the halls and passages of houses, churches, and schools, and with certain provisos, they answer the purpose well. As in heating by hot-water

pipes, the air of stove-heated rooms becomes dryer than is consistent either with health or comfort, and measures should be taken to obviate this. The simplest plan, and one which answers the purpose very well, is to place a vessel containing water on the top of the stove sufficiently near to insure its gradual evaporation. Such an arrangement may be concealed from view by placing over the vessel an open iron-work cover.

Another objection to stoves is the risk that the floating particles in the air may be singed by coming in contact with the stove should it be superheated, and give rise to an unpleasant smell. A more serious risk than this, however, arising from the stove becoming red hot, as it frequently does, is the formation of a very poisonous gas (carbonic oxide) which either passes from the interior of the stove through the pores of the heated metal, or is generated from the air in contact with the outside. In either case, a remarkably small amount of this gas in the air of a room will give rise to headache and lassitude among the occupants, if not to more serious consequences. Both the above faults may be avoided by lining the interior of the stove with fire-brick, and no stove that is not so lined should be fixed.

Very excellent stoves are now made that provide for the introduction of fresh air from the outside, which is warmed by passing upwards through chambers in the stove before it penetrates into the room. The drawing (fig. 236*b*) shows, in section, one of Musgrave's stoves which is constructed on this principle.

Open Fireplaces. — Although, as already stated, open fireplaces are excellent aids to ventilation, their construction is frequently such that great loss of heat, and, consequently, extravagance in the consumption of fuel is occasioned. The chief causes of this are:—(1) The grate is placed so far back under the flue opening. (2) The flue passes backwards and upwards from immediately behind the grate. (3) The back and sides of the grate are constructed of iron, and there is a large space behind, which causes loss of heat by radiation. (4) The front and bottom bars are constructed so wide-apart, that the coal falls through in unconsumed pieces, and as the grate is open from below as well as in front, combustion is needlessly rapid.

Fig. 236*d* shows, in plan and in section, an excellent fireplace, designed by Mr. Pridgin Teale of Leeds, in which the above faults are reduced to a minimum.

The overhanging projection at the back which is built of fire-brick, as are the sides of the grate, radiates the heat down upon the fire and on the hearth, and so aids in the combustion of the smoke and prevents so much loss of heat up the chimney. An ash tray is also introduced which prevents the air from entering underneath the fire.

Mr. Lionel Teale has constructed a grate on similar principles, except that the fire is sunk below the level of the hearth, which is raised 5 inches above the floor level; it is entirely composed of fire-brick with the exception of bars at the bottom. The air for combustion in this case enters under the fire, by an opening in front of the hearth, from which opening the ash tray is removed. A glance at the drawing (fig. 236*c*) will make this clear. This fireplace gives off a great deal of heat and the combustion is slow, consequently it is a very economical arrangement.

Ventilation and Health.—In a brief sketch like the foregoing it would be useless to attempt more than an outline of the principles of a subject so extensive as ventilation, but its importance from a health point of view cannot be over-estimated. Statistics prove conclusively the injury to health which results from impure air. For example, the mortality in districts containing a large proportion of "back-to-back" houses is very much greater than that of similar districts, inhabited by the same class of people, where the houses have back doors and windows which permit of a through current of air.—See *Air—Smoke-Abatement.*

VENTRICLE. — See CIRCULATION — HEART.

VERDIGRIS is an acetate of copper. It is prepared chiefly in the wine countries by acting upon plates of copper, by means of the husks and other refuse of the grape, which are made to undergo the acetous fermentation. Poisoning by verdigris sometimes occurs: it is to be treated in a similar manner to that from the sulphate of copper or blue vitriol.—See *Copper.*

VERTEBRA.—See SPINE.

VERTIGO.—See GIDDINESS.

VESICATION.—Blistering.—See *Blister.*

VESICLE—a little blister, or elevation of the epidermis or scarf-skin, by clear fluid. In the first stage the cow-pock is in the state of a vesicle, but in the later stages, when the clear fluid becomes turbid, like matter, it becomes a pustule.

Refer to—*Skin—Vaccination, &c.*

VICARIOUS ACTION is action set up in one part of the body as a substitute for a similar action in another. It occurs chiefly in connexion with menstruation.—See *Menstruation.*

VILLI are minute, hair-like processes confined exclusively to the small intestine, and giving to their inner surface an appearance something like velvet pile (fig. 237). Each villus is invested with an epithelial covering (1), which rests on a basement membrane, and is supplied with arteries, veins, and capillaries forming a dense net work (2). In the centre of each, entering at the base, is a single lacteal or lymphatic vessel, which terminates at the tip

with a closed end (3). The lacteal vessels, which form the great feeders of the lymphatic system of the bowels, absorb chiefly the fatty portion of the chyle formed in the intestines, and conduct it through the glands of the mesentery to the chyle receptacle, from which it is conveyed by

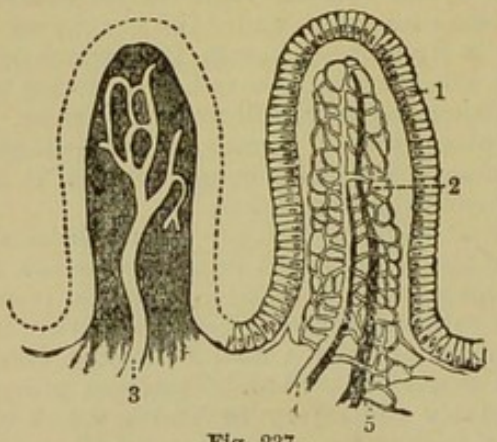


Fig. 237.

the thoracic duct direct into the venous circulation. The blood-vessels of the villi, consisting of a small artery (4) and vein (5), with their network of capillaries, act in a similar way to the lacteal radicles, but are less restricted in the material of the food they absorb, abstracting everything from the chyle, provided it is soluble, and in a state of subdivision minute enough to pass through their walls.—See *Absorption—Digestion—Intestines.*

VINEGAR OR ACETIC ACID.—Acetic acid is the volatile acid principle which, diluted with water, constitutes vinegar. The acetic acid itself may be got very strong and concentrated by various chemical processes; it is also obtained of considerable strength by the destructive distillation of wood; when thus procured, it is named pyroligneous acid, or wood-vinegar. The diluted acetic acid of the Pharmacopœia is composed of one part of acetic acid to seven parts of water. Vinegar is a solution of acetic acid in water; it is of variable strength, and contains colouring matter, and usually, also, spirituous and ethereal principles. It is prepared from wine, malt, sugar, cider, and from various vegetable substances; and also, as stated above, from wood. Except in the case of the last, it is produced by the acetous fermentation, which is carried on under a temperature approaching 80° Fahr.

The wine vinegars, or French vinegars, are made chiefly from the lighter wines by a careful process of fermentation. They are usually better and stronger than those of British manufacture, and more free from adulteration. British vinegars made from malt, sugar, &c., generally want the aroma of the French; most of them contain sulphuric acid, in the proportion of one thousandth part, as permitted by law, but sometimes in much larger quantity. Vinegars are also liable to contain metallic impurities, owing to the readiness with which they act on many metals with which they may come in contact in process of manufacture. These impurities are got rid of by the process of distillation, consequently a distilled vinegar, or acetic acid, is always used for medicinal purposes. The addition of sulphuric acid to malt vinegar is permitted, to counteract a tendency which it might have to pass into the putrefactive fermentation. The colour of the brown vinegars is occasionally imparted by burnt sugar. According to investigations it appears that the chief adulteration of vinegar is by sulphuric acid in excess of the legal quantity; tartaric acid, pyroligneous acid, and some metallic impurities are occasionally found in it, and are derived from the vessels in which it is prepared and kept.

The domestic manufacture of vinegar is so simple, that those who wish it can easily render themselves independent of the manufacturer, and, indeed, many housekeepers do manufacture their own. It is not uncommon, at least in some parts of the country, to see standing near the fire a large brown jar, tied over with a porous cloth, in which the process of vinegar making is carried on by means of the vinegar plant, as it is called. Of this plant, which is in the form of a large, flat, leathery fungus, found on decaying bodies and in liquids undergoing the acetous fermentation, a correspondent in the *Lancet* gives the following account and mode of using:—"Put the plant—a young one—in an earthen jar, add to it half a pound of the coarsest moist sugar, and half a pound of treacle, with five pints of milk-warm water; cover it lightly over, so as to keep out the dust, but not the air, and then put it in a moderately warm place; there let it remain seven weeks, not disturbing it more than you can help. At the end of that time, pour off what is now the clear vinegar, and keep it in well-corked bottles for use. Again add to the plant the same quantity of water, sugar, and treacle, as before. At the end of the second seven weeks the plant will have become like two thick pancakes, and they may be easily divided, care being taken not to tear the old or new plant. If the plant is exposed to the cold, or kept too long out of the liquid, it will become black and die." Another receipt is given in the *Lancet* as follows:—"For every gallon of hot water, take eighteen ounces of sugar, and when the syrup has cooled to 75°, add four per cent. by measure of yeast. When the vinous fermentation is pretty well advanced, in the course of two or three days, rack off the clear wash from the lees into a proper cask, and add one ounce of wine-stone, and one of crushed raisins, for every gallon of water. Expose it in a proper manner, and for a proper time, to the acetifying process, and then rack off the vinegar, and fine it upon beech chips." It should be afterwards put into bottles, which are to be well corked.

The action of vinegar upon the system requires to be considered both in a medicinal and in a dietetic point of view.

The strong acetic acid and especially the concentrated preparation known as the glacial acid, is a powerful irritant, causing redness, and if long applied, blistering of the skin. It is also used as an external application to warts, and corns, which it often quickly removes, acting as a solvent of their albuminous and gelatinous constituents. When the strong acetic acid is employed as a solvent for aromatic essential oils, it constitutes the aromatic vinegar, or, as it was formerly called, "thieves' vinegar." This preparation derived its name and its reputation as an antidote to contagious emanations, from its first having been used in the time of the plague, by those who wished to plunder the houses or persons of the dead or dying without risk. If they escaped, it was probably from the confidence inspired by the possession of such a supposed protection—for vinegar, of any kind, can afford no real protection against contagion, that is, it can exert no chemically destructive effect over the contagious emanations in the way that chlorine does. Nevertheless, vinegar, plain or aromatic, either sprinkled about, or burned in a sick room, is often agreeable and refreshing; only, its use should not be permitted to supersede more essential purifications. Vinegar, diluted with water, in the proportion of one or two table-spoonfuls to the half pint, is used for sponging the skin in febrile diseases. It is also a good addition to gargles in sore throat. Before the more powerful astringent gargles are used, one-sixth part of vinegar may be added with advantage to the warm gruel or water gargle. It assists the separation of the tough mucus, which is apt to cling about the throat in such cases.

As an internal remedy, vinegar is but little used alone, it is, however, employed as a solvent of a few medicinal substances (see *Squill*). As a dietetic condiment vinegar is unquestionably useful and wholesome, more so, however, to some persons than to others. It is generally considered, in common with other vegetable acids, to promote the digestion of oily food, and probably there is something instinctive in its frequent addition to such aliment. But if, in moderate proportions, vinegar assists digestion, taken immoderately it is very injurious, destroying the digestive powers, and even inducing actual disease of the stomach. It is from this injurious effect upon the digestion that vinegar has acquired the reputation for reducing corpulency, which occasionally tempts foolish people to have recourse to it for this pupose—the practice cannot be too strongly condemned.

VIOLET.—The flowers of the common sweet violet are employed to impart their colour and fragrance to a syrup, which is often given to children for colds and coughs. It is said to be slightly laxative. The root of the sweet violet possesses gentle emetic powers, similar to those of ipecacuanha. The two roots have some resemblance in form.

VIPER.—See Wounds, Poisoned.

VISION is the power of taking cognizance of the size, colour, position, &c., of objects, external to the body, by means of rays of light, which are received upon a nervous expansion, capable of conveying the impressions received by it to the sentient being. In the lowest tribes of animals, the organs of vision, or eyes, are of comparatively simple construction, but the same organs in man are most exquisitely elaborate. Under article *Eye*, this structure has already been entered into as far as space permitted. Fig. 238 represents a diagram,

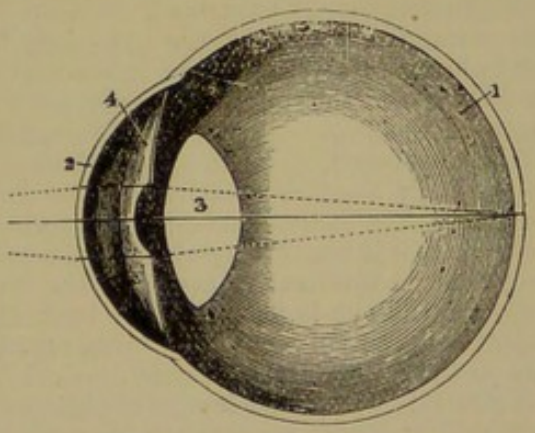


Fig. 238.

not a picture, of the section of the human eye, illustrating the parts essential to vision—first, a dark chamber (1) lined by the nervous retina, and glazed anteriorly by the glass or cornea (2). The rays passing through the cornea, and striking upon the nervous retina, would probably be sufficient to convey to the mind an impression of light and shade, and, perhaps, a general, though confused idea of external objects, but to confer the perfect accurate vision we enjoy, other arrangements are necessary; consequently, we find the lens (3) suspended, as it were, in front of an exquisitely transparent jelly, which fills the

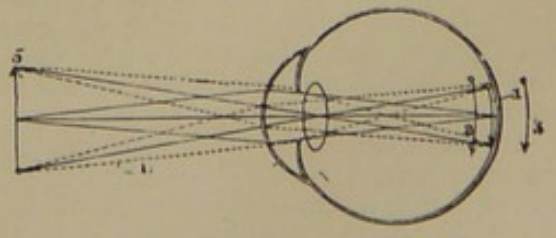


Fig. 239.

cavity (1) and the space between the lens, and the cornea filled with transparent fluid. The result is, that the rays proceeding from external objects, in their passage through these various transparent substances, become so collected and arranged (fig. 239) that by the

time they reach the back of the eye, or the sensitive nervous retina, they form in it exact miniature pictures of external objects, the picture, however, being placed upside down. This, perhaps, will be better understood by tracing the direction of the rays proceeding from the object (5) to the reversed image of it formed at the back of the eye (1). In addition to these arrangements for collecting and arranging the rays, there is superadded the iris (fig. 238—4; see *Eye*), in the centre of which is the aperture of the pupil, through which all the rays pass; and as the iris has the power of diminishing or enlarging this aperture, it acts as a regulator of the amount of light admitted into the interior of the eye. How it is, that, although images are formed in the retina in a reversed position, we see them correctly, is not at present satisfactorily explained.

The refractive power of the eye—*i.e.*, its power to bring to a focus on the retina rays of light falling on the pupil—depends on the strength of the lens, and upon the refractive power of the cornea, and the aqueous and vitreous fluids in front of and behind the lens respectively. But as the lens is the principal refractive agent it is usual to speak of it as representing the whole refractive power of the eye. The shorter the eye is from front to back the stronger the refraction must be to bring rays to a focus on the retina, and *vice versâ*.

In a perfectly normal eye images of objects at considerable distances are exactly focussed on the retina without any muscular action. If objects within a distance of a few feet are to be focussed distinctly, the lens requires to be increased in strength by the action of a small muscle which surrounds it, known as the ciliary muscle. The action of this muscle is involuntary, and as a rule unperceived, but if it is taxed unduly by, for instance, trying to read at a distance of only three or four inches, a distinct sense of effort and strain is experienced.

Departures from the normal eye are not infrequent; of these the first condition is called "*long sight*," and is due to the fact that the eye is too short, the focus of light falling behind the retina; in the second the eye is too long, so that the focus in front of the retina; this is called "*short sight*." Spectacles with convex glasses remedy the defect in long sight, or *hypermetropia*, and spectacles fitted with concave glasses are needed for short sight, or *myopia*. Both these conditions occur in young people, but in Britain long sight is the more common. Many symptoms, apparently unconnected with vision or the eye, arise from this peculiarity, such as headache, peculiar spasm of the muscles of the eye on attempting to read, &c. It is also a frequent cause of squint. When people advance in life, the lens of the eye becomes harder and loses its elasticity, so that it is no longer capable of being altered in shape by the action of the muscle within the eye. It is by the action of this muscle that the lens is rendered more or less convex, enabling us to see both near and distant objects. When by age this power is lost, the ability to see near objects is also lost, and convex glasses are necessary to compensate the flatness of the lens, while vision for distant objects remains good. Another peculiar anomaly of refraction is called "astigmatism." In this condition, the vertical and horizontal planes of the cornea do not correspond in curve, hence while upright lines may be distinctly seen, horizontal ones are misty or invisible, or the reverse maintains. This deformity of vision is only to be remedied by spectacles of a suitable construction.

Vision may be interfered with by causes which obstruct the access of light to the nervous expansion or retina, or by those connected with the retina itself, or with its nervous communications in the brain (see *Amaurosis — Brain*). In the former case, "specks," or opacities on the cornea, opacities of the lens, constituting "cataract" (see *Cataract*) inflammation, acute or chronic, may be the obstructing causes. But, whatever the case, or whatever the probable cause, when so delicate and valuable an organ as the eye is concerned, no time should be lost in submitting it to proper medical examination. For further information, see *Amaurosis—Cataract—Eye*.

VIS MEDICATRIX NATURÆ, Tendency to Health, Natural Powers of Recovery, or of Healing, are all phrases expressive of the same thing: of that power or tendency implanted in a living, organised body by its Creator, to restore to a state of order whatever portion of its living organisation may, by circumstances, have been thrown into disorder. By disorder, is here meant either what medical men call "organic disease," that is, change of structure palpable or appreciable; or what they call "functional disease," or "functional disorder," in which the functions of a part only are affected, or in which, if structure is altered, our means of investigation are not sufficient to enable us to detect the change, and we can only judge of the disease by its functional symptoms.

The existence of a power tending to health, of a vis medicatrix naturæ, has been recognised from the earliest times; but in what that power consists, medical men have never explained; it is, probably, connected with that principle of life which all created things derive from Him who made them. Without it the efforts of the physician or surgeon would be futile. The ends of the fractured bone might be placed in apposition, the edges of the wound drawn together, but in the absence of the vis medicatrix they would remain so only so long as retained in place by art, however long the artificial restraints might be applied. True it is that the natural tendency to cure may be much weakened—may be almost apparently absent—may be vanquished by the power of disease, and at last is vanquished by the power of

death; out why and how this is, we know not, cannot know till we explain what that is which we call "vis medicatrix." Nay, further, till we explain the why and wherefore of disease, why each and all possess certain tendencies to disease, which may, sooner or later, according as they are favoured or not by circumstances, show themselves, and overcome the natural tendencies to health and order in our material systems. These things are connected with the deeper arcana of our being. In this place the question requires more practical consideration. Notwithstanding the recognition of the "vis medicatrix" from the earliest times, it has too often been lost sight of in the treatment of disease and injury, especially in former years; physicians and surgeons acted as if they were the real powers for restoring health, instead of only being the assistants of those powers, and in this way arose an artificial, officious system of medicine, and a meddlesome surgery, from which the worst results ensued. The natural powers instead of being assisted were thwarted, and embarrassed or weakened; if they did ultimately succeed in throwing off the disease, or in repairing the injury, it only served to prove what the natural powers could do even under such circumstances. In times gone by a gun-shot wound was treated with scalding oils, scarified and cauterised; it is now more simply and successfully conducted to cure by the use of water alone (see *Dressing*). To simple wounds, balsams and spirits of various kinds were applied, which now under the plain water-dressing quickly and painlessly get well; but even now, so strongly is the idea of the healing power of plasters entertained by the popular mind, that the cure of a wound is attributed directly to these applications, which only fulfil the mechanical end of holding its edges together, that is, of putting the injured parts in such a position that the natural powers of healing can be exerted.

Formerly, small-pox, fever, and such diseases, were treated by stimulants within, and by the stimulant action of heat without, in the form of hot rooms, closed curtains, and loads of bed-clothes; and, as the reverse of this, it is not long since the natural powers that would cure if they were permitted, were weakened by indiscriminate bleeding. Even now, numbers in this country do not think it possible to get rid of any disease without drugs.

By these observations, it is not meant to weaken the confidence of any in the curative or salutary powers of medicines, which are true and real blessings; but it is intended to point out how, by losing sight too much of the natural implanted power of resisting and throwing off disease possessed by the living body, injurious systems of officious meddling prevailed. Indeed, it may be that at present the current has set too strongly the other way, and many are too much inclined to be altogether sceptical as to the curative powers of medicine. This, it need scarcely be said, is an extreme, equally vicious with the other, which trusted all to it alone. We know that the vis medicatrix naturæ, the natural tendency to health, is strong, and will often prevail even in the most adverse circumstances; but we also know that it is often weak, that it fails to overcome, or that, whilst it is fighting the battle, its resources, its "commissariat," so to speak, fail. In such cases we know that assistance must be given from without by those means, or agents, which He who gave the one power within the body, has endowed with powers capable of assisting that power, of aiding it in the combat.

Nothing, perhaps, makes the above remarks more obvious than the circumstances which occur in cases of fever. This disease is generally admitted to be a continued state of disordered action in the system, in which—although at times the powers seem to be completely overwhelmed—the tendency is in a large number of cases to run a certain course, ending in recovery, or in the victory of the tendency to health over the acting causes of disorder. None, perhaps, are bold enough to profess to cure a fever—to profess to remove the disease by active treatment, either directly medicinal, or otherwise; and the man who attempts it will probably do so at the peril of his patient. The wise physician is content to leave to the vis medicatrix the removal of the disturbance, for which he can offer neither rational explanation nor method of direct cure. But if, in eschewing all *active* interference, he defers to the power within, in rendering his assistance to that power, he fulfils a most important, a necessary office, and often assists to save a life which the unassisted powers of the body must have lost.

The office of the physician in such a case is to preserve those outward conditions of health, which it is every man's duty to provide for himself when he has health and strength to do so, albeit these conditions now require nice management. The blood of the fever patient is disordered—poisoned. The office of the physician must be, by seeing that his patient draws pure air into his lungs, to facilitate the purification of the vital fluid: the exhalations of the body by the skin and lungs are depraved; he must see that, by the removal of these, and of all things which can absorb and retain them, the diseased action is not assisted: the excretions from the bowels are depraved, offensive, morbid; the due evacuation of these must be attended to: the natural appetite and power of digestion is all but annihilated, but a process is going on within which is consuming, burning up the framework, and may come to bear upon the vital tissues; to prevent this the medical man must support strength by nourishing fluids, which pass easily, and with little digestive effort, into the circulation; and if the disease goes on, if the

"vis medicatrix" is still combating, and requires but a little time longer; if, then, all the available supplies for carrying on the ordinary processes of vital warmth, &c., are exhausted, he must, with wine or brandy—alcoholic fuel—keep, almost artificially, the machinery at work. In such offices as the above, and many more, surely there is abundant room for the skill, the judgment, the interference, of a medical man, without his attempting to take into his own hands the office of that power which he cannot supersede, but which he may greatly thwart. In such a disease as fever, it is true, medicine, although often, or rather always, requisite, is not so to the same extent that it is in other diseases; but even in others, in which, such as neuralgia, we can often directly trace the removal of the disorder to the administration of the remedy, we can only look upon the power of the latter as the assistant to the natural tendency to cure. There are, it is certain, some diseases, such as cancer, which resist not only all efforts for their removal from within, but all the assistance we can give by remedy. Why it is so, we cannot tell; that they are thus "incurable," is probably because we are ignorant of the remedy which might give the assistance to the natural tendency to health, which would enable it to overcome the disease, just as there are certain obstinate ulcers, or affections of the skin, which resist many modes of treatment, and at last yield under the influence of a particular remedy, but yet to the remedy can only be ascribed the power of assisting.

The present subject has been dwelt upon, because, as already observed, from the extreme which at one time existed, of trusting all, or, to say the least, too much to medicines, drugs, &c., there certainly has been a tendency in many to discard these altogether, and to trust entirely to the powers, the "vis medicatrix naturæ." As in most other things, in the medium will be found the best course; and he probably will treat disease most successfully who endeavours, by strict attention to the sanitary surroundings of the patient, to put the natural powers of resisting and casting off disease in as favourable a position as possible; who trusts those powers, but yet watches their operations, and who is prepared, with full confidence in the efficacy of medicines, to use them decidedly and actively when rational ground for doing so appears.

There has been, undoubtedly, far too much trusting to drugs alone, and far too great neglect of the general principles of health, in the treatment of disease, but it is folly on that account to attempt to cast aside medicines altogether. If the Author of all things implanted in the living animal body a "vis medicatrix," He also endowed other substances with the capability of assisting that power. We can see how the neglect of the first was an error; surely to ignore the last must be so too.

VITRIOL.—See Sulphuric Acid and Sulphates.

VOICE, or Vocal Sound, produced in the larynx (see *Lungs*), is the endowment of animals generally, and differs from speech, possessed by man alone, the latter, physically speaking, depending upon the formation and action of the parts about the mouth. Crying, singing, and the sound of speech all depend upon the action of the larynx, which partakes of the characters of both a wind and of a stringed instrument. In some diseases the alteration in the voice is very characteristic. In Asiatic cholera it acquires a very peculiar pitch; in consumption it is often of a remarkable hollow character; in some forms of disease it may be almost lost. In cases of aneurismal and other tumours pressing on the nerves which go to supply the mechanism of the voice, a remarkable alteration of intonation takes place, sometimes accompanied by peculiar changes in the sounds of the cough, very familiar to the physician.—See *Aphonia—Cry of Children—Reading Aloud—Laryngoscope*, &c.

VOMITING is the action of discharging the contents of the stomach through the gullet and mouth by muscular effort, or rather by a combination of muscular efforts. Formerly, it was imagined that vomiting depended upon "convulsive" action of the stomach alone; after that it was thought that the stomach was passive in the act, and that the pressure of the muscles of the abdomen, thrown into violent action, was the sole cause. It is now well ascertained that both these agencies are called into play when vomiting occurs; that the stomach does, by the action of its muscular fibres, assist in the expulsion of its contents, but that its efforts are greatly aided by the muscles of the abdomen, including the diaphragm (see *Diaphragm*). Every one is conscious, that previous to the act of vomiting, a deep inspiration is taken; by this the diaphragm is forced downwards towards the cavity of the abdomen, and being there fixed, or rendered tense, by the contraction of its own fibres, it offers a fixed point of resistance, against which the stomach can be pressed by the contraction of the muscles in the forepart of the abdomen. At the moment that this almost convulsive pressure is exerted on the stomach, and by the stomach on its contents, the muscular fibres at the "cardiac" junction of the stomach with the gullet (see *Stomach*) are relaxed, so as to permit of the passage upwards of the matters contained in its cavity, whilst, at the same time, the glottis is closed, so as to protect the larynx and air passages, as in swallowing.

Vomiting is frequently preceded by nausea (see *Nausea*), but not always; probably it is not so in the vomiting of infants, which overfill their stomachs, for nausea is a sensation which causes uneasiness and distress, and yet the little creatures generally look remarkably

happy whilst they relieve their stomachs of the overload. Again, some persons, especially dyspeptics, possess the power of vomiting at will, and can, without any feeling of nausea, discharge the contents of the stomach; neither is there much, if any, feeling of nausea connected with the vomiting which sometimes follows coughing, sobbing, and over-eating.

The causes of vomiting are very numerous. It may depend on local irritation of the stomach by bile, mucus, &c., or by indigestible food, by medicine, or by poison; it may be excited by the mechanical efforts, and probably through the intimate nervous communications in cough, hiccup, sobbing, laughing, &c.; it is often sympathetic with and symptomatic of disease or accident in distant parts, or of excited action in distant organs, as in the case of the womb in pregnancy, or in sea-sickness. Irritating or tickling the throat likewise causes vomiting. In some persons, disagreeable or peculiar tastes, smells, and even sights and sounds, will give rise to vomiting; mental emotion will produce it, and certain drugs, such as tartar emetic, give rise to it if injected into the blood. At the onset of acute disease, vomiting is a common symptom. When a person becomes affected with vomiting, it is of course well to keep these various causes in mind; for though, in the majority of instances, perhaps, vomiting depends upon disorder in the stomach itself, it must evidently be of much consequence to recognise it as symptomatic of disease, which is often of a serious character.

When vomiting has been preceded by symptoms of indigestion, or when it is of a bilious character, accompanied with furred tongue, &c., the probability is that it depends upon the presence of bile or other matters. In such cases, if the natural process of relief appears inclined to be sufficiently energetic, it will be enough to assist by drinks of tepid water or gruel, or of chamomile tea; if the action is not sufficient, an emetic (see *Emetics*) may be given to fulfil the natural indications. These attacks of spontaneous vomiting from disorder of the digestive organs are frequently accompanied with diarrhœa; but when this does not occur, it is generally advisable to give aperient medicine in some form, and as the stomach often remains unsettled, nothing seems sooner to restore it than a few effervescing draughts, either simple, or containing a tonic bitter.—See *Indigestion.*

Vomiting, however, may continue from simple irritability of system or stomach, after the irritation in the latter organ has been removed; when it does, means for allaying that irritability must be resorted to, similar to those employed when the vomiting is the result of sympathy, as it is in pregnancy, &c. In any case, obstinate vomiting is so distressing a symptom, and one so injurious to some patients, that it is desirable at all times to put a stop to it. For this purpose the remedies recommended are very numerous.

If there is offending matter in the stomach, which is the cause of the vomiting, it is of course useless to attempt to stop the latter till the former has been removed, as adverted to above.

As general remedies in vomiting, effervescing draughts are the most safely usable by an unprofessional person; also alkalies, or magnesia, if there is acidity; and with these it is advisable, at times, to combine a stimulant, sal volatile, or if calcined magnesia is used, a little sherry. Small fragments of ice allowed to melt gradually in the mouth will frequently allay the irritation of the stomach. Diluted hydrocyanic acid in five minim doses, every two or three hours till the vomiting ceases, is a favourite remedy. Opium, chiefly in the form of hydrochlorate of morphia solution, may be given in doses of from ten to twenty minims, or may be combined in less proportion with from ten to twenty grains of subnitrate of bismuth. The fermented preparation of milk called Koumiss will often remain on the stomach while other foods, including fresh milk, are rejected. The writer has often treated successfully the obstinate vomiting of pregnancy by one minim doses of ipecacuanha wine, given every hour in a tea-spoonful of water. In other cases, two minim doses of tincture of nux vomica in a drachm of water may succeed. Besides internal remedies, assistance may be derived from external applications, such as three or four leeches to the pit of the stomach, if there is much tenderness, or a mustard plaster or blister; position, too, whether recumbent or not, may make considerable difference. It may be well not entirely to neglect the indication of appetite, or of any unusual craving for food of a particular kind; its gratification may stop the symptom. When vomiting comes on without obvious cause, and when it continues to recur, a medical man should be seen at once, for it may be symptomatic of serious disease. If, without obvious reason, it happens shortly after a meal, and especially if more than one person is affected, the possibility of poison is not to be forgotten.

Refer to—*Chloroform—Creasote—Emetics—Nausea—Poison—Pregnancy—Sea-Sickness.*

WAISTCOATS, UNDER.—See CLOTHING—FLANNEL—WASH-LEATHER, &c.

WAKEFULNESS.—See OLD AGE—SLEEP, &c.

WALKING is the natural exercise of man, and for the strong and healthy it is the best. Even in the case of the debilitated and of the aged, it should not be neglected: no other mode of exertion diffuses the blood and accelerates its circulation so thoroughly throughout the body. The principal caution required for such persons is not to continue

their exercise till exhaustion occurs. Children are not unfrequently injured and weakened in constitution by their daily exercise being a walk, too often carried to fatigue, especially in summer. When attainable, a playground in which rest and exercise can be taken alternately, and at will, is much preferable to the former. Any unusual peculiarity in walking, especially in children or young people, should not be permitted to pass unnoticed; it may be the first indication of spine or hip disease.

WALLS AND WALL-PAPERS.—The principal object, on the score of health, to be regarded in the external walls of dwellings is, that they shall be sufficiently thick for warmth, and not of such porous material as will too readily absorb or give out moisture. Some kinds of stone and badly-made bricks do this, and render dwellings unwholesome. The defect of outer-walls, either as regards material or thickness, may be considerably ameliorated by lathing and plastering within. In covering the inner walls of houses either with paint or paper, too little regard, perhaps, has hitherto been paid to the effect of the materials which are used on health. In another part of this work, it was stated that colours containing lead and arsenic have been found to affect injuriously the occupants of rooms to the walls of which they have been used. Moreover, as light exerts so strong an influence upon health, it is not unlikely that wall colours, especially in the variation from light to dark, may be found to do the same.

Wall papers are of course liable to the same objections, and also to another connected with the size, by means of which they are attached. This will be best illustrated by the following "Hints on Paperhanging," from a popular periodical.

"Many a fever has been caused by the horrible nuisance of corrupt size used in paper hanging in bed-rooms. The nausea which the sleeper is aware of on waking in the morning, in such a case, should be a warning needing no repetition. Down should come the whole paper, at any cost or inconvenience; for it is an evil which allows of no tampering. The careless decorator will say that time will set all right, that the smell will go off, that airing the room well in the day, and burning some pungent thing or other at night, in the meantime will do very well; it will not do very well; for health, and even life, may be lost in the interval. It is not worth while to have one's stomach impaired for life, or one's nerves shattered, for the sake of the cost and trouble of papering a room, or a whole house, if necessary. The smell is not the grievance, but the token of the grievance. The grievance is animal putridity, with which we are shut up, when this smell is perceptible in our chambers. Down should come the paper; and the wall behind should be scraped clear of every particle of its last covering. It is astonishing that so lazy a practice as that of putting a new paper over an old one should exist to the extent it does. Now and then an incident occurs which shows the effect of such absurd carelessness. Not long ago, a handsome house in London became intolerable to a succession of residents, who could not endure a mysterious bad smell which pervaded it when shut up from the outer air. Consultations were held about drains, and all the particulars that could be thought of, and all in vain. At last a clever young man, who examined the house from top to bottom, fixed his suspicions on a certain room, where he inserted a small slip of glass in the wall. It was presently covered, and that repeatedly, with a sort of putrid dew. The paper was torn down, and behind it was found a mass of old papers, an inch thick, stuck together with their layers of size, and exhibiting a spectacle which we will not sicken our readers by describing."

WALNUTS are about as wholesome and unwholesome as nuts generally. The infusion of walnut-tree leaves has been highly extolled as a remedy in scrofula, but that such is the case we have no sufficient evidence. The tincture from the leaf of the walnut given in tea-spoonful doses will often check vomiting.

WARM-BATH.—See BATH.

WARM FLUIDS.—See DILUENTS—HEAT, &c.

WARTS are enlargements of the papillæ of the true skin, and thickening of the covering epidermis or scarf skin. They are most usual in children, up to a little beyond puberty, and generally occur on the hands, sometimes on the face. In the latter situation, they are better not interfered with. When situated on the hands, they often disappear of themselves; when their removal is desired, strong acetic acid, applied every two or three days, is quite the best remedy; caustic, however, or tying, or cutting them off, are measures also resorted to. When a wart on the face, especially in those advanced in life, appears inclined to become ulcerated, or irritated, it ought to be shown to a medical man. It may require removal, to prevent it from degenerating into cancer.

Refer to—*Skin.*

WASHING.—See ABLUTION.

WASH LEATHER, or CHAMOIS LEATHER, is often serviceable when worn next the skin as an under waistcoat, by those subject to rheumatism and chest complaints.

Refer to—*Rheumatism.*

WASP.—See STINGS.

WASTING.—See ATROPHY—TABES.

WATER.—This apparently simple fluid, considered by the ancients as one of the elementary or simple bodies, is composed of the two gases, oxygen and hydrogen, in a state of chemical combination, in the proportion of eight parts of the former to one of the latter, by weight. Chemists demonstrate the gaseous

composition of water in two ways: they either decompose the fluid by means of electricity, and collect the two gases separately, or they form it by causing the two gases to unite in proper proportion. Indeed, the formation of water by the union of the gases may be witnessed by any one in the moisture evolved inside a gas lamp, in consequence of the union of the burning hydrogen with the oxygen of the atmosphere.

Water, when perfectly pure, is transparent and colourless, without taste or smell. It freezes at 32°, and boils at 212° Fahr. It is, however, impossible, perhaps, to procure perfectly pure water, except by the process of artificial distillation; even rain water, which is the purest natural water, although collected at a distance from human habitations, is found to contain traces of ammonia, and sometimes of nitric acid; if collected near dwellings, it is of course liable to contract much greater impurity. Nevertheless, rain water, being the product of natural distillation, that is, having passed into the atmosphere in the form of vapour before its descent as rain or snow, is free from the saline and other impregnations which it necessarily possesses as soon as it has come in contact with the earth.

It is reckoned that a healthy man requires, for his daily consumption, from sixty to seventy ounces of water, about one third of which he obtains from his solid food, and the remainder from tea, coffee, and other beverages (including water), which he is in the habit of consuming. There is no nourishment in the ordinary sense of the word in water, but as the human body is made up in the proportion of from two-thirds to three-fourths water, it is even more necessary for our existence than solid food; a man may live for weeks on water alone, but he would die in a few days if totally deprived of it, and the sensation of thirst is far more terrible to bear than that of hunger. The fluids which are constantly ebbing and flowing through the various organs of the body, and undergoing changes of a chemical and mechanical nature, in the processes of secretion and absorption, must make their exit in time in the solid, liquid, or gaseous state. It is calculated by the best observers that rather more than a pound of fluid is exhaled daily from the lungs, one pound and three quarters from the skin, and not less than two pounds and a half from the kidneys; so that altogether, the estimated excretion of water daily from the system is over five pounds, which has to be returned, in the process of repair, in as pure a condition as it is possible to obtain it. The water in our food, in our tea, and in our beer (if we indulge in the latter), has undergone changes in the preparation which, in all probability, deprive it of any deleterious influence the water may have possessed in the first instance; as in the process of boiling, we have a ready means of destroying any germs of organic life that may exist in the water, though such may not have been patent to the senses. Hence, when any suspicion exists as regards impurities in water, it is a wise precaution to have it boiled before using it in any form, apart from filtration, which for the most part only removes mechanical impurities. Water, however, which has been boiled, is flat and mawkish, and few partake of it unless compelled by sheer necessity. The best kinds of water for drinking purposes are those which are clear, transparent, and well aerated, which sparkle in the vessel into which they are poured, and which are without taste or smell. As a rule, water contaminated with animal or vegetable matter has an unpleasant odour and also taste, and is often turbid, although this is not always the case, while some of the clearest waters are quite unfitted to drink. On the other hand, turbid water may be perfectly pure, when it owes its turbidity to the sands through which it passes; but in most cases it must be regarded with suspicion, especially when it proceeds from shallow wells in the neighbourhood of houses.

With the exception of the air, no necessity of man's living existence, perhaps, exercises more powerful and direct influence for good or evil than the water he imbibes; indirectly, also, it affects his moral condition, whether considered as a beverage, or according to its economic uses. Notwithstanding, however, the acknowledged utility in every way of a free supply of pure water, it must be considered not only an anomaly, but a disgrace to the boasted civilisation of the latter part of the nineteenth century, that so little attention has been given to supplying most of our large towns with this necessary of healthful existence, physical and moral. In their provision for water, the ancients far, very far, surpassed the moderns, as the remains of their magnificent aqueducts testify, and bestowed great care and expense on the means of procuring it pure.

Rain Water.—As stated above, rain or snow furnishes water freer from impurities than that procured from any other source; the absence of all saline impregnations especially renders such water peculiarly well adapted for cleansing purposes; it dissolves soap easily and readily, not curdling it as the hard waters do. Rain water is seldom used for drinking, on account of its vapid taste; but from its softness and freedom from impurities, more especially in country districts, it can be usefully employed in cooking, tea making, and for other domestic purposes. In the case of an epidemic of any kind, and when the ordinary water supply may be suspected to be at fault, it is often advisable to have recourse to rain water only, but it should be remembered that rain water in or near towns is always largely contaminated with the impurities in the air, and should be avoided for drinking and cooking purposes.

Rain water which has descended upon, and entered the earth, becomes, as stated above, impregnated with impurities of various kinds; these vary according to circumstances; they are classed as mineral or saline, and as vegetable or animal impurities. There may also be impurities which are wholly dissolved in the fluid, and others which are merely mechanically suspended; the latter are capable of being completely separated by filtration, the former are not.

"Hard" and "Soft" Waters.—The most important and generally abundant saline impurity in water is the carbonate of lime, from which hard water chiefly derives its character; besides this salt there are often to be found in smaller quantity sulphate and nitrate of lime, common salt as well as salts of magnesia and iron; the latter impurity, however, is not very common, except in mineral springs. The degree of hardness of any water is indicated with reasonable accuracy by the amount of soap required to form a lather with it.

The earthy salts, that is, those of lime and magnesia (and especially lime), are the chief sources of hardness in water; excess of carbonic acid and the presence of iron are occasional causes not often met with. Filtering such water does not in any way modify its hardness. When the hardness of water arises from excess of carbonic acid, exposure to the air in great measure removes the inconvenience, and also does so slightly in water rendered hard by the presence of the carbonates of lime or magnesia; such waters, however, are softened in some degree by long boiling, which causes the separation of the salt of lime or magnesia, in the form of an insoluble carbonate; this is in fact the chief constituent of the crust or "fur" which forms inside boilers, kettles, and sauce pans, in districts where the water is hard. Waters are consequently divided into "hard" and "soft" in proportion to the amount of mineral ingredients they contain, and although soft water is preferable to hard for most domestic purposes, it does not follow that hard water is of itself injurious. The differences in the two waters depend on the nature and character of the soil through which they percolate. Small quantities of hard water can be successfully made soft by distillation; boiling also greatly reduces the hardness by causing precipitation of the carbonate of lime held in solution by carbonic acid. No process is practicable for completely removing the hardness on a large scale; but it can be much reduced. The process, which is known as "Clarke's" (having been patented by Dr. Clarke of Aberdeen) is a very interesting one, showing how an excess of the mineral impurity added to the water relieves it of its objectionable character. The carbonate of lime, which is the cause of the hardness, is soluble in the carbonic acid contained in the water, and when quicklime is added to the latter, the acid is no longer capable of retaining it in solution, but combining with the excess of lime, deposits it in the form of chalk in the bottom of the tank. It may be remarked that hard waters are far more frequent either from surface springs or sunk-wells; and that certain springs, especially from the surface of hilly or undulating countries, are often extremely soft, such springs being in fact supplied by surface water—that is water which has only percolated through the upper strata, and has not passed through those which furnish the deeper springs with their saline, lime, and magnesia impregnations.

River Waters are softer than surface or deep well waters, but still hard, and if the rivers have villages or towns on their banks, they are liable to be contaminated with sewage impurities.

Lake Waters, especially those from among the mountains, are very soft and pure, and, whenever practicable, large towns should be supplied with water from this source.

Artesian Well Water, that is to say water obtained by boring to a great depth through clay or other impervious strata to the chalk or water-bearing rocks, may be either soft or hard, and can always be depended on for its purity.

For purposes of drinking and cooking, and especially the former, the importance to a population of a due supply of good pure water cannot be over-estimated. If the water is impure, it either injures the health or drives people to take it in combination, too often with spirits, or under other forms, and thus engenders habits of drinking. It is, indeed, not improbable, that many of the artificial drinks have been resorted to solely as substitutes for bad water. In the choice or appreciation of a drinking-water, people will, perhaps be greatly guided in their judgment as to pleasantness by the nature of that to which they have been accustomed. As a general rule, however, most people prefer a water which contains a slight amount of mineral ingredient. At the same time, those who have habitually drunk even very hard water do not at first relish that of a softer character. Water which has been drawn for some time becomes, as all know, unpleasant and vapid; this is often accounted for by the loss of carbonic acid, or air, which most waters contain naturally. Another, and probably more powerful cause of the acquired unpleasantness than either of the above, is the facility with which water attracts atmospheric impurities and exhalations, and there are generally sufficient of these to be met with.

Water Supply in Towns.—In large towns especially, where diseases spread rapidly from an impure or deficient supply, it is the duty of the municipal authorities to take every precaution against the numerous dangers which the experience of recent years has shown to be associated with drinking water either originally impure or contaminated from accidental

and unseen sources. In towns, the necessary arrangements for distribution are usually in the hands of the water companies, who calculate roughly the wants of the community by apportioning to each member as many gallons of water per day as their sources of supply will permit, keeping in view in the calculation a suitable provision for town requirements, such as watering of streets, extinguishing fires, and other purposes. From the inquiries made by the Rivers Pollution Commission, the average amounts vary greatly, ranging from a minimum of 4 gallons per head in one town to a daily maximum of 140 gallons in another. Professor Rankine considers that an allowance of 10 gallons per head daily for the domestic requirements of each member of the community should be the rule with all water companies, and that 10 gallons more should be supplied for town and trade use in non-manufacturing towns, while an extra 10 gallons, making in all 30 gallons per head, should be furnished to manufacturing populations. The accompanying table, taken from Parkes' *Hygiene* (edition by Dr. De Chaumont), gives the estimated amounts supplied to each head of the population by various water companies in their respective districts and towns:—

	Galls. per head of Population daily.
New River Company, London,	23
East London Water Company,	22
Chelsea,	33·8
West Middlesex,	30
Strand Junction,	34
Southwark and Vauxhall,	21
Lambeth,	34
Southampton,	35
Glasgow,	50
Derby,	14
Nottingham,	17
Norwich,	12
Edinburgh,	35
Liverpool,	30
Sheffield,	20
Paris,	31
Calcutta, for Europeans,	30
,, for Natives,	15
New York,	300

There are two ways by which water companies convey their supply to houses, named respectively *constant* and *intermittent*, the terms sufficiently explaining the mode of distribution in each case; of the two methods there can be no doubt — notwithstanding the liability to a certain waste of the commodity—that the "constant" plan of water supply is preferable to the other, inasmuch as the water being constantly at high pressure in the pipes, there is little danger of the supply running short, or of its being contaminated in cisterns, since these are in a measure dispensed with. It is always advisable, however, in either case, to have small reservoirs in direct connexion with the water-closets, the best forms of which are known usually by the name of "water waste preventers," and which supply usually two gallons of water and no more each time the closet basin is flushed. It is of importance, moreover, as Dr. Corfield has pointed out, that the water-closets should not be supplied directly from the main, as it happens occasionally from some unavoidable cause, that the constant service is suspended, and the house is served for a time on the intermittent system, in which case foul matters may get into the pipes, either from the soil through leaky joints or from the basins of the closets.

