Home nursing : arranged according to the revised syllabus of the St. John ambulance association / compiled by a committee principally from the original manuscript, written at the request of the association by Mildred Heather-Bigg.

HOME NURSING

AS A COMPANION TO THIS BOOK—

"A CATECHISM OF HOME NURSING."

BY

J. M. CARVELL,

M.R.C.S. and L.S.A.

Price 6d.; by Post, 7d.

HOME NURSING

ARRANGED ACCORDING TO THE REVISED SYLLABUS

OF THE

ST. JOHN AMBULANCE ASSOCIATION

COMPILED BY A COMMITTEE PRINCIPALLY FROM THE ORIGINAL MANUSCRIPT, WRITTEN AT THE REQUEST OF THE ASSOCIATION,

BY

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SYLLABUS OF HOME NURSING COURSE.

Lecture I.

A. Scope of Nursing. Qualifications of a good Nurse.

B. The Human Body; Metabolism; The Blood and its Circulation; Nervous System.

C. Choice and Preparation of the Sick Room; Cleaning and Dusting; Lighting; Ventilation and Warming.

Practical Work: Roller Bandaging.

Lecture II.

A. The Bed and Bed-making, including Beds for special conditions, changing sheets and turning mattress; Appliances for the Bed.

B. Washing Patients.

C. Observation and Reporting.

Practical Work: Roller Bandaging; Bed-making; Changing Sheets, etc.

Lecture III.

A. Pulse; Respiration; Temperature; Rigors; Pain; Attitude; Tongue; Excretions; Sleep; Cough; Vomiting.

B. Bedsores.

C. Digestion, Assimilation and Absorption; Food and its Preparation; Feeding Patients.

Practical Work: Roller Bandaging; Taking Pulses and Respirations; Reading Thermometers and Charting.

Lecture IV.

A. Medicine ; Weights and Measures ; Inhalation ; Spraying.

B. Enemata.

C. Inflammation.

D. Local Applications — Fomentations, Counter Irritants.

Practical Work : Roller Bandaging ; Measuring Medicines and Mixing Solutions ; Making Poultices and Fomentations ; Reading Thermometers, etc.

Lecture V.

A. Fever ; How to reduce Temperature.

B. Infection and Disinfection.

C. Infectious Diseases, especially Consumption and Typhoid, with Notes on other Infectious Diseases.

Practical Work : Roller Bandaging ; Making of Disinfecting Solutions ; Taking Pulses and Respirations.

Lecture VI.

A. Surgical Nursing.

B. Nursing of Children.

Practical Work.

PREFACE.

At the request of the Ambulance Committee of the Order of St. John, we have undertaken the compilation of the official Home Nursing Hand-Book of the St. John Ambulance Association, chiefly from the manuscript of Miss Mildred Heather-Bigg.

We consider some knowledge of Elementary Physiology and Physics to be necessary in order that the principles of Home Nursing may be understood, and have accordingly introduced a small amount of information on these subjects when dealing with the matters to which they more particularly relate.

Following out the plan adopted in the official First Aid Manual, we have given directions for the principal parts of the Home Nurse's duties in the form of simple rules which we trust will prove easy to understand and to remember.

William R. Edwards *(Chairman)*.
William E. Audland, M.R.C.S.
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Charles Cotton, F.R.C.P.E.
Robert B. Duncan, M.D.
George S. Elliston, M.R.C.S.
Isaac G. Modlin, M.D.

HOME NURSING TEXT BOOK.

CHAPTER I.

INTRODUCTORY.

THE St. John Ambulance Association was formed by the Grand Priory of the Order of St. John of Jerusalem in England in the year 1877, and at first confined its instruction to First Aid to the Injured. It soon, however, became apparent that even an elementary knowledge of the art of nursing would prove of much service, especially in cases of accident or illness treated in a private house, when the services of a trained nurse were either unobtainable or, owing to the slightness of the patient's ailment, unnecessary.

The object of this book is to serve, firstly, as a guide to a course of study directed by a member of the medical profession or by a trained nurse, and, secondly, as a simple work of reference for those who have obtained their Home Nursing Certificates and are called upon to undertake the care of a patient in the circumstances indicated above.

Technical terms will be but sparingly used, and will when necessary be included in a

Glossary containing an explanation of all words printed in *italic type*, and also of other words with which a nurse will frequently meet. In many instances more than the mere meaning of a word is given in the Glossary. The object of this is to give explanations of technical matters unsuitable for inclusion in the general text of the book. These will be found particularly useful to those who take advantage of the facilities offered by many hospitals in London and in the provinces to members of the St. John Ambulance Brigade and of Voluntary Aid Detachments, for obtaining practical experience by actual work in the hospitals. Candidates for the Home Nursing Certificate of the Association will not be examined on the Glossary.

SCOPE OF NURSING.

In all cases of illness the welfare of the patient largely depends upon the cordial co-operation of the Doctor and the Nurse. Settling the plan of treatment rests entirely with the former, while carrying out that plan rests to a great extent with the latter. The nurse must promptly, intelligently and tactfully perform the duties assigned to her by the doctor, and so both merit and gain his confidence, without which the work that both should be equally anxious to make as perfect

as possible, cannot be done harmoniously in the best interests of the patient.

In general terms it may be said that treatment of illness falls under one or more of three heads.

1. **Removing or neutralising the cause,** as by taking a patient away from harmful surroundings, performing a surgical operation, or giving an antidote to poison. Under this head may also be included, preventing the spread of infection.

2. **Promoting conditions most favourable to Nature's effort to effect a cure.** Under this head come rest, cleanliness and the provision of proper food, air and warmth.

3. **Supplementing Nature's effort** by drugs and physical means such as applications of heat, cold, pressure, etc.

Surgical operations and prescribing lines of treatment and medicines are clearly the doctor's business, though preparations and anticipating his requirements fall to the lot of the nurse. He will, when necessary, give advice as to the surroundings, though the nurse should have some knowledge as to the general conditions, detrimental or favourable to the recovery of an invalid. The nurse, as well as the doctor, should use every possible precaution to avoid the spread of infection.

The greater part of what falls under the second and third heads will be the duty of the nurse under the direction of the doctor, and not only must she conscientiously carry out instructions given her, but she must be ever on the look-out for changes in the condition of the patient, and be prepared with precise reports of what has occurred during the doctor's absence, to be laid before him when he makes his visits.

Qualifications of a Good Nurse.

Though some are specially endowed with a gift for nursing, every woman of average ability can, with perseverance and good training, become a capable nurse, provided that she possesses or can cultivate the following essential qualifications :—

Health.—Ill-health gives rise to conditions which limit the nurse's powers of being helpful to her charges, and it is her duty, for the sake of others, to endeavour to keep herself in health by observing the following rules :—

1. Arrange your work to permit of at least seven hours sleep daily, and reasonable time for meals, which should be taken at intervals of not more than four-and-a-half-hours.

2. Seize every opportunity, when off duty,

of putting up your feet, if only for a few minutes at a time. This is especially necessary when you begin nursing, and will lessen the risk of flat foot and varicose veins due to prolonged standing.

3. Avail yourself intelligently of all opportunities for fresh air, rest and recreation. Fresh air is so vital that an hour's ride on a motor bus will often do you more good than lying down for two hours. Rest, fresh air, exercise and amusement are all alike necessary, but need not be combined every day in the same way.

4. Be regular in your habits and on your guard against constipation. If your bowels are disinclined to act, do not take aperients as a matter of course; their use induces an undue reliance on drugs for what should be a natural process. *Constipation* can be controlled by stimulation of the nerves and muscles, which can be effected by rubbing the body with a rough towel or loofa, using the circular movement. Before resorting to medicine consult a doctor.

5. Always report to the doctor a sore throat, however slight. Chlorate of Potash gargle used night and morning tends to make the throat immune from *tonsillitis*.

6. Constantly examine your hands for cuts and cracks, especially before dressing a sore. After painting any cuts and cracks found with the mild tincture of iodine, cover them with gauze or cotton wool teased out and afterwards saturated with collodion.

Cleanliness.—Ordinary personal cleanliness is the first step to surgical cleanliness. Much human suffering, as well as actual loss of life, can be traced directly to want of surgical cleanliness (see Chapter XI.) on the part of those brought in contact with patients who have undergone operations.

A warm bath should be taken daily; if this is impossible, a dry rub from head to foot given with vigour and thoroughness will be no bad substitute.

Special attention should be paid to the nails and to the folds of skin round them. A **clean** nail-brush should be used; in the absence of one the following plan may be adopted. After washing the hands well with soap and warm water, rub with soap and a little cold water until the palms are full of lather. Now clench and unclench the hands rapidly several times, thus driving the lather under and around the nails of the fingers. Cleanse your thumb-nails by digging

the thumb of one hand into the lathered palm of the other. The nails should be kept short.

The teeth should be brushed with antiseptic tooth powder **night and morning,** and the mouth rinsed after every meal so that no smell of food may be noticed by the patients.

Conscientiousness.—This quality includes faithfulness in carrying out duties, and truthfulness in actions as well as in words. Verbal accuracy may be far from truthful and, like telling half the truth, may be worse than deliberate falsehood. A nurse would convey a false impression if she said she had given a patient three feeds of milk ordered for him at night, but omitted to add that, having forgotten to give one at the right time, the last two feeds had been given with less than an hour's interval between them.

Loyalty.—This quality goes with conscientiousness. Loyalty to the doctor consists in saying and doing nothing to lessen his patient's confidence in him, and never comparing his methods with those of other doctors. Loyalty to the patient means not only carrying out the instructions of the doctor, but also carrying them out cheerfully and with real regard to the patient's welfare. Invalids often

talk somewhat freely to a nurse about their private affairs, and it need hardly be said that any confidences of the patient must be most scrupulously observed.

Obedience.—Prompt obedience in carrying out an order given without questioning the why or wherefore—the bringing of her individuality into subjection to that of the authority over her—is demanded of all nurses. A nurse who, in her ignorance of the vital issues at stake, refrains from carrying out an order exactly as she has been told to carry it out imperils the life of a patient.

Good Temper and Cheerfulness.—To be thankful for our blessings instead of dwelling upon our grievances keeps us good-tempered even in the most trying circumstances. Our kindly words and actions that conduce to good temper in other people help to keep our own tempers even, for moody looks and curt answers from those around us have a ruffling effect upon any temper.

Observation.—The power of taking in details at a glance, of visualising them afterwards, and of mentally registering those that bear upon the health of the patient, is one of the most valuable gifts a nurse can have. At first she does not quite know what to observe,

and later she may sometimes imagine that she has observed a detail she expected to find, but which was not actually present.

Economy.—There are many ways of exercising this. Lights, when not needed, can be switched off or lowered in passages and elsewhere. Pieces of gauze tissue, ends of bandages, cotton wool, etc., left over after a dressing may, if clean, be collected and kept for future use.

FAULTS TO AVOID.

Amongst those who make bad nurses are :—

1. **The noisy.** These are continual sources of disturbance to the sick. Creaking boots, clattering of heels, slamming doors, rattling crockery, standing at the foot of the bed and shaking it, talking just outside the door, and noisily mending the fire are amongst the most obvious faults of a bad nurse. With a noisy nurse the patient is kept constantly on tenter-hooks dreading the next disturbance.

2. **The ostentatiously quiet.** These are, to many patients, more irritating than the noisy. A cat-like tread keeps the patient wondering in what part of the room the nurse will next appear. Speaking in low, but distinctly audible, tones is infinitely preferable to whispering, which makes a sick person strain to hear what is being said.

3. **The fussy.** Talk about trifling matters that should be settled in silence, and pronounced hurry are very trying, while continual shifting of pillows and bedclothes, constant inquiries as to the patient's feelings, and visits on tip-toe to see if he is asleep are attentions most wearisome to the sick.

The nurse should know something about the structure of the body and the manner in which the various organs and parts co-operate in the maintenance of life and promotion of health. Much of the necessary information can best be afforded when explaining the details of nursing which it intimately affects. On the other hand, the structure of the body, the blood circulation, and the nervous systems are of such general importance as to make it desirable briefly to outline them here.

Structure of the Human Body.

The human body consists of the head, the trunk and the limbs. It is built upon a bony framework, the skeleton, which, besides forming a framework for the body, affords support to the soft parts, protects or helps to protect the vital *organs*, and in conjunction with the muscles attached to the bones, makes possible movement of the whole body and of its parts.

A large proportion of the body consists of water, and the remainder is built up mostly of **living units** called *cells*, which are found either single (for example, the *corpuscles* of the blood) or arranged to form *tissues* (for example, muscle, bone, etc.). Tissues in turn are combined to form structures and *organs*. *Salts* are also found freely distributed throughout the body. Organs are adapted to carry out functions, some of which are vital—that is, necessary for the maintenance of life—while others—for example, locomotion—add to the convenience of the living being.

The life of the body is, therefore, made up of millions of lesser lives ; the cells are perpetually dying and new ones taking their place. The tissues may perish as a result of disease. For example, owing to disease or carelessness on the part of the nurse, a bed-sore may be formed and tissue destroyed ; or *gangrene* may set in and cause the death of a whole limb or part. Destruction of tissue may be so great as to destroy the efficiency of an organ ; for example, lung tissue may be so much eaten away by consumption as to render the organ incapable of performing its functions. The result of this, as in the case of serious destruction of tissue in any other vital organ, is death of the whole body.