To ensure health and cleanliness it is most important that water should be laid on, not only in every house, but in every occupied floor of the house, and it should also be borne in mind that surplus water is not wasted so long as it fulfils the useful purpose of helping to flush the drains.

Impurities in Water.—A small amount of mineral ingredient may not be, and probably is not, injurious; but water containing any great amount cannot be regularly consumed without risk to health, although more to some constitutions than to others. It is tolerably certain that the origin of bronchocele or goitre is connected with the presence of magnesium salts in the waters of the districts in which the disease prevails; and, in all probability, certain hard waters are responsible for some urinary diseases. Bad as hard waters may be, however, those impregnated with organic matter, especially of animal origin, are beyond comparison worse, and are fertile sources of disease. Indeed, there is every evidence to show that organic matter in itself is capable of causing illness, but its presence is important chiefly because it is indication of a risk that the water may become specifically contaminated with the germs of disease (see *Enteric Fever* and *Cholera*). Dysentery, diarrhœa, and ague, are other diseases which have often originated from drinking bad, especially marsh, water. It ought also to be remembered that though the water may be good when drawn, if it be preserved in bad receptacles, such as butts, the wood of which is decayed, in cisterns lined with lead, on which the water acts (see *Lead*), or where it is exposed to contract impurities from the atmosphere, a really wholesome fluid may be converted into an unwholesome or even poisonous one.

Microscopical Appearances of Water.—Under the microscope, water will be seen to contain (in a greater or less degree, according to its purity) various forms of animal and vegetable life, the leading types of which are figured in the accompanying plate (fig. 240), which contains a representation of the following common species:—

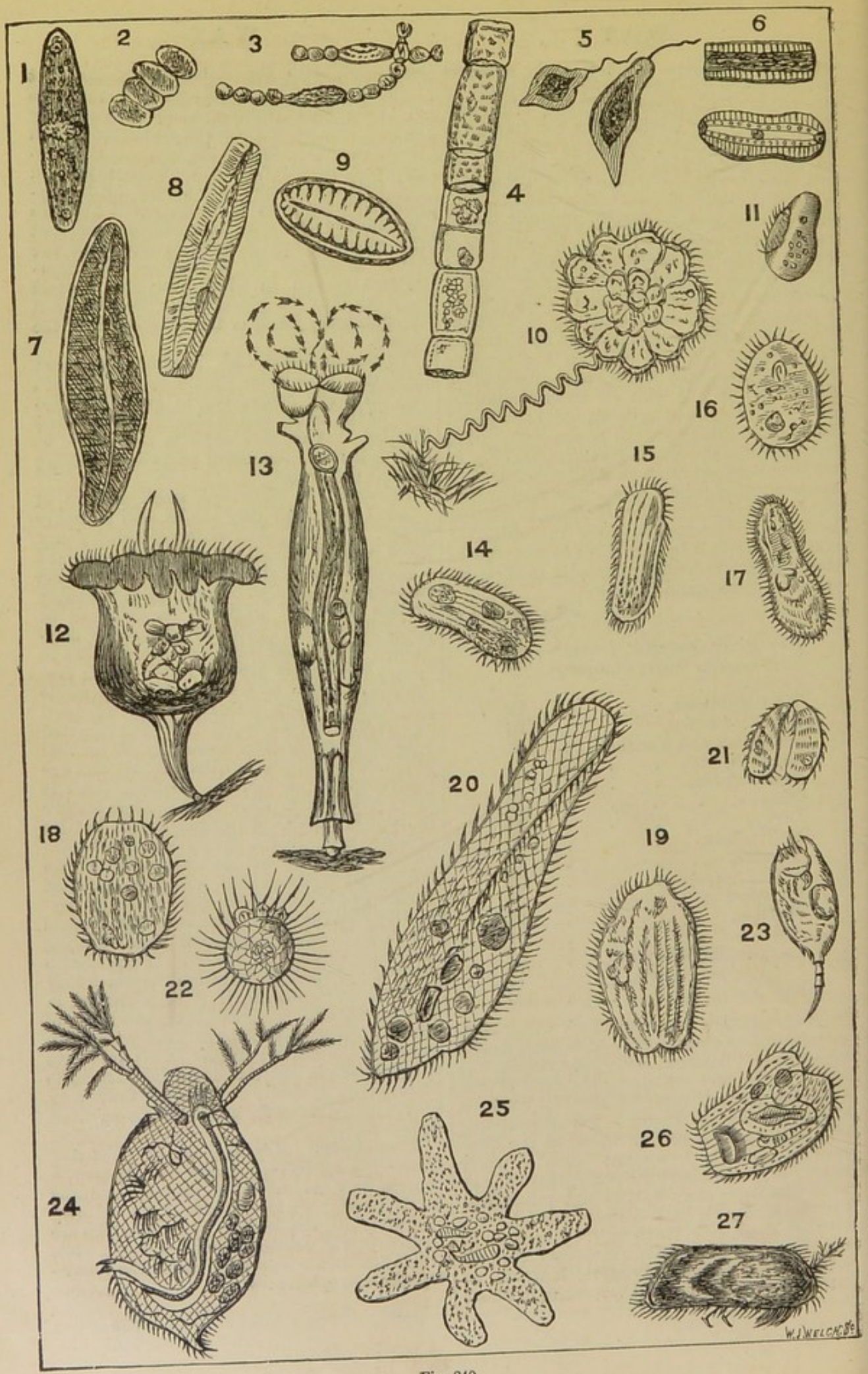


Fig. 240.

No.	
1.	Closterium.
2.	Semidesmus obtusus.
3.	Spores of a fungus.
4.	Conferva floccosa.
5.	Englena viridis.
6.	Diatom vulgare.
7.	Pleurosigma angulatum.
8.	Navicula viridis.
9.	Surirella splendida.
10.	Colony of vorticella.
11.	Cyclidium glaucoma.
12.	Brachionus.
13.	Rotifer vulgaris.
14.	Oxytricha lingua.
15.	Pellionella.
16.	Glaucoma scintillans.
17.	Glaucoma Gibba.
18.	Leucophrys striata.
19.	Paramæcium aurelia.
20.	Paramæcium caudatum.
21.	Paramæcium chrysalis.
22.	Actinophrys sol (budding).
23.	Monura dulcis.
24.	Daphnia.
25.	Amœba.
26.	Chiloden.
27.	Cypris.

Of these microscopical appearances, Mr. Blyth says: "Confervoid growths, algæ, and desmids (Nos. 1, 2, 4, 5, 6, 7, and 8, fig. 240) are met with in running streams of great purity; and if these are the only structures met with, a water should not be condemned; but, in my experience, when such forms have been numerous, infusorial life is also present. On the other hand, ciliated forms (such as Nos. 14, 15, 16, 17, 18, 19, 20, 21, and 23, fig. 240) are, as a rule, indicative of sewage contamination; it is, indeed, said that waters containing *paramœcium* are even injurious to animals. Cotton fibres, epithelium, potato, starch, hairs, and similar structures, although they may be harmless in themselves, are evidences that the water is susceptible of human contamination. Fungi and much decaying vegetable matter are always suspicious.

"With regard to the interpretation which should be put upon microscopic results, the fewer living forms met with, as before said, the purer the water."—*Hygiène and Public Health* (*A Dictionary of*).

Water as a Beverage.—It is perhaps going too far to say that man should never drink anything but the natural beverage provided for him; that it is the only wholesome *regular* drink of healthy men is certain, but to contend that it never should be varied is inconsistent with the law, which seems so general, that change within certain limits is more beneficial than unvarying uniformity. Moreover, if water be the most abundant natural beverage, milk and vegetable juices furnish others in great abundance, and there can be no question that tea and coffee are providential provisions for man's health and comfort (refer to *Tea*, *Stimulants*, *&c.*). At whatever other times water is drunk, and in whatever proportion to other beverages, it is never more beneficial to the majority of people than on first rising in the morning; then a draught of pure fresh drawn water is a most admirable persistent tonic, which may be continued a life through; it has, too, the advantage of stimulating the bowels, and assists to keep them open. Some few persons of weak digestive and nervous power cannot take a large draught, though they may a small one. Another most wholesome period for a good draught of water, with persons of tolerably good nervous power, is just before dinner. Many, however, commit the error of drinking water too largely with their meals. This acts injuriously by washing down the food insufficiently masticated, by giving a sort of artificial appetite, so that more than enough is consumed, and it injures digestion by lowering the temperature of the stomach. Too large a draught of cold water when the body is heated, especially if exhausted, it is well known, is apt to prove serious, perhaps fatal (see *Shock*). In disease, both as an external application (see *Ablution*, *Affusion*, *&c.*) and as an internal remedy, water is most valuable; and, indeed, in febrile diseases attended with much thirst, it may be allowed largely with the greatest benefit. Moreover, pure cold water is generally preferred, at least for a time, to all the artificial drinks. There is among the poor, and even among others, an unaccountable prejudice against allowing the sick to drink cold water. There need be no fear when it is craved by feverish thirst, indeed few febrifuges excel it as a remedy.

In recent years much confidence has been established in filtration on a large scale as conducted by water companies. The absence of very frequent outbreaks of such diseases as enteric fever among communities supplied by river water from a stream which, above the intake, has received the sewage of a large population, points to the conclusion that the poison, the bacterial nature of which has now been pretty conclusively proved, is arrested by the process. Were this not the case one would expect that widespread epidemics would constantly occur whenever cases of enteric fever existed in the community up stream. Quite recently, during the epidemic of cholera at Hamburg, Prof. Koch demonstrated that the almost complete absence of the disease in one part of the town, while it was so fatally prevalent in another, was to be accounted for by the fact that although both parts were supplied with sewage-polluted river water, the water was supplied to the infected part in an unfiltered state, whereas in the case of the district free from cholera the supply was passed through a sand filter. It is not a very consoling thought to know that large populations have to depend upon a few inches of sand to protect them from enteric fever or cholera; but, so long as water-supplies are derived from sewage-polluted streams, it is some satisfaction to learn that the measures adopted to purify them are attended with success.

Refer to—*Diluents*—*Baths*—*Cold*—*Filter*—*Heat*—also to sanitary articles generally.

WATER BEDS AND CUSHIONS.—See Bed—India Rubber.

WATER-BRASH—Pyrosis—is a disorder characterised by occasional vomiting of clear fluid, either sourish or tasteless, from the stomach. It is a frequent accompaniment of chronic indigestion, and those who live much on innutritive vegetable food are pecu-

liarly liable to it. Before the fluid is brought up there is often pain, more or less severe, experienced at the pit of the stomach. Improved diet, and the treatment of indigestion generally, are the most suitable measures. One of the best remedies for this distressing affection is the subnitrate of bismuth, of which twelve grains may be taken twice a day, along with five grains of aromatic powder, well mixed in a little milk. Under article *Saliva*, an affection which is generally confounded with water-brash is alluded to.

Refer to—*Indigestion.*

WATER-CLOSETS.—On account of the dangers which have been proved to be associated with the introduction of water-closets, and which have been especially brought under public notice during the last few years, a variety of different closets have been patented and introduced into public institutions as well as into private houses; some entirely on new principles, while others are simply modifications of those which have been a long time in use. The main object aimed at is (1) to secure a basin and trap that will prove efficient in intercepting sewer emanations, (2) that will nor readily foul of themselves, and (3) to obtain a sufficient flush of water to rinse the basin and syphon without unnecessary waste. It is doubtful whether many of the new contrivances referred to surpass in efficiency the ordinary hopper basin (fig. 241), either jointed

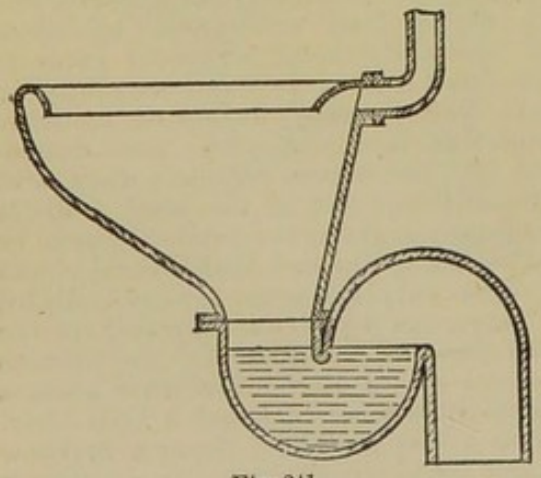


Fig. 241.

to, or continuous with, a syphon of the same stoneware, in which a stratum of water must always remain until removed by flushing. This is the cheapest form of water-closet, and consequently it is most used in the houses of the poor.

The "pan" or "container" closet is not a very costly apparatus, and on this account, notwithstanding its very objectionable character, it is still sometimes employed. In this closet (fig. 242), the narrow end of the basin M projects into a copper pan or saucer, which retains a considerable quantity of water when out of use, by means of which the basin is sealed from communication with the iron box receiver underneath. The pan O (which is in immediate communication by a hinge joint with the pull-up mechanism is upset each time the former is brought into action, and its contents precipitated into the receiver N, and thence to a leaden trap continuous with the

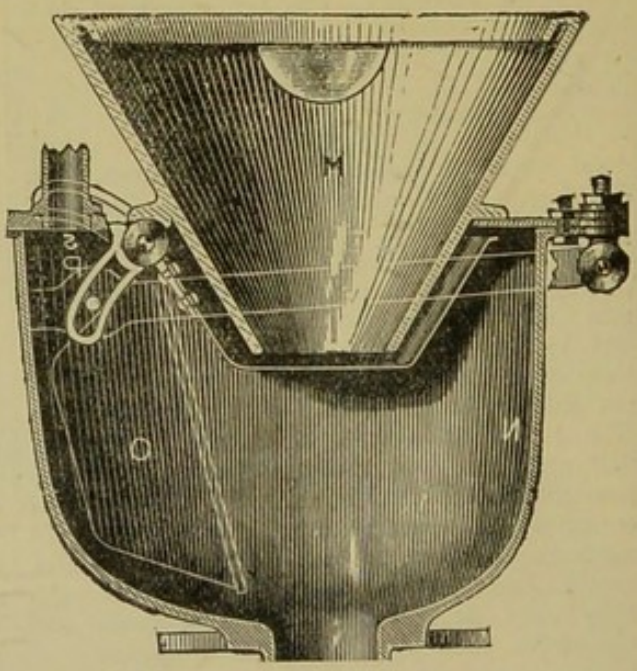


Fig. 242.

soil pipe. The objections to the pan closet are the difficulties experienced in keeping the syphon (or whatever trap is used) free from foul air, which is all the more liable to collect there on account of the iron receiver and the under surface of the pan becoming, in course of time, encrusted with dirt, from which filthy odours are given off each time the closet is used.

The vortex closet (fig. 243), which is an adaptation of the hopper closet, is a much

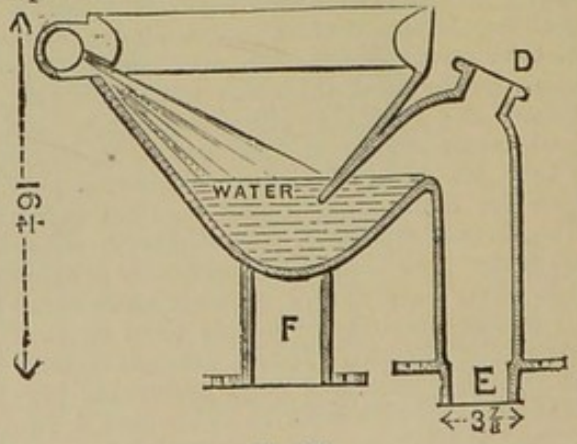


Fig. 243.

improved form, and belongs to the class which is known as the "wash-down," in contradistinction to the "wash-out" (fig. 244). The "wash out" closet was first introduced by Mr. Hellyer as an improvement upon the hopper-form of closet, but it is now unhesitatingly and

deservedly condemned by him. Unfortunately, it has been manufactured in large numbers and fixed in many houses, with the result that large numbers have since been removed in consequence of the nuisance which invariably arises from all closets of this pattern unless an unlimited water flush, more than any water company would sanction, is provided. Comparing this closet with the "wash-down" closet (fig. 243), the explanation of the following defects in the former will be understood. By introducing the shallow container above the trap, which is intended to prevent, and which, no doubt, does prevent to some extent, the fouling of the basin, the flushing effect of the water is greatly impaired, and, in consequence, the trap is seldom, if ever, emptied of its contents. The result of this is that the mixture of urine and fæcal matter, which remains in the trap after the imperfect flush, leads to a deposit being formed on the sides which soon begins to decompose, and each time the closet is used a certain area of this deposit is exposed and foul odours are given off. In addition to this, the splashing of the flush against that part of the closet immediately above the trap causes portions of fæcal matter to be deposited on the sides, in a position beyond convenient reach for cleansing. In time this causes the glaze to crack, and so, by converting what ought to be a non-porous into a porous surface, the mischief is added to. The effect of both these faults is to produce a condition of things which is hardly less objectionable than the nuisance met with in the case of the old pan closet.

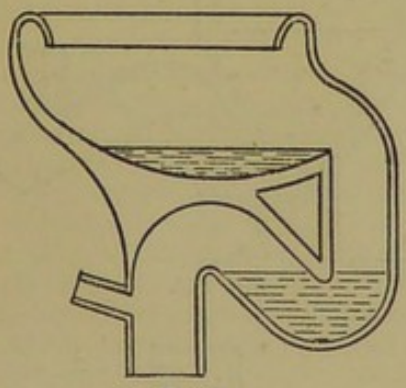


Fig. 244.

The "wash-down" closet on the other hand, if it is designed on proper principles, is free from these objections, as in most cases a two-gallon flush will suffice to empty the trap; at the same time a three-gallon flush is to be preferred; but, unfortunately, as a rule, the regulations of the water companies will not allow of this amount.

A good valve-closet, such as is shown in the drawing (fig. 245), is undoubtedly the most satisfactory form of closet, provided expense is no object. It consists of an earthenware enamelled basin, A, which is kept about two-thirds full of water by means of a valve, B, at the outlet. The water flush is connected with the rim of the basin, which is turned inwards upon itself, C, so that the discharge passes all over the surface, in place of being distributed over one side only, as is the case with the *fan spreader*. By means of a "pull," the valve is depressed within the box, D, which is connected with the basin above and with the soil-pipe trap below, and thus the water and the contents of the basin are discharged through an opening 3 inches in diameter into the soil-pipe. The valve-box, which ought to be made of cast iron enamelled in the inside, is connected with the trap by means of a short conducting pipe, E. An overflow, F, connects the basin (above the water level) with the valve-box below. This is accomplished by means of a lead pipe with a properly con-

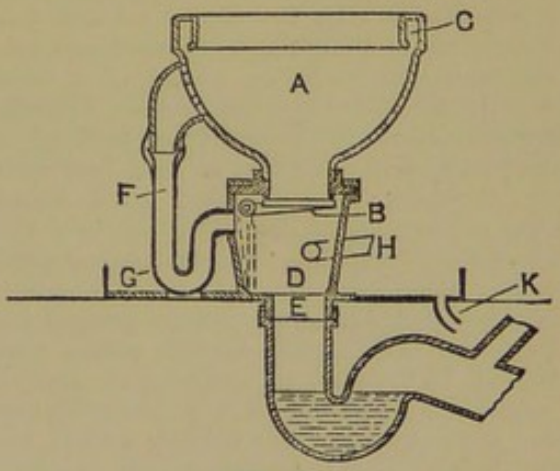


Fig. 245.

structed syphon trap, G. It is also important to ventilate the valve-box by a pipe, H, which should be carried through the wall, where it may be cut short. This vent does away with the danger of the syphon-trap of the closet overflow being unsealed by the rush of water when the closet is in action. Upon the floor under the closet, a *safe* or tray should be fixed to prevent injury to the floor or to the ceiling below (if the water-closet is on an upper floor), in the event of the overflow of the basin being stopped, and the supply valve becoming defective, or any other accidental circumstance that might cause leakage. An overflow, K, from this safe should be carried through the wall, where it should be cut short. The plumbing work connected with the fixing of all closets is of the utmost importance, as the best appliances may be rendered faulty by a careless workman. To go into detail in describing such work would occupy too much space, but a few of the more important points may shortly be mentioned.

Soil-Pipes. — Drawn lead soil-pipes with properly "wiped" joints are by far the best. In most old houses seamed lead pipes will be found, and it is the rule to find them riddled with holes along the seam. Very often such pipes are built into a wall, and their presence

is not discovered until the wall has become thoroughly saturated with sewage. For economical reasons, iron pipes are now often used, and, as a rule, ordinary rain-pipes with putty joints are made to answer the purpose. The only iron pipe which is admissible for this purpose is one which is strong enough to allow of proper caulked lead joints being made, hence a water main pipe is necessary, and it should be protected from rust by Angus Smith's varnish. Glass enamelled iron soil-pipes are now made, and they seem to answer very well, and are much cheaper than lead, at the same time, if cost is not a consideration, drawn lead pipes are to be preferred to any other.

Soil-Pipe Connections.—The connection of the closet with the soil-pipe, and of the soil-pipe with the drain, are matters of considerable importance. In the case of closets with lead out-goes, no difficulty need be experienced, as the union is made by means of a wiped joint. Until recently considerable difficulty was experienced in properly connecting an earthenware out-go with a lead soil-pipe. Some plumbers were satisfied with simply making a putty joint, but it is obvious that this was highly unsafe. Various patent joints were then introduced, most of them consisting of a rubber ring placed between a flanged out-go from the closet, and a similar flange made by tufting back the lead soil-pipe connection, the whole being screwed up by means of clamps. Such a joint answered very well for a time, but, rubber being liable to perish, sooner or later it became defective, and leakage occurred. This difficulty has now been completely got over by a joint which was first brought out by Doulton & Co., called the *metallo-keramic* joint, an arrangement by which a lead out-go is firmly connected to the pottery, thus allowing of a wiped joint connection with the soil-pipe. Although Doulton & Co. were the first firm who made such a joint, several other firms have since brought out similar joints with lead out-goes fastened to the earthenware practically in the same way, so that no difficulty need now be experienced in obtaining a satisfactory wash-down closet for fixing to lead soil pipes.

In some cases it may be thought desirable to fix closets in such a way that in the event of damage to the earthenware, which not infrequently happens in asylums, the apparatus may be replaced without disturbing the soil-pipe connection. The flanged joint with the rubber ring would answer this purpose, but, as pointed out, it is not a reliable joint, and there is no necessity now to make use of it. A far better joint has been introduced by Dent & Hellyer which meets this requirement, and allows of a "wiped soldered" connection with the soil-pipe being made. This arrangement is represented in section in the drawing (fig. 246). It will be noticed that the lead out-go is bolted on to the earthenware trap below the level of the water, so that if any fault should occur, it will immediately be noticed, owing to leakage taking place. In the case of a closet on the ground floor, the best form of joint is that shown in the drawing (fig. 246*a*), the out-go

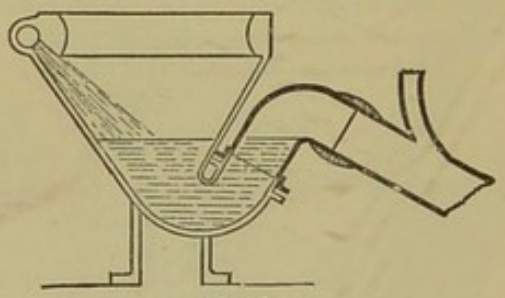


Fig. 246.

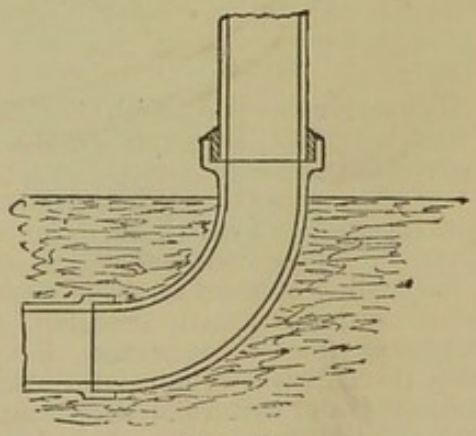


Fig. 246*a*.

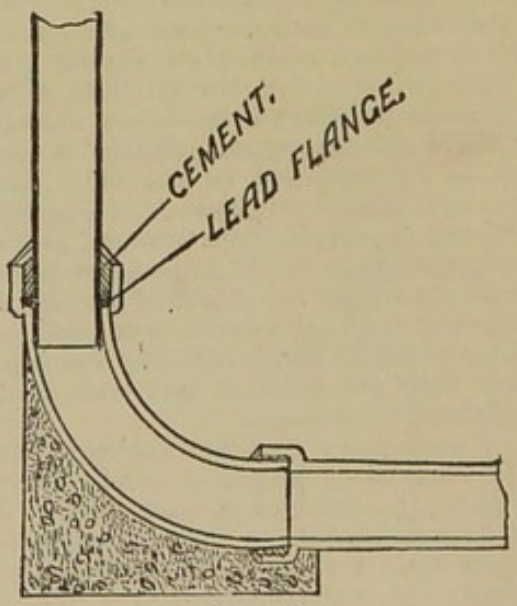


Fig. 246*b*.

from the closet being connected with the drain direct, above the floor level, by means of a cement joint.

As regards the union of the soil-pipe with the drain, a sound joint may be made by an arrangement shown in the drawing (fig. 246*b*).

It will be noticed that the soil-pipe is prolonged for a little distance into the drain-pipe, and it has a lead flange attached to it which rests on the floor of the socket, the joint being made with cement. The drain-pipe which receives the soil-pipe should rest on a solid foundation of concrete.

Ventilation of Soil-Pipe.—In all cases the soil-pipe should be outside the house, it should be ventilated by being carried, full bore and without angles, above the eaves of the house, where it should terminate at a safe distance away from any windows or chimneys. The small opening which exists in most closets at the top and far side of the trap is often supposed by ignorant workmen to be intended to act as a soil-pipe ventilator, but this is not the case. The object of this opening is to allow of an air-pipe being connected for the purpose of preventing the risk of syphonage, a point which has already received notice under the remarks upon *Traps*.

Water-flush.—The danger of connecting a general supply cistern with a closet apparatus direct has been referred to in the article on *Water*, where it is pointed out that a special cistern should be fixed for the closet, called a "water waste prevention."

One of the simplest forms of the apparatus is known as Purnell's, an engraving of which is attached (fig. 246c). Its action may be described as follows:—

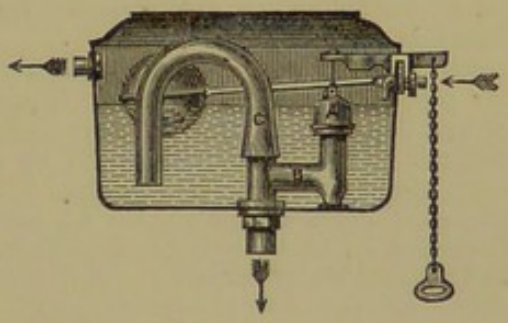


Fig. 246c.

As soon as the valve A is opened by a pull of the handle of the chain, the water flows through connexion B into the discharge pipe, causing

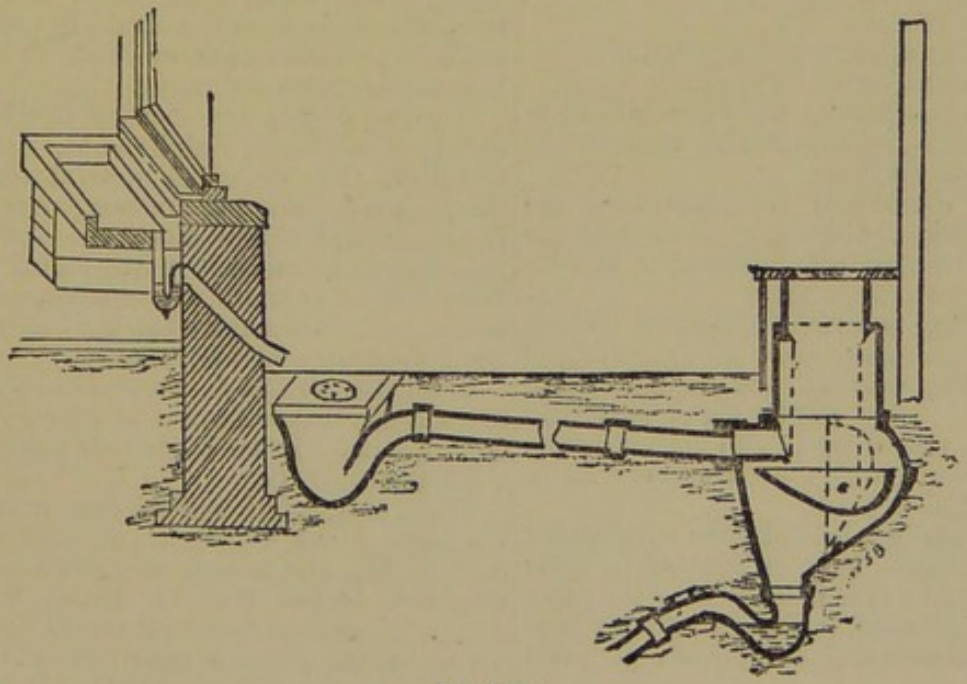


Fig. 246*d*.

a partial vacuum, and the water rushing to fill up the vacuum starts the syphon C; when once the syphon is set in action, it will continue running until the whole contents of the cistern have been discharged.

Slop-Closets.—The above drawing (fig. 246*d*) represents, in section, a slop-closet, to which reference is made in the section on privies. There are various makers of these appliances, but the principle is the same in all, namely—the utilization of the slop-water of the house as an automatic flush for an out-door closet. It will be seen that the sink waste discharges in the usual way on to a gully trap outside; but in place of the drain from this trap going direct into the main drain, it is carried to the closet, where it is made to discharge into a vessel which is suspended on pivots and is so balanced that when full it discharges into a trap below, which carries it to the main drain. Over the "tipper," which holds three gallons, the closet seat is fixed, and the excreta and urine drop into it, to be carried away with a good flush each time the vessel tips over, that is as soon as it has been filled with house slop-water. This appliance can be fixed under ordinary conditions — drain connections included — at a cost of about £4, and, as a substitute for the objectionable privy, it cannot be too highly spoken of. Some forms of

these closets (Duckett's, for example) have the "tipper" placed to one side of the closet trap, in which case the excreta falls into the trap itself. The closet shown in the drawing is manufactured by Day of Wolverhampton.

The question of slop-closets has been specially reported upon by Dr. Parsons, one of the Medical Inspectors of the Local Government Board, and the following are some of the conclusions he arrived at: —

"1. Given good drains, and a supply of water laid or in pipes, the volume of waste liquid produced in a house is sufficient to carry away the excrement of the household, if led by a drain into a closet of appropriate design.

"2. Automatic slop-closets should be used only out of doors, and are applicable only where sewers and a public water-service are available.

"3. *Their advantages* (*a*) over midden or pail privies are the avoidance of the storage of excrement in the neighbourhood of houses, and of the annoyance and expense of its removal by hand.

"(*b*) Over ordinary water-closets the advantages claimed for them are—

"Less prime cost.

"Saving of water.

"Diminution of volume of sewage.

"They are unaffected by frost.

"They are less likely than water-closets to get out of order, at any rate as regards the supply of water to them.

"4. *Their drawbacks* are, that they are less cleanly than a good water-closet, and are liable to be blocked up by improper articles carelessly thrown down them.

"5. They may be recommended for the use of a class of persons, such as artisans and working-people, who do not require indoor water-closets. They will be found especially useful in the newer parts and working-class suburbs of towns where each cottage has a separate yard and closet."

Slop-closets are not looked upon with favour by all sanitarians; but, in judging of their merits, it must be remembered that they are intended as substitutes for universally condemned appliances and for outdoor purposes only.

WATER DRESSING.—See DRESSING.

WATER IN THE CHEST is the effusion or throwing out of the watery or serous portion of the blood into the cavity of the pleura between the lungs (see *Lungs*) and ribs. Such an occurrence may be the effect of two different causes; the most usual, especially when the water forms rapidly, being inflammation of the pleural covering of the lungs, or pleurisy (see *Inflammation*). In this case the effusion of fluid is usually confined to one side of the chest.

Water in the chest, however, especially in the aged, may be caused by affection of the heart or lungs, and obstructed circulation, in which case it often occurs on both sides, and is accompanied with other dropsical symptoms (see *Dropsy*). The difficulty of breathing, caused by a collection of water in the chest is often extremely distressing, and is liable to be aggravated or relieved by particular positions of the body. When the effusion is large, it very perceptibly bulges out the side on which it is situated. When there is air as well as fluid in the cavity, slight shaking of the body causes a very audible splashing sound. These symptoms, however, more generally follow after pleurisy.

It is not likely that an unprofessional person could detect the presence of water in the chest; suspicion of such being the case should at once cause proper medical assistance to be sought; in the meantime, the palliative remedies recommended under *Dropsy* may be resorted to, and if the breathing is very distressing, and the patient not very debilitated, a large blister may be applied over the chest, as a means of affording temporary relief.

Refer to—*Dropsy—Lungs—Inflammation.*

WATER IN THE HEAD.—See BRAIN.

WATER, MINERAL. — A mineral water is one which differs from the fluid as it usually flows from the earth, in possessing, naturally, sensible taste or smell, or a higher temperature than ordinary.

Mineral waters are usually divided into Saline, Chalybeate, Sulphureous, Acidulous, and Hot. The principal mineral springs in Britain are adverted to under separate articles in the present work; those who desire more information will find it in the useful publications of Mr. Lee on the watering places, baths, &c., of both this country and the Continent.—See *Chalybeate—Health Resorts.*

WATERSTROKE—a rare form of "water in the head," characterised by its very sudden development. It has invariably proved fatal.

Refer to—*Brain.*

WAX is a secretion of the bee, formed from the sugar which it collects, or with which it may be fed, and is not, as usually has been imagined, formed from the pollen or flower-dust. When first formed it is said to be quite white, becoming yellow from contact with the honey. In this yellow condition it is, when the combs are melted together, the common bees' wax of the shops. It is, however, purified and bleached for medicinal purposes, and is then generally met with in the form of round white cakes. Wax is used in medicine in the formation of, and for giving consistence to, plasters, ointments, and suppositories. It is also employed in the preparation of the gauze used for antiseptic dressings, and occasionally alone as wax dressing, when it is thought desirable to exclude the atmosphere from the surface of a wound.

WEANING. — The weaning of infants must depend upon two considerations, the condition and health of the mother or nurse, and the age of the child. If the mother be in

such a condition of health that she cannot nurse her infant, with benefit either to herself or it, weaning of course must take place at once; but in the generality of cases, the proper time is about the ninth or tenth month, when the first four teeth have appeared. Indeed, the development of the teeth may be taken as the signal that other food is required; if, therefore, their appearance is delayed, suckling may in most instances be prolonged, for the reason that the late appearance of the teeth is frequently associated with delicacy of constitution, and then it is desirable for the child to be kept longer at the breast.

Previous to weaning, the child should be gradually accustomed to other food. It is desirable for weaning to take place in fine weather, when the infant can be carried a good deal out of doors. Should disorder of the bowels or other symptoms of illness arise, it must be managed as recommended under article *Childhood*, to which the reader is referred.

Refer also to—*Nurse*.

WEATHER. — See CLIMATE — SEASONS, &c.

WEEPING EYE is the flow of tears over the cheek in consequence of the lachrymal sac and passage into the nose being obstructed.

Refer to—*Eye*.

WEIGHTS AND SCALES are most necessary adjuncts to the domestic laboratory. In the British Pharmacopœia, the old system of apothecaries' weight has been abolished, and the avoirdupois pound and ounce adopted, the troy grain weight being retained as a convenient unit. The following table illustrates the division of weights now sanctioned.

1 grain, gr. i.
1 ounce, oz. i = 437·5 grains.
1 pound, lb. i = 16 oz. = 7000 grains.

By this arrangement the old scruple and drachm weights, which represented respectively twenty and sixty grains, are abandoned; but it is still optional with medical men to use the symbols ℈ and ʒ for scruple and drachm, should it be found conducive to accuracy and convenience.

The ounce weight itself is known by the symbol, ℥; the additional mark thus, ℥i, stands for one oz., and ℥ ij for two ozs.; so with grains, it is gr. i, gr. ij, or gr. iii, as the case may be. The weights themselves are always made of brass, the grains in thin plates stamped with as many dots as they weigh grains, the heavier weights with the characters of each: weights, however, are also made, the grains with the numbers in figures, and the others with both figures and the name legibly stamped upon them. Unprofessional persons, who may forget, or who may become confused with the characters, will find it more advantageous to provide themselves with weights of the latter kind.

The scales employed for dispensing medicine are generally of brass, and should be of a convenient small size, care being taken to ascertain that they weigh true. After these scales have been used, they should always be well wiped, otherwise they are apt to become corroded. On account of this tendency, the scale "pans" are sometimes made of glass, and also of the metal platinum; but the former are of course liable to get broken, and the latter are very expensive. Neither are requisite; the brass are perfectly sufficient, with the most ordinary care.—See *Pharmacopœia*.

WEN.—The popular name for a tumour which is usually situated on the scalp and occasionally on the eye-brows and neck. These growths are encysted, that is to say, they are surrounded with a tough cyst wall, which requires to be removed or enucleated along with its contents to prevent the recurrence of the tumour.—See *Tumour*.

WHEAT.—See BREAD—GRAINS, &c.

WHEY.—See MILK.

WHITE-LEG.—See LEG.

WHITES, called by medical men *Leucorrhœa*. This extremely common and troublesome female discharge may occur in a variety of constitutional conditions and circumstances, but more generally it is associated with general debility, and almost certainly so, if it has continued profuse for any length of time. For the latter reason, it ought not, as too often is the case, to be neglected, for not only may the constitution, the general health and strength, be fatally injured by it, but a comparatively mild and easily removable affection may be converted into one of an inveterate and serious character.

The importance of these remarks may be imagined, when it is stated that Dr. Ashwell, one of the highest authorities on these subjects, says: "Of all the diseases peculiar to the sex, there is none so common. Few married women, particularly if they are mothers, escape its attacks." By the same authority, the varieties of the affection are divided into the mild, acute form, accompanied with more or less inflammatory action: the chronic and inveterate or habitually established leucorrhœa; and the variety symptomatic of other diseases, as of the womb, &c.

An acute or inflammatory form of "whites" may arise in those who are in tolerable health, the symptoms being so mild that they are either unattended to, or are quickly removed by rest in every sense of the word, local and general, by cleanliness, and by such antiphlogistic means as reduced diet and gentle aperients, especially mild salines, with perhaps one or two doses of grey powder, at bedtime.

In those of plethoric habit, especially in the middle periods of life, the inflammatory symptoms may be of greater severity, requiring the above treatment to be more vigorously carried out, and combined with fomentation, hip-baths, and leeches; at the same time, in such cases, whether mild or severe, it will be advis-

able both to cleanse and soothe the internal parts by the use of tepid water and a syringe. When any inflammatory symptoms have disappeared, some astringent wash may be substituted for the simple water, and used either cold or tepid, whichever appears to be most beneficial. Some of the forms of lead lotion (see *Lead*) answer well; or one made with five or six grains of sulphate of zinc to the ounce of water; or an alum wash in similar proportions to the last, or decoction of oak bark, or of green tea; in short, any mild astringent. In cases requiring a more powerful astringent, a lotion of one drachm of tannin with one drachm of powdered alum to the pint of water answers well. It must be remembered, however, that in all cases, the strictest cleanliness is absolutely requisite, both as prevention and cure. Indeed, the neglect of this is one of the most frequent causes of the disease. When whites occur in a weak individual, they may, being unaccompanied with any inflammatory action, require the use of astringents from the first, with tonics, mineral acid, quinine, and iron, with good diet and wine, or malt liquor, probably also tepid or cold salt water hip-baths. The bowels in all cases require strict attention, and should be regulated by castor oil, rhubarb, and magnesia, or by tepid enemata of salt and water. In tolerably strong habits, small doses of Epsom salts, in combination with sulphuric acid, answer extremely well. Due attention should of course be given to exercise, and rest at night must be taken upon a hard bed.

In the milder attacks of leucorrhœa, a little well applied domestic management will often be sufficient to remove the symptoms, but when these become in the least urgent, a medical man ought to be consulted, before the disease becomes habitually local. To allow of its continuance, from motives of mistaken delicacy, or from carelessness, is a serious, it may be a fatal mistake; for, as stated above, its continuance gradually undermines the powers of the constitution, and dropsy, consumption, and other diseases of debility, may be originated in consequence.

Moreover, when family is desired, the wish is not so likely to be accomplished as long as the discharge continues, and miscarriage is more liable to occur. The ordinary function of menstruation, moreover, is apt to become deranged.—See *Menstruation.*

As a further reason for submitting continued or severe cases of the affection in question to the care of medical men, is the fact of the white discharge being at times symptomatic of disease connected with the womb. Sometimes, however, it is the result of irritations in the bowels, caused by accumulations in them, and sometimes by worms. To sum up, it should be remembered, that the disease is often the result of neglect, and want of sufficient cleanliness; that it may occur in a form more or less inflammatory, when it requires soothing remedies; that after the inflammatory stage, and often without it, especially in the debilitated, it requires astringent and tonic treatment, rather than relaxing; that if neglected, it is liable to become an obstinate disorder, and, by its continuance, seriously to injure the constitution, and that it may be symptomatic. Lastly, that in all but the mildest cases, the nature of the disease requires proper medical treatment, and perfect rest in every sense. This article cannot be concluded without the fact being alluded to, that the occurrence of the disease in its aggravated form, and the occasional consequences it then gives rise to, have been the means of raising unfounded suspicions of moral impurity, and of creating discord where it ought not to exist. Never ought such ideas to be entertained for one moment in the mind, still less given in words, except when based upon the careful examination and opinion of more than one medical man.

Refer to—*Menstruation.*

WHITE-SWELLING.—See KNEE.

WHITEWASHING by means of lime is one of the most powerful means of general household purification which it is possible to employ, especially on the large scale on which such purification is often required in the dwellings of the poorer classes, particularly in towns. Lime absorbs powerfully the carbonic acid from the atmosphere, and in this, and probably in other ways, tends greatly to remove the most fertile sources of disease.

The effect of whitewashing with lime in this way could not be more strikingly shown than it was in one of the epidemics of fever in Edinburgh. According to Mr. Ramsay's Report to the Commissioners of Police, "The business of whitewashing was commenced on the 14th of September, and continued to the 30th of October, and less extensively up to the 14th of December," during which period, he states there were washed—

"690 staircases,
1531 passages,
2120 apartments, exclusive of
1212 places cleaned previous to that date,

making a total of 5553 different places, at a total expense of £77." Mr. Ramsay further states, "The effect of these limewashings on the epidemic has been matter of great interest to myself; and I have watched with the most anxious care to ascertain whether any new cases of fever occurred in dwellings previously subjected to purification; and I have pleasure in saying, that out of a great number of cases reported to me, with two exceptions, the whole turned out to be cases of relapse."

Beyond these Mr. Ramsay failed to discover any other cases. The above is strong evidence. It might render it a question for boards of guardians and others, whether, to supply gratuitously every necessitous occupier of a house with lime sufficient to whitewash once,

if not twice a year, might not be real economy, and diminish poor-rates as well as disease. Moreover, it has been pointed out that free light, and light-coloured walls, tend to promote health; in this way, the white colour of lime-wash must be an additional counteragent to causes of disease.

Refer to—*Houses—Light—Walls.*

WHITLOW is abscess of a finger or thumb, which in this situation is rendered extremely distressing, and even serious, as regards the use of the member, in consequence of the matter being generally confined by the firm skin, and subjacent firm fasciæ or fibrous membranes which are connected with the tendons, by means of which the fingers are moved. The matter often has great difficulty in reaching the surface, and of being discharged, and probably lies near the bone. The consequence of all this, especially if the inflammation is very acute, is to give rise to disease of the bone, or to mortification of the finger generally; in either case, the member is rendered worse than useless, or requires amputation. Whitlows are certainly more common in those who employ their hands in hard labour, also in cooks and individuals who are exposed to wounds from bones and splinters.

The symptoms are deep-seated throbbing pain in the affected member, which continues increasing till it becomes almost intolerable, the finger feels "ready to burst," and if examined, the skin is found tense and hard, and more or less inflamed. If nothing be done to remedy this state of things, the symptoms increase, the whole arm is affected, is more or less swollen and inflamed, especially in the course of the absorbent vessels (see *Absorbent*), and the glands in the arm-pit are swollen and painful. At last the matter finds exit somewhere by the skin being ulcerated, not unfrequently about the nail When this happens, there is relief to the severe symptoms, but probably so much mischief has been done to the member that the results above described —mortification or death of the bone and the finger—occur, and it is lost. To prevent such a serious consequence, it is needless to say that active measures should at once be resorted to, and the case seen by a medical man as soon as possible.