The vital organs of the body are for the most part enclosed within cavities—the Cerebro-spinal Cavity, the Thorax (Chest), and the Abdominal Cavity.

The Cerebro-spinal Cavity is within the *cranium* and the spine as far as the second lumbar *vertebra*. The *brain* is contained in the cranium, and is continuous through a large opening in the base of the skull with the *spinal cord*, contained in the *spinal canal*.

The Thorax occupies the upper third of the trunk, and is bounded at the back, sides and front by the twelve *dorsal vertebræ*, the *ribs*, the rib *cartilages*, and the *sternum* or breast bone; above by muscles at the root of the neck; below by the *diaphragm*, which separates it from the *abdomen*. The thorax contains the *lungs*, the *heart*, and great blood-vessels connected with and adjacent to it, the greater part of the *trachea* or wind-pipe of the *œsophagus* or gullet, of the *thoracic duct*, and certain large nerves.

The Abdominal Cavity occupies the lower two-thirds of the trunk. It is bounded above by the diaphragm and lower ribs, and below by the pelvic bones, *coccyx*, and the *perineum*; behind by the *lumbar vertebræ;* at the sides and in front by the abdominal muscles. The

cavity contains the *stomach*, *large and small intestines*, *liver*, *spleen*, *pancreas*, *kidneys*, *ureters* and *bladder*, also in females the *uterus* and its appendages. There are also in the cavity large blood-vessels, the lower part of the thoracic duct and nervous *ganglia* (part of the sympathetic system).

How Life is Maintained.

Food and drink are necessary to support animal life. These would not, however, serve their purpose unless oxygen were also taken into the body to aid in effecting chemical changes whereby the tissues of the body are built up and renewed, and energy in the form of power and heat is produced. These chemical changes are grouped under the general term *metabolism*. A further result of these changes is the giving off of waste products and surplus heat, which must be removed from the body.

The Blood and its Circulation.

Food, after treatment by the organs of digestion, and oxygen derived from the air, are carried to the tissues by the blood. Waste products and surplus heat are removed from them by the same agency.

Blood consists of a fluid called *plasma*, in which are floating an immense number of very small solid bodies (*cells*), called *corpuscles*, of

two kinds—red and white. The red corpuscles collect oxygen from the air in the lungs, and in due course give it up to the tissues in the body; they also receive some *carbon-dioxide* (carbonic acid gas) from the tissues to be given up to the air in the lungs. The function of the white corpuscles, known as *phagocytes*, is to enclose harmful germs and other septic matter, which they rapidly digest and destroy, and thus assist in ridding the body of them. The plasma receives nourishment from the organs of digestion which it gives up to the tissues, receiving in exchange *carbon dioxide*, water and other waste products of *metabolism*. It carries these to the lungs and the organs of excretion for removal from the body.

The circulation of the blood is carried out by the *heart* and the blood-vessels—*arteries*, *capillaries* and *veins*.

The heart is a hollow muscular organ situated within the cavity of the chest, with two-thirds of its bulk to the left of the middle line. It is divided by a partition into the right and left sides so completely that there is no direct communication between them.

There are two distinct parts of the circulation of the blood—the General or Systemic Circulation and the Lung or Pulmonary Circulation.

The Systemic Circulation.

Blood is forced from the left side of the heart through the *aorta*, the great central artery of the body, which divides and sub-divides to form branches for conveying blood to practically all parts of the body. The walls of arteries are muscular and elastic, and owing to this these vessels are endowed with the power of dilation and contraction, extension and retraction—in other words, they can become larger or smaller, longer or shorter. As the branches of the aorta sub-divide they become smaller and smaller, until they are so small as only to be visible with the aid of a microscope. They have now become capillaries—very small vessels, whose walls are not nearly as thick as those of arteries, and permit an interchange of fluids and gases between the blood and the tissues. It is by means of this interchange that food and oxygen reach the tissues, and waste products reach the blood. The effect of this interchange upon the blood is to render it impure and to change its colour from bright red to dark purple. The capillaries unite to form veins, which become larger and larger by being joined to each other, and eventually reach the right side of the heart through two large veins—the *superior vena cava* and

DIAGRAM OF THE CIRCULATION.

(The Heart is seen from behind.)

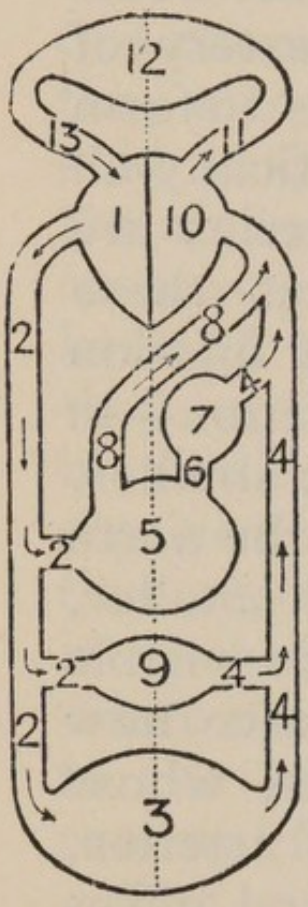


FIG. 1.

1.—Left side of the Heart (p. 18).

2, 2, 2, 2.—Arteries of the systemic circulation (p. 19).

3.—Tissues of the body, with their capillaries (p. 19). The lungs, stomach and intestines, liver, kidneys and heart muscle, though shown elsewhere in the Diagram, are included. They require and receive arterial blood like other parts of the body.

4, 4, 4.—Veins of the systemic circulation (p. 19).

5.—Stomach and Intestines, with their capillaries (pp. 95, 96).

6.—Portal Vein, carrying blood laden with food to the liver.

7.—Liver (p. 96).

8, 8.—Thoracic Duct, carrying lymph and food to the veins. Blood is not carried in this vessel (p. 96).

9.—Kidneys (p. 97).

10.—Right side of the Heart (p. 19).

11.—Pulmonary Arteries (p. 21).

12.—Lungs, with their capillaries (p. 21).

13.—Pulmonary Veins (p. 21).

All blood-vessels to the left of the central line in the Diagram carry arterial blood; all those to the right carry venous blood. This does not apply to the body, on both sides of which both arterial and venous blood circulate.

the *inferior vena cava*. The former of these veins collects blood from the veins of the upper part of the body, and the latter from the lower part.

The Pulmonary Circulation.

It is now necessary for the blood to get rid of carbon-dioxide and the other waste matter which it has received, and to obtain a fresh supply of oxygen. To do this it is carried by the pulmonary arteries to the lungs. These arteries divide and sub-divide to form capillaries, through the walls of which the blood comes in contact with the air in the lungs, to which it gives up carbon-dioxide and water and receives oxygen in exchange. The capillaries now join to form veins, which become larger and larger by uniting with each other, and eventually reach the left side of the heart as the pulmonary veins. These veins contain blood bright red in appearance and fit in every way to do its duty in the capillaries of the systemic circulation, except that it contains nitrogenous impurities, which are removed by the agency of the kidneys (see chapter on "Food").

The Nervous System. The whole work of the body is regulated by two systems of nerves, the Cerebro-spinal and the Sympathetic.

The Cerebro-spinal System comprises the *Brain* and the *Spinal Cord* as its central organs, from which pearly white threads, called nerves, proceed to practically all parts of the body. It affords the means whereby sensations are received, and the will incites movement of the voluntary muscles.

The Sympathetic System consists of two chains of nerve centres called *ganglia*, extending, one on each side, along the entire length of the front of the vertebral column, and sending off branches to all the organs of the *thorax* and *abdomen* as well as to the blood-vessels. This system, by controlling the involuntary muscles, regulates the vital functions and the temperature of the body. It acts independently of the will during vigilance, sleep and *stupor*, and, to an extent, during *coma*.

QUESTIONS ON CHAPTER I.

The numerals indicate the pages where the answers may be found.

CHAPTER II.

Choice and Preparation of a Sick Room.

Choice of the Sick Room.

The room must be selected carefully, and regard paid to the purposes to which other rooms in the house are being put; for instance, quiet being essential to a patient's well-being, one would not willingly locate a sick room next to, or, worse still, immediately below, a children's nursery.

Except in the very hottest months of summer, a south-westerly *aspect* (in the Southern Hemisphere, north-westerly) is best for the patient, as sunshine is thus secured at the right time of day. Sunshine too early in the morning may not be desired, because many people cannot sleep when a room is very light, but in the late afternoon or evening, when the patient is usually tired, chilly, and low-spirited, drawing up the blinds and letting the sunset glow stream in will do him all the good in the world. The individual's own taste must, however, be considered in the matter; there are people who love the morning sun and whose slumbers are not disturbed by it.

Sick Room Requisites.

It is of much advantage when the sick room opens on to a square landing, or communicates with a smaller room. This allows of all the sick room requisites being kept out of sight but close at hand, and greatly assists in keeping milk and other invalid food fresh and sweet.

Bed-pans and—if required—urinals should be kept in the lavatory. On the landing outside, or in an adjoining room, should be a table specially reserved for nursing requisites and the prescribed nourishment for the night.

Cleaning and Dusting.

Everything unnecessary in a sick room should be removed. The essentials will consist of a bed, a bed table, two tables, a couple of ordinary chairs, and an easy chair, perhaps a sofa, a screen and a couple of rugs. Flowers (to be removed at night) and pictures often give much pleasure to the patient.

Having emptied the room as far as expedient, the cleaning must be proceeded with.

With sufficient time for the preparation of the room, the chimney should be swept before the cleaning is started.

In dealing with dust, use a **damp** duster first and then rub the article with a dry one.

Dusting brushes are worse than useless, as they only flick the dust about.

The walls—character of paper permitting—must be carefully swept down with a long broom having a damp cloth tied round the bristles. All curtain-poles, blinds, tops and ledges of windows and doors, and the tops of all wardrobes and other heavy immovable furniture must be similarly treated. Communicating doors that have been kept shut for any length of time should be opened, and their sides and tops—especially the hinge side—well wiped down with damp dusters which should be constantly wrung out in a pail of water containing a solution of 1 in 100 of Lysol, or some other disinfectant, which should be changed several times.

During the course of an illness cleaning should be done with a vacuum cleaner, or with a duster damped with Lysol (1 in 100) or some other disinfectant.

LIGHTING. Ordinary gas jets, candles, and lamps are alike undesirable, because they vitiate the air, and though the gas mantle does not do this to any great extent, it has some other drawbacks. Electric light is undoubtedly best of all artificial lights, as it does not load the air with soot or gases.

Whenever only an inconsiderable light is required, a night-light meets the needs of the case. It should be put in a basin in a part of the room where the light reflected on the ceiling cannot be seen by the patient. Lights of all kinds should be shaded, so that they do not shine directly on to the patient's eyes.

QUESTIONS ON CHAPTER II.

The numerals indicate the pages where the answers may be found.

CHAPTER III.

VENTILATION AND WARMING.

Object of Ventilation and Warming.

Florence Nightingale used to advise nurses to keep the air the patient breathes as pure as the external air without chilling him. To carry out this advice to the letter is well-nigh impossible, but much can be done in this direction by a nurse who understands the principles which should guide her, and has sufficient tact to overcome the too common prejudice against fresh air.

The object of ventilation and warming is to adapt the air around a living person to assist—

(*a*) In the series of chemical changes (*metabolism*) which the tissues of the body constantly undergo, and which are essential for the maintenance of life ; and

(*b*) In regulating the temperature of the body, which must be maintained within certain limits.

Respiration.

Respiration, or breathing, is carried out by the lungs and the air passages. Air enters the body through the nose (or mouth), passes to the back of the

throat, and thence through the *larynx* to the *trachea* or windpipe. The trachea divides into the right and left *bronchi*, which enter respectively the right and left lungs. Here they divide into *bronchial tubes*, which become smaller and smaller by subdivision until they terminate in minute air cells (*alveoli*).

Breathing consists of two acts—Inspiration and Expiration. In the first the ribs rise and the *diaphragm* becomes flattened. These movements increase the capacity of the *thorax*, tend to create a vacuum, and draw air into the lungs. In expiration a reversal of these movements takes place, and air is forced out. (See "*Lungs*" in the Glossary.)

The air on reaching the air cells in the lungs is brought in contact with minute blood-vessels called capillaries, through the delicate walls of which an interchange of gases takes place, the air giving oxygen to the blood and receiving in exchange *carbon dioxide* (carbonic acid gas) and water vapour (steam).

Steam is invisible vapour which water gives off either slowly by evaporation at a temperature below boiling point, or quickly when boiling. It must not be confused with the damp vapour which is seen issuing from the spout of a kettle of boiling water.

AIR. The air within the lungs is composed approximately of 15 per cent. of oxygen, 79 per cent. of nitrogen, and 5 or 6 per cent. of carbon dioxide, the whole being almost *saturated* with water vapour. It is constantly receiving carbon dioxide and water vapour from the blood in exchange for oxygen, and would soon be unfitted for these functions if it were not constantly refreshed by air rich in oxygen and poor in carbon dioxide.

Normally pure air is a mixture of gases, of which oxygen forms about one-fifth, the remaining four-fifths being nitrogen (which serves merely to dilute the oxygen), and under one per cent. of carbon dioxide and water vapour with traces of other gases. It is admirably adapted by its composition to refresh the air in the lungs. When, however, it is surrounding a breathing person it receives expired air, which, though not containing quite so much carbon dioxide as is present in the air remaining in the lungs, has in it about four per cent. of that gas, besides organic matter and water vapour. Additional impurities are also given off by the skin. If, therefore, the air in an occupied room did not constantly change, it would soon become seriously contaminated and unsuitable for the purpose it should perform. Experience

has shown that at least 3,000 cubic feet of fresh air are required by each occupant of a room per hour, and additional fresh air for each gas burner or lamp that is used. To obtain the necessary fresh air, and at the same time to maintain a proper temperature, is the problem confronting the nurse.

Regulation of Temperature.

The temperature of the body as a whole remains in health at about 98.4° Fahr. (normal); in fact a relatively small increase or quite a small decrease is incompatible with life. This may appear strange, as everybody has at times felt too hot or too cold. The explanation is that the ends of sensory nerves are found largely in or just beneath the skin, and consequently the sensation of heat or cold is very apparent on the surface of the body, where owing to contact with outside influences marked changes of temperature do occur.

The maintenance of body temperature within the prescribed limits necessitates, firstly, the generation of heat by *metabolism*, for which purpose an appropriate diet is essential (see Chapter VI.), and, secondly, the loss of excess heat.

The nurse must regulate this loss—

(1) By the temperature of the room.

(2) By the nature and amount of the patient's covering (bed clothes, night shirt, etc.).

(3) By the provision of hot water bottles if necessary.

Heat leaves the body partly through the lungs and through the organs of excretion, but principally through the skin.

THE SKIN. The skin consists of an outer layer called the *cuticle* or *epidermis*, and a deeper layer—the true skin—known as the *dermis*. Under this lies the *sub-cutaneous tissue* in which *sweat glands* are found. These glands, which are under the control of *nerves*, secrete fluid (chiefly water) from the tissues and discharge it through the pores of the skin. This discharge is known as perspiration, which plays an important part in the regulation of temperature.

The circulation of the blood has been briefly outlined on pages 17 to 21, but it is here necessary to add that certain nerves are charged with the duty of dilating or contracting the blood-vessels, thus regulating the supply of blood to particular parts of the body. When the air surrounding the body is warm, the superficial blood-vessels dilate and those deeply situated contract, with the effect of bringing

more blood to the surface of the body, thus allowing a larger quantity of blood to come near the air. This is necessary because the warm air does not cool the blood so quickly as cold air does, and, in order that the necessary amount of heat may be lost by the body, an increased amount of blood must be subjected to the air's cooling influence. The free flow of warm blood to the surface of the body where the sense of feeling is most marked produces a sensation of heat. When the air is cold, the nerves exercise their powers in the opposite direction, causing the superficial blood-vessels to contract, and the deep-seated ones to dilate. This lessens the flow of blood to the surface, and produces a sensation of cold.

Conduction. The principal means by which heat is lost are Conduction and Evaporation. The surface of the body tends to become cool by contact with the air, which conducts the heat taken from the body to the next layer of air and so on. Woollen garments and blankets, being bad conductors of heat, check loss of heat from the body more than cotton or linen, which are better conductors.

Evaporation is the conversion of liquid into vapour, a process which takes up much heat. Evaporation from the skin is continuous.

VENTILATION. There are three ways by which ventilation takes place—diffusion, winds, and the difference in weight between hot and cold air.

1. **Diffusion.**—Where gases meet they have a natural tendency to mix, and the more different in composition they are, the more rapidly they do it. By diffusion the products of respiration are borne away from the vicinity of the nose (or mouth), and mix with the air of the room. This air becomes impure and changes place with the outside air, especially if the window is open. Air also diffuses itself through the crevices of doors and windows, through the chimney, and even through an ordinary wall, the floor and ceiling.

2. **Winds.**—The wind, blowing against a closed window, forces its way in through the crevices; enters freely through an open window; or, passing over a chimney-top, sucks the air up the chimney.

3. **The difference in weight between hot and cold air.**—Air on being heated expands, and consequently becomes lighter and ascends; on cooling it contracts again, becomes heavier and descends. Some of the air heated by a fire will, therefore, go up the chimney,

making room for fresh air to enter by the window, etc. The remainder of the air heated in this way, as well as that heated by the bodies and respiration of the occupants of a room, rises to the ceiling, and forms a warm layer.

The minimum air space which should be allowed for each patient is 1,000 cubic feet. Not more than 12 feet of height is reckoned, so that the floor space for each patient is at least 83 square feet, say 10 ft. by 8 ft. 4 ins., and proportionately more must be allowed if the room is less than 12 feet high. With this space it is found that changing the air completely three times an hour is sufficient to secure adequate ventilation. To do this an opening to the air with an area of 24 square inches per patient is required.

In home nursing there is frequently no choice of rooms, and the nurse has to make the best of what is available. She may have to exercise much tact and skill to keep the air fresh without inconveniencing the patient.

To Ventilate and Warm a Sick Room.

1. **Choose a large room if possible with a fire-place,** and with windows that can be opened at the top and bottom. This choice

may have to be modified owing to other considerations, such as quiet, aspect, etc.

2. **Open the window at the top,** if possible. Air should enter well above the patient and as near the level of the ceiling as possible, so that it may diffuse with the warm air at the top of the room, and lose its chill before falling to the level of the patient.

If for any reason, such as the force of the wind, it is undesirable to open the window at the top, the current of air entering may be directed upwards and its force broken in the following way. If the lower sash of an ordinary window is raised a little way, and the opening is filled in with a board, a space will be left between the sashes through which fresh air will enter with an upward movement (Fig. 2).

A curtain or screen can generally be arranged to check a draught, and there is less draught when the window is opened wide, as a draught is caused more by the rapidity of entrance of the air than by its volume.

3. **Be sure that the chimney is not obstructed.** Open the register if there is one, and remove any obstruction, such as straw, boxes, etc.

4. **Keep a fire, or at least a lamp in the fire-place, constantly burning.** The chimney

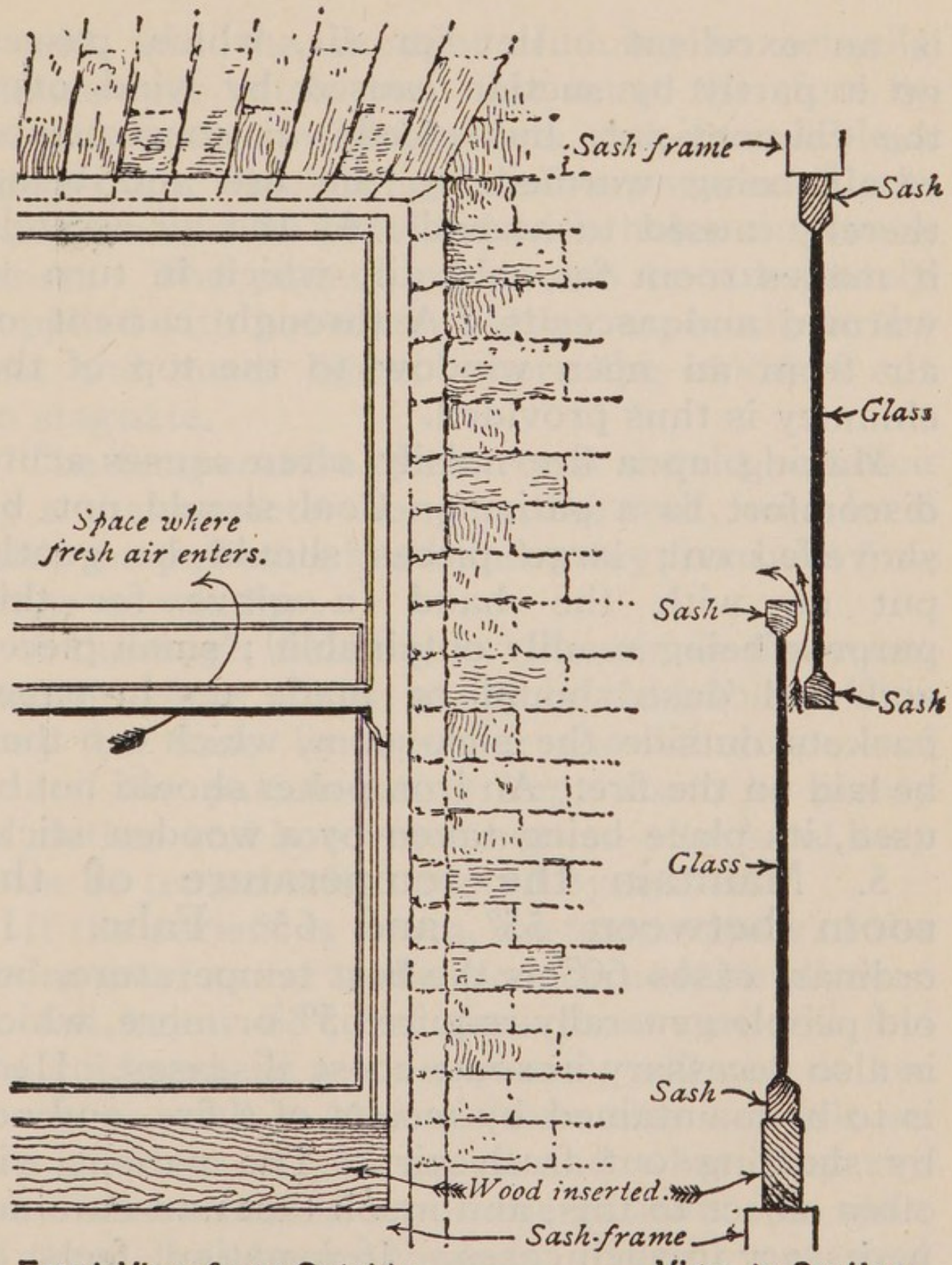

Sash frame
Sash
Glass
Space where fresh air enters.
Sash
Sash
Glass
Sash
Wood inserted.
Sash-frame
Front View from Outside
View in Section (Side View).

FIG. 2.

is an excellent outlet for air, which passes up it partly by suction caused by wind over the chimney-pot, but chiefly in consequence of air being warmed by the fire and being thereby caused to ascend. As the air ascends it makes room for cold air, which in turn is warmed and ascends. A through current of air from an open window to the top of the chimney is thus provided.

Making up a fire noisily often causes acute discomfort to a patient. Coal should not be shovelled on; large pieces should be gently put on with the hand (a glove for this purpose being readily obtainable); small pieces and coal dust should be made up in paper packets outside the sick-room, which can then be laid on the fire. An iron poker should not be used, its place being taken by a wooden stick.

5. **Maintain the temperature of the room between** 55° **and** 65° **Fahr.** In ordinary cases 60° is the best temperature, but old people generally require 65° or more, which is also necessary in some chest diseases. Heat is to be maintained by means of a fire, and not by shutting out fresh air. The patient will often object to this, and much tact and care are necessary in such cases. If a patient feels, or thinks he feels, a draught he thinks he will catch

a cold, and the thought of doing so actually makes him catch one. He must therefore be warmly covered with blankets, and, if available, a down quilt, which is light and very warm. These quilts should be provided with holes for ventilation. The patient must also be adequately supplied with hot-water bottles, especially to the feet and lower limbs, where the blood is apt to stagnate.

The temperature of the room should be taken by a thermometer hung on the wall, on a level with the patient's head and away from the fireplace or window.

A thorough flushing of the air in the room two or three times a day is desirable. This may be done by opening the windows and doors, the patient being kept warm by plenty of clothes and hot-water bottles—his head may even be temporarily covered by a sheet.

If the patient is warm, the temperature of the room may, as far as he is concerned, be allowed to fall below 55°, but then the nurse will feel the cold and, as a consequence, will not do her work so well. Also visitors may remark on the coldness of the room, and what they say may have a bad effect on the patient. In spite of these drawbacks there is a very great deal to be said in favour of the open air treatment—

the patient kept warm in bed and the windows wide open day and night, with an open fire in cold weather. Experience with sick and wounded soldiers has shown that those nursed in tents and make-shift hospitals did better than those in even the best-appointed hospitals, because in the former case there was abundance of fresh air, while in the latter case the most scientific methods of ventilation and warming failed to keep the air inside as fresh as that outside. If it is found expedient, in all the circumstances of the case, to adopt the wide-open window plan, an exception must be made when it is necessary to wash the patient, or expose him for any other purposes. The windows should be shut until the room gets warm, and then the patient should receive the necessary attention, after which the windows may be gradually opened more and more. The open air treatment is for obvious reasons unsuited to delirious patients.

6. **When it is necessary to keep the air humid,** use a bronchitis kettle (Fig. 3), which should be filled and from time to time replenished with boiling water. Take care not to let the steam issue directly on to the patient. If the steam is to be impregnated with any medicament, insert a pad of cotton wool sprinkled with the medicament into the

spout, but not so tightly as to check unduly the escape of steam.