On the first symptoms of whitlow occurring, however, the disease may in some cases be arrested at once, by thoroughly rubbing over the whole of the affected member with lunar caustic, and the most efficient way of doing this is to use a solution of nitrate of silver, or lunar caustic, in the proportion of five grains to the drachm of pure nitrous ether. This proceeding, however, must be resorted to *at once*, and accompanied with a dose or two of a saline aperient. It must be confessed, too, it is more efficacious in those the skin of whose fingers has not been hardened by labour, and in whom the disease is generally least severe. Quite the most efficacious proceeding in whitlow, when there is evidence of matter having formed (see *Inflammation, Pus*), is to lay open the finger down to the bone, by means of a lancet or knife; this proceeding, of course, ought to be done by a medical man if possible, but, under circumstances, it might be resorted to by an unprofessional person. It is certainly attended with great momentary pain, but gives otherwise very great relief, and often saves a finger; after it is done, the ordinary treatment of abscess, poultice and water dressing, will be requisite. When from timidity on the part of a patient—although chloroform might certainly be used—or other cause, a whitlow is not opened early, the only proceeding is to poultice assiduously till the matter finds vent, to support the hand and arm in a sling, to regulate the bowels, and to soothe the excessive suffering by opiates. After the matter is discharged, poultice for a short time, followed by water dressing, will be most suitable if the finger is saved. In some of these cases, the simple poultice or water requires shortly to be exchanged for a more stimulating and astringent application. None answers better than carbolic oil.

WILLOW BARK.—See SALICINE.

WIND.—See FLATULENCE.

WINDPIPE.—See LUNGS.

WINE, strictly speaking, is a fermented juice of the grape alone. It, or rather sherry wine only, is used medicinally to form a vinous tincture, or "wine" of various drugs. The most commonly used preparations are the wines of aloes, of antimony, of colchicum, of ipecacuanha, of iron, and of opium (see articles). Orange wine, which is made by the fermentation of a saccharine solution to which the fresh peel of the bitter orange has been added, is employed in the preparation of wine of citrate of iron, and also in the wine of quinine. For the dietetic properties and uses of wines the reader is referred to *Stimulants.*

The most important constituents in wine are alcohol, sugar, numerous acids, among which tartaric acid predominates, and colouring matter, due to the presence of tannin, which imparts an astringency to ports and clarets, rarely to be found in white wines. The peculiar *bouquet* or aroma characteristic of various wines, and to the same wines at separate stages of their growth, arises from the combined action of the ethyl of the alcohol with the acetic and other free acids contained in the wine, giving it a value in the eyes of connoisseurs probably beyond any medicinal or dietetic virtue the wine possesses, but still indicative of its genuine character. The relaxation of the duties on wines, especially on the light wines of France, Germany, and Hungary, has considerably increased the consumption of these liquors in Britain, but not by any means to the extent anticipated, so difficult is it to alter the acquired habits of the

people, whose tastes for malt liquors and preference for port and sherry, as well as probably the influence of our northern climate, all militate against their general adoption.

Although we are indebted to Mr. Gladstone for the reduction in the rate of duty on wine, still the fact remains that our old-fashioned wines, port and sherry, are very expensive, and the terms upon which they are exported from Spain and Portugal are practically as high as ever, while the ravages of the phyloxera or wine disease have nearly driven them from the market. It is impossible to obtain these wines of a genuine quality, except at a very high price, and it is well known to those who are instructed on such subjects, that the miserable compounds often sold in this country under the name of port and sherry are advertised at a figure far below that at which they can be bought pure and genuine in their native country. The fact is, that the majority of these are "Hamburg Ports and Sherries," that is wines, or rather compounds or mixtures (for they do not deserve the name of wines), adulterated to a large extent with potato or malt spirit. Very little of this so-called port wine, which is consumed in the United Kingdom, is imported from any wine-growing country; it is merely a compound made up largely of alcohol, to suit the taste of the British consumer, coloured with a preparation of elder berries, and a small amount of grape juice, but perfectly innocent of the genuine qualities of the juice of the grape of Oporto. Other red wines, grown chiefly in the south of France and in Spain, and though not of themselves injurious, are doctored in a similar way. Thus to render wines less acid, sugar and tartrate of potash are added, with coarse brandy to preserve and fortify them. The port wines sold in the shops are said to be mostly of this character. Sherry (the so-called) is made up of various kinds of wines, so mixed, and incorporated, and evaporated, to increase their strength, that their original flavour is quite lost. Brandy or spirit is largely added; a proper colour is obtained by means of burnt sugar, and finally, a compound, fiery and heady enough to suit the English market and the English taste, is produced. Mr. Shaw, in his work on *Wine, the Vine, and the Cellar*, thus speaks of the way in which spirit is added to sherry in Spain:—

"One can no more drink, in Spain, the sherry usually consumed in England, than they can, in Oporto, the usual English port. About six gallons of spirits are put into a butt of sherry after fermentation, and generally about four gallons more previous to its being shipped. It is almost quite pale at first. The very dark brown is made at St. Lucar in the following manner:—Twenty or thirty gallons of must (unfermented juice) are put into an earthen vessel, and heated until not more than a fifth part remains, when it looks and tastes like treacle. This is turned into a cask containing more must, which causes it to ferment, and the result is a very full luscious wine, which if originally good, becomes after many years invaluable for giving softness, richness, and colour to others. Large quantities of this product, when new, are used to colour, and to cover the harsh thinness of poor qualities. It is for this reason that it is called 'the Doctor;' and many a butt that comes to England to be sold as 'curious old brown' at an immense price, has to thank the old boiled mosto stocks for its character."

Now, the above description may appear very bad to those who flatter themselves that they have been in the habit of drinking pure sherry, but it must be remembered that much of the so-called sherry has no sherry in its composition at all, and is merely spirits altered and flavoured, so as to give it a resemblance to what is so universally used in England under the name.

The consequence of drinking wine into which this large quantity of alcohol enters is marked indisposition and depression, "reaction" next day, if any quantity be consumed. Such wines, even the best of them, must be looked upon as liqueurs, and they are practically used as such. Wine is not meant to be sipped but to be drunk, and it is needless to remark that should the wines above described be "drunk," in the true sense of the word, the result would be, with most persons, subsequent headache, depression, and indigestion. This result would not follow indulgence in a similar quantity of pure wine, the action of which is to restore to comfort, cheerfulness, and activity of body and mind those who are worn out by bodily or mental toil, as well as to promote appetite and digestion.

Dr. Druitt, of London, has published an admirable treatise (the substance of which appeared originally in the columns of the *Medical Times and Gazette*) upon the cheap wines of France, Greece, and Hungary. We confidently recommend this little work to all those who wish to think independently upon the subject, to escape from the thraldom of custom, prejudice, and acquired taste, to find out for themselves how to tell good wine, and to contrast the advantages offered by cheap pure wines over those which are adulterated and expensive.

Dr. Druitt gives, amongst others, two simple and practical tests to be employed in the tasting of wine, even by those who are neither wine merchants nor professional connoisseurs. He says:—

"In the first place, in drinking a good large sip of the wine, does it *primâ facie* strike us as being *one* liquid, or a compound of many? Wine should have an absolute *unity;* it should taste as one whole. True we may distinguish various properties on reflection, but they should be as parts of a whole, and not as in-

dependent units mixed together. But bad wine resembles a black draught; here a something sweet meets one part of our gustatory organs, there something sour, there something fruity, or bitter, or hot, or harsh, just as if half a dozen ill-blended liquids came out of one bottle.

"2. Wine should have a certain generosity of taste; unless spirit could be extracted by distillation, it would not be wine; but there should be no smell nor taste of added and ill-combined spirits, nor that heat about the throat which they cause."

Dr Druitt strongly advocates the use of well selected, cheap, pure wines, such as those of Greece and Hungary, not only as restorative, but as tonic beverages. He also advises that they should be given to weakly and delicate children, and to children who require stimulating treatment during the course of acute disease, in preference to port and sherry. An able writer in a popular periodical in reviewing Dr. Druitt's book, says:—

"It need hardly be said that the cheap wines now coming into common use are not cheap by reason of inferiority. They are actually superior, not only as pure wines, but for intrinsic commercial worth of material, to many ports and sherries sold at twice their price. We export raw spirit to reimport a considerable part of it from Portugal and Hamburg as port and other wine. A fifth part of even a good bottle of port consists of proof spirit, costing at the rate of about three-farthings a bottle; for the Portuguese buy the spirit they send back to us at the rate of two shillings the proof gallon, taking in one year a million and a half of gallons of spirits, and sending us back three and a half million gallons of their wine. In all pure wines the natural proportion of proof spirit is usually from eighteen to twenty-two per cent.; many contain eighteen; some reach twenty-five or even twenty-seven; and, in rare cases, the proportion of proof spirit may even be thirty per cent. Port wine that has not been brandied for the English market contains twenty-three and a half per cent. Port wine, as we get it, contains thirty-five or even forty-five per cent. of spirit, that will only blend in flavour with the natural wine after the costly process of long keeping, although one of its uses is to throw down the fermentable extractive, and give to the wine at once the appearance, without the flavour, of 'tawny old port.' This sort of old port is usually said to have been long in wood, lest people should look too curiously at the cork, or seek in the bottle for the crust of tartaric acid which is deposited in course of time, and leaves the wine mellower for its absence. Since the vine disease, really good ports and sherries have almost doubled in price; and at prices below five, six, or seven shillings a bottle they are factitious wines, incomparably worse than many a pure wine of France, Hungary, Austria, or Greece, of which a choice quality is to be had for half the money.

"For poor hard-working people who lead in-door lives,—teachers, milliners, dressmakers,—to whom even good beer (the best cheap drink for healthy folks who take active out-door exercise) is indigestible, there is food and medicine in a small dose of light pure wine. The white nervous tongue of the sickly dressmaker, who thirsts for tea that weakens further the deficient appetite, if she took in place of tea a little cheap pure Bordeaux wine, with an equal quantity of water, would recover healthy colour as her stomach regained tone and appetite, and her blood flowed in healthier current. It would be well for the town child between seven and ten years old, who flags in appetite, and is dainty with his meat, as children are allowed to flag in nurseries from which no comfort need be excluded, if the doctor's order answered to Dr. Druitt's suggestion in such case, 'Give some kind of light, clean-tasting, sub-acid wine—Rhine, Bordeaux, Chablis, or some of the clean, dry wine of Greece and Hungary; let this be sipped freely at dinner, and then look to your mutton.'"

It is, perhaps, fair to state that the author is assured by wine merchants that there is a large quantity of inferior port wine brought from districts, both in Spain and Portugal, where the higher class wines cannot be made, and that this port, a mixture of several red wines to which a certain amount of wine from Oporto is added, constitutes a considerable proportion of the cheap wine now largely used in hospitals, and in poor-law districts. It certainly seems to answer the purpose for which it is given in ordinary cases, and it is undoubtedly superior to much of the wine sold as genuine Oporto port at the usual high prices. The faith reposed by the poor in the virtues of "Real Port," will for long make it difficult to satisfy them with lighter wines, such as those of France, Germany, and Hungary. A good and wholesome red wine now largely used in hospitals and places for the sick, as well as in private families, is obtained from Spain even at a much cheaper price than the factitious ports. It is sold as Tarragona and Catalan, from the names of the districts whence it is obtained.

It is not contended that port and sherry wines are not to be obtained pure, but those who desire to indulge in them must be prepared to pay a price which is far beyond the means of the masses of the population.

One of the great advantages of the Greek and Hungarian wines is, that they can be taken with benefit by those whose sedentary occupations and want of exercise prohibit them from the use of beer, while their cheapness (the price of the Greek wines ranging from 1s. 4d. to 2s. 6d. a bottle) puts them within the reach of those who cannot afford to drink

first-class port and sherry, even if they could get them for money. The Greek and Hungarian wines are even now cheaper than most of the inferior growths of the French and Rhenish wines, and, of course, if they become as generally used as they deserve to be, the price would be much lower still. The talented and well-known authoress, Frederika Bremer, in her work upon *Greece and its Greeks*, thus describes the island of Santorin and its wines:—

"I have visited a great wine cellar excavated within the mountain, and have there tasted sixteen or eighteen different sorts of wine, all prepared from the grapes of Santorin. I was most pleased with the 'wine of Bacchus,' with the taste of nectar and colour of liquid gold; so also the 'wine of Night' (St. Elie), which is colourless, and has obtained that name from the fact of the vintage taking place during the night, and from the grapes being hidden under the leaves of the vine, and not exposed to the influence of the sun, by which means the wine is not coloured by it. It has an agreeable acid flavour, like Rhine wine, only milder. The entire island is a vineyard, and the productiveness of its volcanic soil for wine has attracted thither a population which is now too large for the resources of the island. . . . .

"We ate a cheerful dinner at the Dimarch's, with compliments and toasts, which were drunk in nine different kinds of wine—Bacchus wine, Santo Wine, Night wine, Callista wine, and other kinds,—all good, but the wine of Bacchus, nevertheless, the best. . . . There we found sent down for us a superabundance of good things,—grapes, apricots, figs, and large bottles of Callista wine, sweet, red, and thick, almost like a *liqueur*, and which is especially refreshing when mixed with water."

When one first essays a trial of the Greek and Hungarian wines, the puzzle is in the *embarras de richesses* which to select, and for those who really wish to test them fairly, the better plan is to get a number of the different kinds and go over them fairly in the way of ordinary drinking, keeping notes. Those who do so will not find that it is always the most expensive that are the pleasantest. If personal experience might go for anything, the writer would certainly agree with what Miss Bremer says regarding the "St. Elie," or wine of Night—resembling a very light dry sherry, it seems a pure drinking and most wholesome wine; in strength and body, between the sherry and the light wines of France and the Rhine. The Thera is a wine of somewhat similar character, but with more peculiarity of flavour, and therefore not so readily taken into favour by those unaccustomed to it. The same remark applies to Santorin, a red wine approaching Burgundy. The red Hymet, also of a Burgundy character, is liked by most. Another red wine, but more of a claret, the Alderberger Ofner, is well adapted for ordinary drinking, and Red Keffesia may be put in the same category. It is said to be much liked by, and found of service to, consumptive patients. Of the white wines, the White Hymet, White Keffesia, Patras, and Hungarian Chablis are all good. It would, of course, be out of place here to go over the whole long list of Greek, Hungarian, and other wines, and those who desire more information will find it either in Dr. Druitt's *Report on Cheap Wine*, or in a small pamphlet published by Mr. Denman of Piccadilly. The author has mentioned only those of which he can speak from personal trial, and having recommended them somewhat largely, knows that they agree well with the majority of people. He quite coincides with Dr. Druitt in the opinion that, when these wines come to be better known, they will form no inconsiderable amount of the wine consumed in Britain. In some ways, and for some persons, in the colder months of the year, they seem preferable to the lighter, and certainly more acid wines of France.—See *Stimulants*.

WISDOM-TOOTH.—See *Teeth*.

WOMB—in medical language, the *Uterus*. This most important organ is, in its ordinary condition, situated in the cavity of the pelvis, but when distended, as in pregnancy, it rises into the cavity of the abdomen.—See *Abdomen*. Somewhat triangular in form, it is covered by the general lining membrane of the abdomen and pelvis, the peritoneum, and is held in its place by various ligaments. The affections of the womb may be considered as those which are connected with the state of pregnancy (see *Pregnancy*), and those which are not. In the latter case it is liable, though rarely, to be the seat of inflammation, the affection being characterised by the usual symptoms of inflammation, local and constitutional, and requiring the same management as inflammatory affection—peritonitis—of the bowels generally. Congestion of blood, enlargements, tumour, and polypus,—diseases of its neck, including cancer, &c.,—are among the affections to which the womb is liable. It is also exposed to displacements, dislocations, as it were, from before backwards, or the reverse; and likewise to coming or "falling" down, or, as it is called, "prolapsus." The latter occurrence is the most usual after the time of child-bearing is past, in women who have borne large families, and especially in those who have neglected themselves after confinement, by getting up too soon: it is therefore a frequent complaint among the lower orders, who are in a measure forced to neglect themselves under the circumstances. The falling, or prolapsus, of the womb is permitted by general laxity of the parts, but especially of the ligaments which ought to retain the organ in place: it is further aggravated by the congested and enlarged state of the organ which thence results. Such a state of matters cannot be too soon rectified, and by all means

ought to be placed under the management of a medical man, who will recommend one or other of the various instruments contrived for such cases, as may appear most suitable. In the meanwhile, rest in the horizontal posture, and general soothing treatment, are the best palliatives; and if, in the meantime, circumstances render it impossible for the individual to remain quiet, comfort will be derived from the use of such a bandage as represented in article *Prolapsus*. The other displacements of the womb, backwards or forwards, are more usual in its enlarged condition; in pregnancy especially, the former is often the result of permitting the bladder to become unduly distended, so that by its weight it presses the womb out of place, and into such a position that it cannot easily recover itself. In these, and indeed in all affections of this organ, the assistance of a medical man cannot be too soon procured; domestic treatment can do little or nothing for their permanent relief, although it may, if properly directed, palliate considerably the more urgent symptoms. The affections of the womb may of course develop with greater or less rapidity; some are sudden in their onset, and urgent in their symptoms; others arise almost imperceptibly, and go on slowly. In most cases, however, there is sense of uneasiness and dragging weight about the parts, perhaps actual pain of more or less severity; the functions of the bladder may be interfered with, and difficulty of micturition occasioned; or difficulty or pain be experienced in emptying the bowels. Under some circumstances, discharges of blood or matter may take place.—See *Menstruation, Whites, &c.* The constitution may more or less sympathise, and irritable fever arise, or obstinate vomiting, or dyspepsia, with excessive nervous irritability and hysteria. Under circumstances, when symptoms like the above, or others suspected to be in connexion with the womb, show themselves, an individual can scarcely err in assuming, if possible, entirely the horizontal posture; if there is much pain, and especially any symptoms of feverishness, fomentations to the lower bowels, perhaps leeches may be used; and when the suffering is great, opium given by the mouth or by the skin hypodermically; at the same time, the strictest attention must be paid to the due action of the bowels by means of castor oil, senna, &c., or in full habits by salines, perhaps preceded by moderate doses of blue pill, but all preparations containing aloes must be sedulously avoided. Injections of cold, tepid, or warm water simply, or rendered more aperient by the addition of medicines, are often useful. The diet must be regulated according to the habit and constitution of the patient; if this be full, a reduction, especially in stimulants may safely be made; but if the habit be moderate, the diet may be kept so too. In the weakly and debilitated, it may require to be increased, especially if there is any drain, such as discharge of blood, &c., going on.—See *Abortion — Menstruation — Whites, &c.* The above are palliative measures, which may be safely resorted to under most circumstances; they are, however, palliative only; curative means can only be carried out by a medical man, under whose care all affections of this organ, so closely connected with female health, happiness, and well-being, should be placed without delay — without waiting for serious symptoms to arise. Moreover, it should be remembered that there are states of impaired health, of a dyspeptic and nervous character especially, dependent on uterine derangement, which in itself gives no marked sign.

In some affections of the womb it becomes absolutely necessary for a medical man to resort to means of examination, which, though they cannot fail to be highly repugnant to the feelings, no woman of truly delicate and pure mind would object to, when it has been fully explained to her, by a professional attendant in whom her confidence is placed, that such examination is positively required. It may be that the zeal of some has led them to disregard, perhaps too much, the feelings of patients suffering from these peculiar diseases, and to be too ready to avail themselves of all means of investigation, but these are the exceptions.

WOMAN.—See *Child-birth—Education—Menstruation—Pregnancy—Whites, &c.*

WOOD-SORREL.—See OXALIC ACID.

WOOL and **WOOLLEN CLOTHING.**—See CLOTHING.

WORMS. — There are various parasitic animals and plants which infest the human body; some, such as the acari, pediculi, and fungi, occupying the external surfaces only, whilst others, called by medical men "entozoa," are developed and live in the interior of the body. Of these the commonest and best known are the five species of "worms" which infest the alimentary canal. They are the common round worm; the thread, or maw, or chest-worm; the long thread-worm; the common tape-worm, and the broad tape-worm.

The common round worm of the intestines was for long confounded with the common earth-worm, although it is difficult to imagine how it could be. It is firmer in substance, and much more acutely pointed at both ends than the latter, of a paler yellowish-pink, and more transparent. Its length varies from a few inches to a foot. This worm is more common during the early periods of life, and exists in many children without giving rise to any apparent disorder, unless it is developed in great numbers; very frequently, perhaps, after a dose of aperient medicine, a round worm is passed from the bowels by a child in whom such a parasite was not suspected to exist. The occurrence not uncommonly causes much needless alarm; a very large number of children, to all appearance well, are so infested,

and the excretion of one worm is no proof that there are more. At the same time, the occurrence should always give rise to investigation, and to the employment of remedies calculated to remove any more of the animals which may exist. The usual site of these round worms is in the small intestines, but occasionally they find their way into the stomach, and are vomited or got rid of by the mouth—most commonly they pass off by the bowels.

The thread, or maw, or chest-worms, are familiar to most persons; they resemble long maggots, or bits of white thread, and are very lively in their movements when first expelled. These worms usually infest the lowest bowel, or rectum, in which they often exist in immense numbers, passing off with every evacuation, either separate, or rolled in masses; they also creep from the bowels; they are found too, occasionally, in the upper part of the alimentary canal; hence the name of chest-worm popularly given. In this case the worm is coughed or "hawked" up. The thread-worm is most commonly met with in children, but also occurs in adults, especially such as are weak and unhealthy. The long thread-worm does not occur in the immense numbers of the smaller variety, but seems to exist in most persons without causing much inconvenience. The tape-worms are quite the most formidable, and produce the most serious consequences of any of the intestinal parasites. The broad tape-worm occurs chiefly on the continent; the common tape-worm (fig. 247), which is usually

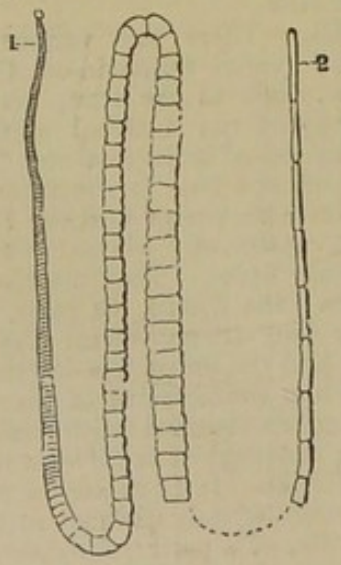


Fig. 247.

met with in this country, grows to many feet in length, extending, indeed, at times, almost throughout the entire length of the intestines. It is, as represented, flat and jointed, the edges of the joints being somewhat waved. At the head (1), it becomes much tapered, but, downwards, increases in breadth, sometimes to as much as half an inch or more, again tapering off towards the tail. In colour it is a dirty white. Generally, one worm only exists in the bowels at a time, but sometimes there are more.

The symptoms caused by the different species of worms are in some respects similar: they are, more or less emaciation, although the appetite is good, unhealthy hue and pallor of the skin, furred tongue, and unpleasant breath, and frequent griping pains in the bowels, which are irregular, the chief characteristic of the evacuations being increased secretion of mucus, with perhaps an inclination to sliminess. Itching and picking of the nose in children is often set down as indicative of the presence of worms, but it is also a symptom of intestinal irritation from other causes; it cannot, therefore, be considered as conclusive. Indeed, it is a question, whether any symptom, except the appearance of worms in the evacuations, can be considered positive. The appetite is apt to be capricious, and there are symptoms of general digestive disorder. Some patients complain of feeling the movements, but except in the case of tape-worm, this is probably imaginary. Perhaps some of the most important effects produced by worms are those which result in irritation of the nervous system. Children more particularly exhibit them. They grate their teeth at night, talk in sleep, or wake up screaming; they are irritable and fretful. In other cases, various convulsive or spasmodic affections, such as St. Vitus' Dance, squinting, stammering, obstinate cough, and many others, have been distinctly traced to the presence of worms. The thread-worm, in addition to constitutional irritation, causes much inconvenience from the constant, and sometimes intolerable itching it gives rise to, about the fundament. The tape-worm seems to cause more uneasiness in the bowels than the other varieties, and its occurrence is certainly characterised by more emaciation and general debility.

The origin of worms in the intestinal canal is explained by the fact that their ova are introduced from without by drinking contaminated water, or by eating fruits and salads containing them in an embryonic condition. A cachectic and debilitated state of the constitution in youth and childhood favours their development. Tape-worms are now well ascertained to be developed from what is called "measly pork," especially if it is eaten underdone. Dr. Spencer Cobbold also, in his elaborate work upon Entozoa, makes the statement, that one form of tape-worm is developed from germs existing in the flesh of veal and beef, and that this form is perhaps even commoner than that which owes its origin to diseased pork. The grand practical rule to be learnt is, to eat no sort of meat which is imperfectly cooked.

To get rid of worms, two modes of treatment are necessary, the one to destroy the offenders and get rid of them from the bowels, and the other to correct the debility which usually favours their existence.

For the round worm, the best purgatives for children are calomel and scammony, or calomel and jalap, given at intervals of a few days, so as to purge briskly, the tonic—and some preparation of iron is generally the best—being given in the intervals. But if this treatment is not successful, santonin, in doses of five grains for an adult and two grains for a child, is an infallible remedy. It should be mixed with sugar, and taken fasting in a little milk twice a day, until four or six powders are administered. As the santonin has no purgative action, castor oil should be administered after or along with it. Some patients see things green while taking santonin, and the urine is coloured citron-yellow. Both these effects, however, speedily pass away and need cause no alarm. At the same time, the diet should be strengthening, well seasoned with salt, and ought to include a due proportion of fresh animal food. In the case of the thread-worms, the same general treatment is advantageous; but as they chiefly inhabit the lower bowels, their removal is much facilitated by the use of injections, either of salt water, or of infusion of quassia, or of turpentine; the latter being more applicable in the case of adults.

For the cure of tape-worm many remedies, and especially turpentine, have been used, but now they may safely be said to be reduced to two—the kousso and the fern, to the articles on which the reader is referred.—See also *Pomegranate*.

WORMWOOD. — This common plant, known by its many cut leaves, silky on the under sides, and by its strong odour, is not much used in medicine at the present time, although it is a good aromatic bitter and tonic. The tops should be collected early in August, and dried. Half an ounce may be infused in a pint of water, and of this a tea-cupful taken twice a day.—See *Absynth—Santonin*.

WOUNDS are separations of the substance or tissues of the body, effected by violence. They may, as all are aware, be occasioned by a variety of causes; according to these causes, therefore, they are usually classified by surgeons into simple cuts, or simple incised wounds; into bruised and lacerated wounds; punctured wounds; poisoned, and gunshot wounds; the treatment of each variety being in some degree different, although there are certain general principles which must be observed in the management of all; these ought to be impressed upon the mind of those who may be called upon to direct the management of such accidents, and no kind of medical or surgical knowledge, perhaps, is likely to prove more useful to unprofessional persons in out-of-the-way places.

The first circumstance, generally, which calls for attention, as the consequence of a wound, is the effusion of blood, but none of the consequences, perhaps, exhibit greater variation. Sometimes an extensive injury may be inflicted, even the arm torn off at the shoulder, and yet the loss of blood be extremely small; on the other hand, a puncture with a penknife, if it penetrates an artery, may be sufficient to place life in the greatest immediate jeopardy; as a general rule, probably, putting the opening of large vessels out of the question, a greater amount of blood is lost after simple cuts than after any other description of wound. When laceration, or bruising, takes place, there is usually, by stretching or otherwise of the coats of the arteries, a sufficient amount of mechanical impediment caused, to modify greatly, if not wholly, to prevent any hæmorrhage. As, under articles *Artery* and *Hæmorrhage*, the various modes of arresting the effusion of blood have been fully entered into, it is unnecessary to reiterate them here. When a wound is small, the best method of treatment is to tie it up at once with a piece of linen rag; this is usually sufficient at once to stop the bleeding, particularly if rest and position (see *Position*) are attended to; the small quantity of blood which may exude, quickly dries upon the wound, and forms a sort of glue, which effectually excludes the air. Friar's balsam is largely used amongst sailors for this purpose. As no better dressings can be used, either the one or the other may be left on till the cut is well; in some cases, before using the dressing, it may be advisable to draw the edges, of even a small cut, together, by means of adhesive plaster or material of some kind (see *Plaster*). Although linen rag is mentioned in the above directions, of course, should it not be at hand, soft calico may be used, or other soft material.

When a wound is extensive, and the bleeding profuse, it will not do to bind it up in this way, first, because it probably would not be sufficient to arrest the flow, and if it did so ultimately, it would retain a large amount of clotted blood, either in or about the wound, in such a way as to interfere with the healing process. In a large wound, therefore, it is necessary that the bleeding should be almost entirely arrested (see *Hæmorrhage*) before it is dressed, that is, closed up, &c.

Incised Wounds.—The first end in view when a wound is dressed, is to get as much of it as possible to heal by the "first intention," or by "adhesive inflammation" (see *Adhesion*); that is, to get the several parts to adhere at once without formation of matter, and thus with as little pain and trouble as possible. When the wound is a simple cut, such as that made by the surgeon's knife, this desirable termination may be expected, and often realised; even the extensive surfaces exposed in amputation of the thigh will heal in this way almost entirely; to attain the end, however, in many wounds, considerable care is requisite. In the first place, the wound must not be closed so soon as that a clot of blood will form between the exposed surfaces; if it does, unless extremely thin, it will prevent union. In the

second place, when the wound is closed, its surfaces must be placed in as accurate a position as possible, and must be thus held together till the process is complete. To effect and maintain this apposition or contact various agencies are employed, and of these position is not the least important (see *Position*); that is, the placing of the parts so that the surfaces of the wound may, as far as possible, fall into contact, and that when other dressings are applied, there may be no dragging to get things to meet. Thus in a wound of the fore part of the neck, it is requisite to fasten the head so as to prevent its being thrown back (see *Cut Throat*). At the same time, position must be regulated with a view to prevent hæmorrhage. The wounded parts being properly placed, the next object is to draw the surfaces into as close apposition as possible; in some cases, this is sufficiently well done by means of strips of adhesive plaster (fig. 248 A—1) placed at such intervals as will permit discharge of matter, should any form. Frequently, however, from the nature, site, or

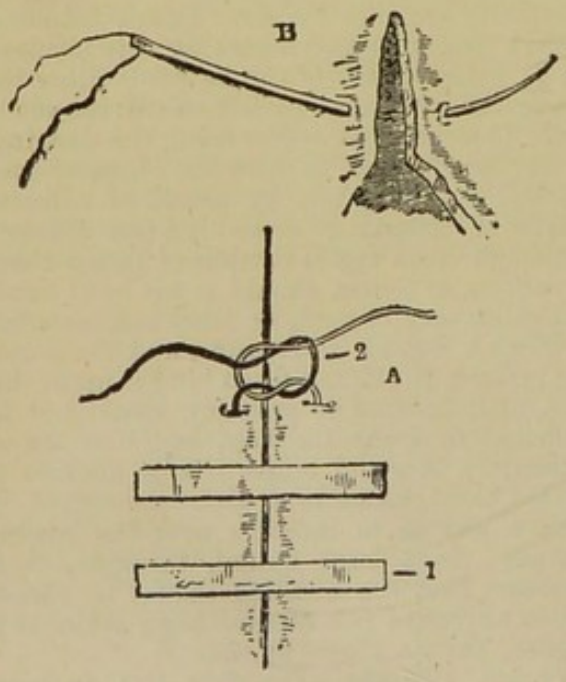


Fig. 248.

extent of the wound, plaster is not sufficient to keep the edges together, or to counteract the natural resilient tendency of the skin to retract when severed. In such instances, stitches, or, as they are called by medical men, "sutures," are employed. These consist of a piece of sufficiently stout silk or fine silver wire passed through the thickness of the true skin (fig. 248—2), at about the distance of a line from each of the severed edges. The thread is passed by means of a curved surgical needle (fig. 248—B), and the two ends being tied as represented, bring the edges together, and retain them most effectually in contact; that is, provided the stitch is not made use of to drag parts into place; this it should never do. If there is a continued strain upon the sutures, not only do they cause much pain, but they quickly cause ulceration, which, by detaching, renders them perfectly useless. The surfaces of a wound having been brought into contact, a piece of thin linen soaked in water should be placed over it, and, if possible, a lightly applied bandage. This not only keeps the dressing in place, and assists to exclude air, but gives support, which is always serviceable, and often, in large wounds, absolutely necessary. The bandage may be kept wet with cold or tepid water, as most agreeable to the feelings of the patient When a wound progresses well towards recovery, when there is no appearance of discharge, or so little, that it is neither inconvenient nor offensive, there should be no meddling; the less the processes of reparation are disturbed the better, and in some cases a week may be allowed to elapse before the dressings are disturbed; they may of course require it before, especially in warm weather (see *Dressing*). It ought to be remembered, that in the treatment of all wounds, it is important to exclude the action of the air as far as possible, and it should be taken as an aphorism, that rest, simplicity, and cleanliness are the great promoters of healing; the last is best attained by the use of water alone.

Lacerated and Contused Wounds.—The above observations have been directed specially to simple incised wounds; when laceration or contusion accompanies the injury, the principle must be to get the wound as much into the condition of a simple incision as possible. To do this, the wound having been thoroughly cleansed from dirt, grit, &c., by means of a soft sponge and water, and any foreign body which *can be easily reached*, removed, all parts not absolutely detached from the body are to be placed as nearly as possible in the natural position, stitches and plasters being used to retain them, and free exit left for the discharge of matter; over these there must be applied either carbolic oil or water-dressing, and a bandage may be necessary or not, according to circumstances.

In cleansing wounds, a solution of carbolic acid, of the strength of one part in forty of water, is the most efficient lotion. All the crevices and irregularities must be carefully washed out, and all dirt removed. The plan of at once using a spray, when it can be obtained, containing the carbolic acid, and covering the wound with a gauze saturated with the same material, has, since its introduction by Professor Lister, been largely adopted, and with the best results. If decomposition can be prevented in a wound, its rapid union is almost secured, and this the antiseptic system effects in a wound made during an operation performed under a spray. When, however, much foreign material has been introduced, and there has been much contusion and

laceration, it is not easy to render the wound antiseptic, and hence in such cases even the above precautions will not always prevent a dangerous amount of decomposition. — See *Carbolic Acid.*

Lacerated and contused wounds are always followed by more or less inflammation, with discharge of matter, and frequently by mortification of some of the injured parts. Often in different portions of the same wound may be seen simple adhesion, suppuration, and mortification going on at the same time. In consequence of these changes, the dressings of lacerated wounds require frequent renewal, the greatest cleanliness being observed. In the course of a few days, after the infliction of the injury, if any parts are killed, or mortify, it is indicated by their assuming the characteristic appearance (see *Mortification*). The wound in such cases is to be managed—modified, of course, by circumstances—as directed in the above article. Such wounds, whether portions of the tissues have mortified or not, ultimately, if they do well, assume the characters of ulcers tending to heal, and require similar treatment.—See *Ulcer.*

The patient must always be carefully watched for the first four or five days after a serious wound, as it is during this period that serious complications are most liable to arise. At the first sign of feverishness indicated by loss of appetite, furred tongue, quick pulse, and headache, the wound must be examined, and if there be swelling and tenderness with redness, it is best at once to remove sutures, lay open the wound, and thoroughly cleanse it. At the same time, the bowels must be freely opened and the patient's strength kept up.

Punctured Wounds.—Punctured wounds are often more dangerous and troublesome to heal than their appearance would lead one to suppose. Their danger is, of course, commensurate with the importance of the parts wounded; on this account such cases should always be seen by a medical man. Generally, a simple poultice or water-dressing is the most appropriate application. Rest, too, should always be observed, and low diet, at least till proper advice has been procured. A wound from a barbed instrument, such as a fishing-hook, may be referred to the class of punctured wounds. The best mode of extraction is to cut off the dressing of the hook, if there be any, and to push entirely through by the shank.

Gun-shot Wounds.—Gun-shot wounds partake more or less of the nature of lacerations and contusions. When small shots have entered beneath the skin, any that can be very easily detached may be, but it is well not to be too assiduous on this point. In such cases, perhaps the best thing that can be done, till a surgeon is procured, is to use means to check bleeding, to place the sufferer in as easy and advantageous a position as possible, to apply poultice or water-dressing to the wound, and to counteract shock (see *Shock*) by the cautious administration of stimulants. Either in this case, or in that of any other wound, if there is much shock to the system, it must be counteracted, and, at the same time, if circulation in the wounded member is interfered with, means must be used to preserve sufficient natural heat, &c.

Poisoned Wounds.—Poisoned wounds are wounds in which the division of the tissues, or even the abrasion of the outer skin, is accompanied with the insertion of poison of some kind, whether that of a gnat or of a wasp, of a rabid dog or of a snake. The wound in itself is generally trifling, perhaps not more than a scratch, but its character depends upon the nature of the poison inserted; a slight momentary pain or itching may be the greatest inconvenience, or speedy death may follow, or the poison may take days or weeks to develop, as it does in inoculated small-pox or hydrophobia. When an individual suffers from a wound, known or believed to be poisonous, immediate steps should be taken to prevent, if possible, the poison being absorbed into the system. The steps to be taken are sufficiently detailed in article *Hydrophobia*, and the minor applications to the bites of gnats, &c., will be found under *Stings.* The most serious poisoned wounds inflicted are those of the serpent tribe; they are not only quickly followed by extreme cold swelling of the limb, but by great or fatal depression of the system generally. The latter consequence has been painfully illustrated by repeated instances of death amongst the keepers of Zoological Gardens, from the bite of the *cobra di capello*, or poisonous hooded snake of India. In addition to the local treatment of the wound (see *Hydrophobia*), continued friction with some oily material appears to be most generally useful, whilst, at the same time, stimulants are freely given internally to counteract the depression. Of course, any stimulant first attainable should be used, but ammonia appears to be most highly recommended. A tea-spoonful of sal volatile may be given every five or ten minutes in a wine-glassful of water, till reaction is thoroughly established.

Such cases as the above are not common in England; they sometimes, however, do occur in consequence of the bite of the adder or viper, the only species of poisonous snake common to this country. The common "ringed snake" is harmless; it has a yellow spot on each side of the neck; whereas the adder is of a dirty yellow colour throughout, marked with black spots, and the belly black. Poisoned wounds, such as those sometimes received in dissection by medical men, or by cooks, and others who have to handle dead animal substances, are apt to give rise to symptoms resembling whitlow, and require similar treatment (see *Whitlow*). They may, however, place life in much jeo-

pardy by the constitutional affection they give rise to, and by causing the formation of abscesses in various parts of the body. Such, and indeed any severe, cases of poisoned wound ought to be put under medical care without delay.

Refer to—*Ammonia—Emergencies—Hæmorrhage—Lock-jaw—Scalp—Ulcers.*

WRISTDROP.—See DROPPED WRIST.

WRY NECK.—This well-known deformity is caused by the rigid contraction of a powerful muscle, the sterno-mastoid, on one side of the neck. It may be either congenital or acquired, and may be sometimes remedied, if not cured, by the person afflicted wearing an apparatus made by the instrument maker, by which gradual extension is kept up upon the muscle until it resumes its natural condition. Obstinate cases require division of the muscle by the surgeon.

YAWNING.—See GAPING.

YAWS.—A peculiar tropical disease, accompanied with a skin eruption. The advice given under *Tropical Diseases* applies also to this affection.

YEAST.—See FEVER—POULTICE—DIABETES.

YELLOW FEVER.—See FEVER.

YEW-BERRIES.—The beautiful berries of the yew tree occasionally tempt children to eat them, and the leaves have been given ignorantly as medicine. Both are extremely poisonous. A child has died within four hours after eating a quantity of the berries. The symptoms appear in some degree to resemble those of poisoning by belladonna, and treatment similar to that recommended in such cases should be adopted. It is thought that the poison resides chiefly in the seeds of the berry.

ZINC.—This now well-known metal yields some useful medicinal preparations. Of these the principal are the oxide, the sulphate, and the chloride. The metal itself, which is of a pale bluish colour, was some years ago introduced in the manufacture of cooking apparatus, and especially of dairy utensils, but seems to have been abandoned as unsuitable (see *Cream*). The oxide of zinc is a white, tasteless, rather light powder. It is used externally in the form of ointment in various skin affections, especially where there is excoriation or slight ulceration, the proportion being eighty grains of the oxide to an ounce of benzoated lard. Internally, it is used principally in spasmodic diseases, such as epilepsy, and St. Vitus' Dance. In the latter disease the author has used it successfully. The dose is from two to six grains twice or three times daily, in the form of pill.

The sulphate of zinc, or white vitriol, is a most useful preparation It is sold in the form of small white crystals, somewhat resembling those of Epsom salts. It has a strong metallic, very unpleasant, styptic taste. As an external astringent application it is used in solution, and forms one of the most serviceable collyria or eye-lotions, in the strength of from one to four grains to the ounce of distilled or rain-water. When used to ulcers, the strength may be increased to double. Its principal internal use is as a tonic for spasmodic diseases of the nervous system, as epilepsy and hysteria, and its action as an emetic is admirably calculated, from the rapidity with which it causes vomiting, to empty the stomach in cases of poisoning by opium or other narcotic drugs. The dose, as an emetic, is from fifteen to twenty grains, in a wine-glassful of water; as a tonic, from one to two grains in pill or powder. The salts of zinc are said to have themselves proved poisonous, but very rarely so; moreover, by the rapidity with which they cause vomiting, they must in great measure prove their own antidotes. In such cases, the treatment should be similar to that for poisoning by blue vitriol. —See *Copper.*

Chloride of zinc is chiefly used as an external caustic, and also as a disinfecting agent. The pharmacopœial solution is powerfully corrosive, and many cases of poisoning have occurred by mistaking it for other medicine employed in the sick-room. Chloride of zinc is the main disinfecting agent in Sir W. Burnett's well-known fluid. The carbonate and the acetate of zinc have properties somewhat similar to the oxide and the sulphate, but they are much less employed.

A combination of sulphate of zinc with valerianate of soda forms the valerianate of zinc, a remedy used as a nervine tonic, and serviceable in numerous neuralgic affections, particularly nervous headache. The dose is from one to four grains in the form of pill, taken two or three times daily.

ZYMOTIC is a term of doubtful signification recently introduced into medical science, and is probably familiar to most from its occurrence in the regularly published reports of the Registrar General. The term includes the various epidemic, endemic, and contagious diseases, such as fever, small-pox, &c., which originate, or are supposed to originate, from a morbid poison being introduced into, and gradually extending itself throughout, the system. The process is likened to that of fermentation, and the term is derived from the Greek verb signifying to ferment.—See *Fermentation—Germs of Disease.*

ON THE MANAGEMENT

OF THE

SICK-ROOM.

By W. ANDERSON, M.D., L.R.C.S., EDINBURGH.

It is very much to be regretted that so much ignorance prevails in this country respecting the domestic management of the sick-room, and that this ignorance is chiefly displayed by those whose duty it is to watch over the sick-bed, and to carry out the directions of the medical adviser. It is believed by many people that, like the poet, the nurse must be born, not made, but this is only partially true, and every day experience is teaching us that much can be done towards the training of efficient nurses for the use of private families who may require their services, and for our great public hospitals and charities. No doubt there are certain qualities of mind and disposition, without being possessed of which no woman will ever become a nurse, in the best sense of the word; but, on the other hand, there are many women who may be made excellent nurses, and yet who would never become such without proper, simple, preliminary training. It is extremely difficult to put down the details of that training in black and white, and it is not too much to say that the training, to bear any good fruits at all, must be essentially a practical one, that is to say, that, in our opinion, every woman who aspires to be a first-rate nurse should either be taught under a skilful teacher, or should cheerfully apprentice herself for a short time to some institution, where good nursing and all its concomitants are systematically taught. If it be asked what inducement there is to make any one undergo so much arduous and, perhaps, repulsive labour, we can only reply, that we have been frequently the witnesses of the heart-rending sorrow exhibited by a wife, a mother, or a sister, who have found too late, when the melancholy occasion required it, that they were unable to undertake those duties which were required of them, and from very ignorance, were obliged to hand them over, it may be, to a cold, perhaps cruel, and mercenary hireling. Sanitary knowledge, and especially this department of it, is making immense strides, and acquiring fresh importance every day; and it is matter of congratulation to all classes of the community that institutions, having for their object the training of skilful nurses, are becoming more frequent in all parts of the country.