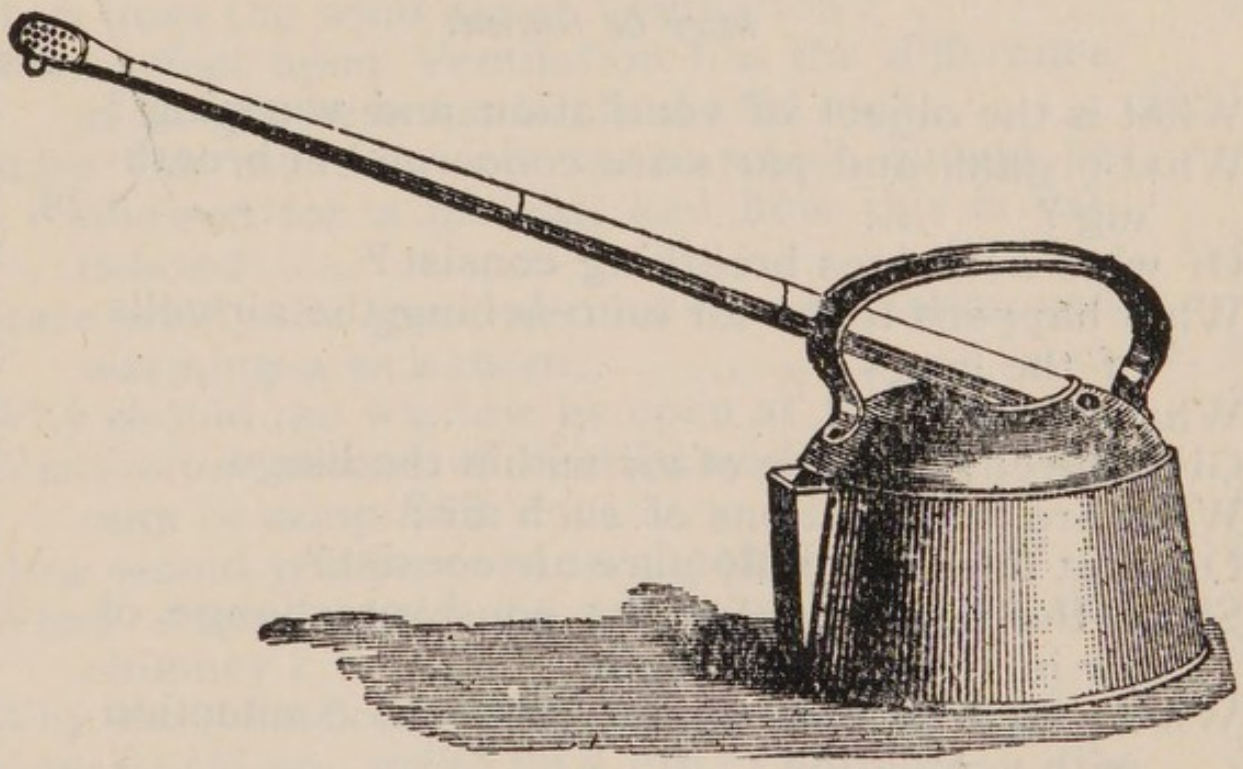


FIG. 3.

It may be necessary in the case of children suffering from throat trouble to arrange a **tent bed.** To do this—

(*a*) Place around the cot two three-fold screens or clothes horses.

(*b*) Place sheets over the screens to form a roof and sides, leaving an opening at one side.

(*c*) Hang a thermometer inside, and maintain the temperature at about 65° F.

QUESTIONS ON CHAPTER III.

The numerals indicate the pages where the answers may be found.

CHAPTER IV.

THE BED AND BED-MAKING.

The Bed should be put in such a position that air can circulate freely round it, and a nurse can easily get at the patient. It must not have its side close up to the wall, or its head up against an outside wall, because external walls are apt to be damp when it rains, and either cold or hot according to the weather, and all these variations in temperature and atmosphere will affect the patient adversely. When possible the head should be 1 ft. or 18 in. from a wall of the next house, or the partition wall of the adjoining room. The bed should never be in the line of draught between the window and fireplace. It should not face the window or, by facing the door, be exposed to scrutiny and draught every time the door is open (Fig. 4).

The bedstead should be of iron, 6 ft. 6 in. in length and 3 ft. 6 in. wide, with a woven wire mattress fitted with a tightening arrangement.

The comfort of a patient depends so much upon the way his bed is made that the nurse cannot be too painstaking in making it.

To make a bed put on the requisites in the following order :

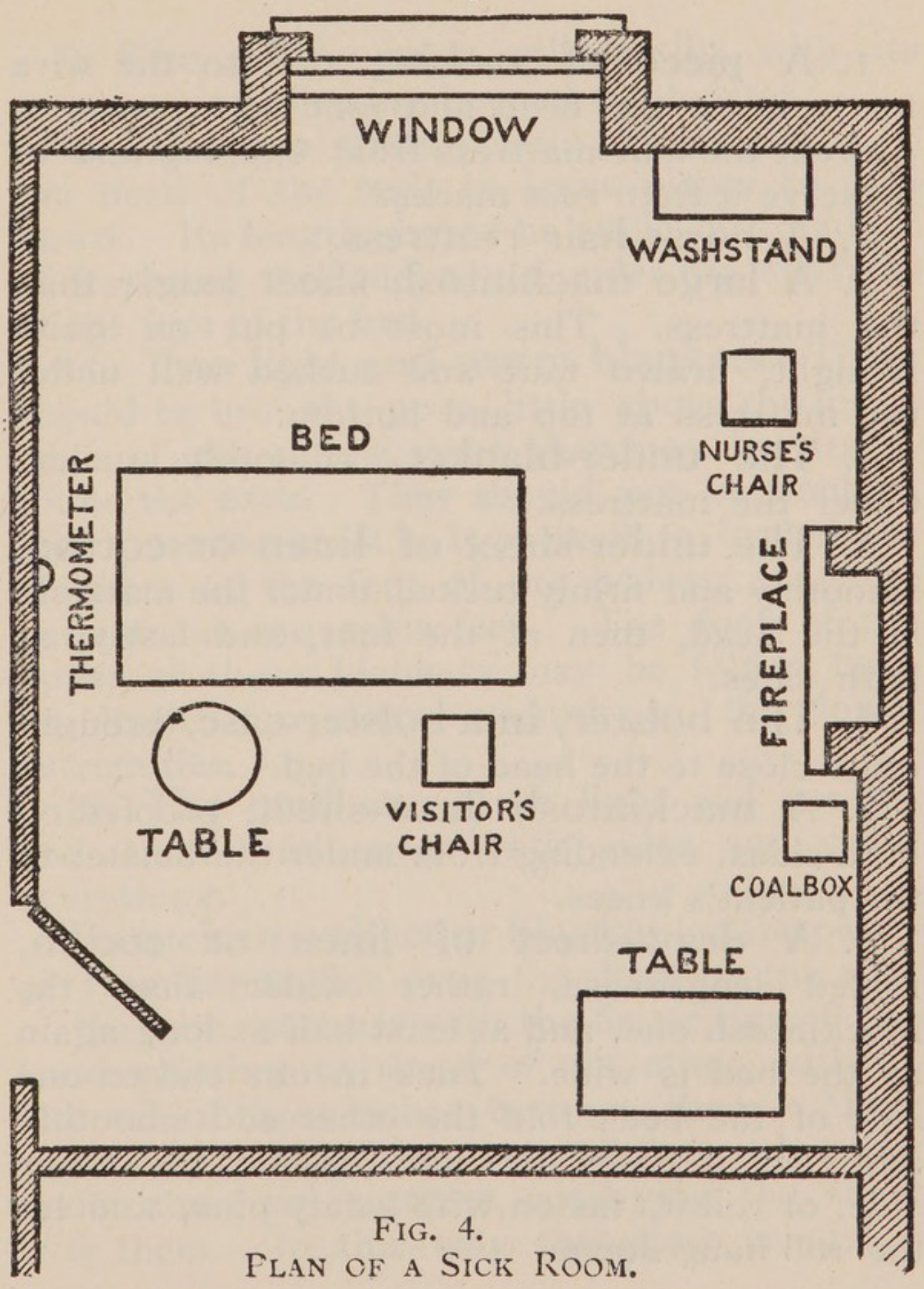


FIG. 4.
PLAN OF A SICK ROOM.

1. **A piece of sacking** tied to the wire mattress at the head and foot with tapes, to prevent the hair mattress from slipping and to preserve it from rust marks.

2. **A horse-hair mattress.**

3. **A large mackintosh sheet** longer than the mattress. This must be put on quite straight, drawn taut and tucked well under the mattress at top and bottom.

4. **The under-blanket,** smoothly tucked under the mattress.

5. **The under-sheet of linen or cotton,** smoothly and firmly tucked under the mattress at the head, then at the foot, and lastly, at both sides.

6. **The bolster, in a bolster-case,** brought quite close to the head of the bed.

7. **A mackintosh draw-sheet,** proofed on both sides, extending from under the bolster to the patient's knees.

8. **A draw-sheet of linen or cotton,** folded lengthwise, rather wider than the mackintosh one, and at least half as long again as the bed is wide. Tuck in one end on one side of the bed; fold the other end smoothly and tuck it under the mattress on the other side, or roll it, fasten with safety pins, and let the roll hang down.

9. **The pillow in a pillow-slip**, with its lower edge projecting beyond the bolster.

10. **The top sheet** should reach right up to the head of the bed, to leave plenty to turn down. Its length should be sufficient to admit of its being well tucked up under the mattress at the foot of the bed.

11. **Two light and warm blankets.** These should be brought up a little above the lower edge of the pillow, that they may be drawn round the neck. They should not be doubled back over the chest. It is well to loosen the blankets at the foot of the bed so that the patient can move his feet. The foot of the upper of these blankets may be folded back on itself for extra warmth to the lower extremities.

12. **The quilt** should be light and porous, and should fall over both sides and cover everything.

To tuck in a sheet or blanket lay the palms of your hands flat over the sheet on the edge of the wire mattress with the finger tips of one hand pointing to those of the other, with an interval of three inches between them. Move your hands sideways away from each other under the hair mattress, conveying the sheet with them. In this way the sheet is spread

smoothly under the mattress, and the mattress itself will not be hunched up, as is invariably the case when the sheet is pushed in by the hands with the fingers foremost and palms upwards.

Water Bed. This may be full length or half length. The latter is usually called a water pillow, and when it is used the space between it and the head pillow is filled in with a small pillow, as a gap between the two is acutely uncomfortable to the patient.

The method of preparation is the same for either size. The bedstead is well dusted, and then strengthened by inserting between the wire of the mattress and the wooden frame of the bedstead six fracture boards. It is advisable to tie the legs of the bedstead together to prevent them from giving way under the increased weight. The horsehair mattress is next laid. It is protected by the usual large mackintosh with a thin blanket over it, and then the empty water bed is lifted on, with its opening to the foot. The thin blanket is used, as two rubber surfaces coming in contact would undoubtedly stick, and might possibly tear when an effort was made to pull them apart. For the same reason the water bed itself has to be covered with a thin sheet before the mackintosh draw-sheet is placed upon it.

To Fill a Water Bed:

1. Make sure that the screw fits, and that the bed is in good condition.

2. Expel all air to prevent water bubbling out.

3. Fill the bed with water at a temperature of 100 deg. Fahr. to the point at which, when the two hands are pressed down on any part, the under surface cannot be felt. A patient may in moving jerk himself off an over-filled bed, while an insufficiently filled bed may make him feel giddy or even sick.

4. Make sure that the bed does not leak.

5. Never let any grease get on the bed, as it impoverishes the rubber.

6. Every day abstract a gallon of water, and replace it with the same quantity of water at 110°.

Before putting away the bed, empty it while in position, leaving a little water in it to prevent the two sides from sticking together.

Bed for Heart Cases.

As a rule heart cases cannot lie down flat, so special requisites for a bed for a heart case are one water pillow under him, a pillow at each side, a bed-rest to support his back and an extra bolster, wrapped in a draw-sheet, under his knees to keep him from slipping down.

In some cases of heart disease it is necessary to use a bed table with a pillow on it, on which the patient leans forward.

Bed for Rheumatic Cases. As rheumatism induces profuse perspiration, rheumatic patients should be kept between blankets. It is necessary to have two pairs of blankets, so that one of the pairs may be aired and warmed every day. A sheet may be placed over the upper blanket and the top turned down under it to lessen the irritation to the patient's face and neck.

Fracture Bed. If the patient is suffering from a fractured back, pelvis, thigh or leg, it is necessary to prepare the bed specially. This is best done by removing the wire mattress, if on a wooden frame, and placing "fracture boards" on the bedstead. Fracture boards are of wood about an inch thick, a foot wide, and corresponding in length to the width of the bedstead. Enough to extend from the head to the foot of the bedstead are necessary. To provide for ventilation the boards should either have holes bored through them, or an interval of an inch should be allowed between each of them.

Changing Sheets with Patient in Bed.

It is desirable to have two nurses, one on each side of the bed, to change the sheets of a patient too ill to be got up.

The pillow and all the top bed-clothes are first removed, with the exception of a sheet and blanket left over him, and the pillow is then shaken up, and the bed-clothes are set to air. Next, one of the nurses stretches over the body of the patient and, placing her hands behind his shoulder and thigh, gently draws him over on his side, so that he faces her. She supports him in this position, while the second nurse untucks the draw-sheet and under-sheet and quickly rolls them up together till they lie in a long, tight roll close against the patient's back. The second nurse then tucks the sides of the warmed clean sheets quite smoothly under the mattress, spreads them over the uncovered part of the mattress to meet the roll of soiled sheets, and then rolls them up till they in their turn lie in a tight roll against the other rolled up sheets. The first nurse now relaxes her hold of the patient, so that he subsides slowly on to his back, when the second nurse draws him over on to his other side right over the two rolls of sheets. The first nurse then quickly withdraws the dirty sheets, unrolls the

clean, and tucks them under the mattress. If the patient is sufficiently strong to lie on his side without support, one nurse can change the sheet without help.

In cases when it is unadvisable to turn a patient on his side, owing to a fractured leg or to any other cause which makes it necessary to retain a splint or other apparatus in position, the under-sheet can best be changed as follows, two nurses being required :—

1. Roll the clean sheet crosswise.
2. Standing one on each side of the bed, roll up from the head as much of the soiled sheet as is free and place the clean sheet above it.
3. Raise the patient's shoulders and roll up the soiled sheet, and unroll the clean one until the small of the back is reached.
4. Lower the shoulders, raise in turn the lower parts of the body, and continue the rolling and unrolling process until the roll is clear of the patient, and the clean sheet is in position.

After this, the clean top sheet is laid over the patient, the covering sheet or blanket withdrawn, and the bed completed in the usual way.

To alter the position of the cotton draw-sheet, withdraw the part folded under the mattress, tuck in the end, turn the patient on

his side ; gather up the slack of the draw-sheet into a roll close to his side ; pass the patient over it ; fold up the length of draw-sheet now transferred to the other side of the bed and tuck it under the mattress. On the second day take out and fold the draw-sheet the reverse way, and on the third day put on a clean one.

CHANGING THE TOP SHEET BY THE "SANDWICH METHOD."

Some authorities recommend the "Sandwich Method" of changing the top sheet when the bed is not free from draught. This method presupposes two covering blankets. One blanket and the quilt are removed, and the other blanket and the dirty sheet are left on. The clean sheet is put over these, and the blanket previously taken off is laid over it. After five minutes, to allow of the under surface of clean sheet becoming warm, the two nurses, standing one on each side of the bed, with one hand hold the uppermost blanket and sheet, and with the other hand roll the other sheet and blanket from the head to the foot of the bed and then remove them. The blanket just taken off is now put on and covered with the quilt. The obvious advantage of this method is that the patient is never left without a blanket.

Turning Mattress. Mattresses have to be turned even though a patient cannot leave his bed. One way of turning or changing the mattress is to remove the quilt and top blanket, and fold back on to the patient all the remaining upper bed-clothes, and then to roll up the lower sheet and blanket tightly together till they form two rolls, one on either side of the patient. Two nurses take hold of these rolls and lift the patient up while another draws the mattress out from the foot of the bed, turns and replaces it. The patient is then lowered on to the bed, and the bed-clothes are arranged as usual. The "human stretcher" (see First Aid Manual) may be used as an alternative method.

Improvised Ring Cushion. Teaze out tow into a circle 16 inches in diameter and 10 inches high. Add above and below this a 3-inch layer of teazed-out cotton wool. Make an opening in the centre and work a roller bandage over the tow and cotton wool until the height of the cushion is about 4 inches, and the opening in the centre is about 7 or 8 inches.

Bed Cradle. Bed Cradles are used to take off the pressure of the bed-

clothes from any part of the body. When the ordinary wood and iron cradle (Fig. 5) is not at hand or cannot be afforded, a good substitute can be improvised from a band-box with an arched opening cut in its two opposite sides (Fig. 6), or from a child's hoop sawn in half with the one half arched across the other (Fig. 7), or even from a three-legged stool (Fig. 8). A bolster placed at the end of the

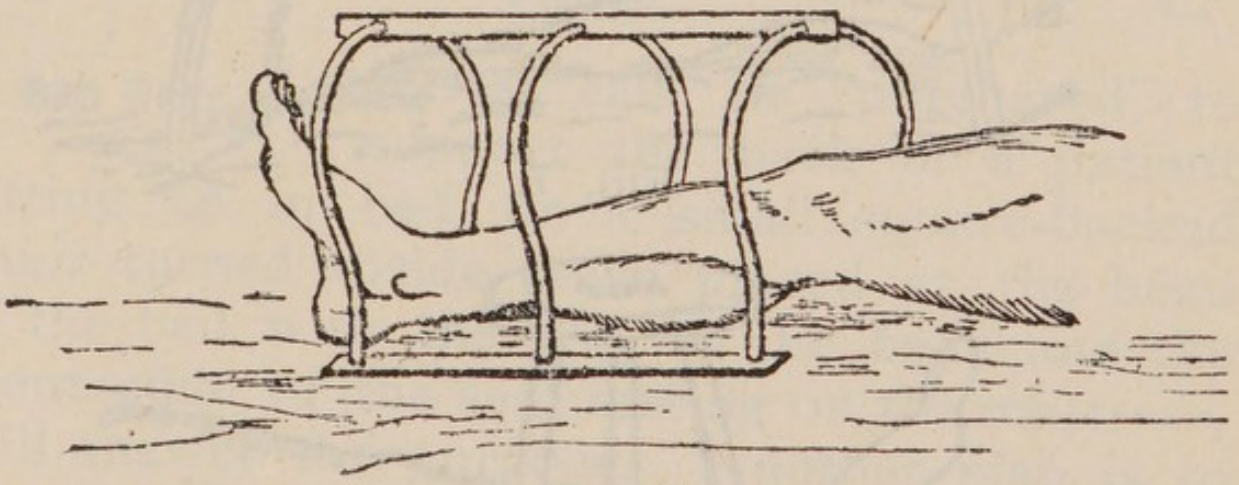


FIG. 5.

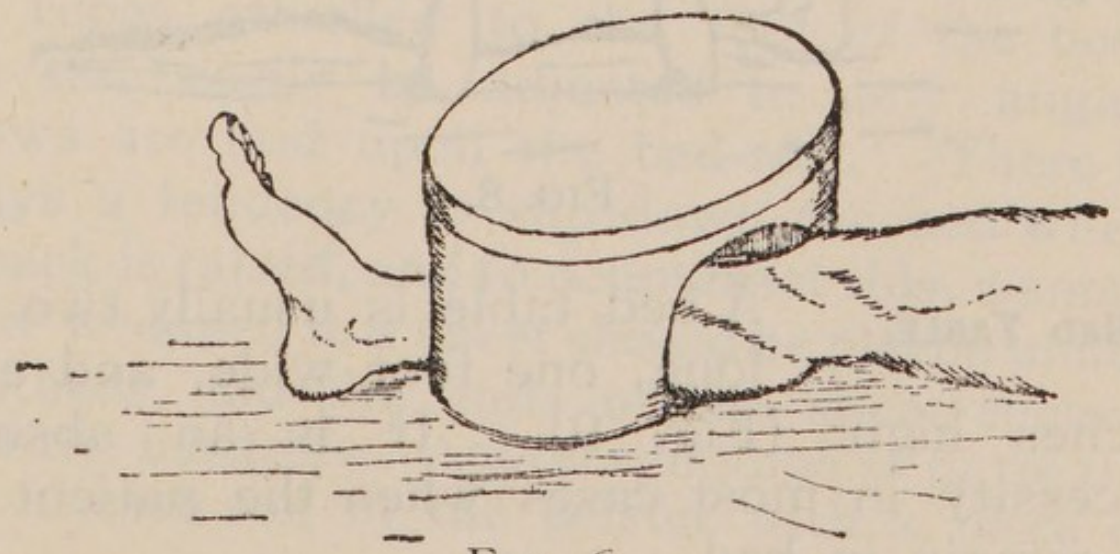


FIG. 6.

mattress is sufficient to take the pressure of the bed-clothes off the feet. When a cradle is used, a thin blanket is laid over the patient.

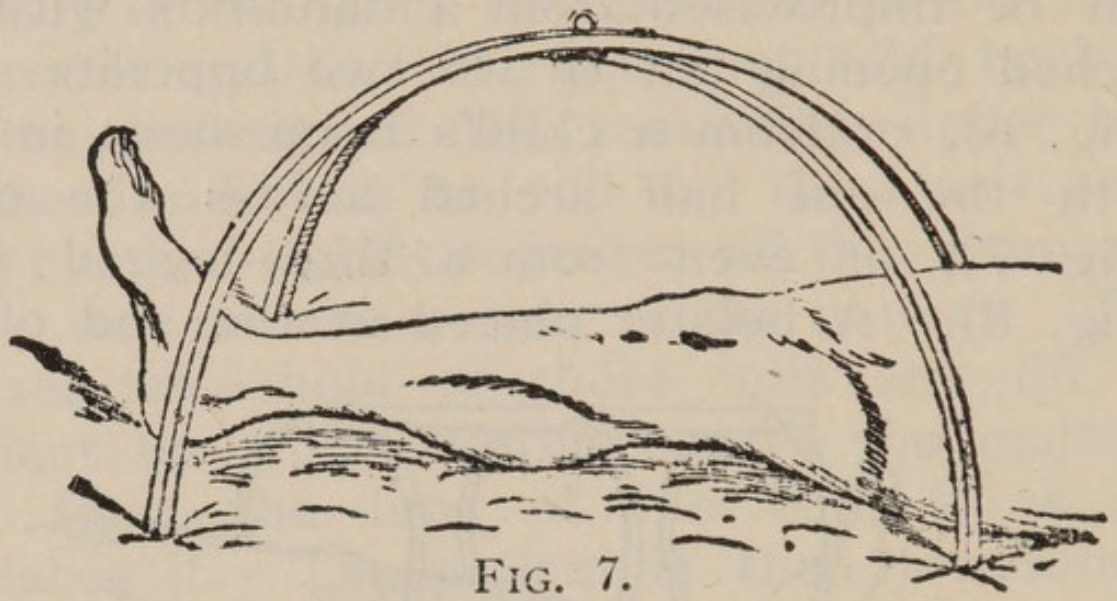


FIG. 7.

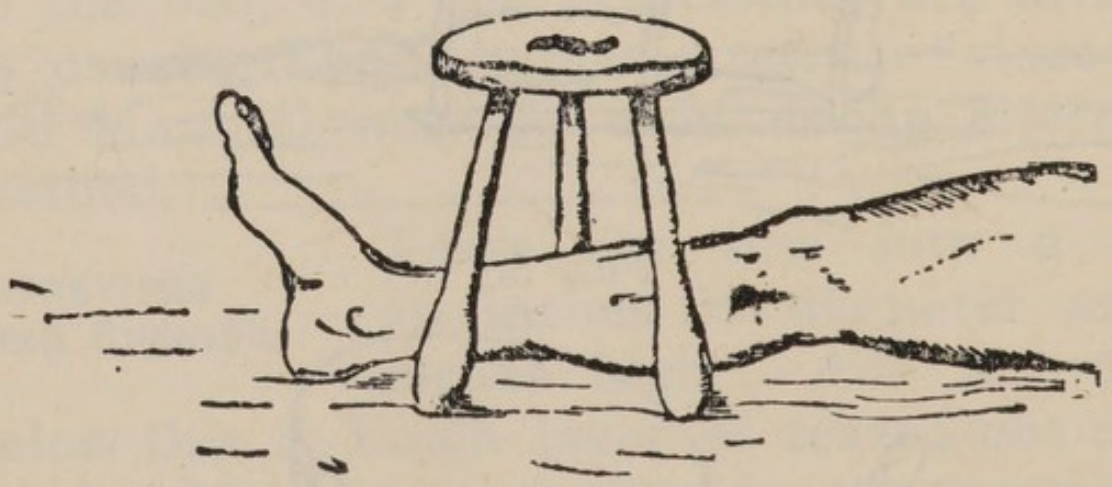


FIG. 8.

BED TABLE. A bed table is usually two feet long, one foot wide, and eight inches high (Fig. 9). It is an absolute necessity in most cases when the patient has to remain in bed.

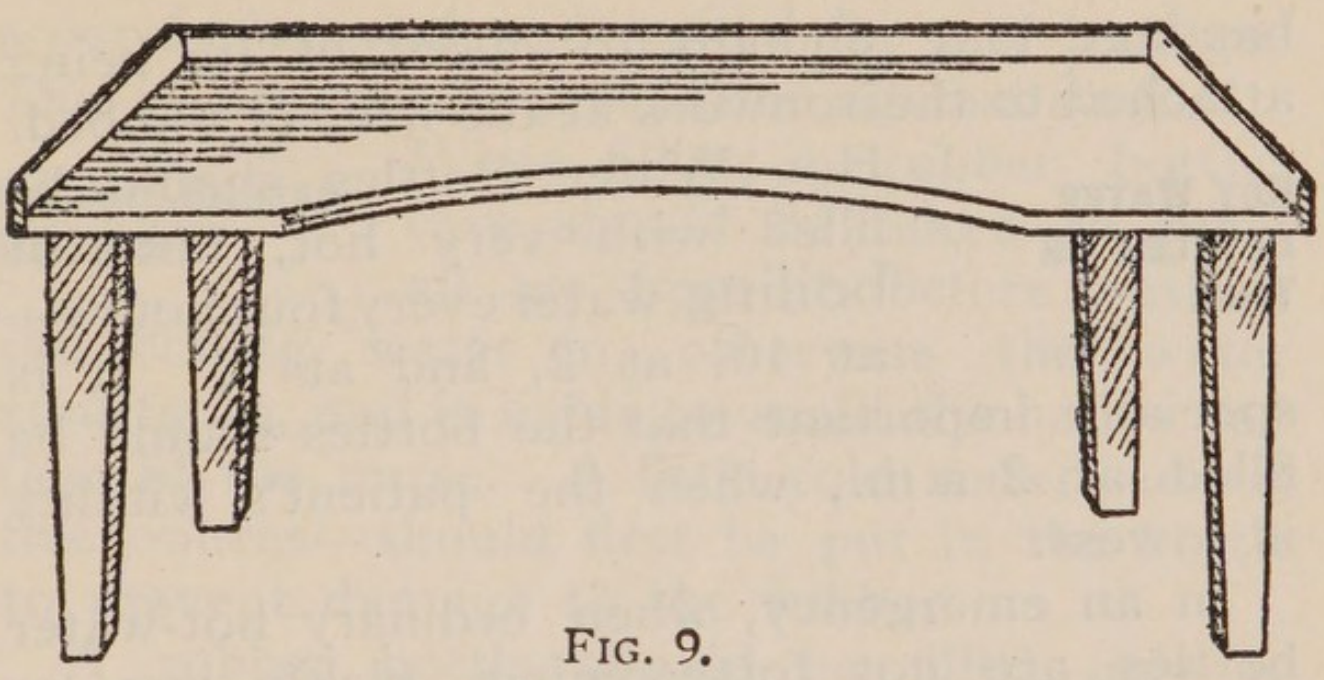


FIG. 9.