CHOICE OF A SICK-ROOM.—With regard to the sick-room itself, it seems scarcely necessary to say that, when a choice can be made, it should always be large, lofty, quiet, and well ventilated; and these remarks apply all the more forcibly to those cases in which the patient is suffering from contagious disease of any kind—more especially from typhus fever, small-pox, scarlet fever, or from any injury which is complicated by having a large discharging surface, or which may be foul, putrid, or even gangrenous. In the dwellings of the poor, these ends cannot always be attained; and moreover, it is sometimes desirable not to remove a patient from the room in which he may happen to be at the time of his illness, or which may be most convenient for him in the case of accident. If the patient must be, then, in a small

room, this great disadvantage must be compensated for by attending, in every possible way, to the ventilation, both for the sake of the patient himself, for those who are in attendance upon him, for those who may come and go, and for those who live in the immediate neighbourhood; because such small rooms, when ill ventilated, become the *foci* from which disease spreads upon all sides, and, in various ways, may eventually lay hold upon all classes of the community. The poor in many places have a great objection to open windows; but it may be asserted that there is no danger whatever in opening the windows, if only care be taken to avoid draughts, and the occurrence of a chill upon the patient's surface. The following passage, quoted from the *Lectures on the Eruptive Fevers*, by Dr. George Gregory of London, shows the difference of practice which has taken place in this respect, as compared with that of former times:—"What think you," he says, "of a prince of the blood royal of England (John, the son of Edward the Second) being treated for small-pox by being put into a bed surrounded with red hangings, covered with red blankets and a red counterpane, gargling his throat with mulberry wine, and sucking the red juice of pomegranates? Yet this was the boasted prescription of John of Gaddesden, who took no small credit to himself for bringing his royal patient safely through the disease." Nowadays, of course, we think it very absurd to treat patients with infectious diseases in beds with any curtains at all. We never dream of increasing the temperature of the room, as was formerly done; we do not insist upon the patient being covered with any more blankets than he chooses; and we certainly are not so cruel or so blind as to refuse abundance of cooling drinks to the parched lips suffering from the maddening thirst of fever. The ventilation is, and has always been, a difficult question. In plain English, how are we to ventilate a room without causing draughts which may chill the patient, and cause him to take cold, or which may even light up inflammation of the lungs, bronchitis, or some other evil, in those who are already weakened by disease? Are we to ventilate by means of the window or windows, by artificial ventilators, or by the door and chimney? All experience teaches us that every sick-room should have an open chimney, and further, that ventilation can be only properly effected by open windows. Some open them from the top, some from the bottom, and some both at top and bottom, allowing the air to escape at one opening and to enter at the other. Now, this appears a very simple matter, and yet surprising how difficult it is to properly ventilate a room, and still more a ward, in this way, without the patients' complaining of draughts and chills. Again, many persons, especially in the lower ranks of life, are accustomed every night in their lives to sleep in such close ill-ventilated rooms, surrounded, it may be, by their numerous families, and perhaps a few lodgers into the bargain, so that it is not to be wondered at if they very soon catch cold when suddenly treated for the first time, according to the modern and enlightened notions—so warmly advocated by Miss Nightingale—as to open windows and fresh air. The writer has found, after many trials, that the least injurious way of admitting fresh air to a room, by the ordinary window sash, is to open it from the bottom to the height of a few inches, more or less, according to the state of the wind, weather, &c. A wooden board is then to be placed against the lower part of the window, to prevent the wind blowing directly into the apartment, and in this way, the current of air is directed upward, and diffused over the entire surface of the room. All the devices at present in use for artificial ventilation are more or less defective and imperfect, and have generally to be abandoned for the simpler sort of expedients alluded to. The chimney board or soot board should never be put up, because, of course, when the window is closed, the room is almost entirely dependent on the chimney for ventilation. In cases where an open window in the room cannot be borne, it is often desirable to ventilate the room by means of air transmitted through an open window in the adjoining room or in the staircase, and here an open chimney is more than ever desirable.

In Miss Nightingale's *Notes on Nursing*, the following excellent practical advice is given as to ventilation:—

"Always air your room from the outside air if possible. Windows are made to open; doors are made to shut—a truth which seems extremely difficult of apprehension. I

have seen a careful nurse airing her patient's room through the door near to which were two gaslights, a kitchen, a corridor, the composition of the atmosphere in which consisted of gas, paint, foul air, never changed, full of effluvia, including a current of sewer air from an ill-placed sink, ascending in a continual stream by a well-staircase, and discharging themselves constantly into the patient's room. The window of the said room, if opened, was all that was desirable to air it. Every room must be aired from without—every passage from without; but the fewer passages there are in an hospital the better.

"In laying down the principle that the first object of the nurse must be to keep the air breathed by her patient as pure as the air without, it must not be forgotten that everything in the room which can give off effluvia, besides the patient, evaporates itself into his air, and it follows that there ought to be nothing in the room excepting himself which can give off effluvia or moisture. Out of all damp towels, &c., which become dry in the room, the damp, of course, goes into the patient's air; yet this, 'of course,' seems as little thought of as if it were an obsolete fiction. How very seldom you see a nurse who acknowledges, by her practice, that nothing at all ought to be aired in the patient's room, that nothing at all ought to be cooked at the patient's fire! Indeed the arrangements often make this rule impossible to observe."

TEMPERATURE OF THE SICK-ROOM.—In many diseases of the chest, as for instance, inflammation of the lungs, the temperature of the room requires to be particularly attended to, because cold air not only increases the discomfort of the patient, but makes the cough worse, and aggravates the disease. Now it is not safe to trust to our own feelings as a guide by which the temperature of a sick-room can be regulated: therefore, a thermometer placed at a distance from the fire ought to be frequently consulted, and the temperature should be kept up to at least 60 degrees Fahrenheit. But whilst the room is kept warm, the bed-clothing of the patient must be regulated accordingly (and this requires particular attention in the case of children), since it would be extremely injudicious both to keep the room warm and to heap blankets upon the patient. Common sense will teach one that, in those diseases in which it is necessary that the patient should breath a warm atmosphere, a cold room with abundance of bed-clothes would be hurtful, but that a warm air and a comparatively light covering to the bed, are what is required. However warm the room may be, or appear to be, the patient should always have a loose, warm dressing-gown at hand, to be put on when he leaves his bed, so that perspiration may not be suddenly checked. It will thus be seen that attention requires to be paid, first, to the temperature of the air of the room, and secondly, to maintaining the temperature of the body by appropriate clothing. As a general rule, it must be remembered that infants and old persons require much more artificial external warmth than adults, especially when sick. New-born children are said to require a temperature of from 65 to 70 degrees Fahrenheit, and old people (with few exceptions) are said to require a still higher amount. Healthy, well-clad, and well-fed adults will bear a degree of cold five or ten degrees lower without any inconvenience: while some people seem to have an extraordinary power of adapting themselves to different temperatures. It is probable that, in some acute diseases of a febrile character attended by great heat of skin, a low temperature, with a current of cooling air passing over the body, is of decided advantage; and this would seem to be proved by the fact that cases of fever treated in tents during great epidemics have generally done well. Most medical men seem to be agreed that in convalescence from all kinds of diseases there is great susceptibility to, and intolerance of cold, so that it is often desirable to keep a convalescent at a higher temperature than when he was the subject of acute disease.

As to the different methods of heating the sick-room, there can be no doubt that the common radiant grate with an open chimney is by far the best and healthiest.

The influence exerted upon the condition of a patient by the temperature of his room is well illustrated by the fact, that patients have been brought from a condition of raving and delirium into a calm and collected state, merely by the doctor's ordering the temperature of the

room to be lowered five or ten degrees; while, on the other hand, violent fits of coughing, with difficulty of breathing, have been at once relieved by reversing the order.

The air of the sick room, generally, should not be too dry; but in some special instances it is desirable that the patient should breathe a warm and moist atmosphere. This may be done very simply in a variety of ways. Perhaps the simplest of all is to allow the steam of a common kettle to diffuse itself throughout the room, or the common urn used for keeping boiling water for the tea-table may be employed. Stoves are very objectionable for the sick-room; but where they are used, special attention must be paid to keep the atmosphere moist.—See *Bronchitis Kettles.*

FURNITURE OF THE SICK-ROOM.—It may not be out of place to say one word as to the furniture of the sick-room. It has been already said that the bed should not be surrounded by curtains; the old-fashioned four-poster, with the curtains drawn, is the very worst sort of bed for a case of fever, or infectious disease of any kind. French beds, without curtains, are to be met with in most houses, and are in many ways suitable, but iron bedsteads are probably best of all. It is also a point of great importance that the bed should not be too high, nor too wide, otherwise it is quite impossible for the nurse to perform those many offices which a sick-room requires. As a rule, hospital patients are better off in this respect than patients in private houses. Miss Nightingale recommends "Iron bedsteads, with rheocline springs which are permeable by the air up to the very mattress (no valance, of course), the mattress to be a thin hair one, the bed to be not above three and a half feet wide. If the patient be entirely confined to his bed, there should be *two* such bedsteads, each bed to be 'made' with mattress, sheets, blankets, &c., complete—the patient to pass twelve hours in each bed, and on no account to carry his sheets with him; the whole of the bedding to be hung up to air for each intermediate twelve hours. Of course, there are many cases where this cannot be done at all—many more where only an approach to it can be made. I am indicating the ideal of nursing, of what I have actually had done, but about the kind of bedstead there can be no doubt, whether there be one or two provided."

Thick coverlets of a close texture ought never to be used, because they retain the excretions of the patient. The bed-clothes ought to be frequently changed and aired. Water beds are invaluable for particular cases. In cases of long or confirmed illness, in which the patient is confined constantly to bed, a bed constructed upon high and noiseless wheels, which can be moved easily from room to room, has been found a great luxury in relieving the tedium of illness.

The reader is referred to the article *Bed*, for an account of the various beds and bed-lifts, for invalids, which are most to be recommended.

One simple article of furniture which has been found of great use in the sick-room is a table so constructed that the leaf comes over the bed of the patient. He is thus enabled, on being propped up with an additional pillow or two, to take his meals with great comfort, and in an easy position, instead of in the usual awkward and constrained manner when it is attempted to take food from the bed-side.

Another of the most necessary and important articles is a night chair or commode. Great improvements have been made in the construction of these; and perhaps it is only necessary to mention that the lid should be of procelain, *not wooden*, and that there should be no seat or cushion above the lid which can retain the noxious exhalation from the pan below. Those made with a seat to the back, and supports to the arms, are decidedly the best, because patients requiring to use the night-chair are often in a state of the greatest debility, so much so that they dread getting up to it, and require to be supported while there.

A bed-pan, or, still better, a couple of bed-pans, ought to be always in readiness. The best are those made of strong porcelain of a shovel shape, and as simple as possible in construction. It is well to know that in an emergency, or where a bed-pan cannot be readily obtained, a common deep plate answers the purpose admirably; and, in point of fact, this can be used by some persons who cannot make use of the ordinary bed-pan.—See *Bed-room.*

On this subject Miss Nightingale, in the work already quoted, gives the following plain and excellent directions:—

"Of the fatal effects of the effluvia from the excreta, it would seem unnecessary to speak, were they not so constantly neglected. Concealing the utensils behind the valance to the bed seems all the precaution which is thought necessary for safety in private nursing. Did you but think for one moment of the atmosphere under that bed, the saturation of the under side of the mattress with the warm evaporations, you would be startled and frightened too!

"The use of any chamber utensil *without a lid* should be utterly abolished, whether among sick or well. But never should the possession of this indispensable lid confirm you in the abominable practice of letting the chamber utensil remain in a patient's room unemptied except once in the twenty-four hours—*i.e.*, when the bed is made—yet, impossible as it may appear, I have known the best and most attentive nurses guilty of this; ay, and have known, too, a patient afflicted with severe diarrhœa for ten days, and the nurse (a very good one) not know of it, because the chamber utensil (one with a lid) was emptied only once in the twenty-four hours, and that by the housemaid, who came in and made the patient's bed every evening. As well might you have a sewer under the room, or think that in a water-closet the plug need be pulled up but once a day. Also, take care that your *lid*, as well as your utensil, be always thoroughly rinsed.

"You can easily convince yourself of the necessity of this absolute rule, by taking one with a lid, and examining the under side of that lid. It will be found always covered, whenever the utensil is not emptied, by condensed offensive moisture. Where can that go when there is no lid?

"Earthenware, and, if there is any wood, highly polished and varnished wood, are the only materials fit for patients' utensils. The very lid of the old abominable close stool is enough to breed a pestilence. It becomes saturated with offensive matter, which scouring is only wanted to bring out. I prefer an earthenware lid, as being always cleaner; but there are various good new-fashioned arrangements.

"A slop-pail should never be brought into a sick-room. It should be a rule invariable—rather more important in the private house than elsewhere—that the utensil should be carried directly to the water-closet, emptied there, rinsed there, and brought back. There should always be water and a cock in every water-closet for rinsing. But even if there is not, you must carry water there to rinse with. I have actually seen, in the private sick-room, the utensils emptied into the footpan, and put back unrinsed under the bed. I can hardly say which is most abominable—whether to do this, or to rinse the utensil *in* the sick-room. In the best hospitals, it is now a rule that no slop-pail shall ever be brought into the wards, but that the utensils shall be carried direct to be emptied and rinsed at the proper place. I would it were so in the private house."

Spitting pots should always be used, since nothing is more inconvenient than to raise a heavy chamber pot for the purpose of spitting into it, and yet it will scarcely be believed that, even amongst patients of the better class, spitting pots are very seldom used, until they are ordered by the doctor. They should be light, and made of white porcelain, so that the medical man may at once ascertain the nature of the expectoration; and, in order still further to facilitate this, no matches, pieces of paper, or fragments of orange peel, &c., should be put into them.

A medicine glass and medicine spoon will be found useful.

A tin stomach warmer, or one made of india rubber, should be always at hand, so that warmth may be applied to any part of the patient's body at the shortest possible notice.

When it is necessary to provide for the dressing of a sore, the following articles should always be kept in readiness, upon a small table appropriated to them, and to them alone, with the exception of the lotion or ointment, or other appliance, which may be used or ordered by the surgeon:—A couple of small basins, a small quantity of tow or cotton wool to bathe the sore, a quantity of clean linen rags cut into appropriate pieces, or of lint, a few bandages, some

oiled-silk, or gutta-percha tissue, and some strapping or sticking plaster. These are articles which are being constantly wanted, and it is very provoking for the medical man to be obliged to send all over the house, first for the one, and then for the other, instead of having them all ready to his hand.

It seems almost superfluous to mention that an abundant supply both of hot and cold water ought always to be provided.

ATTENDANCE TO PATIENT.—How to wash, sponge, bathe, or otherwise *clean* the patient.

It is well known to experienced medical men and nurses, that patients are more grateful for being properly attended to in this way than perhaps any other, and it can be easily understood how great is the feeling of relief and comfort experienced by a patient, who has had removed from him the noxious and irritating excretions and exhalations of his body. The first point to attend to is, how sufficiently to cleanse the patient without exposing him to a chill of the surface. A skilful nurse, even in a very bad case, can easily manage this without much trouble either to herself or to the patient. When it is desirable thoroughly to cleanse the skin, and at the same time to avoid all chance of chill, it will be necessary that the nurse should use a small basin, with moderately hot water, a piece of soft flannel or a sponge, with plenty of soap. Only a small portion, or a single limb, or part of a limb, is to be washed at one time. The operation is to be quickly performed, the part speedily dried with a soft warm towel, and replaced within the bed-clothes. Care should be taken to have everything in readiness, and at hand, so that all may be speedily accomplished, and the patient not fatigued or chilled by having to wait until the different articles are obtained. It is astonishing how very easily the patient may be kept clean by a little common-sense management in this way.

SPONGING.—In certain cases of fever and acute disease, it is frequently necessary to sponge the body over with tepid or cold water, in order to reduce its temperature, and allay irritation. Now, this requires to be very skilfully done, in order to have a good effect; a large soft sponge, or two or three small ones, just moistened sufficiently to prevent dripping, should be passed quickly over the surface of the body, which should be quickly dried. If the patient is then able to bear it, his night dress should be removed, and he should be laid upon a blanket on a sofa or bed, close to his own bed; the sponging should be rapidly and efficiently performed, and a clean night shirt put on, and he should then be removed to his own bed, where he will experience a feeling of the greatest comfort and relief. This process may be repeated several times with benefit, where there is fever and heat of skin.

Sponging the body with vinegar and water has been found of decided value in checking the exhausting perspiration so distressing and so commonly met with in the course of consumption, and other chronic diseases. The sponging should be quickly done, especially over the chest, neck, arm-pits, and face, and between the shoulders, and the parts should be quickly and briskly dried with a soft absorbent towel. In certain cases of consumption, and in persons generally with delicate chests, great benefit is sometimes to be derived from sponging the chest, night and morning, with salt and water. A handful of salt should be used to a basin of water, the upper part of the chest and the arm-pits should be well sponged, and the drying performed quickly, as before. If the process is properly and efficiently performed, no fear need be entertained of catching cold, even by the most delicate, either in summer or winter; in fact, it is one of the best preventives of cold that we are acquainted with.

THE BATH.—The bath is a very useful piece of furniture for the sick-room, and the reader is referred to the different articles under this head, in the body of the work, for useful information on the subject. When it is desired to administer a bath to a patient who is confined to bed, the bath ought to be brought alongside of the bed, so that the patient may be moved into it and out of it as quickly as possible. This is particularly requisite in cases where it is

desired to make use of the relaxing and sedative effect of a warm bath to relieve stoppage of the water or strangulation of the bowels, in rupture, or where it is desirable, as it sometimes is, to administer an injection in the warm bath, in some cases of stoppage of the bowels.

The shower bath must be taken by sick people with great caution, and scarcely comes under the head of the sick-room furniture. It is, however, one of the best means we possess, as a bracing tonic in certain cases of disease, and especially in the nervous affections of children. A conical cap, such as that recommended by Dr. Jephson of Leamington, should be worn, when it is not desired to wet the hair of the head. The water may be used tepid, if cold water produces too much shock, or the hand shower bath will be found a useful and convenient modification, especially for children. Many persons are not aware of the extremely pleasing effect produced by a sudden cold shower bath immediately after a warm plunge bath; in fact, it seems to do away with the relaxing effect of the latter, and to favour agreeable reaction of the skin.

THE HIP BATH.—This form of bath is perhaps, of all others, most generally used in private families and in the sick-room, as it is so convenient, and can be so readily applied. A cold hip bath should not be taken by females at the time of the monthly change, but may be freely used by the strong and robust, and is an excellent strengthening tonic, especially to the organs contained within the pelvis. The warm hip bath, either simple, or with the addition of a handful of mustard, is one of the best agents with which we are acquainted for the stimulation of the womb to activity. In addition to, and after its use, the back may be bathed with mustard and water, soaked in a large sponge, and a mustard plaster, about twelve inches long by four or five broad, should be applied to the lower part of the back. A combination of these means seldom fails to rouse into action the dormant functions of the womb in simple cases.

THE FOOT BATH.—Like the above, the foot bath may be used either with simple water, or medicated with mustard, or otherwise, as directed by medical advice. The following illustrations may be given as examples of these cases, in which it is desirable that it should be employed. It not unfrequently happens that the poison of gout, lurking in the system, gives rise to serious, and it may be, fatal affections of important internal organs. A strongly medicated hot foot bath will frequently serve in such cases to determine the poison to the toe, or some of the small joints of the foot, with immediate relief to the patient, and freedom from danger. A patient who has been delirious for days, owing to the presence of the gouty poison in undue quantity in the blood, irritating his brain, has been thus quickly, and, as it seemed, wonderfully relieved. Again, a patient suffering from some disease of the chest, with congestion of the lungs, and great difficulty of breathing, has been often speedily relieved, so as to fall into a gentle sleep, merely from having his feet and hands plunged into very hot mustard and water, by which simple means a large quantity of blood is drawn to the extremities, and the overloaded and labouring internal organ lightened of its load, and enabled to perform its function in peace. In cases of convulsions in children, when a warm bath is ordered, the effect of it may be very much enhanced by adding a little mustard to the water, and if necessary, applying cold to the head, while the patient is in the bath.

THE NITRO-MURIATIC ACID BATH.—This is useful in cases of torpidity or inactivity of the function of the liver. Nitro-muriatic acid itself is frequently prescribed to be taken internally in such cases, and more especially of late years it has been very much ordered in the form of bath, as follows:—

Take of nitric acid one fluid ounce and a half; hydrochloric acid, three fluid ounces; warm water, from ten to twenty gallons, and mix. It should be prepared in a wooden or stoneware bath, because the acids act upon metallic substances, and the patient should remain in it from ten to twenty minutes. If the bath cannot be borne, the patient may sponge the different parts of the body with a solution of the acids, according to the strength above indicated.

SALT-WATER, OR SEA-WATER BATH.—This is found to be an admirable substitute for sea bathing, and exercises a powerful stimulative action upon the glands of the skin.

Take of bay salt, or sea salt, half a pound, sulphate of magnesia or epsom salts, two ounces, solution of chloride of lime, one ounce; water, from twenty to forty gallons; this forms an excellent artificial imitation of sea water, and can be very readily and cheaply obtained. In cases of debility or chronic rheumatic affection of the joints accompanied with debility, tepid water may be used with the above ingredients, either as a plunge, or as sponge bath, and the body, over all its surface, should be briskly rubbed with a coarse towel, hair glove, or flesh brush. Where there is a predisposition to consumption, or other manifestations of the scrofulous constitution, great benefit has been found to result from the use of the above, a stimulating effect of the salt water upon the delicate chest being very remarkable.

THE ALKALINE BATH.—This is generally prescribed for persons of rheumatic or gouty constitution, and may be made very simply by adding about a pound of carbonate of soda to twenty or thirty gallons of water.

One ounce of carbonate of soda, with one ounce of laudanum, to a quart of hot water, closely resembles the well-known Fuller's lotion. Folded lint or flannel dipped in this lotion may be applied to very painful rheumatic joints, oiled silk being placed over the limbs to keep them moist. In this way great relief is often obtained from severe, dull, aching pain. Carbonate of potash may be substituted for carbonate of soda, especially in gouty cases.

Some diseases of the skin, though not dangerous in themselves, are occasionally attended with so much irritation as to render the life of the patient a burden to him, and relief to this itching sometimes follows the use of a sulphur or other medicated bath, which will be prescribed by the medical attendant. The effect of a sulphur bath is most easily obtained by adding three or four ounces of sulphurated potash to about thirty gallons of water. This bath is frequently used as a cure for itch. The smell of sulphuretted hydrogen, which arises during its use, is very unpleasant to some people.

Itching of the skin is very frequently allayed by a creasote bath. For this purpose one or two tea-spoonfuls of creasote mixed up with a little mucilage or glycerine may be added to the ordinary warm bath. It would be needless to indicate the numerous forms of medicated baths which have each their favourite advocates amongst medical men; and, as a rule, none should be used without the sanction of the medical adviser.

THE PORTABLE VAPOUR AND HOT AIR BATH.—The hot air or vapour bath is of great use in the treatment of gouty, rheumatic, and neuralgic affections, some forms of dropsy, and of skin disease, and in every disease in which increased action of the skin is likely to be of service. It can be used by a person in bed, or on a chair, and also to the whole or any part of the body, with equal facility; it may also be fitted with a perforated tray for herbs, drugs, &c., when medicated vapour is required. It can be obtained of all surgical instrument makers, chemists, and tinsmiths. See *Baths.*

BATHS FOR INFANTS.—It is scarcely possible to pay too much attention to cleanliness in the care of infants, and any neglect on this head is generally followed by disordered health, and sometimes by peculiarly obstinate irritation and disease of the skin itself. In cold weather, the water used for washing infants should never be quite cold, because there is a tendency to congestion of internal organs if the surface is too much chilled without reaction, and, for the same reason, a child, when being washed, and still more being dried after washing, should never be exposed to a draught or current of cold air. For newly born and young infants, very fine soft flannel, or fine Turkey sponge, should be used with soap. The practice, which obtains amongst some old-fashioned nurses, of rubbing the child's skin over with spirit, after a bath, to produce reaction, is a highly reprehensible one, inasmuch as the stimulus is too artificial to be of any benefit.

HOW TO GIVE A CHILD A WARM BATH.—A warm bath is very often ordered by medical men as a remedial agent for children suffering from disease of the lungs, or other internal organs; but it must be manifest that, if the child is unnecessarily frightened, and exhausts himself by crying and struggling violently, owing to alarm at the preparations which are being made for what appears to him a frightful process, more harm than good will be done. The following piece of advice, therefore, to mothers and nurses, it is hoped, will be followed on all such occasions. First, prepare the bath out of the room, and out of the child's sight, so that he may not see it prepared in the room, and steaming frightfully as it seems to him. Secondly, after it is prepared, cover it over with a large flannel cloth, or with a suitable blanket, so as to hide the steam, and so prepared, bring it into the bed-room. If the child is very prone to alarm, and especially if this has been favoured by his having been roughly bathed by his nurse on former occasions, it will be well to place him on the flannel cloth, and let him down gently into the water. A floating ball, of a pretty colour, or a cork with coloured feathers, may be given him to play with in the bath, and in this way, what is often made an object of terror, and is the means of doing injury instead of good, may be converted into a source of real pleasure to children, so much so, that when this plan is adopted, in the writer's experience, they are more apt to cry at being taken out than at being put into the bath.

The temperature of the water used for a child's bath should be from 96 to 98 degrees Fahrenheit, at all events for the first five weeks of its life; but as it grows older, the temperature may be diminished until it is comfortably tepid; and if the infant is moderately strong, cold water may be used in summer, with the precaution that the body must not be left immersed in cold water for any length of time. After washing and bathing, the child should be thoroughly dried; and if the child is very fat, the creases of the skin may be dusted over with a little unscented hair powder, or with simple powdered starch, contained in a cushioned bag. Soap should be used with caution to the delicate skin of an infant, and if there is any abrasion or eruption, to such parts thin starch solution may be employed instead, or tepid water may be simply drained over them.

The parts requiring especial attention as to cleanliness are the thighs and groins, the creases in the neck, the bends of the arms, the hands, the hips, and behind the ears. If there is vomiting, or much discharge of saliva from teething, the lips, chin, and neck ought to be very carefully washed. Want of attention to these little particulars is almost certain to be followed by some troublesome eruption of the skin.

In conclusion, the whole process of washing and bathing an infant should be carried through expeditiously, and should be made a matter of recreation and healthful amusement, and a source of real pleasure, instead of a painful and irritating ordeal, without benefit to the health, and to the direct injury of the temper and disposition of the child.

THE DOUCHE, HOT AND COLD.—It is sometimes necessary, in order to relieve the painful and troublesome affections of the joints and other parts, so common in chronic rheumatism and allied diseases, to employ what is called the hot douche, or the hot douche bath: that is, to apply a continuous stream of hot water to the affected parts, either alone or accompanied by friction and percussion. The simplest and readiest method of effecting this is for the operator to stand upon a table or chair, armed with a jug or tea kettle, from which he allows a stream of water to fall upon the affected part, while, at the same time, an attendant keeps up percussion by means of an india rubber bottle, stuffed with wool, or some soft substance, attached to a handle of cane—any other material will do equally well instead of india rubber for this sort of bath, so much used on the continent, at some of the most fashionable watering-places. A very high temperature (150 degrees Fahr.) can be easily borne; and where desirable, as for instance, to an enlarged, painful, and stiffened joint, the process may be continued for half an hour at a time.

THE COLD DOUCHE.—This is applied in exactly the same way as the other, with modi-

fications, and without the percussion being required in some affections of the joints, &c., in which it may be ordered by a medical man. It will be desirable to use a strong stream of water, and to pour it from a good height; but when it is wished merely to apply cold to the head, as, for instance, in fever, or disease of the brain, or in the case of severe wounds of the scalp, a gentle stream of cold water only should be made to trickle over the patient's head. This may readily be effected by means of a worsted thread (or several threads) dipped in a vessel arranged at a proper height. The patient's head and shoulders should be laid upon a waterproof cloth, so disposed as to allow of the water flowing from it to a vessel placed at the foot of the bed.

OTHER METHODS OF APPLYING COLD TO THE HEAD.—Besides the above-mentioned excellent method, cold may be applied to the head by means of evaporating lotions, or by rags dipped in iced water, or by pounded ice in waterproof bags especially made for the purpose. Even skilful nurses, or what are at all events called skilful nurses, require to be constantly superintended, else they do more harm than good in this particular. For instance, they will take a large cloth dipped in cold water, fold it, apply it to the patient's head, and leave it there for an indefinite time, not knowing that it very soon becomes hot, and acts like a poultice, so that they are, in fact, applying heat instead of cold to the sufferer's head; perhaps, too, the patient is unconscious, and unable to communicate his feelings to those around him. In order properly to apply either cold iced water or evaporating lotions to the head, a simple layer only of *thin* muslin or linen should be used, so as to allow of free evaporation, and this may be frequently changed, or it may be wetted without being removed from the head at all by squeezing a sponge or rag dipped in the lotion upon it.

The following may be recommended as a cooling, evaporating lotion for the head to be used in fevers, inflammation of the brain, injuries to the head, &c. :—

Take of solution of acetate of ammonia three ounces, rectified spirit, two ounces, rose water, seven ounces. Mix. Or simple vinegar and water, or spirit of wine and water may be used; or a lotion made of sal ammoniac and nitre, of each, two ounces; water, 16 ounces.

TO APPLY ICE TO THE HEAD.—The ice should be pounded and placed in one of the india rubber pillows which are made for the purpose. When all the ice is melted, it should at once be renewed, as the water soon gets very hot.

N.B.—It is to be remembered that the long and continuous application of intense cold to the head may be followed by great depression of the vital power, and dangerous results, so that it should be done under the eye of a medical man.

Should the patient complain of the weight of the ice bag or bladder on the head, a string may be passed from it to the rail of the bed post or to the ceiling, and brought down as over a pulley, and tied so as to support part of the weight.

FOMENTATION.—It is very difficult to get people to believe in the efficacy—which, however, is very wonderful—of simple hot fomentations, so that, in different parts of the country, different materials are used for fomenting, according to popular prejudice in their favour. Camomile flowers, poppy heads, marsh-mallow roots, and various other substances with sedative properties, are in common use. The lead and opium lotion, made by dissolving two drachms each of tincture of opium and solution of acetate of lead in a pint of water, is an excellent lotion to use in cases where it is wished to apply soothing and drying hot fomentation to an inflamed part. Three or four poppy heads, with a couple of handfuls of camomile flowers, may be boiled in water, and the liquor used for fomenting. This is a very favourite form of fomentation with the lower classes in several parts of England. We consider the old-fashioned poppy-head fomentation of so much importance that we must give particular directions as to how it must be applied. Four ounces of poppy heads are to be broken up and put into a vessel, into which four pints of boiling water should be poured upon them. The whole is to

be boiled for fifteen minutes, and the liquor then strained off.—See *Fomentation—Bran—Heat.*

POULTICES.—Poultices are useful as fomentations, in cleansing and promoting the discharge from sores, and also, when disinfectants or deodorising substances are added to them, they are serviceable in removing foul and putrid emanations. It will be seen that we have now a much greater number of substances than formerly for application to foul and gangrenous sores, with a view to destroying their noxious emanations ; and it is to be desired that one or other of them should always be made use of to destroy bad smells in a sick-room, as a patient, and his attendants likewise, are sure to suffer in health unless this is attended to.

The principal points to attend to in making a poultice are, first, to crumble the substance of which it is to be made sufficiently, so that there shall be no lumps or irregularities ; secondly, to make them neatly and light, and to fold in the edges of the cloth upon which they are spread, so that they shall not mess the patient by escaping from under the poultice cloth.—See *Poultice.*

HOW TO PRACTISE "RUBBING."—Liniments are often prescribed by medical men, and the direction is left with the nurse, or printed upon the bottle, "to be rubbed into the affected part;" but the kind of rubbing will, of course, necessarily vary with the nature of the case. For instance, when there is excessive pain and tenderness of the part, the liniment is not to be rubbed *into*, but simply to be gently applied over the part, either with the hand, or with a soft piece of lint, or, better still, by means of a camel's hair brush. But, on the other hand, what are called stimulating and counter-irritant liniments, are often prescribed ; and by means of these it is frequently thought to disperse, remove, or cause absorption of chronic swellings of various kinds, as well as to allay pain in parts where there is no real tenderness on pressure. Now these liniments require to be applied in an entirely different manner—that is, they require to be briskly rubbed in by the hand warmed before the fire, or with a flannel glove. In such cases the *medicina mechanica* comes forcibly into play, and is often of as much service as the drug employed in the liniment.

Ointments are sometimes ordered to be rubbed into different parts of the body. Here again the method followed must be according to the effect it is desired to produce. For example, a very powerful ointment, containing aconite or atropia, is frequently ordered, to allay the severe pain of neuralgia ; and ointments are sometimes ordered to promote the absorption of inflamed glands, where there is still a certain amount of pain and tenderness. In such cases the ointment must be applied gently, else it will only aggravate the affection which it was intended to relieve ; but, on the other hand, ointments which are prescribed—such as tartar emetic ointment—to bring out an eruption on the skin, or mercurial ointment, with a view to its absorption into the system, should be vigorously rubbed into the parts indicated by the medical adviser.

Ointments should always be kept in a cool place, else, if the lard becomes rancid, serious irritation may result in the case of skin diseases, for which they are prescribed.

One word more as to the rubbing in of ointments in skin diseases. For example, in bad cases of the itch, great harm is done sometimes by rubbing in the ointment equally over all parts of the surface. It so happens that in certain parts of the body, from the great irritation of the disease, ulceration, and even sloughing, sometimes takes place; and it is very cruel and thoughtless (though it is constantly done) to rub in, it may be, an irritating ointment over parts which ought, on the contrary, to be protected by some soothing application. Such places should be either covered by poultices, by water dressing, by fresh lard, or by some simple mollifying ointment; while the other parts of the surface may be freely rubbed over with the original ointment which was prescribed.

RUBBING WITH THE FLESH BRUSH, HAIR GLOVE, &c.—These methods are principally to be used as hygienic means, and scarcely come under the head of sick-room

management. They are often, however, powerful adjuncts in the treatment of disease, and are useful for promoting reaction of the skin, after the use of baths, liniments, &c. Several new instruments of this kind, both for cleansing and stimulating the skin, have been introduced, since the ready application of the different forms of india rubber manufacture to the production of this sort of article has been understood.

HOW TO APPLY MUSTARD POULTICES OR SINAPISMS.—The acrimony or power of yellow mustard may be increased, if desirable, by making the mustard up into a paste with vinegar instead of water. Few persons can bear a well-made mustard poultice much longer than from fifteen to twenty minutes, in the course of which time it will probably have acted sufficiently. Pure mustard should never be applied to the delicate skin of infants, who are much more easily acted upon by it than adults. For them equal parts of bread crumbs, flour, or oatmeal should always be used, and the mustard poultice should only be kept on until a red blush appears.

After a mustard poultice is removed, the part should always be dressed with some fresh lard, spread cold upon a linen rag, or a sheet of fine cotton wool may be placed over it. Nothing can be more soothing and agreeable to the feelings of the patient than this.

Mustard leaf promises almost entirely to supersede the use of the mustard poultice. It certainly has the advantage of being light, extremely easy of application, and free from the objectionable clammy feeling which accompanies the first few minutes after a mustard poultice has been applied.

N.B.—When mustard poultices are ordered to be applied to the calves of the legs, nape of the neck, or other part of a patient who is insensible, care should be taken to remove them in due time, because it has happened in the experience of medical men, under such circumstances, that in the confusion and hurry of the time, the poultices have been left on until they have produced ugly sores and sloughs, from the effects of which the patient could with difficulty be rallied.

HOW TO APPLY HOT BOTTLES.—It is often of great importance that hot bottles should be very quickly applied to the hands and feet, and to the sides. In certain cases life itself may depend upon the quickness with which this is accomplished.

When a patient, after an operation, or in the course of an acute disease, is seized with what is technically called rigor or shivering, hot bottles should at once be applied, in order, if possible, to check it. The ordinary old-fashioned stone foot-bottles, when enveloped in flannel, retain the heat for a considerable time. Their use, however, is sometimes superseded by bottles of india rubber, which are lighter, and much more easily managed. Hot bricks enveloped in flannel, or the plates from the oven of an ordinary kitchen grate, may be substituted for hot bottles. Bottles made of tin are sometimes used for applying heat in the same way as the stone bottles, and sometimes also they are used in the form of what are called stomach plates, to apply heat to the bowels or chest. They possess the advantage, after a hot fomentation, of being able to retain their heat longer, while they do not wet the patient's bed or clothes; but, on the other hand, there is an undoubted advantage in *warm* and *moist* applications, which the tin plate does not possess. An admirable substitute for the tin plates is the india rubber stomach cushion, which can be used for such a variety of purposes, and which is certainly one of the greatest improvements amongst the many additions which late years have made to the appliances of the sick room. Bags of hot salt, or of hot bran, are often used instead of hot bottles. The salt or bran is to be heated in the oven, and enclosed in a flannel bag previously warmed. This will be found to retain the heat for a long time.

A very good method of applying hot bottles, in order to check rigors which accompany febrile attacks, with dryness of the skin, and cold shivering, till the teeth "chatter in the head," is as follows:—Several ordinary black bottles are to be filled with hot water, and put into the inside of woollen socks or stockings, which have been previously wrung out of hot

water. These (two on each side) are to be placed alongside the patient, the bed clothes being protected by a dry flannel cloth. In a very short time the shivering will be checked, and the patient will be found bedewed with gentle perspiration.

HOW TO APPLY COLD WATER TO WOUNDS BY MEANS OF IRRIGATION.—Surgeons are now almost unanimously agreed in discarding the old, cumbersome dressings, plasters, ointments, bandages, &c., with which wounds and stumps used to be loaded. A practice now prevails of much greater simplicity, and even to the stump of an amputated limb, it is not thought needful to apply anything whatever, but only to lay it in a comfortable position, so as to relax the muscles, perhaps upon a water pillow, and to apply along the line of the wound nothing but a strip of wetted lint or linen, which, for some days, requires to be kept constantly moist. Ragged, torn, and bruised wounds, such as the shattering of the hand or foot by gun-shot accident, or a crush from machinery, whether they require partial amputation or not, are found to be treated most efficiently and simply by the process of irrigation, a process which every medical man, if he wishes to employ it, will direct to be followed out according to an idea of his own. At the same time it will be well that the attendants of the sick-room should be acquainted with, and know how to set in operation, this most excellent method of keeping wounds clean and moist.

If the bed be a four-poster, or a French bed, with a canopy, a vessel containing cold water may be slung from the top of the bed in such a position as to hang over the wound. But if the bed be an iron one without any canopy, it will be necessary either to fix a pole in the wall, or to have an apparatus or support for the vessel in the form of a gallows, the transverse limb of which, reaching over the bed, must have the vessel suspending from it. A few worsted threads are to be placed in the vessel containing cold water and allowed to hang over the wound, till their ends almost touch it. The water will run down the worsted and trickle drop by drop gently but continuously upon the surface of the wound. Nothing can be more soothing and gratifying to the feelings of the patient, or more likely to subdue the pain, heat, redness, and swelling which accompany inflammation. The wounded limb must be placed upon a mackintosh cloth, which can be so arranged that the water should drop from it over the edge of the bed, where it can be caught by a vessel placed for the purpose. If it be desired to have a large number of drops, the ends of the worsted may be kept separate by being passed through perforated cardboard.

Another method still more simple is to suspend an ordinary funnel or tin dish, by means of a piece of string, either to the bed, to a hook in the ceiling, or to such an apparatus as described above. A cork, fitting loosely, may be placed in it, so as to allow the water to escape only drop by drop, or it may be allowed to escape in a gentle stream, if the cork be fitted still more loosely.

Either of the above methods may be applied to wounds of the nature indicated above, to certain cases of compound fractures of the limbs, and, in fact, to cases generally in which it is desired to apply the simplest of all dressings, viz., lint or linen soaked in water and laid loosely over, merely to protect the wound from external influences, to keep it cool and moist, to favour the escape of discharges, and, "to give nature a chance" to effect the healing process.

EXPOSURE TO AIR, LIGHT, &c.—As it is very necessary that the sick-room, being the room in which the patient has to spend wearisome days, and still more wearisome nights, should be exposed as much as possible to a plentiful supply of fresh air, and to light, it is obviously of importance that a good aspect should be chosen. All creatures, whether animal or vegetable, turn themselves joyfully to the light, and it may be roundly stated, that especially for growing children, light is almost as essential as fresh air. Plants which are not exposed to the light grow up blanched and deprived of their natural colour, and the same is the case with our miners, our artisans, and even our women and children who live in densely crowded alleys, or in underground cellars, and especially in the lower regions of some of those

old-fashioned houses, which, though at one time inhabited by the flower of the aristocracy, are now only distinguished for the squalor, filthiness, and wretchedness of their inhabitants.

When any member of a family is laid up with some serious disease which may possibly render it necessary that he should be confined to the sick-room for months, or it may be years, the best room in the house should, if possible, be placed at his disposal, seeing that so much of his time has to be spent within these four walls. In addition to light and air, a good view from the window is a great advantage.

Of course, it is well known that in many cases where there is great nervous excitement, in fevers, cerebral diseases, &c., as well as in many affections of the eye, light for a time must be partially if not entirely excluded. This can, however, always be readily done, by means of a blind of a green, or still better, of a slate colour, which can be pulled up or down at pleasure. For all chronic diseases, and indeed, it may be said, for almost all diseases, with the few exceptions above named, an abundant supply of light is of the first necessity. It is thought by some very careful observers of disease that our great national scourge of scrofula is probably as much engendered by want of light as by want of fresh air. Without light, the mind undergoes degeneration as well as the body, and the body itself soon becomes stunted or deformed, and easily falls a prey to disease. We have reason to be thankful that the houses which are now built to be inhabited by the rising generation, are not liable to such a monstrous piece of exaction and absurdity as the window tax, an imposition which was no less prejudicial to the health of the community than a disgrace to the memory of those who devised it.

QUIET.—How often does it happen that a doctor leaves his patient with the injunction that he is to be kept perfectly quiet, to which the patient assents, and the nurse promises obedience: and yet, no sooner is the doctor's back turned than the sick-room, instead of being sacred and unmolested, is made the scene for the reception of a levée, or for the transaction of all manner of domestic business. How often do troops of sympathising friends force their way into its precincts, and each in his turn require to know the nature of the disease, and of the treatment which is being carried on, relating, at the same time, their own wearisome experiences of what they fancy to be precisely similar cases, and contrasting and commenting freely upon the different plans pursued, with the effect, perhaps, of not only grievously fatiguing the patient, but of filling his mind with groundless anxiety and alarm. It is, or it ought to be, quite sufficient to prevent such intrusions merely to say, that all visitors are prohibited by the medical attendant. The writer is in the habit of leaving a *written paper* to be shown to visitors. But there are a great many other reasons why the patient is to be kept quiet and undisturbed. Everything connected with the arrangements for his comfort, where practicable, should be done outside the sick-room, so that he may not be annoyed by any arrangements of a noisy character which can be avoided. The very least sudden or unwonted noise may alarm and seriously injure a patient suffering from nervous disease, and any noise which suddenly wakes a patient out of sleep does him real harm. Possibly hours may have been spent, and powerful doses employed for the purpose of lulling a patient to sleep, a sleep on which, perhaps, his recovery may hang, when some thoughtless and indiscreet person may spoil all by suddenly awaking him. A patient once roused from this kind of sleep, sometimes awakes excited, frightened, almost terror-stricken, and is sent to sleep again with much greater difficulty than if he had never been asleep at all.

It is not the absolute loudness of a noise which is injurious, but there are some noises which are exceedingly irritating, especially to the excitable ears of a sick person. Such are all rustling of dresses, whisperings, shakings, rattlings, jarrings of all kinds, the creakings of doors or of shoes, and the rattling of windows; the jarring tread of people overhead, or running up and down stairs, is frequently a source of great irritation to the sick man, who will tell you that he feels every step go through him. Patients suffering from an acute attack of gout have been thrown into an agony of pain by the tread of some one hastily crossing the room. As a rule,

children are not so easily disturbed by noises as adults; and it is astonishing how very young children will sometimes sleep in the midst of noises all around and about them.

It is an axiom insisted upon by all writers on the subject of nursing, that no attendant upon the sick should ever wear a rustling silk dress. The gown should be of a soft limp material, and, if we may venture to allude to the subject, we may say that crinoline is nowhere more out of place than in the sick-room.

READING ALOUD TO PATIENTS.—To some this is torture, while to others it is pleasant and soothing. Some will say, "Read me to sleep," and will actually soon drop off into a doze after the first few pages of some sufficiently uninteresting work has been read to them. It must be admitted, as a rule, that most people read very badly, and that conversation is more adapted for the sick, because the tone of the voice is more natural and pleasing when talking than when reading and reciting.

Care should be exercised in reading stories to sick children, especially to those of a nervous excitable temperament, for they often become interested in the story, and will beg it to be continued, little dreaming of the after effect upon their minds. The consequence is, that at night the scenes of the story are repeated, with the most grotesque variations, making a sort of night-mare or night-terror, the effect of which is often to prevent sound sleep, and to exhaust the little patient's strength, besides seriously adding to the nervous symptoms which may be present.

SYSTEM AND PUNCTUALITY.—Perhaps nothing is more effectual in securing quiet rest for patients than proper method and system in arranging and carrying on all the petty details of sick-room management. As an instance of what is meant, it will be easily understood what a much better prospect of quiet rest a patient has who gets his meals and his medicine regularly, and all his little wants attended to at proper times, and whose wishes are anticipated, planned, and provided for, than one who is attended to by those who are stupid and incapable, who blunder through their work without any fixed plan or order, and who continually disturb the patient at the most unseasonable time, by asking him, What will you take now? &c.

THE NURSE RESPONSIBLE FOR THE CARRYING OUT OF DIRECTIONS, NOT THE PATIENT.—When full and proper directions are given by the medical man, and these, it may be observed, should always be received by *one* person, who should be responsible for their being carried out, they should be acted upon without the patient having the trouble of thinking for himself about them. Nothing wearies and exhausts a patient more than having to *think*. He should be freed from all responsibility. He should be allowed to have nothing weighty on his mind. He should not be burdened with the fear of forgetting anything, and should have the comfortable sensation of having resigned the management of his case into other hands, in which he is to be, for the time, a mere passive agent. He should not be allowed to tax his memory by trying to remember the proper times for taking his medicine, or how it has acted; but should trust all these details to his attendant.

SHOULD THE PATIENT BE TOLD OF HIS DANGER?—A question here arises respecting which there is much difference of opinion, viz.:—When there is danger, should the patient be told of it? or is there any hazard in so doing? Now, it may be said that of late years there has been a considerable change in the practice of medical men with regard to this point, and much prejudice which formerly existed has been swept away, it is hoped, for ever. It is now pretty generally known that it rarely, if ever, does any harm to make a patient acquainted (in a proper manner, and at the proper time), with the nature of his case, and with the opinion of the medical advisers, as to the probable issue of it.

We are forced to admit that the contrary practice of former years originated, at all events,

in the desire to adopt this convenient excuse for the concealment of ignorance as to the real nature and probable termination of the disease. The ridiculous airs of profound learning and mystery assumed by medical men in old time has been well ridiculed and burlesqued by many writers, and by none so ably as by Molière in his *Médecin Malgré lui*, and the *Malade Imaginaire*.

Even now the strongest possible prejudice prevails in the public mind against telling a patient that he is the subject of heart disease. But provided that the communication be made with the view of instructing and guiding the patient in the treatment of his case, it will be found that, instead of doing harm, it may be the means of prolonging his life, and of increasing his comfort and happiness. The writer is, and has been, acquainted with many persons who have carried about with them a mortal disease which might put an end to their existence at any moment, and he cannot recall a single instance in which the patient was not the better for the knowledge of the facts of his case, or in which that knowledge was productive of any but the best results to both body and mind.