BED REST. Rests can be purchased to support the back of a patient sitting up in bed, or a small square-backed chair turned upside down placed at the head of the bed with the top of the back and the front edge of the seat resting on the mattress, will answer the purpose. Another plan is to support a wooden frame with cross rails by guy ropes attached to the foot of the bed. This can easily be adjusted to any angle. Pillows are laid upon the bed-rest. There is always a tendency to slip down the bed when the back is raised, and to counteract this, a small pillow wrapped in a sheet should be placed under the knees, and the ends of the sheet tucked under the mattress. Another method is to tie the sheet at each end of the bolster with a piece of

bandage long enough to allow of its being attached to the ironwork at the head of the bed.

Hot Water Bottles or Tins.

Hot Water Bottles should be filled with very hot, but **not boiling**, water every four hours—at 10, at 2, and at 6. It is specially important that the bottles should be filled at 2 a.m., when the patient's vitality is lowest.

In an emergency, when ordinary hot-water bottles are not forthcoming, pickle jars, or bags filled with sand and heated in the oven or before a fire, or a hot brick covered with flannel, can be substituted. Many other substitutes may suggest themselves to a nurse with any initiative.

Very serious results may follow a burn from a hot-water bottle, and it must be borne in mind that not only unconscious, but paralytic and dropsical patients, are insensible to feeling. A hot bottle must be enclosed in a flannel or felt bag.

Rubber bottles are best for applying to the abdomen and chest, their pliability adapting them to any position.

Filling Tin or Stone Bottles.

Tin or stone bottles should be filled to the top with very hot, but not boiling, water, and the screw

securely fastened and tested for any leakage. This is a necessary precaution against scalds.

Filling Rubber Bottles. When filling a rubber bottle, care should be taken to expel all air from it before putting the boiling water in, otherwise the water squirts up, and is liable to scald the hands and face of the nurse. A little cold water—about five ounces—should first be put in the bottle to prevent damage to the rubber.

A rubber bottle should be filled only to three-quarters of its capacity, as, if over-filled, it would be most uncomfortably hard.

Woollen Bed-Socks. Woollen bed-socks secure an equable warmth to the feet, but there is always a danger that covered feet may lead to overlooking the necessity for clean feet. Bed-socks will need changing twice a week.

The nurse must remember that all woollen garments may become a source of uncleanliness, and must therefore never omit their frequent changing and washing.

Bed-Pans. Bed-pans are of two kinds, the round (Fig. 10), and the slipper (Fig. 11). The round one is passed in from the side nearest to the nurse; the slipper is gently pushed in beneath the buttocks from

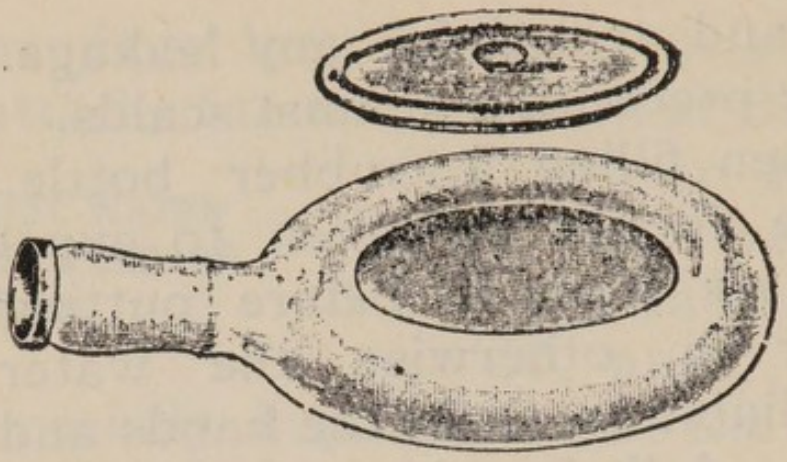


FIG. 10.

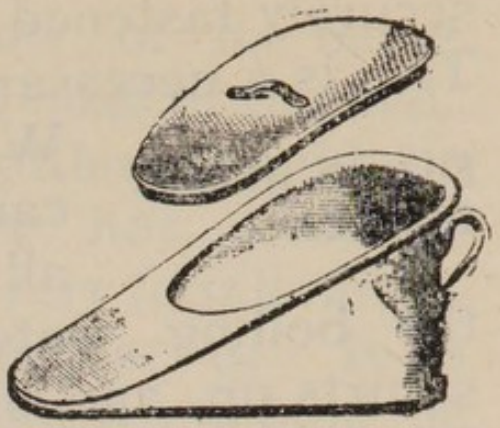


FIG. 11.

between the legs, the legs being bent to facilitate this.

A bed-pan should always be warmed before being given to the patient, and its rim should be smeared round with vaseline or oil if the patient is very thin. If the round bed-pan is used the handle should be plugged.

The hot water used for warming the bed-pan must be emptied and the rim of the bed-pan must be well dried before it is put under the patient. The bed-pan can be given by one person, if the patient is able to move himself a little, but when he is helpless it needs two persons—one to lift the patient and one to place the bed-pan in position.

WASHING BED-PANS AND URINALS.

Bed-pans should be washed over the pan of the W.C., in the case of a round one a can of water being poured through the handle.

Bed-pans should always be covered after use and removed from the sick room.

Urinals need to be washed out every day with hot water and soda.

QUESTIONS ON CHAPTER IV.

The numerals indicate the pages where the answers may be found.

CHAPTER V.

DETAILS OF NURSING.

WASHING THE PATIENT.

THE daily washing of a patient adds to his comfort, and is an essential for keeping the skin free of germs. It should be done in the morning **after breakfast**, as follows :—

1. **Before disturbing the patient** place a table close to the bed, and put on it water (hotter than is required for use, to allow for cooling), soap, washing glove, towel, etc. Put the patient's spare night-shirt before the fire to warm, or wrap it round the hot-water bottle, should there be no fire. Close all windows.

2. **Remove the upper bed-clothes except the sheet,** and place them over a chair—never throw them on the floor.

3. **Place a thin blanket under the patient,** with the sides folded over him in front. If his hair is to be washed, fold a warmed draw-sheet and lay it under his head.

4. **First wash and dry the face and neck,** using firm pressure and avoiding light dabs. Washing well behind the ears produces a refreshing effect. Wash the beard and moustache and brush them well.

5. **Now remove the night-shirt**, and with one hand wash the chest and arms while holding up the blanket with the other. Dry these parts. Turn the patient on to one side, wash his back, and then wash and dry the legs and feet.

6. **After washing**, rub the buttocks and sacrum with spirit (a circular movement being used) and powder them. This keeps the blood circulating and prevents bed-sores. To take off any feeling of dampness it is well to powder the body all over, but if this is not feasible, powder the chest, the armpits, under the breasts, and the folds of the groin of the abdomen and (in stout people) of the neck.

7. **Put on the warm night-shirt.** In the case of an injured limb, the shirt, or trousers, must be drawn over the limb that is injured first, and then over the uninjured one. The reverse method should be followed when taking off a garment.

8. **When the patient cannot clean his own teeth**, take a small pellet of lint, or wrap a piece of wool round a small stick or bow forceps, steep it in a suitable antiseptic lotion, such as a mixture of Boracic Lotion 2 parts, Glycerine 1 part, Lemon Juice a few drops, or weak solution of Sanitas or Lysol, and carefully wash both sides of the teeth

and also between the gums and the cheek. Also gently rub the tongue down.

Baths. When giving a bath to a convalescent patient, it is wise for two nurses to be present, as serious and even fatal accidents may arise from lack of this precaution. If a patient faints in a bath pull up the plug. Changes of temperature in water are much more noticeable than in air, and therefore accurate thermometers should be used to test the heat of a bath.

Hot Bath.—A hot bath (temperature from 98°F. to 105°F. for adults, but not above 100°F. for children) causes dilation of the blood-vessels of the skin and consequently a feeling of warmth. The pulse and respiration increase in frequency. On leaving the bath reaction is experienced. This is due to the vessels of the skin contracting and driving the blood into the body, with the result that a sensation of chill is felt. When a patient is put into a hot bath, his shoulders should be covered with a blanket. He should not be allowed to remain in the bath for more than ten minutes, and on coming out a warm sheet should at once be thrown over him. He should then be dried and got into bed as quickly as possible. In the case of children, who are

often alarmed by the appearance of a hot bath, it should be covered with a blanket, by means of which the child should gradually be lowered into the water. **Always test the temperature of the bath.**

Warm Baths (temperature 92 to 98 deg.) cause stimulation of the central nervous system, followed by a slightly increased flow of blood to the skin and increased frequency of pulse. They have a soothing effect after muscular exertion. If stayed in too long they are apt to cause depression.

Tepid Baths (temperature 85 to 92 deg.) act only on the skin, and do not affect the nerve centres or alter the body temperature. They consequently are not followed by reaction.

Cold Baths have approximately the temperature of the air. The water is not artificially heated or chilled, but as the temperature of the water changes much less quickly than that of air, there is frequently a difference of several degrees between the temperatures of cold water and of the surrounding air. A cold bath is stimulant and tonic unless immersion is too long, in which case there is a risk of collapse.

Medicaments are frequently ordered to be added to baths. The general rule is that the bath should be "warm."

Observing and Reporting.

It is a nurse's duty to observe carefully and report accurately to the doctor every detail of the illness she is nursing. She should proffer no expression of opinion as to *diagnosis* or treatment, but she may discreetly anticipate the possible directions of the doctor by getting things in readiness for the remedies she expects he will prescribe.

The nurse should acquire the habit of discreet, accurate and systematic observation, and of making careful notes of what has been observed. Undue reliance should not be placed upon the statements made by patients, unless they are supported by signs the nurse can see for herself.

Nothing is too trivial to observe, as a very slight alteration in the condition of the patient may give warning of an approaching serious change. It is a safe rule for the nurse to tell the doctor too much—for obvious reasons not in the hearing of the patient—rather than too little, but she will be materially helped in making useful reports if she has some knowledge of the causes and importance of what she observes.

Records should be kept systematically and in a form convenient for inspection by the doctor. The following form will serve as a guide for ruling and filling up loose sheets or

NURSE'S REPORT.

PATIENT'S NAME : *S. Johns.* DISEASE : *Pneumonia.*

DATE AND TIME.	SLEEP.	MEDICINE.	ACTION OF BOWELS.	NOURISHMENT.	DOCTOR'S ORDERS AND NURSE'S REMARKS.
1918 March 3rd.	10 a.m. to 11.30 a.m.	10 a.m.	9.30 a.m.	9 a.m. Bread and Milk, ½ pint.	11.40 a.m. Doctor's Visit.
		2 p.m.		11.35 a.m.	12.30 p.m.
9 a.m. to 9 p.m.	2.30 p.m. to 4 p.m.	6 p.m.		Broth, 6 ozs. 1.30 p.m. Egg in Milk, 8 ozs.	Complained of severe pain in abdomen. Relieved by hot fomentations.

pages in a book, each of which should contain the record made by the day or night nurse during her period of duty.

Food. Enter time of giving and amounts on the chart; it is advisable also to enter nourishment and stimulant on a separate sheet, with a summary of the total amount given, so that the doctor can see at a glance what the patient has had. On the special sheet must be mentioned if any of the food has been returned in the vomit. When convalescence sets in, observe with what appetite the patient eats.

The Pulse. The pulse is that movement in an artery which is caused by its expansion and contraction as the heart beats. It affords an indication of what the heart is doing.

The pulse can be felt in any artery near the surface. The usual way of taking it is to place the first three fingers on the radial artery at the front of the patient's right wrist, and press slightly. The middle finger-tip must be half an inch away from the outer edge of the wrist on the thumb side.

Take the pulse at the same time as the temperature and record the number of beats in a minute.

A watch with a second hand should be used, and the beats should be counted for one whole minute, or, better still, for a quarter of a minute four times in succession. The normal number of beats per minute is in an adult 70 to 80, in youth and childhood 80 to 100, in infancy 100 to 120. The rate may vary according to position and other circumstances, and no anxiety need be felt if an adult's pulse is as slow as 60 or as fast as 85, while a rapid rise of the pulse rate in children and infants is common and is not necessarily alarming.

When the pulse becomes so very rapid that one beat can scarcely be distinguished from another, it is known as a thready or running pulse.

The knowledge of having the pulse taken often quickens it in a nervous patient, so that the nurse will do well to take it in a casual kind of way, when she has got the patient interested in something she is saying.

Food, moreover—and of course alcohol—quickens the pulse, which should not, therefore, be taken immediately after a meal.

If the beats are not regular both in time and strength, a note to this effect should be made on the daily report.

RESPIRATION. With regard to respiration, note its rate, the proportionate

length of Inspiration and Expiration, whether shallow or deep, and the sounds which accompany it.

In severe illness, **the rate of breathing** should always be recorded. To count the respirations the nurse should find some plausible pretext for laying her arm across the patient's chest, as, if he knows what she is doing, he is liable to breathe more quickly. It is easiest to count the respirations by the rise and fall of the chest when the patient is asleep—always remembering that the rise and fall are but one respiration—the inspiration and the expiration of a breath. The normal rate is from fifteen to twenty times a minute —about a fourth of the rate of the pulse. Noting the breathing is more than ever necessary when the patient is unconscious. It will be found in such cases that turning his head on one side makes breathing easier, as the tongue is less apt to cause obstruction to the air passages when the patient is in this position than when he is lying face upwards.

TEMPERATURE. The normal temperature of an adult is 98·4°F. Slight variations are common in health, and the temperature is usually at its lowest between 1 and 3 a.m., and at its highest between 6 and 10 p.m.

The temperature should be taken from the onset of an illness, as early facts about it will greatly help the doctor in his *diagnosis*.

The sensations of the patient and the warmth or coldness of the skin are not reliable guides as to the actual temperature of the body.

The clinical thermometer (Fig. 12) is the instrument for taking the temperature. It differs from an ordinary thermometer, inasmuch as—

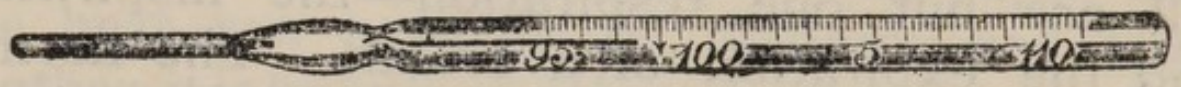


FIG. 12.

1. The scale is graduated only from 95° to 110°F, as follows:—

(a) By long lines (four of which are marked respectively 95, 100, 5—representing 105—and 110). Each long line represents a degree, so that if, after taking a temperature, the mercury reaches exactly to 100, the patient's temperature is 100. If the mercury reaches exactly to the next long line, the temperature is 101, and so on.

(*b*) By short lines in groups of four between the long lines. Each short line represents two-tenths of a degree (·2). If the mercury reaches to the first short line above 101, the temperature is 101·2; if to the second, 101·4; and so on 101·6, 101·8, while the next long line, of course, indicates 102. Normal temperature (98·4) is marked —>

2. The mercury does not fall of its own accord, and has to be shaken down after the temperature has been taken and recorded. To shake it down, hold the thermometer by the end away from the bulb, and give it a few sharp jerks.

To take and record a temperature—

1. **See that the mercury is standing at or below 95°.** Immerse the thermometer in cold water and dry it. It may easily be broken by immersion in hot water.

2. **Place the bulb of the thermometer in the mouth or armpit**—in exceptional circumstances in the groin or rectum (bowel).

If the temperature is taken **in the mouth**, the bulb is placed under the tongue, and the patient should be cautioned against talking, opening the lips, and biting the bulb off. If

in the armpit, the skin must be thoroughly dried, and no fold of bed-clothes or garment must hinder the all-round contact of skin and glass. The patient's arm should be pressed close to his side, and his hand laid across his chest. A child's arm should be held against his side by the nurse. If in the groin, the thigh must be pressed back against the groin. If in the rectum, the bulb should be oiled, and the thermometer inserted about two inches and held in position.

Some thermometers are marked to indicate the time required for them to register a temperature. A longer time than that marked on the instrument should be allowed; unmarked thermometers should be left in for five minutes.

3. Always take a patient's temperature in the same place. If for a good reason this is not done, record the fact.

4. Never take a temperature just after the patient has been washed, nor in the mouth just after he has drunk something.

5. Record the temperature on a chart (Fig. 13) and verify your record by a second inspection of the thermometer before shaking down the mercury.

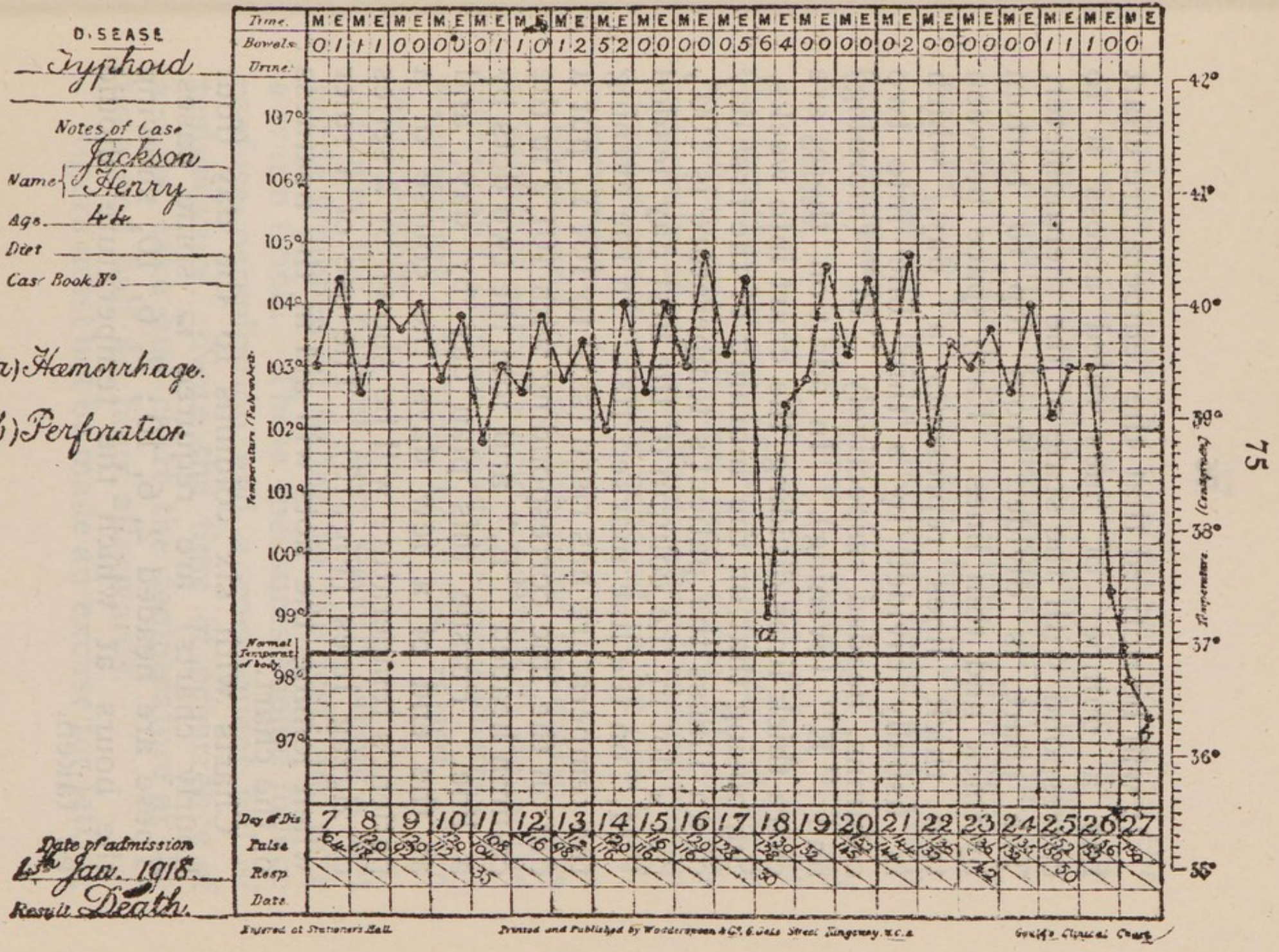

DISEASE
Typhoid
Notes of Case
Name Jackson Henry
Age 44
Diet
Case Book No.
(a) Hæmorrhage.
(b) Perforation
Date of admission 6th Jan. 1918.
Result Death.
Time.
Bowels
Urine.
Temperature (Fahrenheit)
Normal Temperature of body
Temperature (Centigrade)
Day of Dis
Pulse
Resp
Date
Entered at Stationers Hall
Printed and Published by Wodderspoon & Co. 6 Vale Street Tungeway W.C.2
Guelph Clinical Chart

FIG. 13

It will be noticed that the temperature chart has a number of lines ruled across it to correspond with the scale of the thermometer. The chart is divided from top to bottom by thick and thin lines. Each space between two thick lines represents a day, which is usually divided by a thin line into two columns, headed respectively "M" (morning) and "E" (evening). In addition there are extra thick lines dividing the chart into weeks. Supposing that on the morning of the first day of an illness the patient's temperature is 100°, put a dot in the column of the first day headed "M," on the line marked 100. In the evening the temperature has risen (say) to 101·2, put a dot on the line corresponding with 101·2 in the column headed "E," and join the two dots by a line. Pursue this plan day by day, and at the end of a few days the course of a patient's temperature will be shown by a series of zigzag lines (Fig. 13). The use of a ruler when joining the dots will aid in the neatness of the chart.

Charts with six columns to the day (four hourly charts) are required in some cases. These are headed 2, 6, 10; 2, 6, 10, showing the hours at which the temperature should be taken.

Spaces are usually provided for recording the pulse-rate, respirations, action of the bowels, amount of urine, diet and any special notes.

6. **Cleanse the thermometer** by immersing it in disinfecting solution; then wipe it and replace it in its case, bulb first.

7. **Never let a patient take his own temperature.**

RIGORS. The term "rigor" is applied to the shiverings which occur during the course of many illnesses. A rigor is often one of the first signs of illness, especially fever and inflammation; inflammation of the lungs is usually ushered in by one long, severe rigor.

Before and during the rigor the patient has a feeling of extreme cold, particularly down the spine, and shivers violently; nevertheless the temperature of the body is raised, often considerably.

Cover the patient very warmly, apply a hot bottle wrapped in flannel to the feet, and give a warm drink. These measures should induce profuse perspiration and a consequent fall of temperature. Note the time of occurrence of a rigor, take and chart the temperature at the time and half an hour afterwards.

Rigors must not be made an excuse for letting

the air in the room get overheated and impure.

Pain.

Observe the expression of the patient, because this is often the chief indication of the amount of pain he is suffering. Often a helpless patient is beyond speaking of pain, yet its presence reveals a symptom which the doctor should treat promptly.

The chief points to notice with regard to pain are :—

Situation.—Suggestions should not be made to the patient as to the seat of pain ; he should be asked to say where it is, and then whether it is localised or widespread, stationary or shifting. Superficial pain is generally increased by slight pressure, deep pain by harder pressure. The situation of the pain does not always coincide with that of the disease, as pain may be reflected some distance by the nerves. Thus pain in the knee often accompanies hip-disease, and pain in the side of the face or in the ear may arise from a decayed tooth.

Intensity.—Difficulty will at first be experienced in finding out the degree of pain which a patient suffers, but as the nurse is better acquainted with her patient, she will be able to form a fairly accurate opinion.

How intensified.—In pain connected with

the chest or lungs, respiration often increases it. In diseases of the stomach food may bring on a fresh attack. In certain diseases of the eye light excites pain. In many brain diseases both light and sound increase the suffering.

How relieved.—It is necessary to watch closely what gives most relief—for example, heat or cold, rest or movement, rubbing, change of the position of the patient or of the limb, and a number of other simple things may lessen the pain. It frequently happens that an attentive nurse, by due appreciation of the signs, is a better judge than the sufferer of what really gives most relief.

Posture. Observe the position the patient takes up in bed. A very sick patient generally lies on his back, and when it is necessary to change his position, as in pneumonia, or to prevent bed-sores, he has to be propped up on his side by means of a pillow at his back.

In very exhausting diseases—for instance, towards the end of a long fever—an absolutely horizontal posture is natural, and any desire to have the head raised is a good sign.

In diseases—for example, bronchitis—when the breathing is difficult, the patient prefers to sit up, as the respiratory muscles have

most power in that position. In such cases lying down is a good sign, provided that the strength keeps up, but lying down may be a sign of collapse and impending death.

Lying always on the same side may be a sign of local disease—possibly of the lung, as the patient in such cases usually lies on the affected side, thereby allowing greater freedom to the unaffected side.

In inflammation of the bowels, lying on the back with the knees drawn up to relax the abdominal muscles is usual.

In colic, as pressure affords relief, the sufferer often lies on his face. Lying down is often impossible with certain forms of heart trouble. (See heart bed, page 49.)

Lying continually in one position causes congestion of the lungs, which in exhausting diseases is a grave complication. For this reason occasional changes of posture are necessary, but for the greater part of the time a patient should be assisted to retain the easiest and best position, as by a pillow laid against the back to support him on his side, or by a comfortable bed-rest to support the head and shoulders. Constant attention may be necessary, as pillows soon get disarranged and slip down. Raising the foot of the bed

may assist in checking a tendency to slip into a horizontal position, and a pillow placed under the knees and secured to the head of the bed is frequently useful to effect the same purpose.

A "bed-rope" attached to the foot of the bed or to a hook in the ceiling is a great assistance to a patient when he wants to change his position or to sit up.

In some diseases a sudden change of posture is dangerous. Lives have been lost by carelessly or suddenly raising patients. Great care in this respect is required in heart disease, typhoid fever, *pneumonia*, *diphtheria* and *phlebitis*.