It is no doubt one of the most painful tasks that falls to the lot of the physician to pronounce that there is no hope, when such a verdict is evidently quite unlooked for, and when the patient, instead of expecting such melancholy tidings, is anticipating nothing but a speedy recovery. Young men and young women, it may be, in the prime of life, with a brilliant future apparently in store for them in this world, are sometimes found to be suffering from acute disease, which has come suddenly upon them, and which has already advanced so far as to leave no chance of life, while all the time no thought of real danger has as yet crossed the mind of one who, it may be, in a few days, or perhaps in a few hours, will be no more. Under such circumstances, when the physician has made up his mind as to the probable issue of the case, it is but fair,—it is only honest, when appealed to,—though with all due caution, to prepare the mind to receive tidings of the great change which is awaiting. Indeed, it is cruel to waste or to lose any unnecessary time, because long before death actually takes place the mind may be clouded, and the attention and faculties so engaged in the struggle against the great destroyer, that the mind loses its fine natural susceptibility to external impressions, and is utterly unable to deal with any subject, connected either with this world or with that which is to come. Here, as in every other relation in life, medical men, as well as the friends and relatives of patients, ought to follow the golden rule of doing unto others as they would be done by; and we think it would be generally agreed that no one would wish to be left in ignorance upon a matter of such momentous importance.

And here it may be said that, to the writer, it has often appeared needlessly cruel, and very unwise, studiously and mysteriously to conceal from children the fact that they are not likely to recover from a mortal disease. Surely it is a mistaken kindness, and one that argues little for the proper understanding which ought to exist between mother and child, to hear some parents, up to the moment of their child's death, assuring their child that it will soon be better. Any one who has seen the opposite course employed with children who have been sensibly brought up, will have been astonished at the very different effect upon their minds, and at the dignity, fortitude, and good feeling exhibited by many children at such times.

THE MANAGEMENT AND TREATMENT OF DELIRIOUS PATIENTS.—The reader is referred to the articles *Delirium*, *Delirium Tremens*, *Alcohol*, *Dipsomania*, *Intemperance*, *&c.*, for information as to the different kinds and treatment of delirium; but here it will be necessary to give a few general directions which may be of use in the sick-room. And first of all, it must be remembered that, in acute diseases, in fevers, after child-bed, &c., delirium, even of the most dangerous, violent, or suicidal nature, may develop itself so suddenly that the attendants may not be able, from want of sufficient warning, to prevent serious consequences. It will therefore be needful for those who have charge of the sick to carefully note and report symptoms which may arise in the course of the disease, such as wandering, incoherence, delusions upon any subject, or any outré act or speech which might

lead one to suspect the giving way of the mental powers. As a rule, when such symptoms have once manifested themselves, it is not safe for the patient to be left unwatched; and no article should be left within reach with which he might inflict an injury upon himself or others. Neglect of such precautions as these has, to the great grief and sorrow of all concerned, been followed by most serious consequences. Patients in whose family there has been no hereditary taint of insanity, and who themselves have never exhibited any trait of mental aberration, have, while the subjects of certain diseases, been known to get out of bed and throw themselves from the window. In the delirium of fever, patients, if unrestrained or unwatched, would oftentimes destroy themselves.

The cunning of maniacs and insane persons is proverbial; and while the "restraint system" is every day becoming more and more obnoxious in the eyes of medical men, it is much better that time and care should be expended in keeping a constant watch over patients who have exhibited a tendency to delirium, than that the slightest risk to life should be incurred.

In the treatment of all kinds of delirium, as in the treatment of the sick generally, patience, kindness, and firmness are the chief requisites on the part of the attendant; and where these are to be met with, cases will be very few and far between where anything like artificial restraint will need to be employed. No doubt it does sometimes occur that it is better the patient should be made to feel that he is overpowered, and that all his efforts to get loose are unavailing. Under such circumstances, restraint properly applied, without violence or disturbance of any kind, is in itself one of the very best means of quieting a furious patient, who will often drop quietly asleep after finding that his struggles lead to no result.

A careless attendant, when a patient is safely secured in the strait-jacket, or by other means, has been known to leave the patient for a length of time unwatched, thinking that now he is safe, and may shift for himself for a time. But this is very wrong; for the patient, especially if some of the apparatus alters its position in his struggles, may seriously injure himself, or may even, as has actually been the case, be found strangled.

In adjusting restraints upon the ankles, wrists, and other parts of the body, the greatest care should be taken not only to see that they are properly applied at the time, but to examine them repeatedly, in order to see that there is no chafing of the skin caused by the violent efforts to get free. Neglect of this precaution has been followed by the formation of deep sloughing sores, with other serious injury. Nothing is more foolish or reprehensible than when a patient is rambling in his talk in an incoherent manner, which may happen to be amusing to those who are standing by, to take up the thread of his wanderings, and encourage him to talk upon the subjects which, no doubt, are crossing and recrossing his brain in grotesque disorder. A kind, grave, firm and sensible nurse never appears to greater advantage than when dealing with a case of this kind, whereas one who reasons, talks, and attempts to argue with the patient upon his delusions, is sure to aggravate his disorder.

Sometimes, without the slightest assignable cause, patients suffering from delirium will be suddenly seized with the most violent aversion to, or dread of those who have been kindest, or are nearest and dearest to them. It is always best in such a case at once to remove the person from their sight, in which case the dislike or fear may very likely at the next visit be completely changed into sentiments of an opposite description. In the progress of disease, patients are much more liable to attacks of delirium at night, or during the early hours of the morning, and nurses cannot be too much cautioned as to the fact, since patients who have appeared to go quietly to sleep at their usual bed-time have, in the course of a few hours, suddenly awoke in a state of, for the time, raving madness.

No patients of this class require closer watching than those who are afflicted with suicidal melancholy. Such a one will often remain for days without saying a word to any one, and requires to be induced to perform the ordinary duties of life, to take his food, or even to change the posture which he has originally assumed. The despondency and depression of spirits are so intense, that, while they continue, the patient cannot be left with safety a moment, while he has the means of putting a termination to his existence. When he finds that he is closely

watched, and that it is impossible for him to carry out his determination, he will often, with a sinister cunning characteristic of his disease, throw aside his dull and morose manner, and assume a cheerful and contented deportment for days, or even weeks, in order to lull the suspicions of his friends. At the end of this time, however, when the vigilance of his attendants is relaxed, he will carry out the intention which he has probably premeditated and brooded over for a length of time, and will accomplish his own destruction in any way that may be in his power. Intending suicides will attempt to destroy themselves in various ways, even so as to baffle all the ordinary precautions. For instance, they will set fire to their clothing, they will attempt to strangle or hang themselves by every conceivable method, they will attempt to poison themselves with their medicine, or with anything else, and will even try to suffocate themselves by stuffing their clothes into their mouths, so as to prevent breathing.

One of the most embarrassing features in the management of insane or delirious patients is, that they sometimes absolutely refuse to swallow food of any kind. When this is the case, the attendant should be careful to tempt the patient with different articles of food; when this method fails, it will be necessary that the medical attendant should inject food into the stomach, by means of the stomach pump, such food being, of course, fluid, and of a highly nutritious description, such as different mixtures, containing milk thickened with farinaceous food, strong beef or mutton tea, milk, wine, brandy, cod-liver oil, &c. But it may happen that it may not be possible to secure the services of a medical man for this purpose, and at all times, in the case of a private patient treated at home, it is a very arduous and a troublesome process, that of feeding a patient three or four times a day, and one involving very frequent attendance on the part of the medical man. Therefore, in extreme cases, or where the services of the doctor cannot be procured, a long flexible tube might be passed through the nose, and down by the posterior nostrils, into the gullet. To the end of this a funnel is attached, and liquid food of the kind mentioned above being poured into the funnel will descend into the stomach, simply by force of gravitation. Failing this, nutritious enemata of the same kind as indicated above may be slowly injected three or four times a day, till other means can be adopted.

An attendant upon a delirious or insane patient should never make promises to him without keeping them, should listen patiently to the story of his wrongs, grievances, and complaints, instead of treating them with contempt, and should, as a rule, never argue or reason with him, but as far as possible, even under the most severe provocation, preserve an equably kind, cheerful, and firm manner, by which means an influence will be acquired over all kinds of nervous patients, never to be gained by any amount of severity, punishment, violence, or restraint.

Presence of mind, and confidence in our own resources, exert a great moral influence over the insane, and have often been the means of rescuing an attendant from sudden peril in his intercourse with them, as well as of saving the unhappy creatures themselves from injury or destruction. The following anecdote well illustrates this :—

A patient in a high state of delirium eluded his keeper, and, running upstairs to the attics, escaped through a window opening upon the roof of the house. His keeper followed him out upon the slates, and upon seeing him, the maniac shouted, "Look here, I will make you jump down to the ground." With the utmost readiness and presence of mind the attendant replied, "Oh ! any one could do that, but if you will come down with me, I will show you that I can jump *up*." The *ruse*, which certainly, under the awful circumstances, was quite justifiable, completely succeeded.

One other anecdote will suffice to illustrate the good effects of presence of mind in dealing with the insane. A medical friend of the writer's, the governor of an asylum, was once surprised alone, by a visit from a patient who had, for some entirely groundless reason, taken a great dislike to the doctor, and fancied that he was the cause of all his misfortunes. "Now," said the patient (who was an immensely powerful man), "I have caught you, and you will find resistance of no avail, for I have the strength of three men." To this the doctor, looking him steadily and unmovedly in the face, replied at once, with the greatest coolness, "There you

are mistaken, for I have lately had given me the strength of *ten* men, and if I chose I could double you up, and throw you out of the window." Immediately the current of the patient's thoughts was changed, and he began eagerly to inquire about the supposed miraculous gift of strength, and ever afterwards continued very much attached to his medical friend, whom he looked upon as the most remarkable man of the age.

There are few offices which require more good sense and delicacy of feeling than that of a nurse, because every nurse ought to be one who can be depended upon as "confidential." To her may be entrusted, either as a matter of necessity, or inadvertently, secrets which may involve the peace and comfort of families; and the qualities of such a nurse will be thoroughly tested in attending upon any cases of delirium, and mental disease generally. The greatest prudence and discretion will be necessary to avoid gossiping and talking, and it may be laid down as a rule, that any nurse who discloses what takes place in the sick-room, or who answers any questions respecting her patient or his friends to any except those who have a right to ask them, is quite unfit for her business. Truly, no one should venture upon undertaking the responsible duties of a nurse who is not prepared to carry them out in strict honesty of purpose, and who does not hope to be supported in them by a spirit of religious devotion.

It seems scarcely necessary to caution any young and inexperienced nurse against making the delusions and fancies, or the delirious freaks, of patients under certain circumstances, matter of amusement to herself or her friends. Surely it must be always a melancholy thing to contemplate a mind over which reason has lost its sway, and where the different faculties are permitted to run riot instead of properly controlling one another.

THE ADMINISTRATION OF FOOD AND MEDICINES.—For all information on this subject, the reader is referred to the articles *Cookery for the Sick*, *Nurses*, *Medicines*, *&c.*, in the body of the work. It is very difficult to get inexperienced persons to pay attention to *regularity* in the giving of food to sick people, and also to study the hours at which food can be taken by the patient. The stomach of a sick man is so very delicate and capricious that it requires to be carefully observed as to these particulars.

The stomach is often so enfeebled by disease that it cannot even take liquid nourishment, except in the smallest quantity at a time, and at proper intervals. For example, how many patients will tell a medical man that they cannot take milk, that it always makes them worse, that it creates the bile or the phlegm, or something of that sort, whereas, the fact is, that there are very few, if any stomachs, that cannot bear milk, provided it be properly administered. It is not to be wondered at that a delicate stomach, during disease, should reject milk, if a large draught, say half a pint, or a pint, be taken all at once, and without any preparation. People forget that the stomach requires to be educated, oftentimes, before it will bear even those sorts of food which are most likely to be of benefit. Many patients have been kept alive almost entirely upon milk who were well assured beforehand that they could not take it at all. But it should be given in small quantities at a time, and if there is much acidity a little soda or carrara water or lime water may be added to it, and in cases of great debility, a little rum or brandy. Patients who have been sick after taking milk, and who have seen that they have vomited the milk in a state of curd, often think this is conclusive evidence that milk must disagree with them, not knowing that milk must always undergo this change, by the acid of the gastric juice, before it can be digested or assimilated.

Some of these remarks apply also to beef tea, mutton tea, &c. A small quantity frequently administered, such as a tea-spoonful every half hour, will often be retained, when a large quantity, say a half-pint every two or three hours, would be rejected by the stomach. The doctor has very frequently to listen to the oft-repeated complaint, on the part of patients, that the nurse is always wanting them to take something, and that they can get no rest: and this is often very well founded, for a stupid nurse, without any system or method, generally contrives to be always tormenting the patient with something, whereas, by judicious arrangement of time, the patient could be got to take twice as many things with half the amount of fatigue.

In critical cases, life may depend upon the careful and punctual administration, not only of stimulants, but of nourishment, and it will be readily understood that, when the stomach is only capable of receiving a small amount at a short interval, if that interval be prolonged the opportunity of saving the patient may be lost.

In cases of sickness of old standing, perhaps connected with disease of the digestive organs, there is sometimes so great a repugnance to food of any kind, and so little power of appropriating it, that the patient, if left in the hands of an unskilful nurse, would certainly die of starvation. In order to prevent this, it will be the duty of those who have the superintendence of such matters to exercise all the ingenuity of which they are capable in preparing and cooking the patient's food; in giving it to him at those times when exhausted nature most requires it—for example, during the night or in the early morning, and in changing and varying the time of meals according to the state of the appetite or inclination of the patient. It may be repeated here that, both to avoid the danger of disgusting the patient and in order to keep the sick-room at all quiet and in a wholesome condition, no cooking must ever be done there, nor must any food be left about. It is too common to find a room littered about with half-consumed puddings, jellies, oranges, apples, grapes, &c., all of which should be kept out of the patient's sight, otherwise he will not relish them half so much when he is able to take them. It can scarcely be too much impressed upon the mind of a nurse, that she must plan and regulate the patient's diet according to system, and have everything prepared to carry out the proposed arrangements. It is the very refinement of cruelty to torture a patient with questions as to the arrangement of his diet, since nothing is more necessary than that the mind should be perfectly at rest, and free from all thought and responsibility on such subjects. Wherever practicable and desirable, it is a good rule to have written directions from the medical man as to the administration both of food and stimulants.

Attention should be paid to the quantity, or rather to the bulk, of food or drink which a patient may properly consume. Brandy and wine, when ordered to be taken with water, are sometimes so "drowned" that the enormous quantity of fluid dilutes unduly the gastric juice, and weakens the already enfeebled digestive power of the sufferer. Beef tea, broths, and farinaceous foods are also often made too thin or too bulky. In connection with this subject, let it be kept in mind that nothing disgusts a sick person more than to have large quantities of food put before him. When a little gruel is ordered, the nurse perhaps, instead of a cupful, brings a basinful, with the effect of thoroughly nauseating the patient by the sight of it.

By using the simple apparatus figured in article *Bed-Room* a cup of beef tea, or mutton tea, or something of the kind, may always be kept at hand warm, and it is wonderful how refreshing it proves to those who are wearied and exhausted by disease, and who lie awake in the early morning, ready to "sink through the bed," from sheer weakness. They will often go to sleep directly after having had warm and strengthening refreshment. Even a cup of tea or of coffee, at such times, will soothe and comfort a patient, and therefore, the means of procuring these readily should always be available.

Some people have the idea that calf-foot jelly is one of the most nutritious articles that can be given to a sick person; consequently it is, and has been in great favour in the sick-room, and has almost been looked to as a sovereign remedy in cases of desperate weakness. Others have gone so far as to state that *it has no nutritive power whatever*. The truth, however, lies as usual between the two extremes. Pure gelatine, if given alone without any other article of food, has no power to support life; but when given *along with others* it is a substance which helps to build up, and to supply the waste from the animal frame. Moreover, it is a convenient vehicle for wine and for nutritious articles of food. Sometimes, and in many diseases, it is agreeable to the patient, and easily taken, so that there is no reason whatever why this old favourite should be entirely banished from the sick-room, as suggested by some people.

NUTRITIVE INJECTIONS.—It occasionally happens that food of any kind what-

ever is rejected for a time by the stomach. This occurs in disease of the organ, and in the course of other affections, after severe operations, &c. In such cases (generally of great extremity) it becomes necessary to nourish the body by means of fluids, introduced into and absorbed by the lower bowel. Beef tea, milk, brandy or wine, and other like substances, are given in this way. The great rule to attend to is not to give them quickly, otherwise they are sure not to be retained till any quantity is absorbed. They should be given slowly, and without causing any irritation. An ordinary enema tube of any kind may be used—the simpler the better. Difficulty of retention may be counteracted by the addition of five to ten drops of laudanum if admissible. Such injections too should always be small in bulk.

MEDICINES.—It need scarcely be said that the first duty of the nurse, as regards medicines, is to attend to the regularity with which they are given, seeing there are many remedies which, unless given according to system, do not present their characteristic action, and, consequently, the design of the physician is frustrated. In most diseases, however, sleep is of the utmost consequence, and, as a general rule, it may be said, a patient should never be aroused from slumber on account of his medicine, which may be given to him as soon as he awakes. Medicines are disagreeable at any time, but they are much more so when a person is roused from a refreshing sleep to have them administered.

As regards sedative or soothing draughts to be given at bed-time, one caution is necessary. Unless the patient is kept perfectly quiet, and nothing extraneous allowed to disturb him, the effect of the sedative draught will be to excite instead of to compose him, therefore it should never be given till all preparations for sleep are completed.

Medicine is generally given to produce some effect which can be observed by the senses, it is therefore of the first necessity that the nurse should mark this, and be able to communicate it to the medical attendant at his next visit. For instance, some medicines are given with a view to produce sleep or perspiration, or increased action of the bowels or kidneys, and the effects of prescribed remedies in these aspects must all be carefully noted by the nurse.

When medicines are ordered in drops, it is better to avoid the troublesome and uncertain process of dropping from the lip of the bottle; it is well known that fifty drops from one bottle may only equal in bulk thirty drops from another, therefore the drop-measure or minim-metre ought always to be used.

Many substances are employed to remove the nauseous taste of medicine, especially in the case of children, but, as a rule, sweet things, so generally given, are objectionable; and experience has proved that nothing is so effectual as a piece of dry biscuit or oatmeal cake.

Great trouble is often experienced in administering medicines to children, and where there is more than usual difficulty, the "medicinal spoon," recommended by Dr. Anthony Todd Thomson, may be employed.—See *Bed Room: Requisites for the Sick.*

It is astonishing how many people, even grown up people, have a difficulty in swallowing pills. Any one, however, can readily acquire the habit of practising with pills made of bread crumbs; and when it is considered how very desirable it sometimes is that medicines should be given in this form, it will be well that any one who suffers from the sort of nervous difficulty alluded to should endeavour to overcome it.

Effervescing mixtures are generally agreeable to the palate of the patient, and are besides often serviceable in allaying irritability of the stomach. Care should be taken to give them while they are actually in a state of effervescence, and not when the carbonic acid gas has evaporated, or, in other words, when they are flat. The powder of citric or tartaric acid, or the lime juice, if that be used, should, first of all, be put into the glass; then, when the patient is ready, the dose of the medicine should be poured over it, so that it may be taken while in a state of brisk effervescence.

When medicines are ordered containing chalk, magnesia, or insoluble powders, which by their gravity sink to the bottom of the phial, a label should accompany the bottle directing it to be shaken before each dose of the medicine is poured out. If this is not attended to all the active

ingredients accumulate at the bottom, the patient takes an almost inert mixture for, perhaps, a couple of days, and then gets an overdose at the last. This direction is no less to be attended to in the case of light medicines, lighter than the water in which they are mixed, and which *float at the top of the bottle.* For instance, prussic acid, which is often prescribed in medicinal doses, is apt to float at the top of any mixture containing it, and if the bottle be not properly shaken, as directed, the patient might get too large if not a poisonous dose all at once. Sulphuric ether is still more likely to float.

Any person of intelligence can easily understand that it is impossible to give all the directions necessary for the continued and proper administration of particular medicines upon the label of the bottle; and, therefore, we would caution nurses not to listen inattentively to the directions of the medical man, trusting that they will find it all written out for them there. As an example of what is meant, we may instance the case of a patient taking tartar emetic. The doctor may, perhaps, direct that it is to be discontinued, or to be given in a smaller dose if it causes sickness after the third or fourth dose, while he informs the nurse that he will not be surprised at its causing sickness at first, and trusts that it will be taken afterwards without that effect. He may warn the nurse that it may produce undue action of the bowels, in which case he may wish it stopped; or, he may explain to her the exact effect which he wishes to be produced, and may direct the remedy to be continued in a larger or smaller dose, and at a longer or shorter interval. Now it will be seen at a glance that it is impossible to convey all this upon the label of a bottle, and yet the successful issue of the case may depend upon the acumen of the nurse in appreciating, and her skill and faithfulness in carrying out the doctor's orders.

PECULIARITIES OF PATIENTS IN REGARD TO MEDICINES. — It is well-known that some patients are peculiarly affected by certain remedies, and it is highly desirable that any such *idiosyncrasy* should be reported to the physician, if it is known from former experience to exist. There are patients who cannot take certain remedies at all without experiencing peculiar effects quite foreign to the usual recognised action of the drug. For example, opium in some persons causes intolerable itching of the skin, or spasms of the stomach, or sleeplessness; and ipecacuanha acts upon some persons in the same way as if they were affected with what is known as hay asthma or hay fever. Again, it not uncommonly happens that a remedy which ought to act, and which does generally act, say, upon the kidneys, shows a tendency in some persons to "run off" by the bowels, and so forth

INSPECTION OF THE EGESTA BY THE MEDICAL ATTENDANT.— In some cases it is not at all necessary for the physician to see the excretions of his patient, and it may be remarked, by the way, that some fussy people have most ridiculous notions on this subject, and seem as if they scarcely thought the doctor had earned his fee without examining the mysteries of the night stool on every visit. But, on the other hand, cases constantly do occur in medical practice, where it is absolutely necessary that the excretions should be inspected, and others where, in addition to this, their quantity must be noted from day to day. These details must not be looked upon by the attendants of the sick-room as in any way derogatory or offensive, because upon a proper performance of them may depend the issue of the case for life or death, inasmuch as without them it is quite impossible for the physician to have any idea of the effects of those powerful remedies which he is using to stop, to promote, to diminish, or to increase any one or more of the excretions of the body. Let us give an example of this:—In the well-known disease diabetes, powerful remedies are employed, and an entirely peculiar form of diet prescribed, in order to check, if possible, the enormous amount of urine containing sugar which is draining away the patient's strength day by day. It will be necessary, probably, to weigh the patient, so as to judge whether he is gaining or losing flesh; and, in addition to this, to note daily the amount of his excretions, part of which will be directed to be preserved, so as to be tested by the medical man. It is found that such

patients improve under one plan of treatment and retrograde under another; it will, therefore, be easily seen how important it is that these details should be so carried out that the progress of the case for better or worse may be determined. Another example—In all forms of dropsy, but especially in that depending upon Bright's disease of the kidneys, a daily note should be kept in a book or in a paper suspended by the bedside, of the amount of the patient's excretions; that is to say, at all events, of the quantity of the urine and of the number of the stools; for by this means the physician can see at a glance how his patient is being affected by the diuretic or purgative medicines which are given to remove the dropsy.

On daily noting the quantity of the urine in particular diseases, it will be necessary to remark, for the guidance of the physician, whether the patient has perspired profusely or has had diarrhœa, because without these careful observations the diminution in the quantity of urine, which will probably coincide with them, might be put down to the agency of remedies instead of the real cause.

INSPECTION OF VOMITED MATTERS AND OF EXPECTORATION.—It need scarcely be said that all vomited matters and everything which is spat up or "hawked up," should be preserved most carefully for inspection, instead of being thrown away, as is too commonly the case. No amount of description from a non-professional person can take the place of inspection, seeing it requires special training and education in order to observe these things to any purpose, and to be able to discover their exact nature.

None of the excretions are to be kept *in the sick-room*, but are to be preserved for inspection in a porcelain vessel, with a cover of the same material; either in the open air or in an outhouse; or, at all events, in another apartment, the windows of which should be kept open if possible. The importance of this rule will be admitted when it is reflected that in most contagious diseases the exhalations from the patient play the chief part in propagating the malady—and in the disease known as gastric, typhoid, or enteric fever, it is by *the stools* that the fever is communicated. When it will not interfere with the examination, a little of some disinfecting or deodorising fluid may be put in the bottom of the night-stool or bed-pan, or, at all events, they can be washed or rinsed out with it each time after being used.—See *Disinfectants.*

SYSTEM AND MANAGEMENT OF DETAILS.—It invariably happens that when the care of a sick person is undertaken without proper arrangements being made as to the economy of time and strength, there is a waste of both, and the attendants are knocked up and thoroughly unable to perform their duties, while the sick man is neglected, and everything goes wrong. It is not to be supposed that any nurse can remain with a patient and perform the duties required of her day after day, and night after night, without intermission. It is simply absurd to expect it, and yet how many people practically do so, or at all events, which is quite as bad, neglect making the proper arrangements for a change of attendants. In hospital practice, of course, every provision is obliged to be made for this, and consequently there is a staff of day nurses, and night nurses, or, what is still better, those who are engaged throughout the day for a week at a time take a turn at the night work, and *vice versâ;* but in private practice, when people engage a nurse, they seem to expect that if they require her services during an illness, she will be at her post night and day. Now, as we have said before, this is simply impossible, and therefore it will be necessary that the nurse must sleep or have leave to go to bed, either during the day, or during the night. In critical cases it is important that a person of experience should be with the sick during what are called the small hours, that is to say, early morning, because it is well known that at such times there is a liability to great depression of the vital power. With regard to a substitute, however, one point deserves special attention: it is absolutely necessary that when she goes upon duty, and undertakes to be responsible for the conduct of the case, she should receive instructions of the minutest kind upon all points as to medicine, food, &c., and not only so, but that she should

receive at the same time information as to all that has lately taken place, so that in the event of the medical man making a visit in the interval, she need not reply to any of his queries "I don't know,"—or, "the nurse never told me." The nurse should be particularly careful to give to her substitute the minutest information as to everything that has taken place since the last visit of the doctor, and when the substitute goes off duty again, she should in her turn report to the nurse everything that has occurred during her absence. In this way responsibility is not divided, and the doctor is enabled, as he is always entitled, to receive from one person, the person who is on duty at the time, full particulars as to the progress of the case. It is very aggravating when the doctor puts such a question as—Has he had any fits since I was here? that the nurse should reply, "Not when I was with him, sir," forgetting that it is the nurse's duty to know and to be able to report everything that has taken place.

Many cases come to a bad and unsuccessful issue through neglect of the golden rule that one person, and one only, should be responsible for the conduct of the sick-room. For instance, how will it be possible, if there are several people in a sick-room, to maintain quiet and order, unless one is in charge, and has authority to dictate as to the treatment of the patient, and to see that the orders of the doctor are carried out. It may be that one of the patient's friends, either not knowing, or, in his or her self-conceit, not approving of the directions of the medical man, may fancy that a patient who was ordered to be kept quiet would be the better of a little cheerful conversation, or that some new method of treatment might be entered upon. None but those accustomed to sickness can have any idea of the popular prejudices and fallacies with regard to it, or form the slightest notion of the confidence with which advice is tendered by those who are ignorant of the premises, and are utterly incompetent to give any opinion upon the question.

The absurdity of the nature of the advice and confidential communications which are daily tendered by the public to their sick friends, is aptly illustrated in a footnote to Miss Nightingale's *Notes on Nursing*. "I have heard a doctor condemned whose patient did not, alas! recover, because another doctor's patient, of a *different* sex, of a *different* age, recovered from a *different* disease, in a *different* place. Yes, this is really true. If people who make these comparisons did but know (only they do not care to know) the care and preciseness with which such comparisons require to be made (and are made) in order to be of any value whatever, they would spare their tongues. In comparing the deaths of one hospital with those of another, any statistics are justly considered valueless which do not give the ages, the sexes, and the diseases of all the cases. It does not seem necessary to mention this; it does not seem necessary to say that there can be no comparison between old men with dropsies and young women with consumptions, yet the cleverest men and the cleverest women are often heard making such comparisons, ignoring entirely sex, age, disease, place—in fact, all the conditions essential to the question. It is the merest gossip."

It will be granted that all such feeble counsellors and advisers should be rigorously excluded from the sick-room, and the person of authority over it will do well to keep them in remembrance, for they are a most intolerable nuisance to the sick man.

It seems scarcely necessary to say, that while strangers, gossips, and busy-bodies are kept strictly in check—it will often, also, be necessary in special cases to keep a watchful eye upon the admission of certain letters and newspapers (not to say telegrams and messages), which might contain intelligence often of an alarming or depressing nature. Bad news is always depressing, but especially so to the sick, who, when capable of being interested in conversation, should, if possible, be regaled only with topics of a light and cheerful description, and should be encouraged to look forward to the prospect of a happy future for themselves and for those in whom they take an interest.

FLOWERS IN THE SICK-ROOM.—There exists in the minds of many, a popular, though an ill-founded, prejudice against flowers in a house, the idea being that they exhale poisonous odours and are detrimental to health, but this is not the case; and although flowers

with a heavy sickly odour should never be admitted into a house at all, those of a brilliant and pleasing colour, either with or without agreeable odours, are always much appreciated by the sick. In some of our large and best conducted hospitals, flowers are regularly arranged in the wards. They are sent by railway by some of the country families in the neighbourhood from their conservatories, packed in tin boxes, and we feel quite sure that the liberal donors would be more than repaid if they could witness the joyful and eager looks of the pallid faces clustering around the newly arrived box and bestowing words and glances of heartfelt admiration upon its treasures as they are one by one drawn forth.

People who live a great deal in the country can scarcely form any idea of the instinctive longing for, and the intense pleasure felt at the sight of plants and flowers of almost any description, which is experienced by the weary and careworn artizan who spends every day of every year in the midst of our large manufacturing towns. Those who live constantly amongst and every moment of their lives breathe an atmosphere contaminated by dust, and smoke, and foul air, have the keenest delight at seeing and smelling a flower, which may recall to them some loved scene of their childhood, and may serve to awaken the highest and purest feelings, as well as help others to forget, for a time, the scene of their present weary toil. It has been found, then, that the patients in the large hospitals of our crowded towns have derived great benefit, both mental and bodily, from the introduction of flowers into the sick wards, and we feel sure that every medical man of experience will acknowledge that their presence in the sick-room, especially of a town patient suffering from a chronic disease, is, perhaps, one of the most valuable adjuvants to his treatment that he can possess. Flowers of a brilliant red colour have an exhilarating effect upon the mind of the patient, and should always have a preference given to them when there is a choice.

PICTURES AND PRINTS IN THE SICK-ROOM.—Several years ago, in some of the leading papers, the attention of the public was drawn to the fact, that the poor in our large hospitals were confined in the most cheerless wards or rooms, absolutely without any attempt at decoration; and it was suggested that private families might make a very acceptable donation to the governors of hospitals by presenting them with prints, pictures, &c.—chromo-lithographs, or those of a brilliant colour, being thought preferable. It was objected to this, *mirabile dictu*, even by some of the most eminent of the profession, that the presence of pictures in the wards was apt to suggest images to the mind of the sick man, which might, at certain seasons, serve as food for his delirious fancies. It has now been proved by experience, however, that this is not the case, and that a patient is much more likely to conjure up for himself, at a time of delirium, frightful images from the bare walls by which he is surrounded, than from any of the beautiful and interesting objects with which they may be clothed. We, therefore, strongly advocate pictures for the sick-room, and would decidedly give a preference to those with a pleasing and simple subject, and to such as represent familiar incidents in domestic and social life. Even for the poorest class of patients such may be most readily obtained at a trifling cost; as, for instance, the large chromo-lithographs published by the *Illustrated London News* and the *Graphic*. They may be either hung up as they are, or pasted upon a card board and varnished, or which is of course better though more expensive, framed and glazed.

During convalescence from illness, there is often a tendency in some patients to despondency and depression of spirits, accompanied by loss of appetite, and at such times when they are confined to the sick-room, and can't be allowed to go beyond its door, it is surprising how their recovery may be hastened, and their imprisonment rendered endurable, if not agreeable, by a little attention to the *æsthetics;* not the least of which is to furnish them with nice books, pictures, flowers, &c.

For children, pictures are more especially necessary, not only on the walls, but they must have picture books which they can turn over leaf by leaf for themselves. This keeps them employed and amused, and is a great economy of the nurse's time and strength. The picture books should be made of calico, or some other material which cannot be easily torn, if they are to be given to young children.

THE WALLS OF THE SICK-ROOM.—Several points require special attention upon this head, in the choice of a sick-room. In the first place, green papers are to be avoided, as many of them contain arsenic in quite appreciable quantity, and the exhalations from them being breathed night and day by the patient, may give rise to poisonous symptoms. Secondly, papers which have been put on with bad size, or which have a nasty smell, are noxious in the extreme. A room, the walls of which are oil painted, and which can consequently be well dusted or washed, is perhaps the most suitable that can be found in a private house. In hospitals and large establishments, where the air is much polluted by emanations from the sick, the best walls are those which are made of glazed tiles, or of some material which will allow of their being well swilled or washed when the ward is cleaned.

CARPETS.—Were it not that it is desirable to keep the sick-room as quiet as possible, we should recommend that carpets should be altogether abolished from it, and that the floor should be a highly polished one, so that the dust and any impurities can be thoroughly removed from its surface. Such a floor does not, like a carpeted one, afford a *nidus* for the accumulation of morbid poisons, and is much more easily cleaned. But if the carpet is to be done away with, it is quite necessary that some matting either of india rubber or other material, be used upon those parts which the attendants must necessarily traverse, otherwise the noise is disagreeable. If neither carpet nor matting is used, list shoes or slippers must be worn by the attendants, and several large pairs kept outside the door to be worn over the boots of any one who comes in.

SCRUBBING OF THE FLOORS.—A great deal of discussion has lately taken place amongst medical men, as to the respective merits of scrubbing and dry rubbing, and some have gone so far as to state that hospital gangrene and other disastrous diseases have been originated and kept up by the emanations from a floor after being washed. Acting upon this idea in certain hospitals, no scrubbing of any part whatever has been allowed, except at certain periods of the year, when the patients were removed from the wards. The floors were ordered to be daily rubbed and polished after being swept, and it has been asserted that by the adoption of this plan the wards have been maintained in a healthier condition. At all events, it will be well to remember that a patient should, if possible, be removed from the sick-room while the floor is washed, since at such times the damp and unwholesome air is apt to be impregnated with peculiarly hurtful impurities.

COMMON OBSERVATIONS AND PRACTICAL EXPERIENCE.—To the observant man there is scarcely a study more interesting than that of the "human countenance," under all its varying aspects and conditions; and while we can generally form a pretty accurate estimate of the character of the individual from the study of the face, it is no less certain that the "physiognomy of disease" is a study, the importance of which is being more and more realised day by day, and one which will thoroughly reward not only medical men but also the attendant upon the sick-room. As an illustration of this, we may instance the remarkable fact, that if you take an intelligent physician into the sick ward of an hospital, and allow him to walk down the centre of the room and glance attentively and observingly at the countenances and attitudes of the different patients, while no doubt he will also listen to their breathing, and perhaps make numerous other little observations almost unconsciously to himself, of which you are ignorant, he will be able to form a tolerably accurate idea of the diseases from which they are suffering. It is not impossible, we will say, for a physician in this way to make what is called a correct "*facial diagnosis*" of the diseases of perhaps eighteen out of twenty patients. This shows how much is to be done by cultivating the faculty of observation with regard to the sick. One who has been taught to observe, in the best sense of the word, can tell almost at a glance whether his patient is better or worse, and reads with a wonderful certainty the happy signs of recovery, or the sad approach of death.

The sick-room attendant ought to be able, as the result of observation, to know when the patient is asleep or awake, in pain or at ease, when his breathing is oppressed and difficult, when he is low and faint and requiring nourishment or stimulus, when he wishes to be let alone, &c. These points are of even more importance as applied to the nursing of children, who are unable to make known their wants, or to describe their symptoms.—See *Nurses for the Sick.*

There is another kind of observation which one might call surgical observation, inasmuch as it is more to be exercised by surgeons or by surgical nurses, but which is a great advantage in the sick-room. For instance, one who has been taught this kind of observation knows at once, at a single glance, whether a wound is healing or not, whether it requires a cleansing poultice or a stimulating dressing, whether a fractured limb is lying in its proper position or not, &c. As to the observation of wounds, it is marvellous how experienced nurses, by keeping their eyes open, acquire a skill in the treatment of them, and know when and how to apply particular dressings so as greatly to expedite the healing process. An ignorant person, when no medical man is at hand, will go on applying substances to a sore which can never heal it, but only keep it open and make it worse, whereas a skilled and observant one can recognise and apply the appropriate remedy.

During convalescence, and throughout the progress of disease, relapses are oftentimes to be feared, and it is an important part of the duty of an intelligent observer of the sick-bed to note those appearances which indicate their probable appearance as well as to take every precaution against them.

It is of the first importance that a nurse should accustom herself to *accuracy* of observation, so that when she has to make her report to the doctor she may not use vague and indefinite expressions, such as, the patient has slept "a good deal, sir, to-night," or, "his bowels have been open a many times;" but the answer ought to be expressed in figures, as, for instance, the patient has slept three, four, or six hours, as the case may be, or his bowels have been moved once, twice, four, six, or eight times. As near an approach as possible to the actual state of the fact must be reported, else nothing but confusion can ensue, since it is obvious that what one nurse might think a good night another might consider a bad one, and what will appear excessive to one nurse might be deemed nothing extraordinary by another. It will be needful to employ the same accuracy of speech, thought, and observation, as regards the eating and drinking of the patient, and it will not do to tell the doctor that he has a good appetite merely, since people's ideas as to a good appetite are apt to vary, and unless a doctor actually sees the dinner that is consumed by his patient he ought to be told, in cases where such particular inquiry is necessary, the exact quantity, or as near it as possible, of ounces of meat, or whatever it may be, that the patient is able to take.

It may be said here that the nurse must tax her own memory, and not that of the patient, with the proper answers to such questions, since it is cruel to make the patient think for himself at all; in fact, he should be allowed the luxury of caring for none of these things, since entire rest of mind as well as of body may be quite essential to his recovery.

What we want, then, to impress upon the nurse's mind is that she must be accurate in making her observations, and that she must report them herself. If her memory is treacherous, we would recommend that she should note down *facts* upon a slip of paper, and she should remember that the *facts* only are valuable, and that her *opinion* is of no value whatever to the medical man when compared with them. With regard to this subject, we may be allowed to quote again the following practical remarks from Miss Nightingale's *Notes on Nursing*:—

"In diseases which have their origin in the feeble or irregular action of some function, and not in organic change, it is quite an accident if the doctor who sees the case only once a day, and generally at the same time, can form any but a negative idea of its real condition. In the middle of the day when such a patient has been refreshed by light and air, by his tea, by his beef tea, and his brandy, by hot bottles to his feet, by being washed, and by clean linen, you can scarcely believe he is the same person that lay with a rapid fluttering pulse, with puffed eye lids, with short breath, cold limbs, and unsteady hands, this morning. Now what is a

nurse to do in such a case? Not cry "Lord bless you, sir! why, you'd have thought he were a dying all night." This may be true, but it is not the way to impress with the truth a doctor more capable of forming a judgment from the facts, if he did but know them, than you are. What he wants is not your opinion, however respectfully given, but your facts. In all diseases it is important, but in diseases which do not run a destined and fixed course it is not only important, it is essential that the facts the nurse alone can observe should be accurately observed, and accurately reported to the doctor."

Without observation acquired by experience, scarcely anyone can tell, with any approach to certainty, whether a patient is better or worse, or whether death is near; but to those experienced in such matters, the countenance of the patient speaks a language which is quite unmistakable. By those who are not versed in this kind of observation, patients are often thought to be worse when they are actually better, and *vice versâ*.

The signs of dissolution must be seen in order to be understood. The countenance of approaching death was so thoroughly well described by Hippocrates, the father of medicine, that it is common amongst medical men to talk of the *facies Hippocratica*. Of course, it is not the countenance alone that is to be depended upon, but the general aspect of the patient, modified by his general constitution and temperament, as well as by the symptoms of the disease from which he has suffered, or is suffering.

It has happened that a nurse or attendant upon a sick person, has been required to give evidence in a court of justice, with regard to the symptoms of the patient's illness, and to the action and effect of the remedies prescribed. Under such circumstances the importance of registering and attending to facts, instead of theories, will be forcibly demonstrated. In cases of sudden death, and where a person has been found dead in bed, evidence may be required of the nurse as to the appearances presented. When a new-born infant dies at the same time as the mother that gave it birth, important civil rights may depend upon the question as to which lived the longest, and the evidence of a nurse may also be taken as to whether the child ever lived at all. In cases of death owing to suspected criminal abortion, suspected infanticide, as well as in all deaths by or from accident, suicide by drowning, by hanging, by strangling, or by suffocation of any kind, evidence may also be required from the attendants or bystanders: in cases of death by starvation, or from extremes of temperature, from cold, from heat, by lightning, &c. The same remark applies to deaths by violence, and the nurse may be questioned, and may be required to give answers, so far as her ability lies, as to the nature, appearance, and apparent effect of wounds of the head, neck, chest, abdomen, or extremities. Questions may be put as to the appearance of marks of violence upon the body, the appearance presented by the garments, the detection of spots of blood, or any other circumstances calculated to be of weight in medico-legal cases.

Important questions may also be put as to the mental state and condition of a patient at given times, as to whether he was in his right mind at the time of the execution of some document.

The above remarks are especially to be kept in mind, where a medical man cannot be found, or where he has not the opportunity of making the requisite observations.

HOW TO ACT IN CASE OF ACCIDENT.—The proper disposal of the sick-room for the reception of accidents, as soon as possible after their occurrence, is of great consequence, so that the patient may at once be placed under circumstances the best adapted for his recovery, and the least likely to cause him pain or inconvenience.

Let us suppose the case of a shattered or fractured limb. The accident will probably have occurred at some distance from the house, and the patient will have been brought along on a litter or in some conveyance, in such a position as to rest as much as possible the wounded part. If the hand be shattered, or the arm, it is generally best to bend the elbow at right angles, so as to relax the muscles, to support it in a broad sling and lay it across the chest. If the leg be the part injured, it should be bent or flexed at the knee-joint, also to relax the

muscles, and laid upon its outer side (if this position be not incompatible with the state and condition of the injured parts). It may be laid upon a board, or a tray, or a pillow, or anything that will support it and can be easily moved along with the limb; as, for instance, in removing a patient by means of a carriage, or by railway, from the scene of accident. Bleeding seldom occurs in shattered or fractured limbs to such an extent as to endanger life, simply from the fact, that the blood-vessels are torn instead of cut through, so that the application of cold, or the mere exposure of the wound to the air, will generally suffice to arrest the hæmorrhage. Failing this a tourniquet must be applied over the main blood-vessel, or a handkerchief or bandage may be passed round the limb, and tightened by means of a stick twisted into it. The effect of this will be greatly increased by placing firmly a pad under the bandage over the situation of the leading blood-vessel, if that is known or can be felt beating by the fingers. A bleeding limb should always be held as high as possible, the bleeding part being rather exposed to the air than covered with a number of cloths, as is the popular custom. If cold is applied, it should be by means of a single cloth, which may be either frequently renewed, or a gentle stream of cold water may be kept playing upon the wound. These precautions, as to bleeding, will be much more necessary in the case of incised wounds where the cut ends of the blood-vessels bleed with great activity. It is to be remembered as a golden rule, that almost all bleeding, even of the most urgent kind, can be checked for a time, or, at all events, till the arrival of the medical man, by direct pressure applied to the part, either by the fingers, or by a pad of lint, or a dry sponge.

Another rule is always to keep a limb which is broken in a natural, easy, or relaxed position, otherwise, from the action of the muscles, the ends of fractured bones may be forced with violence through the skin, or may injure blood-vessels, and may convert what was a tolerably simple into a very severe injury.

Should severe shock and depression of the system supervene after an accident, wine and water, or brandy and water, may be freely given at once, and if there are any symptoms of coldness of the extremities and shivering, warm bottles, heated blankets, hot bricks, or bags of hot salt, should be applied.

Let us suppose, now, that the patient has been carried from the scene of accident to his own house, or to the room where he is to be laid up. The first thing to be done is to choose a good room, according to the principles laid down in the beginning of this article; a well ventilated, and well managed sick-room being quite as essential to the healing of a wound as to recovery from sickness. In case an operation should be required, a room should be chosen with a good light, or if artificial light is required, several good tapers should be provided, and the bed so disposed that it can be easily got at and easily lighted up.

The next thing to be done is to arrange the bed properly, and in doing this, reference should be had as to whether it is the right or left limb that is injured and that requires to be treated. If the patient is suffering much from the shock, or from cold, the bed should be warmed. A mackintosh, or piece of waterproof material should be arranged under the wound, so as to protect the bedding from blood and discharge, and when it is desired to irrigate a wound, the mackintosh should be large, and so disposed as to allow the current of water to escape over the bed into a vessel placed for the purpose of receiving it.

Everything now being in readiness, the patient is to be got into bed, and in getting him in it will be necessary to remove his clothes, an operation giving great pain to the patient unless properly conducted. They should be slit up the seams and cut off where necessary, so that the wound may not in any way be dragged upon, and in this manner they may be removed, as it were, in one piece, even when there are the most painful and extensive injuries, without any pain or inconvenience. While all this is being done, it should be the duty of one person to attend to and hold the injured part, and to support it in a relaxed position, which is one of ease to the patient. When all the clothes are removed, a night shirt may be put on; and if it be the arm that is injured, the corresponding arm and shoulder-piece of the night shirt may be slit open. The patient is then to be placed in bed, and the limb, being still held by the

person in charge, deposited safely on a pillow, or otherwise, in the required position. Some loose tow or cotton wool may be placed around it, to absorb the blood if there be any, and care must be taken to prevent the weight of the bed-clothes from pressing upon it, either by means of a "cradle," by pillows, or by supporting the bed-clothes in any other way. The wound must be looked at every now and then till the arrival of the medical man, in order to ascertain if there is any bleeding; and if there is much shock or faintness from previous loss of blood, stimulants must be freely administered.

In cases of accident from drowning, the reader is referred to the article, and references are also to be made to *Bandage, Dislocation, Emergencies, Fracture, Hæmorrhage, Poison, Suffocation, &c.*

In cases of injury to the head, or of suspected fracture of the cranium, the patient may be quite insensible, and consequently such patients are often much tumbled about by those who remove them and who put them to bed; but the most serious accidents have resulted from want of care in this respect, and it has happened that bleeding inside the skull, which had been temporarily arrested, has been made to burst out afresh, with a fatal result, owing to nothing more than rough handling.

Wounded parts, which are very painful and uncomfortable in any position, may be placed upon a water pillow, the yielding and undulating surface of which readily accommodates itself to them, and does away with the effects of pressure.—See *Ambulance and Emergencies.*

THE ARRANGEMENT OF THE SICK-ROOM FOR, AND THE DUTIES OF THE ATTENDANTS AT, A SURGICAL OPERATION.—Surgical operations may be classified into two kinds: *primary* and *secondary*, that is, those undertaken at once in a case of accident for the removal of injured limbs, for the arrest of urgent bleeding, &c., and those, on the other hand, which are undertaken deliberately for the removal of diseased parts, which may have been more or less affected for weeks, months, or years. Now, although an operation must be always a dreadful and formidable thing when it is necessary that it should be performed in a private house, it is still more dreadful when it comes under the head of the first of the two classes. The accident may have happened in a moment of time and in the simplest manner possible, and yet it may have hopelessly destroyed a fair working limb, upon which may depend the subsistence of the sufferer and that of his wife and family. We will suppose that the surgeon, after anxious deliberation as to what is best to be done for his patient, has decided upon an operation. In any private house, however well-conducted, there will be a great many arrangements to make, a great many orders to be given, a great deal of hurrying to and fro, and the safety and welfare of the patient will in some measure depend upon the coolness, promptitude, and common sense of those who may be called upon to assist. In country districts, and in places generally, where medical men are not easily found, assistance of the most important kind may be demanded of those who would otherwise shrink from such a duty, but the demand for their services is urgent, and with coolness and readiness, excellent service may be rendered on an occasion, even by those quite unaccustomed to such matters. What is especially to be avoided, is all hurry and bustle. In the excitement of the moment every new idea is acted upon hastily without reflection, and from want of deliberation in the making of plans and arrangements, things are forgotten and overlooked till they are wanted; therefore, at such a time, more than at any other, are we called upon to observe the time-honoured injunction, *festina lente.*

The following articles should be provided and laid out ready for an operation, whatever it may be—Two long vessels, pitchers, buckets, or cans, one containing cold and the other hot water; two or three small basins, which are to be supplied from the above when required. These basins should never be quite filled with water when they are to be used, but only half filled, or even not quite so much.

Three or four, or more sponges. These should be soft and should be well wrung out of hot water before they are used. A large sponge, if suitable, may be cut or torn up, so as to make several small ones.

A number of napkins will be required, and should be folded and arranged on a table close at hand.

Wine and brandy should always be ready in case of faintness, and should also be placed upon a table close by.

The operator's instruments should all be neatly laid out on a tray, covered with a napkin before the commencement of the operation, so that they may be handed to him when required. The assistant, whose duty this is (if not accustomed to it), should learn the name of the different instruments so as to know at once which is meant when it is asked for.

And now that all the different articles required are arranged, everything will be ready for the removal of the patient.

Minor operations are generally performed while the patient is in bed. The large and the capital operations, as well as those requiring great delicacy of manipulation and very good light, should be always performed upon a table. This should be of a convenient length and very stout, it should be covered with a blanket, and over this a piece of mackintosh cloth, or a piece of red blanket cloth. A shallow box containing saw-dust should be placed beneath, to absorb any blood which may drip down, and a pillow or two should be placed to support the head and shoulders. Above all, it is necessary to have good light.

In removing a patient from his bed to the operating table, the utmost care and discretion is necessary, and this will generally be superintended by the medical man, who, if chloroform is to be given, very often commences its administration before the patient is subjected to the pain and irritation of being moved.

In the case of a limb being injured, or a joint diseased, or in cases of large tumours of the extremities, it can easily be understood that great pain and even injury may be consequent upon the slightest movement, therefore we again repeat that one person should devote his attention exclusively to the management of the diseased or injured part, and while others are removing or raising the body, he will move or raise the limb in his charge simultaneously with them, and endeavour to lay it in as easy a position as possible, and to do so with as little pain and inconvenience to the patient as he can.

When several persons are engaged in lifting or moving a patient, they must act in concert, that is, they must all lift at the same time, or else the patient is sure to be the sufferer. Nothing is more aggravating than to see this clumsily done, as happens when one lifts after another, and each tugs at the patient without any other effect than to cause him pain. One person should support the patient's head, one each shoulder, and one at each hip, while another lifts the feet, and another, as we have stated above, devotes his whole attention to the diseased or injured part.

Each of the attendants, before the operation commences, should have a particular duty assigned by the medical man. For example—Several will be required to restrain the patient's movements; and here it may be said, that at what is called the stage of excitement during the administration of chloroform, patients may require as much, if not more, forcible restraint, than when no chloroform is given at all. One attendant should take charge of the hands and arms, another of the body, and another of the legs and feet. If the patient is very powerful, one should have charge of each arm and each leg, and so on. Another attendant may be directed by the medical man to wring out and hand sponges. These are used to sponge away the blood, in order to enable the operator to see distinctly what he is doing, therefore he requires them frequently changed when they become saturated with blood. Another assistant may be directed to look after the hot and cold water and towels, and another may be required for handing instruments, &c.

It seems scarcely needful to say, that *perfect silence should be maintained during the whole time of the performance of an operation.*

Quietness and attention to the wants of an operator, and to the movements of the patient are highly necessary, and mark at once a skilful and valuable assistant.

When the operation is over, the same rules are to be observed as to removing the patient

as those laid down above, and it will be more than ever necessary that one person should take charge of the part which has been operated upon, since bleeding of a dangerous and troublesome kind may arise from its being roughly handled or jarred. The greatest care will be required in placing the patient in bed again, and one grand point to be observed is always to keep the head low, in case of fainting, which is likely to ensue after the operation and after chloroform has been given.

After the patient has been placed in bed, he should not be left alone, because of the dangerous possibility of bleeding, or of the effects of the chloroform, if that has been employed. Generally the part is covered by the bed-clothes, supported, of course, by a cradle, and it will be the duty of the attendant to raise them from time to time, to examine if there be any tendency to bleeding, and to see if the part be lying comfortably. A stump will generally be arranged by the surgeon upon a pillow or some other support, but after he has left, troublesome and painful involuntary movements or twitchings not unfrequently take place, and these must be counteracted by pinning a soft, light handkerchief, or a piece of a bandage, to the bed-clothes, on each side of the stump or limb, so as to keep it steady.

An opiate or sedative draught is very generally given immediately after an operation, and then it will be requisite to soothe and quiet the patient as much as possible, so as to induce sleep, otherwise undue reaction and excitement are sure to follow.

Now-a-days, even to the most formidable wounds, only the lightest and most simple of dressings are applied, and in many cases nothing more than a strip of wetted lint. If orders are given by the surgeon that this is to be constantly kept moist, either the irrigating apparatus, described in this article, should be used, or it may be damped from time to time, by dipping a sponge or rag into cold water and allowing it to drop upon the dressing till it is saturated. The drops should not be allowed to fall from a height, but should be close to the wound, else the effect of the stream of water is too irritating.

For the first few days after an operation, more particularly if it is hoped to obtain union of the lips of the wound by what surgeons call the first intention (see article *Wound*), the dressing or dressings may not require to be moved at all; and, in point of fact, nothing may be required but careful watching and attention to the position of the part. The constrained position in which the patient is sometimes forced to lie is so irksome and painful, that a skilful nurse will have ample opportunity of showing her resources, by adjusting pillows and supports, props, cushions, pads, &c. Water pillows and air pillows are invaluable for the support of wounded parts, and ought always to be employed where practicable. A hand or foot, which has undergone an operation, when laid upon an ordinary pillow, even though it be covered with mackintosh, sometimes becomes so hot and painful, and so uncomfortable from the wet and stuffy feeling of the support, that the patient is prevented from sleeping, and suffers considerable uneasiness. This is the time when a water pillow, *only half filled, and with cold water*, is found to be of so much service, not only in affording a yielding and comfortable support, but in keeping the part cool. The good effects of these pillows in sloughing bed-sores can scarcely be over estimated. (See article *Bed-sores.*)

When it is required to remove dressings from a wound every day, in order to substitute clean or fresh ones, you will save the patient endless pain and discomfort by attention to one simple rule, viz., soaking them well. Tepid water should be used, that is, water about the temperature of new milk, and the parts where the dressings are adherent to the wound, that is to say, sticking to it by the blood or discharge, are to be repeatedly moistened with water dropped upon them from a sponge, held close to the wound, till they are quite loose, and can be removed without any of that tearing which is as painful as it is unnecessary. This process requires time of course, therefore, if the surgeon directs that the dressings are to be well soaked before his visit, the nurse should commence to do so in sufficient time, and should continue soaking till they are removed, without once allowing them to get dry. This is rather an awkward proceeding in the case of some wounds, because it involves the use of a considerable quantity of water, and if skill be not exercised the bed will infallibly be wetted. A mackintosh cloth with sponges

may be arranged to intercept the water in most cases; and in others, a basin with a semilunar part of its brim cut out, so as to fit the limb, or the side, or other part of the patient's body, ought to be used when much of this bathing has to be done every day. Basins of this kind made of metal, porcelain, and vulcanite, are sold by the instrument makers, and are so contrived as to fit the irregularities of the surface of the various parts of the body. Anyone who tries to bathe a part with the ordinary basin and with such a basin as that described will appreciate the difference. In the one case the bed is probably deluged, and in the other, even though used by inexperienced hands, not a drop of water is spilt.

MANAGEMENT OF DIFFERENT DISEASES.—It would be impossible, within the limits of an article like this, and even if it were possible, it would not be desirable, to enter into the management of the sick-room, in all the different diseases which flesh is heir to. It must be well known to all who have any experience of illness, that no two cases, even of the same disease, are ever quite alike, and that the management and treatment must also vary according to the symptoms presented by, and the peculiarities of, each particular case. Take, for instance, two cases of inflammation of the lungs, always an anxious, and sometimes a highly dangerous affection—one will proceed from beginning to end without any unfavourable symptoms, and so long as he remains confined to bed, with scarcely any feeling of discomfort to the patient. In fact, so long as he remains quiet in bed, it is difficult to persuade him that he is ill at all, and, much more so, that he is the subject of a disease which oftentimes proves fatal. But another case of the same disease, under apparently the same external conditions, and in a person of, perhaps, the same constitution, will be accompanied from first to last by symptoms of the most distressing kind, both to the patient and to those by whom he is surrounded. Pain the most urgent, difficulty of breathing, and delirium, may be present during the greater part of the progress of the disease. The greatest uneasiness, suffering, and distress may be felt by the patient, and he may either, after great care and long anxiety on the part of his physician and attendants, make a slow recovery, or death may put an end to the struggle. It will be obvious how, in such a case, and, indeed, in all cases, the treatment and attention required will be as different as possible in the one case and in the other. Disease assumes very different aspects also when it attacks persons of diverse constitutions and in varying climates. Children are affected differently from adults, and many other difficulties might be mentioned, which prevent one from generalising upon the treatment of different diseases to a non-professional reader. Throughout the body of this article we have endeavoured to place before the reader some of the main points to be attended to in the management of the sick-room during the course of diseases of a general kind, and in the treatment of injuries and wounds. Attention has also been directed to what will be required in the conduct of cases requiring surgical operations, yet it has not been attempted to follow out the steps of management necessary during the course of any particular disease or even class of diseases. It may not be out of place, however, to take one or two instances or examples, which may serve as typical illustrations of their class, and to indicate, however imperfectly, the course of treatment required.

If one were to attempt anything like a classification of diseases, so far as their nursing was concerned, it would be found that it will agree pretty closely with the practical allotment of diseases which obtains in our general hospitals. Besides the great subdivisions of acute and chronic diseases, we would classify by themselves, medical and surgical cases; fevers, and contagious diseases; cases of mental diseases; special diseases of women; and diseases of children. Every medical man knows that in each and all of these departments are to be found nurses whose experience and skill is of great value, but yet who, for the management of any other disease, not falling under the class to which they have been specially trained and accustomed, are little better adapted than those who are comparatively inexperienced. The proof of this is, that when an experienced nurse in a surgical ward is changed to a medical one, and instead of managing patients with wounds and broken limbs, undertakes the charge of those with acute

and chronic diseases of the brain, lungs, &c., much of her experience in her former capacity is comparatively valueless to her, and although she may have been a perfect adept in dressing a wound, or in changing the bed-clothes for a patient suffering from compound fracture of the leg, it may take some time before she acquires proficiency in, perhaps, the more nice observation required in studying and attending to the wants of a patient, with nervous, or heart affection, or understands all the precautions required in the case of those who may, in outward appearance, appear in tolerably good health, but who are no less the victims of mortal disease. Again, all hospital physicians know how invaluable the really good "fever nurse" is, and how often a desperate case of fever may owe its recovery mainly to the judicious, skilful, and constant care of a nurse accustomed to the conduct of cases of this kind. It is also notorious to every one, that some women can manage and control children, either in health or in disease, who are quite unmanageable when left in charge of others, and that the symptoms exhibited by a sick child speak an intelligible language to one woman which is a dead letter to another. To any one who doubts this, we beg to recommend the perusal of a small volume entitled *How to Nurse Sick Children*, by Dr. Charles West of London, Physician to the Hospital for Sick Children. The diseases peculiar to women, also, are occasionally of such a nature that a nurse who has experience and skill in their management is greatly to be preferred to one who has not this recommendation.

MANAGEMENT OF MEDICAL CASES.—Let us take as an example of an acute medical case of a general kind—acute rheumatism, or what is popularly called rheumatic fever. This disease, when it occurs in an aggravated form, leaves the patient wholly dependent upon his nurse, and consequently it may be taken as an example of many in which the best nursing is required. It is oftentimes accompanied with great pain and suffering. Moreover, it is one of the commonest diseases of this country, probably owing to our cold, damp climate, and our habits of life. It depends upon the presence in the blood of a poisonous material, probably lactic acid, and this poison expends its force, not upon any one part or organ, but affects all the different textures around, entering into the composition of the joints, as well as the fibrous tissue of the ligaments and tendons of the muscles. Consistently with this tendency to attack organs of the above description, it has a remarkable and most dangerous tendency to implicate the membranes surrounding and lining the heart, which may be looked upon as the most serious complication of the disease. Thus, whether we consider the intense agony which a patient experiences from the slightest movement of the affected joints, the intensity of the fever which invariably accompanies a severe case, or the above mentioned tendency to implicate the heart in a manner which may cause either sudden death or irreparable damage to that organ for life, it will be seen that here, perhaps, as much as in any other case, good nursing and management must be of the highest consequence. Immediately upon the thorough establishment of the disease, the patient is reduced to the last extremity of helplessness. He lies upon his back motionless and dreading the slightest movement, and is, in every respect, a melancholy spectacle of suffering and misery. He cannot and he dare not move, because the slightest motion gives rise to the most agonising pain in the affected joints—the weight of the bed-clothes is insupportable, and even the tread of an attendant crossing the room thrills him all over with pain. If any one standing near the bed happens to shake it, or to lay down any thing upon it, or forgetting the state of the patient for a moment, to sit upon the edge of it, or to rest his knee upon it, a cry of agony from the patient will quickly remind him of his thoughtlessness. The skin is literally bathed in sweat, which is acid, and of a peculiar odour, and adds much to the suffering and discomfort of the patient. Many of the ordinary symptoms of general fever are present, a quick pulse, foul tongue, constipation, high coloured and scanty urine, frequently with large sediment somewhat like pea soup. One of the most remarkable and dangerous features of the disease is its tendency to change about from place to place, so that a patient who, in the morning, complained bitterly of pain in the ankles and knees, may, in the evening, be quite free from pain in these parts, and refer all his sufferings to his wrists and elbows. At another time one wrist

will be very much swollen and full of pain, and perhaps next morning the pain will have entirely left it and taken up its residence in the wrist upon the other side. In the course of twelve hours or so, back again the pain flies to its original seat. But of all the changes which are apt to take place in this disease, which is so liable to shift about, the one by far the most to be dreaded is the change to the heart or its membranes. So common is this, that it is computed to occur, perhaps, once in every three cases of rheumatic fever. It is a result very much to be dreaded, inasmuch as the consequences may be very serious, either at the time of attack or in after life. Incurable disease of the heart may remain with the patient for the rest of his lifetime, and render existence completely miserable. On the other hand, the attack may be so violent as speedily to put an end to life. Patients have been known to die in a moment from the effects of the rheumatic poison suddenly changing to the heart. At every visit the physician anxiously examines the region of the heart to discover whether there be any signs of an impending attack, and he leaves directions with the attendants, of such a nature, that he may be sent for on the first approach of symptoms that would indicate that the heart was about to be affected. Besides the tendency to the complication of heart disease with acute rheumatism, inflammatory affections of other organs are very likely to occur, owing, no doubt, to the presence in the system of the poison, which acts as an irritant and gives rise to inflammation. The membranes of the lungs may become affected, giving rise to rheumatic pleurisy, or the substance of the lung itself may be inflamed (rheumatic inflammation of the lungs), or there may be inflammation of the bronchial tubes (rheumatic bronchitis), which is one of the most distressing and painful accompaniments of the disease, since the harassing cough, by shaking the patient, causes him the acutest suffering, and greatly aggravates his troubles. Another and rarer complication of rheumatic fever, but still one very much to be dreaded, is inflammation of the membranes surrounding the brain, or even of the substance of that organ itself. It does occasionally happen also, but quite exceptionally, that the inflammatory process runs so high as completely to destroy one or more of the affected joints. This, however, is quite contrary to the common progress of the disease, for in most cases it is marvellous to note, how, on the subsidence of the affection, the joints which a few days before were red and swollen and intensely painful, recover their natural size, colour, and motion.

When the disease is not attended by any of the complications enumerated above, when it occurs in a healthy subject, and is subjected to skilful treatment under conditions favourable for recovery, it may be said to run its course in a time varying from little more than a week to three weeks. The violence of the disease has almost always abated before the last mentioned time.

Patients, as a rule, do not die of acute rheumatism itself, for the disease is one that runs a certain course, arrives at its maximum, and gradually terminates in recovery. No doubt cases do occur in which the patient sinks rapidly, overpowered, as it were, by the violence of the disease, and from the presence of the poison in large quantities in the system. These cases, however, are to be looked upon as entirely exceptional, and when death does occur, it is almost always due to one or other of the complications mentioned above, by far the most commonly fatal of which is heart disease. Even should the patient recover at the time from the heart affection, he is sometimes, though by no means always, left the subject of chronic heart disease of an incurable kind. The consequences of this are sometimes, and in certain constitutions, comparatively trivial, while, in the majority of cases, they leave the patient an invalid for life. On the slightest exposure to cold he is liable to be attacked by some inflammatory affection of the chest, accompanied with difficulty of breathing, or with dropsy, and on the slightest excitement he may be affected by palpitation, or with some sudden seizure, which puts an end to life itself.

The disease is undoubtedly hereditary; in fact, every day we are becoming more familiarly acquainted with a variety of evidences of the hereditary nature of rheumatism, different members of the same family being affected by different diseases, which can all now be traced to the one rheumatic origin. Rheumatic fever itself occurs most commonly in grown-up people between the ages of fifteen and thirty-five.

The first thing that will probably be required, seeing that the patient at the commencement of the disease is generally suffering from all those symptoms depending upon disordered secretions, is the administration of a dose of purgative medicine. Now, if attention has been paid to the above description of the disease, it will be seen at a glance that this is a point which requires careful attention, and for which proper provision must be made. Nothing could be more cruel, and yet it is constantly done by unthinking persons, than to give a patient, suffering from acute rheumatism, a smart and active purge without making the slightest provision for its effects. It may be that the patient is in a private house, or in lodgings, where the wants of the sick-room are unknown. A bed-pan, or even a night chair, may not be at hand, and thus, even from the want of such apparent trivial precautions, the greatest suffering may be induced and the disease aggravated; and every one can fancy the torture which it must be to a patient whose joints are swollen and painful, upon the slighest movement, to jump out and in of bed several times, to respond to the calls of a brisk aperient which has been so thoughtlessly prescribed for him.

There are very few diseases accompanied by more suffering than acute rheumatism, the pain in the joints being often excessive, and many expedients have been devised to relieve this. Of all the numerous applications which have been recommended there is none so comforting, so easily managed, and so productive of advantage to the patient as cotton wool, loosely wrapped round every affected joint. Sometimes this may be covered with oiled silk or gutta percha tissue, so as to cause perspiration to exude in great quantity and constitute a local vapour bath, but at other times this cannot be borne at all, and after it has been kept on for any length of time the pain is thereby very much increased. If it is desired to apply this, a few turns of a bandage will secure the oiled silk or gutta percha over the cotton wool, and the heat produced will cause the gutta percha to mould itself into the required shape and to constitute almost an air-tight bag. A few drops of chloroform and of laudanum may be sprinkled on the surface of the cotton wool before it is applied. When the pain refuses to be allayed by these and similar means, and when it is very violent in any particular joint, the celebrated lotion of Dr. Fuller, or what is equivalent to it, may be employed; it may be made by adding an ounce of bicarbonate of soda and an ounce of laudanum to a quart of hot water. A piece of folded lint or of flannel soaked in this may be frequently laid over the affected joint or joints, and in order to keep it hot and moist as long as possible it may be covered with oiled silk. When the violence of the disease seems for a time to have centred in the wrists or ankles, this lotion will be found of special advantage. Great relief may be sometimes given to a very painful joint by placing it upon a water pillow, or in the case of the foot or hand, by carefully adjusting them to a padded splint so as to prevent all unnecessary movements.

As mentioned above, the great fear and great danger in this disease is the implication of the heart, or, in popular phraseology, that it should fly to the heart; let the attendants, therefore, be on the look-out for and carefully note the first signs of the impending danger, so that assistance may be had before it is too late. The first symptom complained of may be pain over the region of the heart, with fluttering or palpitating action of that organ, sighing, or perhaps a tendency to delirium. These symptoms, however, are somewhat like those occasionally presented by hysterical patients suffering from rheumatism, who have themselves perhaps been led to look out for them by leading questions, and who are possibly under the influence of medicines, and it may be, suffering from pain and distention of the stomach, causing uneasiness over the region of the heart. The attendants, therefore, must not rashly conclude that every pain referred to this situation of necessity implies that the heart is about to be affected. Until medical assistance can be obtained, the most important point to attend to in the event of the heart becoming affected is, on no account to allow the patient to rise up, or even to sit up suddenly in bed, since immediate death by fainting may be the result. Stimulants may be given if there is great tendency to faintness and depression; a current of cool air may be allowed to play around the patient, and smelling salts or eau-de-Cologne may be applied.

During the progress of the first part of the disease, the patient's *diet* will require to be very low indeed, and must be made up principally, if not entirely of fluids—such as beef tea, milk, arrow-root, &c.; while, owing to the excessive perspiration, and the consequent great thirst, abundance of cooling drinks may be allowed, especially potash water, or lithia, or soda water. Milk may be given with these, with lime water, or with the effervescing carrara water. Lemonade may also be given, or a drink made by adding a tea-spoonful of bicarbonate or nitrate of potash to a pint of water. Another excellent refreshing drink is made as follows—take of cream of tartar, one ounce, oil of lemons, fifteen drops, loaf sugar, two ounces, boiling water, two pints.

There is perhaps scarcely any disease in which it is more necessary to use the feeding cup for the administration of food, drink, and medicines. Sometimes the muscles of the neck are affected to such an extent that the slightest movement of the head is exquisitely painful, and yet the patient is tortured by a consuming thirst. In such a case the great advantage of the feeding cup is, that an attendant can administer a mouthful of some cooling beverage as often as necessary, without the slightest movement on the part of the patient.

Any one who has seen much of rheumatic fever will be struck by the fact that the subject of it generally lies upon his back, sunk down in the bed, in an apparently helpless position: he cannot relieve himself by changing his position from side to side; hence the occurrence of bed-sores is very much to be dreaded, more especially if the rheumatic is complicated with any other disease, which either aggravates its severity or prolongs its duration. The back or part upon which the patient lies constantly must be carefully watched, and on the first symptoms of anything like a flush of redness, should be washed twice a day with brandy. The patient should be laid upon a water bed or water pillow, or, failing this, pads or supports of different kinds should be adjusted under him, that the pressure may be distributed and may not fall all together on one spot, so as to give rise to a sore. In fact, all, and more than all the ordinary precautions must be taken which are enumerated under the article *Bed-sore*.

APOPLEXY.—The most common form of apoplexy is that in which hæmorrhage takes place in the substance of the brain. It occurs most frequently in advanced life. The amount of effused blood varies from the smallest appreciable quantity to many ounces. The cause of it is generally to be found in a diseased state of the blood-vessels, and it takes place frequently as a consequence of heart disease, or of Bright's disease of the kidneys.

It is one of those affections which occur so suddenly, and with so little warning, that no preparation can be made for it. A person falls down in the street, or in church, or at a public meeting, and is conveyed home in a state of insensibility. Skilful attention in the sick-room may greatly assist recovery from this affection, while improper treatment or neglect may have an opposite effect. Promptitude of action is essentially required, since unless effectual measures are taken at the commencement they may be of no avail.

The pressure upon the substance of the brain, caused by the effusion of blood, gives rise to sudden insensibility, with loss of sensation, thought, and voluntary motion. As a rule, a second or third attack is more severe than a first, which is often comparatively mild, while the second is sometimes followed by paralysis, and the third is so frequently fatal that, according to popular belief, a person seldom survives a third attack.

When a person is brought home in a state of insensibility, and supposed to be suffering from apoplexy, if a medical man has not been sent for, those standing around should be careful not to form too hasty an opinion as to the nature of the affection, for it has often happened that a fit of "apoplexy" has turned out to be only a fit of drunkenness. On the other hand, policemen, and meddlesome persons, have caused fatal mischief by treating a patient really suffering from apoplexy upon the supposition that he was only drunk. The practical rule to be observed, therefore, is carefully to examine such persons; to endeavour to ascertain the absence or presence of the odour of spirits in the breath; to observe their general appearance or age, and to make all possible inquiry as to the probability of the seizure being due to narcotic poison, to drunken-

ness, to apoplexy, or to any other cause. As regards the general appearance, it may be said that those are most subject to apoplectic attacks who have florid features and short thick necks; a large head, a flabbiness of the muscles indicating sedentary habits, a protuberant belly, and a general appearance of being accustomed to good living, all indicate a tendency to apoplectic seizure. The patient is generally seized without much warning; sometimes, however, he will have been heard to complain of headache or giddiness, noises in the ears, swelling of the eyes, with some alteration of vision, transient loss of memory, melancholy, rambling and incoherent speech, or a tendency to drowsiness. Sometimes also, paralysis, either of the face or of a limb, precedes the loss of consciousness, and is a terrible warning of what may be about to take place.

The patient will probably be found in the position of one who has fallen down suddenly, lying in a deep sleep without consciousness or movement. The face is generally flushed (though in some forms of apoplexy it is pale), the breathing is snoring or puffing, or a combination of the two, and the pulse is full and labouring, but not frequent. Care should be taken to ascertain, inasmuch as it is a great help in determining the nature of the case, whether the patient is suffering from paralysis of any part, or from rigidity or contraction of its muscles; whether there is any distortion of the features, and whether or not convulsions occur at intervals. Sometimes there is no absolute loss of consciousness at first, and the patient, after having suffered from some suspicious head symptoms, apparently rallies for a little, but this state is often, after a few hours, succeeded by complete unconsciousness, which very often ends in death. Again, there may be no unconsciousness at all, and the patient may be found paralysed on one side of the body and unable to speak, although he may be quite aware of what is taking place around him. There exists the greatest variation as to the occurrence of the symptoms enumerated above in different cases. Sometimes the unconsciousness or the paralysis is complete, sometimes only partial, and so on.

With the preventive treatment of apoplexy we have nothing to do in an article on sick-room management. What we wish is to give directions by which the disease may be recognised, and all possible precaution taken to prevent further mischief being done, as well as also to indicate how best to carry out the appropriate treatment which may be prescribed.

In former times, when bleeding was so much in vogue, almost every patient who had or was supposed to have an apoplectic attack was immediately bled. If a doctor could not be found, any person who happened to be present did not hesitate to open a blood-vessel, if he could, with any instrument which came to his hand, and the writer once saw a servant endeavouring frantically to open the temporal artery of her master (who was seized with apoplexy) with a fork. It may at once be said that no case should be bled in the absence of a medical man, and that, indeed, the cases are very few where bleeding is required, while it may often do great injury. The greatest care should be taken in lifting and moving a patient, supposed to be suffering from apoplexy, since movements of the head and neck especially may increase hæmorrhage, or may bring it on again after it has once stopped. Yet how often do we see well-meaning but ignorant and officious persons raising up such a patient suddenly, and endeavouring to rouse him to consciousness! and in the case of poor patients found "in a fit" on the streets, what rough treatment or handling do they sometimes receive at the hands of the police, or others, to whose tender mercies they are entrusted! It often happens that some person who has once in his life seen a case of imposture successfully treated, insists upon trying his favourite remedy upon all the cases that subsequently come under his notice, forgetting that, unless he is certain (which no one but a medical man can be), that it is a case of imposture, he may inflict a fatal injury.

In all cases, a patient should be placed in a well-ventilated room, the head should be gently supported upon a pillow, and the shirt collar and neck-tie, and all tight parts of the dress should be removed, so as to admit of free circulation of the blood. If the face be flushed and the veins turgid, cold should be applied to the head, either by means of muslin rags dipped in cold water and vinegar (if the water is iced so much the better), or pounded ice may be applied in a bladder; in almost all cases of apoplexy, active purgatives do good, and should be ad-

ministered, especially if the face is flushed, and the veins turgid as before mentioned. It becomes a question how they are to be administered. If the patient is quite unconscious, and has lost the power of swallowing, it will be necessary to mix up three or four drops of croton oil with some syrup, or sugar and water, and place it on the back of the tongue, by means of a feather, when it will be probably swallowed at once; or ten grains of calomel may be placed on the back of the tongue. If, however, the patient can swallow, a black dose may be given, or five grains of calomel, with a scruple of jalap powder; or half a drop of croton oil may be mixed with ten grains of the compound colocynth pill mass, and divided into two pills, both of which may be given at once. A stimulating and purgative enema, consisting of two table-spoonfuls of turpentine and a wine-glassful of castor oil to a pint of gruel, should be administered slowly. Mustard plasters should be applied to the calves of the legs, care being taken that they be not allowed to remain too long, if the patient is unconscious or paralysed. There is a popular prejudice in favour of emetics in cases of apoplectic seizure, but, as the very act of vomiting causes a determination of blood to the head, it will be very unwise to employ them without proper medical advice.

Should the extremities be cold, owing to exposure or other causes, hot blankets or bags of hot bran or hot salt may be applied to them. It is to be particularly remembered that no hot bottles or hot tins, or anything hotter than a hot blanket, is ever to be applied to a limb that is paralyzed, else it may be followed by sloughing of the most painful and dangerous kind.

SMALL-POX.—Like the other eruptive fevers, small-pox is often attended by great irritation of the nervous system, and it may be by violent delirium. At the commencement, sickness and pain in the back are the symptoms most complained of. When the eruption comes out the itching is intolerable, and the desire to scratch the pustules is so great that the patient must be watched, and in the case of children, the hands should be muffled. Of all the cooling applications to soothe the itching, the writer gives a decided preference to carron oil, which should be kept in a pot by the bedside, with a feather or large camel's hair brush stuck into it, so that the nurse may at once apply it to any part that is irritable.

The very disagreeable odour which emanates from a patient afflicted with small-pox after the eruption is fully developed, requires to be counteracted by all possible skill and ingenuity in the use of disinfectants (see *Disinfectants*). In some bad cases of what is called confluent small-pox, the bad odour is so overwhelming as to cause immediate sickness to any one coming in from the open air, unless disinfectants be freely made use of, along with good ventilation. Scabs and crust, which form from the bursting of the pustules, should be kept constantly moistened with carron oil, and, if practicable, poultices should be applied in order to further their removal. A poultice made with charcoal and linseed meal is probably the best, because the charcoal destroys the bad smell. Particular care will be required to prevent bed-sores, and sloughing of the back, the hips, and even of the heels. In very bad or malignant cases, the skin has been seen to come off in great masses, and to adhere to the bed-clothes. Such cases will, of course, require all the care and skill which a good nurse can bring to bear upon them, to lessen the sufferings of the poor patient. The tongue, lips, and teeth should be repeatedly cleansed from the crusts which are apt to form upon them, and the best way to do this is by the finger either alone or with the help of a muslin rag dipped in lukewarm water, or in water to which a little borax and tincture of myrrh have been added. The nostrils are apt to be plugged by crusts which, impeding the breathing, cause great discomfort. These should be repeatedly softened with oil, and, if possible, removed; owing to the presence of pustules upon the inner membrane of the throat, the patient may complain of pain in swallowing, and of general sore throat. This is best relieved by frequently steaming the throat. The eyelids swell so that on or after the fifth day of the disease the patient is often quite unable to see, and his whole countenance is so altered that he can with difficulty be recognised. The eyelids should be repeatedly bathed with lukewarm milk and water to prevent their being joined together, and if matter forms inside of them, lukewarm water, to which a little alum has been added, should be fre-

quently injected inside the eyelids by means of a syringe. This is to be particularly attended to in the case of children, else loss of one or both eyes may be the result.

Delirium, which frequently occurs, is to be treated in the manner directed under the head *How to manage Delirious Patients.*

The action of purgative medicines must be carefully watched, owing to an occasional tendency to exhaustive diarrhœa.

There is no disease in which the patient requires more attention as to cleanliness. In bad cases, unless the hair is cut very short and repeatedly cleansed, filth and vermin will accumulate to a surprising extent. The long back hair of females has generally in such cases to be entirely removed, but, if practicable, part of the front hair may be left. Red precipitate powder may be sprinkled upon the hair after it has been cleansed to kill the vermin, but rubbing it with carbolic oil will be found the best remedy.

No special application has any influence whatever in preventing pitting, but this only occurs in very bad cases.

Suppuration in the ears often occurs after small-pox. When this happens, poppy head fomentation, or a poultice composed of bruised chamomile flowers, should at once be applied to the ears.

No special medicine has any effect whatever upon the progress of small-pox. It is a disease which runs a given course, and presents a variety of symptoms, according to its severity, which it must be the duty of the medical man and attendants to relieve as far as lies in their power. Cooling drinks, such as lemonade, soda-water, or plain cold water, or any of the numerous fever drinks, may be allowed *ad libitum.* The diet, at first, should consist almost entirely of beef tea and milk, arrow-root, gruel, fruits, &c. Afterwards, if the eruption does not come to a head soon enough, strong broths and wine may be allowed, and still later, when the discharge from the pustules is great enough to weaken the patient, the most nourishing and liberal diet, with a plentiful supply of stimulants will be requisite. If there be great irritability and restlessness, so as to prevent sleep at night, an opiate draught will probably be ordered by the medical man, after the administration of which the patient should be kept very quiet, and undisturbed by any noises which might prevent him from falling asleep.

When great heat of skin is complained of throughout the disease, tepid sponging and anointing with olive oil will often give great relief. The patient is only to be kept comfortably warm, and not smothered with bed-clothes, with the view of bringing out the eruption, according to the prejudices of some old-fashioned and ignorant nurses.

FEVERS.—There can be no doubt that a skilful "fever nurse" is able to deal with a case of fever much more easily and successfully than one who has had no experience in the treatment of that class of diseases. She has been trained and accustomed to observe the aspect and general condition of patients in the different stages of fever. She is able to understand and to cope with their delirium. At night when the fever patient's wanderings are most pronounced, or it may be delirium most violent, she is not easily frightened, and knows from experience of similar cases how to quiet and how to manage the patient. She also understands how to administer food and stimulants; she has been taught the importance of their being given regularly; and her assistance is of great value in keeping the patient clean and providing against the occurrence of bed sores. In many other details her knowledge of the course that is run by diseases of this kind leads her to administer to the comfort and supply the wants of fever patients at particular times, in a way that can be done by no other person, and in fact so valuable is good nursing in fever, that it may safely be said to be of more value than medicine.

The general remarks which we shall make as to nursing in fever may be made to apply with more or less modification to all the continued and eruptive fevers, and to cases of fever generally, whether occurring in this country or abroad. Fever usually commences with an indefinable preliminary stage, languor and lassitude, debility, want of appetite, shivering or chilly sensations, followed by heat of the surface of the body, quickness of the pulse, great

weakness, headache, pains in the limbs, and general disturbance of most of the functions of the body. All these may accompany the fever which is merely symptomatic of some other affection, but they are also met with at the commencement of those fevers to which have been given distinctive names. During this first or preliminary stage the patient, although evidently drooping, is not yet confined to the sick-room, but plods on as best he may with great weariness, and with the sensation that something is about to happen to him; at times very low-spirited, and at other times indulging the hope that his symptoms may pass away. Nothing can be done for him except to administer as much as possible to his personal comfort. He should be kept quiet and free from all mental excitement, and he should also be prevented from exposing himself to cold, or to anything which, when the disease does become developed, might tend to aggravate its severity or prolong its duration. When there is much shivering or chilliness, the patient should be put to bed, and hot bottles applied. Headache should be relieved by applying cold to the head, the bowels should be gently acted upon, perspiration encouraged, the simplest food given, and the strictest quiet observed. The symptoms above enumerated are generally most severe at night, and a slight remission occurs at the approach of morning. When the feverish state has become fully developed, the symptoms are much increased in severity, and several new ones are added. For example, the headache may become very severe, wandering, or even violent delirium, may supervene. The weakness of the muscular system may be so marked that the strongest patient is unable to turn himself in bed, while emaciation takes place with a rapidity and to an extent that is quite remarkable. At this time also, the lungs may become affected from the fever poison circulating in the system, and the case may become seriously complicated by the occurrence of inflammation of these organs, or of bronchitis. The prostration is so great that the patient is frequently unable to pass his urine, the discharge from the bowels takes place involuntarily, there is a great tendency to bed-sores on any part of the body subjected to pressure, and in fatal cases the pulse increases in weakness and rapidity; there is constant twitching of the muscles; or the patient seems engaged in picking things from the bed-clothes; the countenance becomes livid; the breathing very rapid; and the patient passes into a state of stupor which ends in death. (The reader is referred to the article *Enteric Fever*, and to *Fevers* generally, for information as to the treatment of these diseases; and reference is also to be made to the different articles, *Small-pox*, *Scarlatina*, *Measles*.)

The great heat of skin, complained of at the commencement of fevers, should be relieved by tepid sponging. In all cases, but especially where the throat is complained of, a free supply of cooling drink may be allowed. Plain water, iced, or ice itself, may be given; or toast water, or barley water, or any of the so-called fever drinks. The diet should consist almost entirely of milk, beef tea, and farinaceous food. Afterwards, in cases where there is great loss of strength, and where the vital powers evidently begin to fail, the strongest beef tea, mutton, or chicken broth, must be given regularly, and stimulants, wine or brandy, are to be administered as directed by the medical man, with the utmost precision and regularity. It is even insisted upon by some of the best writers on the subject, that when stimulants and nourishment are urgently required, the patient must not be allowed to sleep on without being awaked for his nourishment at the appointed hour, because, it is said, that if this is not done, it will be found that when the patient awakes he is in such a state of prostration that it is almost impossible to rally him again. The writer, however, does not, as a general rule, subscribe to this practice, and thinks that it is very doubtful whether or not a patient should be awaked from sleep in order to administer food or stimulants; in fact, he rather regards it as an instance of the ridiculous extreme to which the followers of the highly stimulating school of physicians have gone. Besides, it is notorious among nurses of experience that after a patient has been aroused out of a refreshing sleep, it is sometimes impossible to set him off to sleep again. The time spent in sleep may be looked upon as a reparation especially for the nervous tissues of the body, and it will generally be found that, however exhausted a patient may have been beforehand, he will lose nothing by being allowed to sleep as long as possible.

When patients suffering from fever are seized with pain in the chest, or cough, mustard

poultices, or turpentine fomentations may be at once applied. These symptoms generally indicate the commencement of bronchitis, or inflammation of the lungs, which are common complications of fever, and may often be arrested when treated in this way at once.

The skin of the body over the lower part of the back, the hips, and even the shoulders, or elbows, and all prominent parts of the body, must be carefully examined in case of bed-sores forming upon them; and the reader is referred to the article "Bed-sore," for information what to do. A very bad case of fever is almost sure to be followed by bed-sores, which may be so severe as to threaten a patient's life, or even cause death by sinking; but with constant care and vigilance, as well as diligence in the use of all the means recommended, the first formation of a bed-sore would be detected, and its further progress at once arrested. Fever patients, when thoroughly prostrated by the disease, are frequently unable of themselves to pass water, and sometimes for many days they require to be relieved by the medical attendant. This is a point in connection with which great trouble to the medical man may be avoided, when intelligent and accurate information is afforded him by the nurse. When this inability to pass water occurs, the fact is that the bladder is generally full and distended, the urine keeps dribbling or overflowing, so that an ignorant nurse might think everything was right, and in answer to inquiry, on the part of the doctor, as to whether the patient had made any water, might reply, "Oh yes, quite freely," whereas all the time the bladder was full and distended with urine, and a cause not only of suffering, but of harm to the patient. It will be necessary then to distinguish between the mere dribbling or overflowing of urine, and the real power possessed by the patient of voiding it voluntarily. It may be noticed here, in passing, that bed-sores are much more likely to occur when the bed is wetted by this dribbling of urine, or when the patient passes his motions unconsciously. Wherever practicable a water bed should be ordered at the very first sign of redness or excoriation of the skin at exposed parts. No delay can be permitted, for if the red parts are neglected and the continuous pressure permitted for many hours, unavoidable sloughing of the parts is sure to ensue, with the formation of a large sore, with a tedious recovery, if not a fatal termination to the disease.

CONVALESCENCE.—It is perhaps as much during the period of convalescence as at any other time that the prudence and firmness of the nurse are put to the severest test. Any indiscretion, such as allowing the patient to get up too soon, or to eat or drink anything which he has been recommended to avoid, may be speedily followed by a relapse worse than the original distemper. The feeling of strength, which a patient may sometimes boast of after long illness, is often quite deceptive; and such patients are astonished to find that, on making the experiment, they cannot even stand upon their legs. In convalescence from very serious and protracted cases, the strength returns so slowly that it is almost imperceptible. For many days the strongest may be unable to turn themselves in bed. Any attempt to assume an erect position, in some cases, is immediately followed by fainting, and it must not be forgotten that death has occurred owing merely to convalescents getting up too soon from bed in the attendant's absence, to help themselves to some article in the apartment, or to go to the night-stool.

With regard to the diet of convalescence, it may be said truly that nearly all the relapses in typhoid fever are due to errors in diet at this period. During recovery from fevers, and most acute diseases, which have caused great and rapid emaciation, the appetite is wonderfully keen. The convalescent, under these circumstances, will be always eating. He has scarcely finished a meal, when he inquires eagerly what he is to have next, and his appetite may be truly described as ravenous. Now, this morbid appetite requires to be restrained within proper limits, in order that "good digestion may wait on appetite, and health on both." No more food must be given than the patient may make use of or assimilate, and above all, we must avoid giving much at a time. As convalescence advances, a liberal diet and allowance of stimulants may be granted. The patient should not be allowed to go long at a time without food, and every opportunity should be afforded him to make up for that excessive loss to which the tissues of his body have been subjected.

There is perhaps no time at which people are more liable to catch cold than during convalescence from disease. This is particularly to be borne in mind, in the case of those diseases which are followed by scaling or desquamation of the skin, such as scarlatina, erysipelas, measles, &c. A chill to the surface, after an attack of scarlet fever, may give rise to consequences worse than the original disease. The way in which the mischief arises is this—The skin is in a transition state as it were, and is deprived of its natural covering, the so-called scurf skin, so that all its numerous little glands and pores are exposed to the influence of cold. A chill occurs, the secretions from the skin (which are very large in quantity) are stopped, and thrown in upon other organs, such as the lungs or kidneys, which endeavour, as it were, to take on for a time the function of the skin; but this sometimes proves too much for them, and the overtaxed organs become inflamed. In this way, not only is there incurred great and immediate danger to life, but, in the case of the kidney especially, chronic and irreparable disease may be left which the patient can never get rid of, and which he will probably carry to his grave after a more or less wretched and miserable life. It follows from this that the greatest care should be taken to prevent chills; that the patient should be contented to abide strictly by the direction of his medical adviser in these respects, and should not leave his bed till permitted to do so; that he should be clothed in flannel from head to foot; and that in cold, damp, windy weather, he should not venture out of doors.

All over-exertion, both of body and mind, is to be strictly avoided. Exercise is to be kept within the limits of fatigue, whether in-doors or out of doors. The convalescent must not be allowed to sit up longer than he is able to do without feeling tired, and it must never be forgotten that, at this time, the nervous system is very easily upset, and that even trifles make a much deeper impression upon the mind than at other times, when the patient is in his usual health. The cares of life, and the anxieties of business, must not be too hastily resumed, since it often happens that the feeling of strength, which is thought to be sufficient for these things, proves to have been quite deceptive, and the consequence is that a very tardy and unsatisfactory recovery is made, and a much longer time elapses before the patient is really able for work, than would have been the case if he had not commenced before he was quite strong—mentally and bodily. Above all, the mind is to be kept from preying upon all the evils connected with illness, and must not be allowed to dwell upon melancholy or unpleasant subjects. The patient must not be permitted to mourn over the time or opportunities which have been lost during the period in which he has been laid aside from business. Books of a cheerful description should be read to him, and everything done to call his attention as much as possible away from himself to external objects. These precautions are to be particularly observed when the head has been affected, or when the brain itself has been the organ implicated by disease; and, in fact, it may be laid down as an axiom, that when any organ has been attacked, care must be taken to guard it against a recurrence; for instance, if the disease has been inflammation of the eyes, common sense would teach us to refrain from using them for any work that involved close attention or exposure to a strong light, till they had quite recovered their former strength.

MANAGEMENT OF SURGICAL CASES.—We come now to consider the management required in cases of injury, or of disease requiring surgical interference, of which one may almost be made to serve as a type for the whole, so far as regards the general directions necessary for the attendants of the sick-room. Let us take, for example, compound fracture of the thigh, an injury which entirely disables a man, and which, during the treatment necessary for recovery, leaves him wholly dependent upon those around him, without whose assistance he would be quite unable to perform the ordinary functions of life, as well as unfit to provide for his ultimate cure. A *compound* fracture is one in which the bone is not only broken, but has protruded through the skin, so as to leave a wound of the surface. Part of the bone may be found sticking out of the wound immediately after the accident, and may have to be removed by the surgeon, or it may have receded. It may be broken in one place, or it may be

shattered into many fragments. There may be hæmorrhage more or less from the wound, owing to the fractured or splintered ends of the bones having wounded the blood-vessels. If no large blood-vessel, however, is wounded, and the bleeding only amounts to oozing, this is not a complication of any importance, and all that is necessary will be to apply cold by means of sponges soaked in cold water, or wet linen rags. When the hæmorrhage is very profuse, and evidently coming from a large vessel, pressure must be applied upon the main blood-vessel of the limb, either by means of a tourniquet, or by the best means that can be provided for the purpose. It is here necessary to give one precaution as to the application of this tourniquet, or of the temporary substitute for it, and that is, it should not be applied unless it is absolutely required, as in the case mentioned above. The objection to its use is, that it presses tightly upon the veins of the limb and prevents the return of the blood, causing what is called venous bleeding, that is, bleeding from the cut end of the veins. Bleeding of this kind from veins may be generally distinguished by the dark colour of the blood, and it may almost always be stopped by the removal of pressure *above* the bleeding part, or the application of cold. Every care must be taken in moving the limb to prevent the ragged ends of the bone from doing injury, and for information on this point and others, the reader is referred to articles *Ambulance*, *Emergencies*, *Fractures*, *Hæmorrhage*, *Wounds*. It will be obvious that since a fractured limb requires to be placed and to be maintained very accurately in position, a bed with a firm and unyielding bottom will be necessary, it may therefore be requisite to put boards or some unyielding material under the mattress to prevent it sinking down at any part. This should be done before the patient is put to bed at all, since it saves a great deal of after trouble, and it is important in the case of a fractured thigh, in which it may very likely be requisite by means of a splint to extend the patient's limb in a perfectly straight line. It is no part of the intention of this article to describe the surgical treatment of fractures of the thigh, but merely to explain, if possible, the rationale of it, and to indicate in a general way how patients require to be managed who are suffering from fracture of a limb. It is usual to put up a fractured thigh either in a straight line, with a long splint extending from the arm-pit beyond the foot, or to lay the limb upon a splint such as the one called MacIntyre's splint, which is a double-inclined plane. In either case perfect immovability of the limb is desired, and may be obtained by adjusting the bandages and securing the limb and the splint to the bed. But in the case of a compound fracture, open spaces or "windows" must be left, through which the wounds may be dressed from day to day. As a matter of course, the patient must remain constantly on his back, and the mere mention of this fact will suggest how much care and trouble will be required at the hands of the nurse. When the night shirt or bed-clothes are changed, the body must be raised, as it were, in one piece, if raised at all. The patient will require to use the bed-pan, and especially in the case of the aged, the feeble and delicate, or of those suffering from a complication of injuries, the greatest vigilance will be requisite to prevent the occurrence of bed-sores, and to relieve the pains and aches consequent on lying in one position. In addition to this, the nurse must be careful to report to the doctor any complaint of the patient as to pressure of the bandages upon any particular part, and in the case of delirious and insensible patients, must note for herself whether any of the bandages or appliances are chafing the skin, since dangerous sloughing, followed by the most troublesome sores, have occurred from this source. After recovery from all fractures, but especially from fractures of the thigh, the use of the limb must be resumed very gradually indeed, crutches being used at first to bear the weight of the body. It seems almost superfluous, and yet the patient must be cautioned against breaking the limb for a second time; since numerous cases have occurred in which the patient, either owing to a slippery floor, to his being unaccustomed to the use of crutches, or to his not being sufficiently supported by his attendants, has fallen upon making his first essay to walk, has broken the limb a second time, and has had the whole course of treatment to go through again. It should be considered that for some time the broken leg is absolutely useless, and that even the sound one is comparatively so owing to long confinement to bed. Patients find the constrained position very irksome, and it will be well that the attendant should pay particular attention to the direction of the

medical man as to the limb, and should carry them out with firmness, otherwise a bent, short-ended, or otherwise deformed limb may be the result of a nurse's culpable good nature in yielding to the desire of a patient to loosen his bandage or to change his position for a time.

MANAGEMENT OF DISEASES PECULIAR TO WOMEN.—With regard to these, it may simply be said, that in special cases, where there is great pain and suffering, in many incurable cases, and in cases requiring operation, a very great advantage will be gained to both the doctor and patient by securing an attendant who has had experience in this department, and who, where occasion requires, will consequently often be able to alleviate suffering, and to save trouble. In incurable cases, much is to be done in the way of palliation; and although a skilful general nurse, by careful attention to the directions of the medical man, may and can do all that is necessary, yet experience in a nurse in this department is very much valued by those who suffer from such diseases, and it will, therefore, be the duty of those concerned to procure such a nurse for them when it is practicable. This is perhaps still more necessary in cases where operative interference has been required, and every medical man of experience knows the luxury of having the assistance of a skilled nurse in this department, both during, and in the after treatment of an operation. Nervous and hysterical patients also can sometimes be thoroughly controlled and kept quiet by such a nurse; while a weak and foolish person, or one who has had no experience in such symptoms, by injudicious management frequently prolongs and aggravates a case.

GENERAL MANAGEMENT IN DISEASES OF THE EYES.—Whether we consider the extreme delicacy of the organs in question, or their near relation to and intimate connexion with the brain itself, it will be easily understood how much caution and care are requisite in the treatment of them in disease. Any one also who is conversant with eye disease knows well how much, in the case of one eye being affected, the other sympathises with it; so much, indeed, is that the case, that removal of the diseased eye is often resorted to, mainly from the desire to save the other and sound one. The fibres of the optic nerves within the cranium interlace, at what is called the optic commissure, in such a manner as readily to account for their sympathy, seeing that morbid impressions or stimuli can be so easily conveyed along the nervous filaments from the morbid to the sound eye, in the same fashion as the electric current is transmitted along a series of iron wires.

Within the last few years great advances have been made in the treatment of diseases of the eye, owing to the introduction, into medical practice, of the ophthalmoscope, by means of which the morbid conditions of the internal structures of the eye can be discerned, and the results of treatment observed.—See *Ophthalmoscope.*

Another point in which we have unquestionably progressed is in the simplicity of our general treatment of eye disease, and in the almost total abandonment of the administration of mercury, and the reckless and indiscriminate blood-letting that used formerly to be so much in vogue. In the forms of inflammation of the eyes met with in scrofulous children, and in those of a weak constitution, all lowering and depleting measures are now generally discarded in favour of a highly tonic and stimulating plan of treatment. Even the youngest infants, when afflicted by purulent inflammation of the eye, are often cured by the physician ordering them better support, either in the form of cow's milk, or by substituting the milk of a strong and healthy wet nurse for that of the mother, which may be poor in quality; and by prescribing (of course in addition to proper local treatment) a tea-spoonful of port wine two or three times a day. In the case of delicate and neglected children, the greatest benefit often ensues from directing the attention of the parents, or of those interested in them, to the importance of warm clothing, regular exercise in the fresh air (or change of air in some instances), good nourishing diet, with a plentiful supply of milk and eggs, cod liver oil, and tonics, especially quinine. Such cases are often tedious, but seldom fail to yield, in a marked manner, to constitutional treatment of this kind when efficiently and persistently followed out.

Some discussion has taken place as to what is the colour most agreeable to or most adapted for weak eyes, or those which are unable to bear the light. Slate colour and green are the favourites, and at the present time a preference seems to be given to the former in the colouring of the walls of hospitals for the reception and treatment of ophthalmic disease. Shades also are made now of this colour. They may be easily manufactured from cardboard and calico; the latter material may be obtained of a slate colour, at almost any place.

It is a point to be recollected in the treatment and management of diseases of the eye, especially of those accompanied with a discharge of matter, that this matter is sometimes capable of communicating the disease to the sound eye of a healthy person, hence the utmost caution is to be observed in the use of towels, sponges, &c., in the sick-room. Instead of using a sponge at all, it is perhaps better to employ cotton wool or fine tow, or a syringe, for the purpose of bathing the eye, and of ridding it of the accumulation of purulent discharge which takes place. The advantage of using wool or tow is, that each piece can be thrown away or burnt after use, whereas a sponge is valuable, and is kept carefully by the nurse, and may be used in other cases. A syringe is peculiarly valuable, and indeed quite indispensable for those cases, occurring so frequently in children, where purulent matter collects under, and is retained within the eyelids. It is sure to do mischief, and to destroy the textures of the eye, unless it be carefully and regularly removed by syringing the eye, either with warm water or milk and water, or with a weak solution of alum and water, or some other astringent solution, which may be prescribed by the medical man. It is well worth knowing that an eye or eyes may often be saved from untimely destruction, owing to the care, skill, and regularity shown by the nurse in attending to this apparently simple procedure. After each time of syringing, a piece of cotton wool should be placed over the closed eyelids, and retained in its place by being bound round the head, either with a very light silk handkerchief, or a turn of a bandage.

When the eyelids, as often happens, not only in eye disease but in fevers, and other acute diseases, are glued together at their margins, so that the patient is unable to open or separate them, they should be frequently bathed with tepid water, or milk and water, till they can be easily separated, and then the edges should be smeared gently with a little simple ointment to prevent them from adhering again. When a case of this kind has been neglected for some time, and when a sort of milky crust has formed owing to the inflammatory secretion having been poured out, and become thickened and hardened upon the eyelids and cheeks, frequent poulticing and fomentations should be resorted to till the scabs or crusts are quite softened, and can be removed without hurting the patient.

HOW TO PUT DROPS INTO THE EYE.—In the course of the treatment of many eye diseases, it is necessary to drop certain solutions into the eye with the view of producing different effects. The object may be merely to allay pain, or to contract or dilate the pupil of the eye, or, on the other hand, to check discharge from the surface of the lining membrane, or to promote the healing of ulcers. In any case the method of procedure is the same, and is perfectly simple. A quill with the end cut off is to be dipped in the solution till it contains a few drops. The operator then gently separates the eyelids with the two fingers of his left hand, while with his right hand he applies the end of the quill to the inner angle of the eye in such a manner that the fluid rapidly runs along and diffuses itself over the surface of the eye. Various kinds of eye douches are in use for the application of solutions of different kinds to the eye. They are so numerous that none requires any special description, and they may be had at the different instrument makers.

Pain in the eye, either from disease, from the presence of foreign bodies in it, or from application of strong medicated solutions, or caustics, may be very much relieved by poppy-head fomentations, or by fomenting with warm water, to which a little laudanum has been added.

It is well known that blisters applied to the temples, behind the ears, or even the nape of the neck, and between the shoulders, have an effect, not only in relieving the pain, but in promoting the cure of certain diseases of the eye. One of the readiest and, at the same time, most

effectual methods of applying a blister with this view, is to soak a few threads in blistering fluid and lay them behind the ear. They can be frequently renewed or not, according to the effect it is desired to produce.

After certain operations upon the eye for extraction of cataract, &c., the greatest care and caution is sometimes required on the part of a nurse to prevent the patient from making any sudden strain or exertion, the consequences of which might easily be to expel the whole contents of the eye through the hole made during the operation, by which accident, of course, sight is completely lost. After such operations the eye is carefully protected, as far as possible, by the medical man; still, with some patients, and more especially with those who have had chloroform, and who may not entirely recover from the effects of it for some time, it is absolutely necessary to watch them most assiduously, in order to prevent such a catastrophe.

It should be known that the feeling of a foreign body being present in the eye is not always a sure indication that such is actually the case, but is often one of the precursory symptoms of inflammation of the organ.

Patients frequently complain that they see floating before them black specks, like flies, when they look at any object, and they are naturally very much alarmed and apprehensive of incipient disease of the eye; it is well, therefore, to remember that these may be, and are frequently, the consequence of indigestion, or of some other functional disturbance of the system. They are not to be looked upon as in any degree serious if they float or move about when the eye is fixed steadily upon any object; a persistent black spot, however, which steadily remains and does not leave the spot upon which the eye is fixed, is not unfrequently a symptom of grave organic disease.

GUIDE

TO THE

MAINTENANCE OF HEALTH

AND THE

MANAGEMENT OF DISEASE IN WARM CLIMATES.

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When a person bred and born in a temperate climate, such as we enjoy in the British Isles, is about to proceed to the tropics for either business or pleasure, for residence or travel, a host of questions arise to which at times it is extremely difficult to get satisfactory answers. The principal points one wishes information upon are :—

1. The nature of the climate and its probable effect on the health.
2. What clothes are required for the voyage and for the stay.
3. How goods ought to be packed.
4. Whether it is advisable to take children to the selected place of residence.
5. Whether medicines or simple surgical appliances are necessary.
6. What books written in simple language can be obtained to serve as a guide to health, and the treatment of simple ailments.

These and a host of other more or less relevant questions arise, and as some of them are all-important for the comfort and well-being of the tropical visitor and resident, it is the purpose of this article to reply to them. Before, however, dealing with these in detail it is necessary to give a short *résumé* of the climates and countries included in the word "tropical."

Tropical Climates.—The part of the world named "tropical" embraces a wide area and includes countries possessing a variety of climates. In it are comprehended such countries as Java and Japan, which, although lying some 2,500 miles north and south from each other, are both spoken of as "tropical." In Java the days and nights vary but little in temperature, there is nothing to mark the seasons as regards foliage or flower, seed-time or harvest, but day follows day with almost exact meteorological similitude. In Japan all this is changed. The seasons are mapped out as they are in Britain, the heat of the day is followed by the cold of the night, fierce typhoons prevail at times in place of the calm of equatorial regions ; the winter is severe and snow falls regularly. From this single statement it is evident that the region "tropical" includes countries differing widely in their meteorological characteristics, necessitating different measures to be taken to meet the requirements of existence in climates so totally unlike.

As it is impossible in a short article to deal with every one of the many districts within the tropics frequented by Europeans, and more especially by British people, I propose to deal with the question by dividing the region tropical into three zones—the equatorial, the tropical, and the sub-tropical.

1. *The Equatorial Zone.*—Immediately adjacent to the equator, the meteorological conditions are quite special and characteristic. The equatorial zone includes the region within 12°

north and south of the equator: it is marked by a wonderful uniformity of temperature by night and day, as well as throughout the year. The greatest heat seldom exceeds 90° or 95°, and rarely falls below 74°, the maximum may be taken at 95°, and the minimum at 68°; the usual range of temperature is only 11°. In this region the rainfall is excessive, and vegetation is rife. The whole belt is practically a forest-girdle round the earth; and across these hot, damp forests no great storms of any kind sweep to stir and vivify the air, for it is a region of almost perpetual calm. There is a popular belief that the nearer the equator, the greater the heat. This is only true in the average for the year, but it is not the case that within the zone the highest temperature obtains. Far other is the case, for it is seen from the above statement, that the maximum temperature is much below that experienced in, say, New York or even Moscow. The heat is equable, and one is not subjected to those sudden variations in temperature which are so trying and so fatal in their effects. Of all tropical regions, it is the safest to live in, so far as the direct effects of intense heat are concerned.

2. *The Tropical Zone.*—The northern and southern limits of this zone are mapped out by the tropics of Cancer and Capricorn, 22° respectively north and south of the equator; these limits include the equatorial belt, so that the specific regions here discussed are those lying between 12° and 22° north, and 12° and 22° south of the equator. Marked contrasts in climate characterise this zone; the summer heat attains a high maximum and the cold in winter is decided, more especially towards the out-lying limits. The annual rainfall in many places exceeds 100 inches, but in it we find the rainless regions of Arabia and Africa. Storms of great force, constituting the cyclones of the Indian Ocean and the typhoons of the China Seas, disturb the air, and the monsoons and trade winds heat or cool the air according to their direction. In the tropical zone, therefore, it is apparent that the European has to be prepared to resist both cold and heat, and it is the cold, slight though it seems to be, that renders him most susceptible to illness.

3. *The Sub-Tropical Zone.*—Northwards of the tropic of Cancer the hottest places on earth are met with. In the Valley of the Indus, more especially around Multan, the heat is intense, and yet Multan is situated in 30° north latitude.

The Persian Gulf lies wholly to the north of the tropics, but not even the Red Sea can compete with it as regards heat. The heat of the tropics is due more to the direct solar influence than to telluric conditions, for the hottest countries known are beyond the tropics. Maps, and the study of longitude and latitude, give but an imperfect notion of a climate, for the isothermic lines are determined by winds, ocean currents, the proximity of land, the contour of the land itself, and not wholly by the distance any given place lies north or south of the equator. Some of the most unhealthy places of the "tropics" are strictly extra-tropical; so that it is impossible to define the term "tropical," from other than a solar point of view, with any exactitude, as regards meteorological conditions. This being so, we return to the terms "tropical" and "tropics" as an undefined region which has come to be associated with prolonged and intense heat; and in this sense the terms are to be employed in this article.

As a general rule, the regions to the south of the equator are relatively much cooler than corresponding latitudes to the north. This is no doubt determined by the winds, and by the expanse of open sea. To the north a greater extent of land affects the climate. The great area of Asia bestows a continental climate on almost the whole of the countries within its boundaries, and has direct influence upon Eastern and Central Europe likewise. Northern Africa and the northern part of North America are also continental in their climate; and the north of South America and the great continental Island of Australia come under a similar category.

In these regions the temperature of the night and day are widely divergent, and the winter and summer seasons are marked by intense cold and fervent heat.

Outfit.—Traditions handed down from the days when steamboats and railways were unknown, when trans-continental crossings and overland routes were unheard of, when a voyage to most tropical countries took as many months as now it takes weeks, still cling to us, and scare the traveller into all sorts of unnecessary expense, as regards outfit. There are, of course,

certain places where a bulky "kit" is needful, but these are few indeed. The stay-at-home for the most part imagines every tropical place to be uncivilised, and unprovided with such domestic appliances as are to hand in Britain. One still hears of people providing themselves with endless suits of clothes "for the warm weather"; with numerous pairs of boots; with extensive wardrobes of underclothing and haberdashery, when they are starting to take up their residence in a warm climate. This is at once an unnecessary proceeding and a great expense. Young men or women starting to earn their livelihood in the tropics are frequently landed in debt before leaving home, owing to having provided themselves with clothing and other articles which are not only unnecessary, but, more often than not, wholly unsuitable to the climate they are destined to endure. The grand rule is: Buy as little as possible in Britain before starting, and get clothes, &c., on arrival at your destination. The people, already located in the place of selection, have their clothing, their boots, their hats, and other apparel supplied to them by local tradesmen. The clothing supplied locally is that which is requisite for the particular climate, and is more likely to be suitable than raiment furnished by London tradesmen, who perhaps have never even heard of the name of the country for which they are intended. Few persons who have bought their tropical clothing in London have not repented it. Native tailors are cheaper than, and for the most part quite as good as, those in Britain; and as they have no goods to supply, except those required for the particular climate in which they dwell, one gets exactly what is wanted.

One great mistake constantly made is, that winter clothing is left behind. A greatcoat is given away, and a fur cloak is left with friends. In the tropics, it is thought, these cannot be wanted, and if this idea is acted upon, repentance comes with the cold weather, by having to obtain a complete refit of warm clothing. Anywhere north and south of the equatorial belt, "winter" clothing is required. The ordinary tweed suit and overcoat are the daily dress for well-nigh four months in the year; and fur coats are not unwelcome during the north-east monsoons. As with outside apparel, so with underclothing; it is unwise to leave any behind in the belief that they will not be wanted. Even if the destination is somewhere in the equatorial belt, and the altitude some 2,000 feet or more, a blanket is required at night, and a tweed suit after sun-down is a comfort; again, if one has to travel northwards, for change or business, winter clothing is wanted.

On the Voyage.—Travellers proceeding eastward through the Suez Canal do not change their clothing until after Malta is passed; and, in winter, it may be that the shores of Egypt are in sight before a change is requisite. During the first part of the voyage, therefore, tweed suits and ordinary underclothing are necessary. The safest plan is to regulate one's clothing by that of the officers of the ship; they are old hands at the journey, and may be trusted as useful indicators of the time to change.

When the hot weather is really upon one, a thin flannel suit is the safest and best attire. A pith hat or helmet, or double "Terai" hat is required for head protection. A shirt of thin flannel or Elgin twill is the best, and an undervest of Indian gauze or fine silk and wool. Socks ought to be of thin wool, and not of cotton or silk. If a waistcoat is left off, a cumberbund should take its place. At night thin flannel pyjamas and a cholera belt of flannel are all that are required. The shoes or boots are best made of canvas, with leather soles. India-rubber soles should never be worn in hot climates. A social question as to dressing for dinner on board always crops up. It may at once be said that some change in attire is expected of everyone before sitting down to dinner. For men, white duck or flannel trousers, and a thin black cloth or alpaca jacket with a cumberbund (black), and no waistcoat, is a common garb. A white shirt, collar, and a black necktie complete the change necessary.

On arrival at the place of destination, the intending resident should immediately take advice of the residents as to what to get in the way of clothing. It depends upon the season of the year one arrives, whether it be in the cold or wet weather, the dry spring, or the trying autumn, what the texture of the requisite clothing is to be.

During the cold season, summer clothing as used in England is to be worn. Light tweed

suits are then in vogue, and a greatcoat, more especially for evening wear, is a necessity. Corresponding underclothing is worn, and, in fact, summer dress, as used for instance in the south of England, is the rule to go by.

In hot weather, **flannel** is the material most to be recommended, and, moreover, it is the safest. Many tropical residents, more especially women, object to flannel next the skin, and use linen or cotton instead. Linen should be entirely discarded in the tropics. It is very cold to the touch; it absorbs moisture but to a small extent; and, when wet, clings to the body uncomfortably.

Women's Dress.—When the advice of inexperienced lady friends is asked for, the lady traveller is not infrequently scared at the amount of money she is expected to spend on clothing previous to starting. The governess, nursery-maid, or hospital nurse who has accepted a situation in the tropics is appalled at the list of things she is expected to provide before starting. She views with dismay the fact that, if she follows the advice, her contemplated first year's earnings are perhaps more than swallowed up before she sets foot on board the vessel that is to convey her to her destination. The usual amount of even a modest wardrobe is seldom put down as under £40, and not infrequently she would break her engagement if she could; but, when she cannot, she starts considerably in debt. Let me advise the lady traveller to divide her estimated expenditure of £40 by ten, and what £4 or £5 cannot purchase to do without. Even should she be going to an ever so-out-of-the-way place, she will be able to procure raiment better adapted to her wants at the port of call, before she goes up country, than she can "at home." With ladies in a more luxurious state of life, of course, the initial expenditure is of no moment, but even with them, except for "Parisian-fashioned" attire, more suitable clothing will be obtained locally than in Britain.

As a general rule, the recommendations as to the texture of clothing laid down for men apply to women.

Underclothing.—By far the best material for "combinations" is merino.

Corsets should be of the best and strongest make. On the "providers'" list net corsets are vaunted, but they are to be condemned for two reasons. In the first place, they do not last long; the perspiration soon tells upon them, and they wear badly; in the next place, they do not protect the body sufficiently from chills. The corset plays a most important part in protecting the body from the inevitable chills of the evening and nightfall; to this article of dress more than to any other is to be ascribed the immunity women enjoy from abdominal ailments, compared with men. Corsets serve instead of the cumberbund and flannel belt of men. Moreover, they are not apt to be laid aside as is the cumberbund, and, therefore, act as a permanent good. It is a well-known fact that women do not suffer in the tropics from abdominal troubles in anything like the ratio that men do, and it is admitted that corset-wearing is a great conducive to that desirable end.

Knickerbockers, since that is the fashionable underclothing for the lower limbs nowadays, should be of alpaca.

Stockings of fine merino are better than when made of open thread or silk. The reasons for this are, in the first place, merino is more suitably adapted to absorb perspiration and prevent the feet getting hot, and its closer texture assists in preventing mosquito bites. Women are apt to suffer from the bites of mosquitoes in a most irritating manner; hence the advantage of wearing knickerbockers, which fasten at the knee, instead of the loose petticoat; and the advisability of having stockings of close texture. So annoying are these insects at some seasons, that women at times wear two pairs of stockings when sitting, say, at dinner, or in the verandah, especially in the evenings.

The *Skirt* may be of any material the wearer fancies, but the *Blouse* should be of cotton, or, better still, cotton-silk material. The covering for the *head* is seldom of consequence for women, unless they are likely to be exposed to the sun for a length of time, as during journeys on horseback. Then a helmet or solar topee, covered with silk, is requisite. Women's hair, no doubt, serves as an adequate protection from the sun, and when it is platted and made

up at the back of the head, it affords greater protection than when coiled on the top of the head.

Waterproofs of mackintosh or india-rubber are too hot for wear, especially if walking exercise is contemplated. Light waterproof cloth is the best material to ward off rain, and the garment should be made quite loose, so that air may circulate between the dress and the waterproof covering.

The **Night Dress** ought to be of flannelette. This material is cooler than silk and wool, and allows of perspiration being carried off better than a garment of cotton.

Children's Clothing in tropical countries errs in almost every instance by being insufficient. The cotton dress one generally sees little children in, with their lower limbs bare from above the knee to the short cotton socks coming just above the boot, may be very pretty, but in proportion to its prettiness so is it dangerous. In the first place, mosquitoes and sand-flies have their full meals off the bare and tender limbs, and the bites they leave are apt to become irritable sores in consequence of scratching and the action of the sun. Let the material be as light as possible, but the *child's limbs ought to be covered completely*, and cotton materials ought to be avoided. Children cannot be kept quiet; they are perpetually active, be they in the temperate or tropical climes. A child's cotton clothing gets soaked with the constant state of perspiration in which they are, and wet cotton clothes, when the sun approaches the western horizon, induce chills, and lay the child up with fever, diarrhœa, or dysentery, with pernicious frequency. Light flannel or **flannelette** clothing, both for under and for outer garments, is the only safe dress for children.

Cotton.—The native in the tropics, however, dresses in cotton, and it would seem at the first glance that it must surely be best to dress as the natives do. This depends on circumstances. The whole question resolves itself into whether one is so situated that perspiration is imperative, or whether it can be reduced to a minimum. If a man engaged in business has to get about in the sun, to climb many stairs, or make journeys afoot, then he must perspire freely, and flannel in that case is the material to be worn. If, on the other hand, one's lines in life are such that exertion is uncalled for, then cotton may be worn with comparative comfort and safety. It should be carefully noted, however, that when a native of the tropics is about to undertake any muscular exertion he casts off, or lessens, his cotton clothing, and his body may be seen dripping with perspiration. When the task is finished, he remains quiet a few minutes, wipes his body with a cloth, and, when his skin is dry, resumes the cotton clothing. In this way cotton clothing may be worn by Europeans, but in a damp, hot climate, where one's skin is constantly perspiring, independently, it may be, of any exertion, then flannel, and not cotton, is the only safe clothing to have next the skin. Wet cotton clothing is uncomfortable, is apt to induce chill, and is, in every way, an undesirable material to have next the skin. Woollen material retains within its meshes a moist atmosphere, which is an excellent non-conductor, preventing sudden transitions of heat and cold.

Flannel.—The one material, we repeat, which it is safe and wise for Europeans to wear next the skin in tropical countries is flannel. There is no gainsaying this maxim, although many people transgress in this, as they do in many other sanitary laws. Those who wish to avoid it plead a series of objections, all of which, however, are assignable to immediate personal comfort. Flannel next the skin is said to irritate, to produce prickly heat, to harbour parasites, and to induce a profuse perspiration, which is weakening. Women are chief offenders in this respect, and it is at times impossible to overcome their prejudice. Not only so, but they dress their children similarly, in the same belief, and cause endless ailments which might be avoided.

In hot climates, when the air is laden with moisture, the least exertion causes perspiration. When this season, more particularly, is upon one, it is essential to wear clothing which will serve as a bad conductor of heat and a good absorber of moisture. For this purpose flannel garments are an ideal clothing. During exercise it is necessary to provide for the absorption of the moisture on the surface of the body. Flannel, from its material and texture, possesses so

high a hygroscopic power that it rapidly absorbs the moisture, and thereby cools the surface of the skin, and reduces the body heat. When the exercise is finished, the evaporation still goes on: if cotton or linen is worn, the perspiration passes through them, and evaporates from their external surfaces without condensation, and the loss of heat is rapid; with flannel, however, the perspiration is condensed in the wool, and slowly gives out again the latent heat. A woollen fabric, therefore, feels cool during sweating, and prevents the chill which is sure to be induced by too rapid evaporation from soaked linen or cotton clothing. In fact, flannel clothing preserves a covering of air around the body which absorbs moisture and gives out heat gradually. It is the air in the flannel, not the material itself, which serves as the safeguard.

Silk.—Rich Orientals dress in silk. All their garments are of this fabric, but it has nothing to recommend it for the European of active habits. When absence of free perspiration is guaranteed, as when sitting or lying about under a punkah, silk may do no harm; but the moment any exercise is taken, silk behaves like linen, it becomes soaked, retains little air, and acting as an evaporating surface, reduces the body temperature too rapidly.

Cellular Clothing.—What is termed "cellular" clothing has much to recommend it. The material of which it is made varies; it may be of silk, wool, or cotton, or a mixture of these; the chief advantages claimed for it are its porosity and retention of air which gives it, in common with woollen tissues, the property of being a non-conductor of heat. Indian gauzes are mostly a mixture of silk and wool, and especially suit those who cannot tolerate wholly woollen fabrics next the skin.

Night Clothing ought invariably to be of flannel or flannelette. Linen or cotton sheets are not to be recommended, but Europeans have difficulty in bringing themselves to consider it wholesome or cleanly to lie in flannel or flannelette sheeting.

Bedding.—When the weather is very hot a fine straw matting is, more especially in the Malay Peninsula, spread over the mattress. It is cooler than sheets, and does not get soaked by perspiration.

Even in the hottest weather, however, a thin flannel sheet should be placed over the abdomen or, at anyrate, kept on the bed so that it may be pulled over one during the cooler early morning hours.

Exercise.—In the tropics the first effect of the heat is to increase and stimulate the energies, and for the first twelve months or so, the newcomer rejoices in abundant exercise. After the initial effects of the heat subside, taking exercise is less of a pleasure and more of a task. One cannot live in a vapour bath and expect to preserve the vitality engendered by a cold climate. The nervous stimulus lessens, and the body loses its vitality, thereby inducing a muscular indolence which increases with advancing years of residence in hot climates. Anæmia is a constant factor in tropical life, and no one escapes it, however free he may remain from actual disease. The red-blood corpuscles become fewer, and, as these minute bodies are the means by which oxygen is picked up from the air in the lungs during respiration and carried to the tissues, it comes about that an insufficient amount of oxygen is supplied for the purposes of the body, be they muscular or digestive. Unwillingness to take exercise, therefore, is an organic condition and not merely to be ascribed to what are called "luxurious" habits. How far this is to be humoured or fought against is a nice question. To yield to it is, however, most injurious; whilst, on the other hand, over-fatigue is yet more to be avoided. Want of exercise will soon induce a condition of the digestive system which will end in chronic dyspepsia and liver derangements. The kidneys may cease to accommodate themselves to the necessities of the economy, and renal calculus or Bright's disease may supervene. Over-fatigue, also, has its train of evils, the chief amongst them being the extreme liability to inroads of malaria. Walking exercise usually presents but little attraction; the monotony of a mere constitutional walk is not calculated to induce one to take outdoor exercise.

Horse-riding is much more attractive, and possibly more beneficial, than walking exercise. The infinite succussions experienced during the act of riding on horse-back are of great value in promoting the functional activity of the liver, which, in all warm climates, is apt to become

torpid. The popular maxim that there is nothing better for the inside of a man than the outside of a horse is specially applicable in the tropics.

Early morning, before the sun becomes fiercely hot, is the best time for a ride; but, if that hour is not favourable, the cool of the evening ought to be selected. Polo is a species of game on horse-back which has everything to recommend it.

Lawn-Tennis, as an outdoor game, perhaps, plays a larger part in maintaining health in tropical countries than any other. There is much in its favour. It is played usually near home or at any rate near a house or shelter where a change of clothing may be had immediately the game is finished. It can be stopped at any period of the game, hence there is less chance of over-fatigue. Women can join in the game on fairly equal terms with men, and a rational dress can be chosen to suit the occasion.

Tennis matches for those who are not robust should on no account be indulged in.

Cricket and **Football** are excellent games during the cool weather, and even in the equatorial regions they may be played with benefit. Cricket is much the more dangerous, owing to the length of time one may be kept in the field exposed to great heat.

Cycling.—In tropical countries with good roads—a by no means common circumstance—cycling in moderation is a most healthy form of exercise. Long rides, however, are more deadly in their consequences there than at home. Not only is there the direct effect of heart-strain to be considered, but the liability to malarial incursions induced by over-fatigue are ever before one. **Racquets, Fives, Rowing,** &c. are calculated to preserve health if indulged in with judgment and due precautions.

Baths.—All Europeans dwelling in the tropics soon appreciate the pleasure of frequent bathing. It is a daily necessity, imperative for cleanliness, and especially calculated to prevent chills when taken after violent exercise. As a restorative agent in over-fatigue, or after a long day's outing, such as a shooting expedition, it is at once a pleasure and a therapeutic agent.

It was through contact with tropical countries that the bath came into frequent use in Britain. Daily baths are a recent introduction; in our grandfathers' time the daily bath was unheard of. It was the returned tropical residents that brought it into fashion, nor has it yet spread to the Continent of Europe to any great extent.

The temperature of the bath is an all-important question. Without entering into physiological details it may be at once stated that it is the hot-bath that is in vogue in the tropics. The cold bath is indulged in by young men, in robust health, for some time after they take up residence in the tropics; but it has to be given up, and it is doubtful if it is conducive to good health at any time. The water ought to be about the temperature of the body, that is, between 90° and 100°, if full benefit and enjoyment are to be derived from it. Cold and tepid water are apt to induce chills and "internal" congestions, which are dangerous. One should not stay in the bath beyond five minutes at the outside, otherwise exhaustion is produced, and a weakening instead of a stimulating effect is the result.

Food.—In the tropics, British-bred folk miss the beef and mutton of their home diet. Beef, even when it can be obtained, has neither the flavour, relish, nor nourishment of the home product; and although the mutton may be better, it is far below European value. In many, in fact, in all parts outside big towns where Europeans congregate, "butchers'" meat is a rarity, and fowls form the staple flesh diet obtainable. The sameness of this regime tends to cause the appetite to flag. Game comes, in some districts, as a welcome change, and serves as a relish and appetiser. Luncheon, or "tiffin," as it is locally called, ought to be a very light meal. This is not usually the case, and the consequence of disregarding the rule is fraught with evil effects. A chop or bit of chicken, with toast and a glass of water, or claret and water, is the model to go by, and any departure from the rule brings repentance in time.

Fish.—The products of warm seas have not the flavour or crispness of those of more temperate regions. The fish yield of the Pacific generally is of a lower quality than that of the North Atlantic. The quality of fish caught on the Atlantic seaboard of America is much superior in every way to that procurable on the Pacific shores of America. Still, edible fish is obtainable, and, for those dwelling on the seaboard, it is wholesome.

Vegetables.—Where any considerable gathering of Europeans reside, European vegetables are usually grown; but, even without these, as most natives are vegetable eaters, there is seldom any scarcity.

Fruits in season should be taken freely, and, for some unexplained physiological cause, the morning is the best time for their consumption.

Drink.—The question of alcohol is one which has given rise to great controversy. It may at once be said that teetotalers thrive as well as those who take alcohol; but that they thrive better than do moderate drinkers is not the case. Alcohol would seem, therefore, not to be a necessity. The amount of alcohol that can be taken with safety is very small. It should never be taken before five in the afternoon, nor after nine at night. Whisky or gin is the safest spirit. Beer-drinking, except an occasional glass, is a mistake. Claret with water is the best drink at dinner, and, if anything is drunk at luncheon, it should be a glassful of thin claret undiluted. A glass of champagne after a long, fatiguing journey, shooting expedition, or continued violent exercise, is the safest alcoholic beverage.

But it is not only the alcoholic element in drinking that leads to trouble. Excessive indulgence in fluids of any kind during the heat of the day is to be avoided. The imbibition of a "long drink" of any kind whilst the sun is up brings on at once intense perspiration, and induces prickly heat. The kidneys are not flushed by the fluid, but the skin is drenched. The fluids requisite for health and for flushing the kidneys should be taken during the cooler hours of the morning and evening; then, and then only, do the kidneys get the benefit of the fluid imbibed. The soldier on a long day's march, or the sportsman who can restrain himself from imbibing fluids, be they alcoholic or not, until the sun sets, will be able to withstand the climate infinitely better than he who keeps continually gratifying his appetite. The habit of sipping cold tea is an excellent one, as thirst is relieved thereby without the ills arising from long drinks being induced. Aerated drinks are very tempting beverages, and soda waters and such like are too constantly in evidence. They induce a form of dyspepsia which is fed by its further imbibition, and cause a fulness of the abdomen with a stomachic "sinking," which is deleterious and depressing in the extreme.

Sleep.—As a rule, one requires more sleep in warm than in temperate climates. Late hours are a great drawback to the maintenance of health in the tropics. Ten o'clock is the recognised hour for retiring, and sunrise the time to get up. The mid-day or afternoon sleep (siesta) is not a necessity; it is chiefly caused by a heavy luncheon, and, in proportion as it is indulged in, so is the night's sleep restless. Those who maintain the best health do not sleep during the day. During the hottest period of the day it may be necessary to keep in doors and to rest, but if the night's sleep is to be restful and refreshing the habit of taking a siesta ought to be fought against.

DISEASES.*

Insolation.—Synonyms: *sun-stroke, heat-apoplexy, heat-stroke, ardent fever,* &c. The foremost enemy to be fought in the tropics is the sun. Always take the shady side of the street when there is one, and by every means possible ward off the direct rays of the sun from the body. It is said that it is when the sun strikes the back of the neck that its most injurious effects result; and many declare that the slanting rays of the early morning or afternoon sun are more deadly than when the sun is in the meridian, no doubt because they can reach the back of the neck more easily. Others declare that sun-stroke is brought about by the glare of the sun acting through the eyes. Hence the necessity for coloured glasses to shade the eyes. Where shade is impossible, a sun-shade of silk, or bamboo and paper, such as natives use, is an excellent protection.

As a protection against the sun, a pith helmet for the head covered by white pipe-clayed calico, a pair of coloured glasses for the eyes, a light sun-shade, where such can be carried,

*In addition the reader should refer to certain articles in this book, such as Tropics, Fever, Liver, Ague, Jaundice, Cholera, &c.

will for the most part serve to ward off the direct rays of the sun; when these are not available wetting the head-dress, or wearing a plantain leaf inside the hat will serve as an alternative. Whatever the head-dress chosen it ought to be ventilated freely so that air may not only find entrance but exit. The most fatal forms of sun-stroke are met with in those who are alcoholic.

Sun-stroke is the term usually applied to that form of sun-fever which comes on whilst exposed to the direct rays of the sun; heat-stroke to the development of symptoms which supervene after sundown.

Symptoms.—In sun-stroke, or true heat apoplexy, the person attacked may fall down suddenly, and become insensible. The face is flushed, the eyes blood-shot, the breathing stertorous, the pulse strong, full and quick, the skin dry, and the heat of the body, especially the head, most marked. Frequently, however, there are premonitory symptoms, such as shivering, intense headache, pains in limbs and back, thirst, nausea, and dry, parched tongue. This condition, sometimes designated "ardent" fever, may subside or pass into that of heat apoplexy.

Treatment.—For the more severe forms immediate steps must be taken, otherwise death is imminent. These consist in stripping the patient of his outer clothing, laying him down with his head and shoulders slightly raised, pouring cold water, jug after jug, from a height of three or four feet, over his head and body. The patient should lie in a free current of air, or he may be fanned vigorously, or placed below a punkah. Rub the extremities strenuously, apply mustard poultices over the heart and the nape of the neck. The cold applications must not be kept on too long—not more than 10 minutes—otherwise serious depression of temperature may be induced.

As soon as the patient can swallow, give a little wine or brandy, wrap him up in blankets, and give Warburg's tincture with a drop of croton oil if these remedies are at hand; if not, a dose of castor oil followed by 10 grains of quinine will do good.

When the symptoms are less severe a cold bath, or wrapping for 10 minutes in a sheet wrung out of cold water, and the administration of castor oil and quinine will afford relief. When combined with heat-stroke, the patient is markedly alcoholic and the temperature very high, 107° to 110°, the application of 20 leeches to the nape of the neck, or a free bleeding from the veins at the bend of the elbow are the only remedies likely to prove efficacious.

Malaria.—All tropical residents live in the dread of "fever." It is a constant quantity to be reckoned with, and one lives in a perpetual state of taking precautions to ward it off. Within recent years it has been proved that malaria is due to a parasite in the corpuscles of the blood, which, whilst it causes deterioration of the blood itself, lowers the vitality of the various organs of the body. Indiscretions of any kind favour its development; fever shows itself in the form of ague, intermittent fever, remittent fever, continued fever, and a host of visceral ailments which include dysentery, enlargement of the liver and spleen, and a marked form of anæmia. The indiscretions referred to are:—Sitting in draughts, "cooling off" without changing the clothing more especially when cotton or linen garments are worn, over-fatigue, upsetting the liver and the digestive organs generally by indulging too freely in the pleasures of the table, getting a chill at night owing to throwing off the bed clothes, in fact, any circumstance which lessens the powers of the body to resist the malarial parasite. In other words, the body's debility is malaria's opportunity.

Intermittent Fever—*Symptoms.*—Typical ague presents three stages in its course—the cold, the hot, and the sweating stages.

The *cold* stage is ushered in by rigors of more or less severity, lasting, it may be, from a few minutes to a few hours. In some parts of the tropics the cold stage is prolonged and the rigors attain a marked intensity, the very bed shaking beneath the patient; in others the cold stage is evanescent, and the shiverings but slightly, if at all, noticeable. If the temperature, however, be taken during this stage, it will be found that the heat of the body is gradually rising, and, whilst the patient is still complaining of feeling cold, the temperature may reach 102° to 105°.

During the *hot* stage, when the skin is dry, the thirst intense, and the headache severe, the

pulse excited, and the breathing distressed, the temperature may reach excessive limits. As a rule, the younger the patient the higher the temperature. Children may show a temperature of 106° without the symptoms indicating great danger, but the same temperature in an adult is to be viewed with alarm. The hot stage usually exists for an hour or two, but may exceed these limits, and continue for several hours.

The *sweating* stage is ushered in with restlessness, and a desire to get rid of the clothing. Perspiration going on, it may be, to saturation of the bed and clothes, is followed by relief, and the patient, except for weakness, feels quite comfortable.

After a complete intermission, during which time the temperature becomes sub-normal, the temperature may again rise, and a series of signs and symptoms similar to those of the attack described above recur. The interval may be of twenty-four, forty-eight, or seventy-two hours' duration, and the types of fever are named quotidian, tertian, or quartan, according as the attacks develop daily, every third day, or every fourth day. If the fever appears at an earlier hour during the recurrences than at the initial attacks, it is evidence that the fever is of an intense nature, and likely to recur; but, if the hour of re-appearance is delayed, it is a hopeful sign of its early disappearance.

Remittent Fever.—When, instead of the temperature falling to, or below, the normal during the sweating stage, it continues above the normal, when, in fact, the feverishness is continuous, and not intermittent, the name remittent is applied to designate the disease. This form seems to continue, in spite of treatment, and may last three days, a week, a fortnight, three weeks, or even a month. It is very similar to typhoid at times, and requires careful study of the individual case to be sure of the diagnosis.

Besides these more typical forms, there are several types of fever which have defied classification up to the present, but which will, no doubt, in a few years be definitely grouped.

Treatment.—The *prophylactic methods* to be adopted are indicated by the statement just given as to the cause. Avoid draughts and chills; wear flannel next the skin night and day; to prevent night-chills wear a flannel belt round the abdomen; mosquito curtains are considered to be useful, not only in warding off the mosquitoes, but in guarding the body from cold currents of air and mosquitoes in the early morning hours; use hot, and not cold, water baths; avoid fatigue and over-indulgence in eating and drinking. Quinine, as a preventive against malarial poison, is, when wisely given, at once safe and effective. Of course, quinine, when continued abnormally, will lose its effect somewhat; but there are seasons, localities, and situations in which one is more exposed to malarial poisons than in others; it is then quinine should be taken, and when infection is less likely to take place it may be left off. However, for months together, quinine may be taken with advantage. Before going out, especially in the very early morning hours, and again in the evening, or when fatigued after a hard day's work, 3 grains of quinine suffice to afford a protection of considerable effectiveness against malaria.

Treatment of Fever.—Quinine is the remedy *par excellence* in malarial fever. Its prophylactic value has been indicated above, and its curative powers are undoubted. There is a proper time, however, to administer quinine, and that period must be chosen if the greatest good is to be effected. When the temperature is rising, or at its height, quinine should not be given. If, however, feelings of feverishness are merely threatening, 10 grains of quinine taken at once will often help to stave off an attack. It is during the intermissions that the drug should be given. In quotidian ague 10 grains of sulphate of quinine every four or six hours will modify, if not completely arrest, the disease in its course.

If the disease is tertian or quartan, 10 grains given every eight hours during the whole period of intermission will, in all probability, render the expected attack abortive.

Quinine is best taken in powder. Place the prescribed amount in the palm of the hand, and lick it off; this is perhaps not the most elegant, but it certainly is the most efficacious, method of administration. Quinine tastes less strongly when dry than when dissolved in a mixture, and it is easily washed down by water. If made in a mixture it is necessary to add about a drop of dilute sulphuric or nitro-hydrochloric (muriatic) acid for each grain of quinine taken.

Quinine in the form of pills is objectionable, more especially when the pills are coated, as they at times refuse to be dissolved, and the pill is passed in much the same state as it was swallowed.

The drug ought to be continued in 5 grain doses twice a day for three days after the date of the threatened attack has passed. In remittent fever it is well to commence, first, with a 4 or 5 grain calomel purge, given at bed-time, when the stomach is empty. After ten hours a "driver" should be exhibited, such as a dose of Epsom salts, a seidlitz powder, or some other saline purge. When the bowels have been well cleared out, quinine should be given with a free hand, 10 to 15 grains every eight hours for two or three days. If, after three days, the temperature does not yield to quinine, then, in all probability, the fever is not malarial, but typhoid.

To procure the free action of the skin, the patient should be placed between blankets and means taken to make him sweat. This is effected by a variety of methods—hot drinks, alcoholic or simple; by such drugs as sweet spirits of nitre in drachm doses (measured teaspoonful), combined, it may be, with sal volatile in half drachm doses. Antipyrin and phenacetin are largely used drugs in the tropics; the latter is, perhaps, the safer, but the former is the favourite. Ten grains of either given half an hour before the dose of quinine, will no doubt help to promote perspiration. With both, a dessertspoonful of brandy should be given to prevent any evil effects of depression inherent in the drugs themselves. No more than three doses of either should be given consecutively. Many people declare they cannot take quinine; this is an ill-founded prejudice, and at times an unfortunate belief. Every one can take quinine, if it is given at the proper time, and with judgment. Quinine should not be given to pregnant women except it be combined with opium, nor should it be freely administered at the menstrual period. Many substitutes for quinine have been tried. Arsenic is the favourite after quinine, and 2 to 5 drops of the liquor arsenicalis—Fowler's solution—given after a meal in a wineglassful of water, and continued for a week, is a useful remedy in malaria when quinine cannot be borne.

Tropical Diarrhœa—*Treatment.*—In tropical, as in temperate, climates undigested food irritating the bowel is apt to set up gripes and intestinal flux. Removal of the cause by a dose of castor oil is the essential, and in most cases the only, remedy required.

In the tropics, diarrhœa is frequently caused by a chill, as when during the night the bed-clothes get adrift; in such cases it is wise to give the castor oil in a small dose, 1½ drachms, combined with 15 to 20 drops of laudanum (tincture of opium) and to apply a wet pack to the abdomen. The "pack" is made by wringing a towel or piece of flannel out in hot water; laying it upon the abdomen, so as to cover the surface from the nipples to the groins, and round the sides as far as the flanks; then covering it up by wrapping the body tightly round in a thick dry bath towel, securely pinned. The pack may be renewed after two hours if required.

The food should be of the simplest nature, sips of equal parts of milk and water (not soda-water) being administered occasionally, or sips of toast-water, whey, weak tea, or roasted-rice tea, being all that is requisite for the first twenty-four hours. Should the diarrhœa continue it will in all probability go on to muco-enteritis or dysentery.

Muco-enteritis.—Synonyms: *Inflammation of the Bowels; Enteritis.*—When, in addition to fluid excrement, patches of the mucous lining of the gut appear in the stool more decided steps in the treatment are required. It is of primary necessity that the patient be put to bed. The hot wet pack may be tried if there is much pain and griping, or when the temperature is above the normal; to be followed by the cold wet pack when the acute symptoms have subsided. Milk usually perpetuates the disease, being impossible of digestion, but whey, with lime water, or rice-water (the water rice is boiled in), is well tolerated. As an alternative chicken-tea, from which all fat has been removed, or weak beef-tea is useful. A preliminary purge of one or two teaspoonfuls of castor oil should be administered, and in the case of children small doses of grey powder ($\frac{1}{6}$ of a grain) ought to be given every four hours. For adults, Dover's powder in 10-grain doses should be given after the castor oil has had time to do its duty, and

the dose kept up every four hours for twenty-four hours. For children, Dover's powders in 1 to 2 grain doses are to be given every three hours, if the grey powder fails to effect an improvement. If the temperature keeps above the normal, more especially if there is marked sweating, quinine deserves a trial, as frequently malaria complicates the condition. Rhubarb at times has an excellent effect, and either Gregory's powder in small doses (3 grains for a child and 10 grains for an adult), or powdered rhubarb root, in 1 to 3 grain doses every six hours, may be exhibited.

Washing out the lower bowel by an enema of warm water, with or without boracic acid (30 grains to the ounce), has a soothing and beneficial effect.

Dysentery.—When, along with mucus, blood appears in the stool the patient is said to be suffering from dysentery. Blood is met with in the evacuations from other causes than dysentery, so it is necessary to note the condition of the stool and the attendant symptoms before pronouncing the case to be one of dysentery. The disease may come on suddenly or may be ushered in by an intestinal flux, which instead of subsiding grows more and more intractable, and ends up as a true "bloody flux." The symptoms most noticeable in dysentery are—griping pains in the abdomen, especially before a motion; tenesmus, or a desire to strain and continue at stool; alternate sweatings and rigors; clammy skin; fever; quick pulse and intense weakness. The stools may occur every few minutes or at intervals of half-an-hour or an hour. The evacuation at first may be slightly flocculent, but as the disease advances blood and mucus alone obtain. Sago-like particles imbedded in flocculent mucus shreds and stained with blood are a sign of deep infection. In the later stages, hiccough is an untoward symptom, and should large sloughs appear in the stools the disease is usually of the malignant type, and of a very fatal nature.

Treatment.—Dysentery must be looked upon as a specific disease, and the "bloody flux" as no mere symptom of bowel derangement. The mucous membrane of the gut—the larger bowel—becomes ulcerated from a specific cause, and according to the extent of the surface involved so does the danger vary. Hence, it is an illness that has to be guided towards recovery, rather than one that is to be suddenly arrested by vigorous treatment. When the evacuations are partly fæculent and foul smelling, it is well to commence with a dose of castor oil 1 to 2 teaspoonfuls (drachms), together with 30 drops (½ drachm) laudanum. Should benefit arise therefrom it is well to continue the oil in teaspoonful doses, combined with 20 drops of laudanum, morning and evening. If, however, there is no appearance of true fæcal matter in the motions, but blood and mucus only, reliance is to be placed on ipecacuanha in large doses. The method of administration is as follows:—Give 30 drops of laudanum in a little water twenty minutes before the time fixed to administer the ipecacuanha; ten minutes after giving the laudanum, apply a mustard plaster, about the size of the hand, to the pit of the stomach; five minutes before the ipecacuanha is to be given the patient is to suck ice if it can be had. At the time arranged, give 30 grains of powdered ipecacuanha root in pills or wafer papers. Let the patient continue to suck ice and lie flat on the back, neither moving nor speaking for some time, so as to avoid vomiting. After ten minutes remove the mustard plaster. No food is to be given for some two hours before the ipecacuanha is given, nor for four hours afterwards, when a little tea may be sipped. If no vomiting occurs one may look for immediate benefit. The same dosage may be repeated in twelve to twenty-four hours and kept up until the motions become fæculent. A very excellent adjunct is the application of a wet pack to the abdomen. At first the water used may be warm, but the temperature should be gradually reduced until cold water, or even ice-cold water, is employed. The pack ought to be ample, and changed every two hours. When there is great pain morphia may be given hypodermically, ¼ to ½ grain at a time, until relief is obtained.

When the tenesmus is distressing, an enema of warm water will ease it, or an enema of starch and laudanum (30 to 50 drops to 2 ounces of starch emulsion) may be administered. On no account should the patient be allowed to get up to stool; the bed-pan must be insisted on, however much the patient resents its use.

When dysentery becomes chronic other methods of treatment in force are adopted. Amongst these Epsom salts, a teaspoonful dissolved in a few drops of sulphuric acid and given with a minimum quantity of water is much vaunted. The dose is repeated every few hours until the motions become fæculent. Washing the bowel out with boracic acid (20 grains to the ounce of hot water) or nitrate of silver (½ grain to the ounce) are used as alternative methods. In almost every part of the world some local drug is in favour as a means of dealing with this prevalent disease. The bowel washings may be combined with the exhibition of drugs by the mouth. In East Africa, lungili is in use amongst the natives; and in the Malay Peninsula mangostine (3 mangostine skins boiled in 1½ pints of water, until reduced to a pint, when a fourth of the quantity is to be given at a time) is similarly employed. All fæces should be disinfected as they are passed, and deeply buried in the soil when it is feasible. An acute attack of dysentery will in even favourable cases last a week, but it is more usual for it to continue for two, three, or four weeks, in a more or less acute phase.

Malignant dysentery—when large sloughs are shed—usually proves fatal within a week.

Cholera.—Choleraic attacks may occur at any time, and in any country, in a sporadic form; but true Asiatic cholera is always epidemic in character in all but a few endemic centres in India.

Symptoms.—When cholera prevails all attacks of diarrhœa ought to be seriously treated. What seems a mere laxity of the bowels may be the onset of an attack of true cholera. Cholera, on the other hand, may set in suddenly, and the disease may terminate fatally in a few hours. At the commencement of an epidemic recovery is less probable than when it is on the wane. The onset of the disease is usually marked by vomiting and purging, and cramps in the extremities proclaim the true nature of the illness. The tongue is white and tremulous, thirst is intense, and a peculiar feeling of sinking at the pit of the stomach, especially after a motion, attended by marked depression, occur at an early stage. The stools soon exhibit that peculiar character termed rice-water. The eyes are sunken, the nails and skin generally become markedly bluish, the pulse feeble and frequent. The temperature of the skin falls, whilst that of the rectum may rise to 105° or 108°. Noises in the ears, suppression of urine, restlessness, speedy exhaustion, and threatening collapse, complete a category of symptoms which render diagnosis unmistakable.

Treatment.—No case of cholera is to be considered hopeless; even the most severe cases recover, but no patient is considered safe until the urine secretion is well re-established. When cholera is prevalent, a case of diarrhœa should be at once treated by giving a pill of 1 grain of opium and 4 grains of acetate of lead. If these drugs are not at hand, chlorodyne, 30 drops, with a tablespoonful of brandy in a small quantity of water, is usually to be had. In India, a cholera pill consisting of opium (1 part), asafœtida (2 parts), black pepper (3 parts), made into a 5-grain pill, and exhibited every two hours, is highly efficacious. Dover's powder in 10-grain doses, repeated according to the number of stools, is an excellent substitute.

Should choleraic symptoms develop, hot-water bottles ought to be applied to the feet and abdomen; a mustard plaster to the pit of the stomach; cramps are to be relieved by friction with the hands, or by flannel dipped in warm turpentine. An application of the same kind may also be applied round the loins, so as to induce the return of activity to the kidney. Ice should be sucked, but if it cannot be had, hot water or hot tea will allay thirst. Medicines are, unfortunately, of but little use in severe cases, as they are speedily rejected by the stomach. Stimulants are really the sheet anchor; brandy and champagne are to be freely administered in quantities according to the exhaustion. When, in spite of these, collapse threatens, ether is to be injected hypodermically, 15 minims at a time, and repeated every ten or fifteen minutes. Raw meat juice is often retained when nothing else can be kept down; but, during the vomiting stage, it is well nigh useless to give food by the mouth. The writer has seen great improvement brought about by immersion of the whole body in a bath at a temperature of 100°. Anomalous as it may seem, ice in the rectum, or cold water enemata administered at the same time, have a reviving effect, and help to restore the balance of temperature between the skin and the bowel.

During the third or collapse stage of cholera, when the pulse at the wrist fails and the breathing is laboured, and the features pinched, there is little to be done medicinally. Although the vomiting diminishes in frequency, it is unwise to give anything by the mouth; the number of stools also lessen, allowing of rectal nutriment being given. However far spent a patient seems, recovery is never beyond hope; the possibility of recovery is dependent, for the most part, on the state of the heart. When the temperature at this stage begins to rise very speedily to high above the normal, death is imminent; but a gradual rise towards the normal is a satisfactory and hopeful indication.

Intestinal Worms.—Many worms inhabit the intestine in tropical countries, but of these the round worm—the Ascaris lumbricoides—is by far the most frequent. Although children are most frequently attacked, both men and women, more especially the latter, are subject to be infested. In children they give rise to irregularity of the bowels, at one time looseness, at another constipation; blood may appear in the motions, and a well-simulated dysentery supervene. Fever which is ready to appear, whatever the ailment may be, is apt still further to complicate the disease, and render diagnosis difficult. During teething also—for children of but nine months' old may have worms—the round worm may cause untoward symptoms, often of a puzzling character. In fact, in all intestinal troubles, the fact of worms complicating the disease must ever be present to one's mind, and steps to eliminate the doubt should be immediately taken.

Santonin is the drug *par excellence*, and it is to be administered as follows:—Take six powders of 2 grains each for a child and 4 grains for an adult, and give them morning and evening until all six have been taken; it is well to give a dose of castor oil after the third as well as after the sixth. The stools must be carefully examined after each motion, and the patient must be warned that red urine and "seeing yellow" whilst taking santonin is only the direct effect of the drug, and not attended by any element of danger.

Other worms are met with in the intestine in tropical as in temperate climates, and they are to be treated in the manner described elsewhere in this work. Piles are, perhaps, more common amongst tropical residents than amongst home dwellers. They are no doubt a direct result of the hepatic (liver) congestion so frequently present, more especially in the case of those who live freely. They are to be treated as directed elsewhere in this volume.

Itching and moisture of the anus is a sure indication of liver or intestinal derangement, more especially the former. Local applications of a soothing nature will relieve the complaint, but strict attention must be paid to the diet and the general regimen if it is to be cured.

Hill Diarrhœa.—It has been observed in the hill stations of India, that, when dwellers on the plains go to recruit in the mountains, a form of diarrhœa not unfrequently develops. The stools are of a light pipeclay colour, and come on in the early morning. As many as six stools may occur before 11 a.m., after which hour the diarrhœa ceases, to recur again the next morning. Should ordinary remedies prove unavailing, it may be necessary for the sufferer to return to the plains when the troublesome affection will in all probability promptly cease.

Sprue, or as it is technically called psilosis, is a complaint prevalent in India and China. It is preceded by gastric derangements of a persistent nature, and characterised by sore mouth, bare tongue, and a persistent diarrhœa, of a more or less matutinal character. The mouth is so tender that only the most bland food can be tolerated. Salt, pepper, mustard, curry, and in severe cases even bread causes irritation and pain when consumed. The patient is often reduced to a milk diet, as the only form of nourishment possible. The stools are pipeclay in colour, pultaceous in consistence, and at times fermented. The patient waxes thin and feeble, and in time becomes altogether an invalid.

Treatment.—The usual treatment of sprue is to put the patient on milk, given at regular intervals every two or three hours, a half pint of fresh milk to be slowly sipped or taken in spoonfuls at a time. On this regimen in all probability the diarrhœa will subside, and the

stools become solid. The writer, however, does not hold with the milk treatment of sprue for several reasons—firstly, because although milk will check the flux, it will not cure the ailment. Whenever the patient attempts to take food other than milk, all the symptoms return; and as sprue is associated with a small and atrophied liver, the ingestion of milk tends to continue the liver in its shrunken condition. The writer has for many years stopped milk in sprue and allied diseases, and adopted instead what is known as the "beef-and-hot-water" treatment. At first when the disease is acute the patient may have to be fed every half hour on raw meat juice, scraped beef, raw meat sandwiches, or underdone fresh beef minced very carefully. By-and-by a piece of fresh underdone meat may be chewed, and if all goes well a small quantity of steamed rice is to be taken with the meat. The white of an egg (poached) is a safe addition to the diet after a few days. Within a week in ordinary cases a cut from the joint will be found to be easily digested. The great thing in the treatment is to withhold vegetables and starchy foods until the irritation of the bowel abates, and the stools cease to be fermented. As regards drugs they are for the most part deleterious; but a teaspoonful of castor oil every second morning will help to keep the bowel empty and clear away any fermenting matter that may develop. Opium or any and all drugs which arrest the diarrhœa are to be avoided, as the diarrhœa is only a symptom of the disease and not the disease itself. In addition, a cold wet pack to the abdomen, applied as indicated above, is of immense service in restoring the gut to a normal condition.

Skin Affections.—There are one or two skin diseases which are well nigh peculiar to the tropics. Amongst these, **Lichen Tropicus,** or **prickly heat,** takes a prominent place. It is a very annoying ailment, causing painful "prickling" of the skin, whilst associated with the nerve irritation is a "rash," consisting of an eruption of red-based watery vesicles. The condition is induced by sudden bursts of perspiration during violent exercise, by imbibing a quantity of fluid at a draught, or by wearing too heavy clothing. Coarse flannel next the skin is a frequent incentive, and provokes prickly heat on the slightest provocation.

Treatment.—Light clothing, desisting from violent exercise, and abstaining from "long" drinks, are the chief means of alleviating the discomforts of prickly heat. Warm baths, to which have been added a handful of bicarbonate of soda or potash, are pleasant and efficacious. After the bath, sponging with Eau de Cologne or spirits of wine (1 part to 3 of water) allays the itching. No soap should be applied to the skin. If the "rash" is very pronounced, 20 grains of sulphate of copper to 1 ounce of warm water may be dabbed on the skin with great benefit. If the disease is very aggravated it will be necessary to spend a day or two indoors, so that the extreme irritation may pass off and allow the skin to recover.

Dhobhee Itch.—A variety of Tinea known as Dhobhee's or Washerman's itch is a common tropical skin affection. It is supposed to be contracted from the clothes that have been returned from the wash, owing to the "habit" the oriental washerman has of wearing his customers' apparel whilst it is in his possession. The sites of selection are the arm-pits and the fork, where it spreads to the groins and to between the hips. In stout people, especially, a true eczema may ensue. Happily it is easily cured, if proper attention is paid to treatment. Wash the parts with warm water softened by the addition of bicarbonate of soda. Afterwards apply a lotion consisting of sulphur and lime, made thus: Take of slaked lime and of sublimed sulphur, 4 ounces, add to these 1½ pints of water. Boil the water until the fluid measures a pint only, when it is to be filtered through a handkerchief. The lotion thus prepared is very strong, and requires to be dabbed carefully on the patches of affected skin, especially round the margins. If done too vigorously the part will smart severely. Three or four applications of this lotion are sufficient to cure the disease. If continued too long the skin becomes inflamed. After the lotion has dried it is advisable, especially in very stout people, to dust the irritated parts with powdered starch, or equal parts of boracic acid and starch.

Skin affections are prevalent in the tropics, no doubt, in consequence of the moist condition in which the skin is kept by the profuse perspiration. Eczema, tetter of the soles of the feet, lice, and pigmentary changes are prevalent, but they require similar treatment to the same

diseases in temperate climates. Leprosy is seen in many countries, but the European need not dread contracting it unless exposed to intimate contact with lepers. It is necessary to keep a sharp look out amongst one's servants in case of a so-called skin disease being leprosy.

Tropical Anæmia.—Every European dweller in the tropics becomes in time anæmic. The blood corpuscles diminish in number independently of any actual disease; but should illness supervene, more especially malaria, the anæmic process is hastened. Residents in warm climates do not appreciate how anæmic they are until some visitor or fresh arrival from "home" appears amongst them, when the contrast makes their relative pallor evident. On the other hand, when an old tropical "hand" comes to Europe, it is easy to perceive that the complexion is very different in its freshness from that of the home-dweller. The absolute cure for tropical anæmia is change to a temperate climate; one's native air is preferable. But it is not always easy or possible to command this luxury, and one must be content to fight the condition locally. Nothing produces the deterioration of the blood more speedily or surely than malaria; and liver derangements are a fruitful source of inducing the same condition. To these may be added insufficient exercise, irregularity or over-indulgence at table, over-fatigue, and alcohol. Women are more liable to become anæmic than men, chiefly, no doubt, on account of their disinclination to take exercise. "Tiredness" is, in many instances, held to indicate that exercise, more especially walking exercise, is inadvisable. The muscles, especially during the hot weather, are allowed to become soft and flabby, and the least exertion brings on a feeling of "tiredness." The wisely-advised will learn, and be persuaded, that the way to overcome the feeling is to take *more* exercise, and to strengthen the muscles so that they may carry the body weight without fatigue. As a rule, it may be stated that the greater the feeling of impossibility to take walking exercise in health, the more should it be insisted upon. Happily, tennis, cycling, and horse exercise play a considerable part in the social life of the Europeans in the tropics, and thereby some of the evil effects of tropical lethargy are counterbalanced.

Treatment.—In temperate climates the administration of iron in some form is the means of effecting relief, but in tropical countries the same drug does not act so beneficially. The liver in warm climates cannot stand being deluged with iron, and the congestion induced but adds to the baneful effects of the disease. Anæmia is best treated by relieving the engorged liver by saline draughts. Vichy water at or after meals, an occasional blue pill, and strict attention to diet will often bring about an improvement independently of iron or any other "blood-making" drug. When iron can be given, it ought to be in some digestible form, well diluted with water and in small quantities. The Japanese have an ærated iron water of great value, "Tansan." It is a natural water, impregnated with carbonic acid, and containing carbonate of iron. Tansan is readily digested, and requires only to be known to be universally used.

The Liver.—The liver is the organ of all others that commands the attention of the tropical dweller. The effects of a warm climate tell on the liver more markedly than on any other organ, and, although many ailments are ascribed to the liver that arise from other causes, there is no doubt that, according to the power of the liver to accommodate itself to its surroundings, so is life rendered possible or impossible in the tropics. Continued or intense heat is, no doubt, the direct cause of hepatic troubles, but it is only when the body is exposed to chills that the consequences become recognisable. In temperate climates it is the lungs and pleura which register the deleterious influences of sudden changes in temperature, but in the tropics the liver has to bear the burden. A sudden chill drives the blood from the skin to internal organs, and the liver becomes surcharged beyond its powers of accommodation. This tells its tale in many ways. Dyspepsia, either catarrhal or atonic, usually ushers in the train of symptoms, to be followed by intestinal derangements, give rise to either constipation or flux. The effect upon the liver itself is to cause it to become engorged, congested, or inflamed, causing enlargement, tenderness, fever, and possibly abscess. The spleen harmonises with the liver in all its departures from the normal, and enlarges or diminishes in consonance with it. These organs being both intimately concerned with the welfare of the body generally, and the elaboration of the blood more immediately, any interference with their functions is attended by injurious

effects of a widespread and vital character. It is essential, therefore, to see that the indications of liver derangement are fully recognised, and timely dealt with.

Constipation.—Chronic constipation is a condition requiring careful handling and close attention. Violent purgations are, as a rule uncalled for, seldom attended by any good, and frequently cause considerable harm. Of all drugs cascara is the best; it is not to be used as an active purge, but to be taken continuously for a time with the object of effecting a cure. It may be taken in tabloid or liquid form; the former is perhaps the more agreeable. The drug may be given alone or along with one or two adjuvants, and should be of strength sufficient to induce one stool daily. The plan of taking a small quantity immediately after meals, twice or thrice daily, is preferable to one larger dose. If the constipated habit is of long standing it will be necessary, before effecting a cure, to take it for say three months. During the second month the dose should be reduced, and again it should be still further diminished during the third month. Other means of treating the habit is to eat plenty of fruit. The best time for taking this more natural remedy is the early morning, on first getting out of bed, or at 11 a.m. Fruit should not be eaten, during, or at the end of a meal, except sparingly. Exercise, especially horse exercise, massage to the abdomen, or exercise in any form contribute to alleviate constipation, but it is seldom that some drug is not required. Laxative mineral waters taken in the early morning are useful and efficacious, but when once the habit of their use is established it is difficult to break away from it. Cold wet packs to the abdomen applied for an hour or two every morning for a few weeks have frequently a most salutary effect.

GLOSSARY.

Glossary of Scientific and Medical Terms not included under Alphabetical Headings in the Dictionary. References in *italics* are to Articles.

ADEPS. *Hog's lard.*
ADYNAMIC. Applied to a want of vital power.
ÆSTHESIA. Nervous sensibility.
AGUE CAKE. Enlargement and hardening of the spleen.
ALIENATION, Mental. *Insanity.*
AMBLYOPIA. Indistinct *Vision.*
AMENTIA. *Idiocy.*
ANASTOMOSIS. Communications between the extremities of blood-vessels.
ANTHRAX. *Carbuncle.*
ANTIPERIODIC. A remedy against a crisis or paroxysm of disease.
ANTIPHLOGISTIC. A remedy opposed to *Inflammation.*
ANTIPYRETIC. A remedy antagonistic to *Fever.*
ANTISCORBUTIC. A remedy opposed to *Scurvy.*
ARTERITIS. Inflammation of the *Arteries.*
ARTHRITIS. Inflammation of a *Joint.*
ARTICULO MORTIS. The moribund condition.
ASTHENIA. Want of strength.
ASTRAGALUS. The *ankle* bone.
ATAXIA. The febrile condition, without any special character; disordered locomotion.
ATHEROMA. Fatty and calcareous deposits.
ATLAS. The first *Vertebra.*
ATONIA. Want of tone in the system.
ATRA-BILIOUS. Denoting the biliary diathesis.
ATRESIA. Imperforate condition of the natural openings of cavities of the body.
ATTENUANTS. Remedies to induce thinness.
AURA. A sensation or an exhalation from the body.
AUTOPLASTY. Repair of injured, by transplanting healthy, skin.
AUTOPSY. A *post-mortem* examination.
AXIS. The second *Vertebra.*

BACTERIA. Rod-like bodies, representing the lowest forms of organic life.
BALM OF GILEAD. The resinous juice of a small tree, native to parts of Arabia.
BASEMENT MEMBRANE. The base of mucous membranes and the dermis.
BIOPLASM. Rudimentary material of growth.
BLACK DEATH. Name given to a malignant form of fever.
BLACK VOMIT. A name given to one form of yellow fever.
BLACK WASH. A lotion made with calomel and lime water.
BLASTODERM. The germinative membrane.
BLEB. A bladder-like swelling of the skin.
BLENNORRHŒA. A term synonymous with gonorrhœa.
BLOODY FLUX. *Dysentery.*
BLUE GUM. The purple line on the gums induced by *Lead* poisoning.
BLUE STONE. Sulphate of *Copper.*
BREAST PANG. *Angina pectoris.*
BROW AGUE. Neuralgia of the parts above the eye-brow.
BRUNNER'S GLANDS. Small granular bodies in small intestine.
BUCKU. The leaves of some species of Barosma, used as a drug.
BULLÆ. Skin *Vesicles* of large size.

CALAMINE. Impure carbonate of zinc.
CALCANEUM. The heel *Bone.*
CALCIUM. Quick *Lime.*
CALEFACIENTS. Substances which excite warmth.
CALLUS. New matter which unites *Fractures.*
CANALICULI. Minute canals in *Bones.*
CANNABIS INDICA. Indian hemp.
CANTHUS. The angle of the *Eye.*
CANULA. A small tube.
CARUNCULÆ. Small bodies in canthus of *Eye.*
CASEIN. The organic constituent of *Cheese* and *Milk.*
CAUDA EQUINA. Lower part of the *Spinal* Cord.
CEPHALIC. Connected with the *Head.*
CERATE. Combination of *Lard* and *Wax.*
CEREBRAL. Connected with the *Brain.*
CEREVISIA. Malt liquor.
CERVIX. The neck, a term chiefly applied to *Bladder* and *Womb.*
CHELOID. A disease of the skin.
CHOLESTERIN. A crystalline substance found in the *Bile.*
CHORION. The external covering of the fœtus.
CHOROID. The vascular coat of the *Eye.*
CILIA. Filamentary processes on the surface of *Mucous* membranes.
CINNABAR. Vermillion, a sulphide of *Mercury.*
CIRRHOSIS. Chronic atrophy of the *Liver.*
CIRSOID. Term applied to enlarged *Arteries.*
CLINICAL. Applied medically to bedside instruction.
CLONIC. Spasmodic contraction, alternating with relaxation.
CLOVE-HITCH. Peculiar kind of knot used in *Dislocations.*
COCCUS CACTI. Cochineal.
COLOSTRUM. First milk secreted after *Child-Birth.*
COMPRESSION. Comprising *Fracture*, indentation of skull and extravasation of blood.
CONDY'S FLUID. *Potash* permanganate.

CONDYLOMA. A wart-like tumour.
CORROBORANTS. Strengthening remedies.
CORYZA. *Cold* in the head.
COXA. The *Hip.*
CREMATION. *Disposal of dead* by fire.
CREPITATION. Sound heard in diseased *Lungs, Fracture,* &c.
CRUSTA LACTEA. A form of *Eczema.*
CRYSOPHANIC ACID. The chief constituent of Goa powder.
CUCURBITULA. *Cupping* glasses.
CUTIS ANSERINA. Goose *Skin,* induced by *Cold* and *Fever.*

DECUBITUS. The horizontal *Position* of the body.
DEFÆCATION. The expulsion of *Stools.*
DEGENERATION. Morbid alterations in structure.
DEGLUTITION. The act of *Swallowing.*
DEMENTIA. Deficiency of intellect.
DEPLETION. The act of unloading, as in *Blood-letting* or evacuation.
DETERGENTS. Substances cleansing the *Skin.*
DISCRETE. A term applied to pimples or pustules when distinct from each other.
DRACUNCULUS. The name of the Guinea worm.

ECCHINOCOCCUS. The hydatid or bladder *Worm.*
ECLAMPSIA. *Convulsions.*
EFFLORESCENCE. A term descriptive of some cutaneous rashes.
ELEVATOR. An instrument used to raise depressed bone.
ELIMINATION. The act of expelling matter from the body.
EMACIATION. General wasting, either of the whole, or part of the body.
EMBRYO. The ovum and early growth of the fœtus.
EMUNCTORY. An *excretory* duct.
ENCEPHALON. The *Head.*
ENSIFORM. The term applied to the cartilage of the sternum.
EPHELIS. *Freckles.*
EPIPHORA. Flow of tears as in *Weeping Eye.*
EPULIS. A fibrous tumour of the dental sockets.
EROSION. Destruction of tissue by *Ulceration.*
ETHMOID. Cribriform bone of the *Nose.*
EVACUANTS. Medicines which empty the bowels, *Purgatives,* &c.
EXACERBATION. An increase in the local or general *Symptoms* of a disease.
EXALTATION. A marked increase of *Symptoms.*
EXCITO-MOTOR. A term applied to the reflex functions of the *Nervous System.*
EXCRESCENCE. Warty and fungoid growths.
EXFOLIATION. Separation of *necrosed* bone.
EXOPHTHALMUS. Protrusion of *Eye*-ball.
EXOSTOSIS. Osseous tumour of *Bone.*
EXPLORATION. Examination of the interior of organs.
EXTRAVASATION. Escape of blood and other fluids from their natural passages.
EXUDATION. Discharge of fluid from the *Skin* or *Membrane.*

FALSE CONCEPTION. An imperfectly developed embryo, a mole.
FAUCES. The back part of the *Mouth.*
FIBRIL. A small filament of *muscular* or *nervous* tissue.
FIBRO-CARTILAGE. A combination of *Cartilage* and ligamentous substance.
FILARIA SANGUINIS HOMINIS. Worms found in the blood and lymph.
FILM. An opacity, generally applied to the cornea of the eye.
FIRE DAMP. *Carburetted Hydrogen,* found in coal mines.
FISSURE. Abnormal opening or slit in the skin and soft parts.
FLUKE. An intestinal *Worm.*
FLUXION. Determination of blood to any part, flow of mucus.
FŒTOR. An offensive smell.
FOLLICLE. A small secreting cavity.
FORAMEN. An aperture in any part of the body.
FORENSIC MEDICINE. Medical jurisprudence.
FORMICATION. A creeping sensation on the surface of the skin.
FORMULA. A prescription.
FOWLER'S SOLUTION. A solution of arsenic.
FRÆNUM. Folds of the mucous membrane, constituting a bridle or tie.
FRAGILITAS OSSIUM. Brittle *Bones.*
FROST-BITE. Numbness and gangrene produced by cold.
FURUNCULUS. A small boil.
FUSEL OIL. Deleterious product obtained from alcohol.

GALACTOMETER. An apparatus for measuring the amount of cream in milk.
GALBANUM. A gum-resin.
GALLIC ACID. An acid obtained from *Gall* nuts.
GLEET. A mucous discharge from the urethra.
GLENOID. The socket of the shoulder.
GLOBULINE. The chief constituent of the *blood* globules.
GLUTEAL. The region indicated by the buttocks.
GONORRHŒA. A purulent and infectious discharge from the urethra.
GREY POWDER. *Mercury* with chalk.
GUMMA. A tumour caused by the poison of syphilis.
GUSTATORY NERVE. The nerve of taste.
GUTTA. A drop, not a minim.

HÆMATOCELE. Blood effused into the sac of the *Testicle.*
HÆMORRHOIDS. *Piles.*
HAUSTUS. A draught.
HAVERSIAN CANALS. Minute canals in *Bone.*
HEMIDESMUS. Indian sarsaparilla.
HISTOLOGY. The study of minute textures.
HORDEOLUS. A stye in the *Eye-lid.*
HUMOR. Moisture or discharge from any part.
HUMULUS LUPULUS. The *Hop* plant.
HYDROCHLORIC ACID. A compound of hydrogen with chlorine.
HYDROMETER. Measurer of water in connexion with the specific gravity of fluids.
HYDROPS. *Dropsy.*
HYOIDES. A bone at the root of the *Tongue.*
HYPERÆSTHESIA. Excessive sensibility.
HYPERTROPHY. Excess of nutrition.
HYPNOTICS. Medicines which induce sleep.

ICHTHYOSIS. Fish-like disease of the *Skin.*
ICTERUS. *Jaundice.*
ILEUM. The lower part of small *Intestine.*
IMPACTION. Obstruction in any part of the circulation.
IMPERFORATE. Congenital or abnormal closure of a natural passage.

INANITION. Exhaustion, want of vitality.
INCARCERATION. A term used to denote the state of the bowel in *Rupture*.
INCUBATION. The interval between the first germination of a disease and its appearance.
INDIGENOUS. A term applied to *endemic* disease.
INDURATION. An increase in the natural hardness of a part.
INFILTRATION. Diffusion of fluid into the tissues.
INFLUENZA. Epidemic *Catarrh*.
INGESTA. *Food* and *Drink*.
INNERVATION. The functions of the *Brain* and *Nervous System*.
INOCULATION. The insertion of poison or other matters into the skin.
INOSCULATION. The union of blood-vessels.
INSALIVATION. Combining the food with the *Saliva*.
INSOLATION. *Sun-stroke*, or exposure to sunlight as a remedy.
INSOMNIA. Sleeplessness.
INTUMESCENCE. Large swelling.
INTUSSUSCEPTION. The descent of a part of a bowel inside another part.
IODOFORM. A crystallised preparation made from *Iodine*, pearl ash, and alcohol.
IRIDECTOMY. Excision of a portion of the *iris*, for a new pupil.
ISCHURIA. A term applied either to retention or suppression of urine.
ISINGLASS. Gelatin obtained from the swimming bladders of fishes.

JABORANDI. A sudorific remedy obtained from Brazil.

KEPHALALGIA. *Headache*.
KERATITIS. Inflammation of the cornea of the *Eye*.
KLEPTOMANIA. A morbid desire for other people's goods.
KNOCK KNEES. A deformity, now remedied by surgical operation.
KRAMERIA. Rhatany.
KREATIN. Organised material obtained from *Flesh*.

LACTIC ACID. A product of *Fermentation*.
LARDACEOUS. A term applied to diseased growths of a lardy consistence.
LENITIVES. Soothing medicines, mild *Aperients*.
LESIONS. Wounds, or the results of disease in organs.
LIPOMA. A fatty tumour.
LIQUOR SANGUINIS. The *Blood* without its corpuscles.
LITHIC ACID. A product of the *urinary* secretion, uric acid.
LOCOMOTOR ATAXY. A form of *Spinal* paralysis.

MACULÆ. Temporary or permanent spots on the skin.
MALASSIMILATION. Faulty digestion and improper nourishment.
MALINGERING. A term applied to feigning disease for improper objects.
MANIA. Synonymous with most forms of insanity.
MARSHALL HALL'S METHOD. A method of treating suspended animation.
MATURATION. Ripening, such as the full formation of pus in an abscess.
MELÆNA. *Hæmorrhage* from the bowels.
MENINGITIS. *Inflammation* of the membranes of the *Brain*.
MENTAGRA. An eruption on the chin.
MIDRIFF. The *Diaphragm*.
MITRAL VALVE. The valve of the left ventricle of the *Heart*.
MOLLITIES. Softening of any part, though applied usually to the *Bones*.
MULTILOCULAR. *Tumours* having several cysts or cells.
MUSCÆ VOLITANTES. Small bodies which appear to float before the *Eyes*.
MYOPIA. Short *Vision*.

NARES. The cavities of the *Nose*.
NATES. The gluteal region or buttocks.
NOMA. A spreading ulcer of a malignant type.
NUCLEUS. The solid centre of a *Growth* or *Concretion*.

OBSTRUENTS. Medicines which tend to close the natural passages.
OCCLUSION. Closure of a blood-vessel or cavity of any kind.
OLECRANON. The head of the *Ulna*, the elbow.
ORPIMENT. The yellow sulphide of *Arsenic*.
OTALGIA. *Earache*.
OTORRHŒA. Purulent discharge from the *ear*.
OZŒNA. Offensive discharge from an *Ulcer* in the *Nose*.

PALUDAL FEVER. Marsh fever. *Ague*.
PANNUS. Thickening of the membrane, covering the *Cornea*.
PAPAVER SOMNIFERUM. The white poppy, which yields *Opium*.
PARENCHYMA. The spongy substance of organs, as of the *Lungs*, &c.
PARONYCHIA. An abscess near the nail, *Onychia*.
PARULIS. *Gum-boil*.
PEDICLE. A band of attachment to a *Tumour*.
PELLAGRA. Another name for *Leprosy*.
PELVIMETER. An instrument for measuring the *Pelvis*.
PEMPHIGUS. A disease of the *Skin*.
PERCOLATION. Filtration, specially applicable to *Tinctures*.
PERINEUM. The space between the anus and scrotum.
PERINEPHRITIS. Inflammation round the *Kidneys*.
PERIOSTEUM. The investing membrane of the *Bones*.
PERTUSSIS. *Hooping* or whooping cough.
PHALANGES. The bones of the *Fingers*.
PHOSPHATIC DIATHESIS. A condition in which *Phosphates* appear in the urine.
PHYMOSIS. An affection of the prepuce.
PIA MATER. The vascular membrane of the *brain* and *spinal* cord.
PITYRIASIS. A desquamative *Disease* of the *Skin*.
PLACEBO. A prescription to please or soothe.
PLASMA. Matter from which new bodies are formed.
PLUMBISM. *Lead* poisoning.
PODAGRA. *Gout* which attacks the foot.
POSOLOGY. The department of *Materia Medica* which treats of doses.
POTT'S FRACTURE. *Fracture* of fibula and tip of tibia immediately above the *Ankle*.
PRESBYOPIA. Long sight, the common form of defective *Vision* in old people.
PRIMA VIA. The *Alimentary Canal*.

PRIMIPARA. A female in her first pregnancy.
PROPHYLAXIS. Measures intended to ward off disease.
PROTOPLASM. Germinal matter forming the basis of *Life*.
PTOSIS. *Paralysis* of upper lid of the *Eye*.
PUTRID FEVER. Malignant *Typhus Fever*.
PYELITIS. *Inflammation* involving *Kidneys* and membranes about the pelvis.

RECRUDESCENCE. Return or relapse of a disease.
RECTUS. A name applicable to several muscles of the abdomen.
REFLEX ACTION. A term denoting certain functions of the *Nervous System*.
REGURGITATION. Check to the natural flow of blood through the heart.
RESECTION. Excision of the ends of broken bones or of the ends of the bones forming a *Joint*.
RETROVERSION. An abnormal inclination of the *Womb* backwards.
RHINOPLASTIC. Employed to denote the method of making a new nose.
RHYTHM. The course of successive pulsations or sounds of the *Heart*.
RING FEMORAL. An internal opening in the groin through which the bowel passes in *Rupture*.
RODENT ULCER. An ulcer having a tendency to gnaw and destroy the skin.
ROSEOLA. A cutaneous eruption of a dull rose hue.
RUBEOLA. *Measles*.
RUPIA. A skin disease, associated with syphilis.

SARCOMA. *Tumour* of the consistence of flesh.
SCLERIASIS or SCLEROSIS. A term usually applied to hardening of the *nervous* centres.
SCORBICULUS CORDIS. The region underneath the lower end of *Sternum*.
SCORBUTUS. *Scurvy*.
SCRIVENER'S PALSY. Writers' *Cramp*.
SCROTUM. The skin and investing membranes of the *Testes*.
SENSORIUM. The base of the *Brain*.
SEPTIC. Connected with poison or putrefaction.
SEPTICÆMIA. Blood poisoning from any cause.
SEQUELÆ. The after consequences of disease.
SEQUESTRUM. An *exfoliated* portion of bone.
SILVESTER'S METHOD. Means of restoring animation in *Drowning, Suffocation, &c.*
SINGULTUS. Convulsive sobbing.
SORDES. The dark matter on the teeth.
SPHYGMOGRAPH. The instrument used for defining the character and beats of the *Pulse*.
SPICA. The name of a particular form of *Bandage*.
SPINA BIFIDA. A congenital deficiency in the vertebral canal.
SPIROMETER. An instrument for ascertaining the capacity of the *Lungs*.
SPLINT BONE. The *Fibula*.
SPUTUM. The *Expectoration*.
STAPHYLOMA. Protrusion from the front surface of the *Eye*.
STAPHYLORAPHY. The operation, for closing fissure of the *Palate*.
STHENIC DISEASE. *Acute* and inflammatory forms of *Disease*.
STOMATITIS. *Inflammation* of mucous membrane of *Mouth*.
STRABISMUS. *Squint*.
ST. VITUS' DANCE. *Chorea*.
SUPERFŒTATION. Multiple *Pregnancy*.
SUSPENSORY. The name of a bandage or bag-truss for the scrotum.
SYCOSIS. A cutaneous eruption affecting the hairy parts of the face.
SYNTONIN. The chief constituent of *Muscle*.

TACTILE CORPUSCLES. The delicate nerve filaments of the papillæ of the *Skin*.
TACTUS ERUDITUS. The skilled sense of touch.
TALIPES. *Club-foot*.
TARSUS. Part of the foot between the *Toes* and the *Heel*.
THROMBOSIS. Coagula in the course of the *Circulation*.
TINEA. An eruption of the *Skin* produced by parasitic fungi.
TORMINA. A twisting or griping of the *Intestines*.
TORSION. Twisting the ends of blood-vessels to check hæmorrhage.
TORTICOLLIS. *Wry Neck*.
TOXÆMIA. Another name for *Blood Poisoning*.
TRANSFUSION. The name of the operation of injecting blood into the veins.
TRANSUDATION. The passage of fluid from one porous organ to another.
TRAUMATIC. Connected with wounds.
TRISMUS. Locked jaw.
TROCHANTERS. The processes at the upper extremity of the *Thigh bone*.
TYMPANUM. The drum of the *Ear*.
TYPHLITIS. Inflammation of the *Cæcum*.

UNILOCULAR. A cavity or *Tumour* containing one cyst or cell.
URÆMIA. Blood poisoning induced by the retention of *Urea* in the *Blood*.
URIC ACID. A constituent of healthy *Urine*.
URTICARIA. *Nettle Rash*.
UTERO-GESTATION. The interval of *Pregnancy*.

VARICELLA. *Chicken Pox*.
VARIX. A knotty and twisted state of the veins.
VASELINE. *Petroleum* jelly.
VASO-MOTOR. A term applied to the *Nerves* which supply the *Blood-vessels*.
VEGETATIONS. *Fungus* growths either in the interior or on the external surface of the body.
VERMICULAR. Peristaltic movement of the *Intestines*.
VIRUS. *Poison* or venom, applied usually to the *Contagium* of *infectious* diseases.
VITELLUS OVI. The yolk of *Egg*.
VITREOUS HUMOR. The chief fluid contained in the *Eye*-ball.
VOCAL CHORDS. The elastic ligaments forming the sides of the *Glottis*.

WEBBED FINGERS. Adherent fingers, a congenital *Deformity*.
WHITE LEAD. Carbonate of *Lead*.
WHITE PRECIPITATE. A compound of *Mercury* and *Ammonia*.
WHITLOW. *Onychia* and paronychia.
WORMIAN BONES. Bones formed between the *occipital* and *parietal* bones.

YELLOW WASH. A lotion formed by the decomposition of corrosive sublimate and lime water.

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