THE TONGUE. Inspection of the tongue should be made by the nurse before food is taken. It is important to note :—

The colour, especially at the tip and edges.

The size and shape. It is sometimes so swollen that the sides are marked by the teeth.

The movements. It is sometimes protruded with difficulty, as in low fever and apoplexy ; protruded to one side, as in certain serious nerve affections ; tremulous, as in nervousness, low fevers and delirium tremens.

Whether furred—as in indigestion—and how it cleans after an illness ; the fur generally cleans off first at the tip and edges.

Excretions. Enter all **movements of the bowels** on the chart. Note the amount, colour and consistency of the motions, and whether blood, *mucus*, worms, etc., are present. Note the quantity of **urine** passed during the twenty-four hours, also its colour and whether it shows a deposit when left to stand. At the onset of an illness, as a matter of routine, preserve the stools and a specimen of urine passed three hours after a meal, for the doctor to see. Later on, do this only when directed, unless there is something special which the doctor should see. (See *Urine* in Glossary.)

Bed-Sores. The term "bed-sore" is used to denote a local inflammation experienced by patients confined to their beds. Though every class of patient is liable to be affected, bed-sores are more common in those suffering from paralysis and dropsy. The parts where bed-sores are generally found are the lower part of the spine, the hips, heels, ankles, shoulders, elbows and back of the head, where the skin being directly over the bone is insufficiently protected by soft tissues. In slight cases a bed-sore may be no more than skin irritation, with redness of the affected part ; in the next stage the skin is broken, while later

on a very serious *ulcer* may be formed, with extensive destruction of *tissue*. Bed-sores frequently arise with surprising quickness, **and the nurse must be on her guard against them from the very first.** While difficult to cure, they are comparatively easy to prevent. Bed-sores are caused by :

1. **Local pressure**, causing stagnation of the blood in the part. **This is aggravated by wrinkled sheets or night clothes, or by crumbs in the bed.**
2. **Dampness**, whether due to perspiration, incontinence of *urine* or *fæces*, or insufficient drying after washing, etc.
3. **Friction**, usually due to restless movements of the patient.

RULES FOR THE PREVENTION OF BED-SORES.

1. **Attend to the back and all parts liable to be affected twice daily. If there is any sign of redness, or the patient complains of tingling, attend to the parts every four hours.**

(*a*) Wash the back, etc., with warm water and soap, rubbing the soap well in with a circular movement; dry with a soft towel.

(*b*) Rub briskly with methylated spirit, still using the circular movement.

(*c*) Dust with equal parts of oxide of zinc and starch powder, which help to absorb any moisture on the skin.

(*d*) When dampness is being caused by incontinence or perspiration, rub the back with ointment composed of two parts of lard and one part of white wax instead of with methylated spirit, but do not use powder, as it cakes with the ointment.

Relieve local pressure.

(*a*) By change of position unless the nature of the case (for example, fracture) makes this unsafe. If necessary, support the patient by pillows or a bolster judiciously placed.

(*b*) By a water-bed or by a ring or horse-shoe air pillow, or an improvised ring cushion placed around a part affected or likely to be affected.

(*c*) By keeping the bed-clothes and night clothing free from creases. Pull the draw-sheet through after attention to the back, and whenever the bed is made.

(*d*) By removing all crumbs from the bed. Wiping the sheet with a clean cloth is more reliable than dusting it with the hand.

Sleep. Sleep is a manifestation of rest, and is essential alike in health and sickness. Intervals of rest alternating with periods of work are the necessary condition for the healthy performance of the functions of the body. In sickness the active work of the body is necessarily far less than in health, but there is always some work going on, and in its weakened state the body requires long periods of sleep.

Much can be done by the nurse to induce sleep. A darkened room, whether at night or in the daytime, generally has a soothing effect. Lights should be shaded to avoid glare in the patient's eyes. The flicker of a fire will make some patients drowsy, while in other cases it will have the opposite effect. It is a mistake to keep the house too quiet to enable a patient to sleep, as if this is done the slightest noise is apt to awaken him. During sleep there is a reduced amount of blood in the brain, so that anything that tends to draw blood to other parts of the body may help in promoting sleep. For this reason a little food or warm milk, by drawing blood to the stomach and intestines, or a hot bottle to the feet, by drawing blood to them, may have the desired effect. A soft handkerchief folded and fastened firmly over the

eyes, or a wet compress lightly placed over the eyes, especially if renewed once or twice, may be helpful. Gently rubbing the hands and arms, brushing the hair, sponging the face and hands, or reading aloud may be tried, often with satisfactory results.

Report the number of hours you know for a fact that the patient has slept, the time you have reasonable grounds for believing he has slept, his own account of the matter, and whether the sleep has been light, deep, broken or troubled.

Cough. Note with regard to cough :—

1. Whether it is
   - (*a*) Dry—without *sputum*.
   - (*b*) Wet—with sputum.
   - (*c*) Loose—with sputum easily brought up.
   - (*d*) Hacking—short, feeble and frequent.
   - (*e*) Painful—the patient will obviously try not to cough.
   - (*f*) Accompanied by straining.
   - (*g*) Increased by change of posture, alteration of temperature, etc.
2. The character of the sputum, if any, especially if it is accompanied by blood.

Preserve a specimen of the sputum in the spittoon, and be careful to keep it covered, as dried sputum is in certain cases highly infectious.

VOMITING. Note times of vomiting, how long after food is taken, and whether it relieves any pain preceding it. Inspect the vomit for traces of blood and for undigested food. Keep vomit if no instructions to the contrary have been given. Notice particularly whether vomiting occurs without nausea.

Vomiting may be relieved by keeping the patient lying quiet, loosening the clothes and affording fresh air.

QUESTIONS ON CHAPTER V.

The numerals indicate the pages where the answers may be found.

CHAPTER VI.

FOOD AND FEEDING.

FOOD AND HOW IT REACHES THE TISSUES.

The doctor, when prescribing diets, is guided by definite principles, even a limited knowledge of which will help the nurse in carrying out her instructions.

In order that a person may benefit by food taken, the food must be **digested, absorbed and assimilated.**

The two great ends achieved by **digestion** are :—

1. **To dissolve solids**, and so make them capable of passing from the alimentary canal through the walls of the blood capillaries.
2. To render food **capable of assimilation** by the tissues, when it is brought to them by the blood.

The Organs of Digestion are the mouth, the teeth, the *salivary glands*, the *pharynx*, the *œsophagus* or gullet, the stomach, the *liver*, the *pancreas*, the *small intestine*, into the commencement of which the *ducts* of the *pancreas* and *liver* discharge ; and the *large intestine*, the terminal portion of

which is known as the *rectum*, while its orifice is called the *anus*. The path from the mouth to the anus is described as a whole either as the Alimentary Canal or as the Digestive Tract.

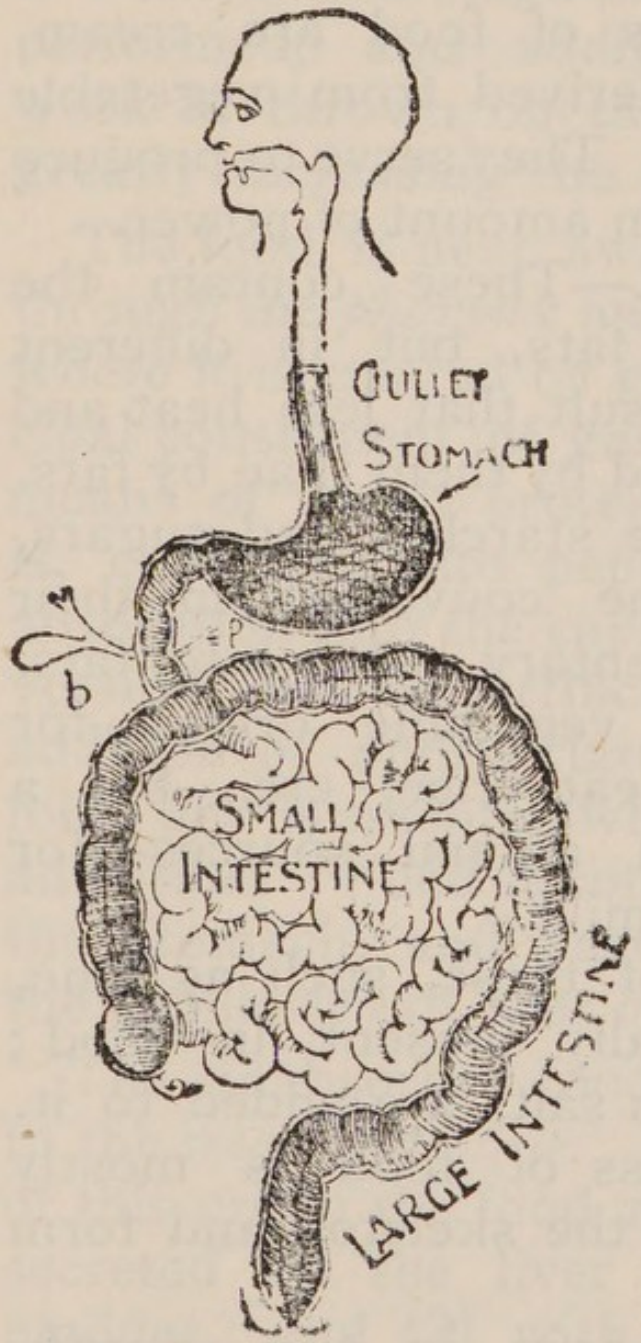


FIG. 14.

ALIMENTARY CANAL.

b. Gall Bladder. *p*. Duct bringing fluid from the Pancrea .

Foods are classified according to their composition as follows :—

1. **Proteids**, also known as Proteins—contained for example, in lean meat, white of egg, milk, some vegetables, especially the pulses (lentils, peas, etc.) cereals and cheese — contain a large proportion of nitrogen (hence the term nitrogenous foods), besides carbon, hydrogen and oxygen, and serve to form and build up the body in its growth and make good the wastage of the tissues.

2. **Fats.**—These consist of carbon, hydrogen and some oxygen, but not enough to combine with the whole of the hydrogen to form water. Examples of this class of food are cream, butter, meat fat, oils derived from vegetable or animal sources, etc. They serve to produce animal heat and a certain amount of power.

3. **Carbo-Hydrates.**—These contain the same constituents as fats, but in different proportions, with the result that less heat and more power are produced by them than by fats. Foods of this class are starches and sugars, some of which become converted in their passage along the alimentary canal into fats. They are mostly of vegetable origin—for example, potatoes, wheat, rice, etc., but a few are derived from animal sources—for example, the sugar of milk.

4. **Salts.**—Several of these, such as lime, soda, etc., are naturally present in food; others, such as common salt, are added to it. The value of this class of food is mostly to build up and support the skeleton and form the digestive juices.

Digestion should begin in the mouth, and does so when food is properly masticated. During the process of mastication, food is cut up and ground by the teeth, and intimately

mixed with *saliva*, which converts starch into sugar and makes it soluble. If, however, food is bolted, this stage of digestion is imperfectly performed, and additional and unnecessary work is thrown on the other organs, thereby greatly increasing the risk of indigestion.

The food is next swallowed, that is, passed through the *pharynx* and *gullet* to the stomach, where it is treated by gastric juice. The principal constituent of gastric juice is pepsin, by means of which proteids are peptonised—that is, converted into peptone, a fluid capable of absorption into the capillaries. A similar conversion can be artificially performed by the addition of appropriate substances to proteid food, and is essential when such food is given as an *enema*. Food becomes more or less fluid in the stomach, and part of it is **absorbed** by the capillaries of that *organ*.

The unabsorbed food now passes as *chyme* to the *small intestine*. In the uppermost part of this organ the food meets with (1) the *bile*, secreted by the liver and stored in the gall bladder ; and (2) with pancreatic juice, a fluid secreted by the pancreas, containing three ferments. Of these ferments one converts starches into sugar, completing the unfinished action of the saliva ; another supplements the action of

the gastric juice by peptonising proteids not absorbed by the capillaries of the stomach ; and a third, in conjunction with bile, acts on the fat, thus making it capable of absorption.

The food now passes along the small intestine, from which it is gradually **absorbed.** Some parts pass into the capillaries and walls of the intestine to be carried to the *liver* for further treatment, and thence to the right side of the heart, while other parts pass through minute vessels to be carried to a large channel known as the *thoracic duct*, which empties itself into large veins at the base of the neck. On reaching the lower end of the small intestine, what is left of the food passes into the large intestine. This channel is not nearly so well adapted for absorbing food as the stomach and small intestine, but absorption is to some extent continued in it, so that by the time the lower part of it (*rectum*) is reached practically all the digested food has been absorbed, and there remains only waste matter, which is periodically excreted through the orifice of the bowel, the *anus*.

The food absorbed by the blood is carried to all parts of the body (see "Circulation of the Blood," page 19), and is **assimilated** by the tissues through the walls of the capillaries. Assimilated food maintains and renews the

tissues of the body, and provides heat and power. Food taken in excess of requirements throws an undue strain on the organs of digestion and excretion. An insufficent supply of food to the tissues causes loss of weight and a diminution of heat and vitality.

Water and nitrogenous waste are *secreted* from the blood by the kidneys and passed into the bladder to be periodically excreted as urine.

Rules for Giving Food.

In disease the organs of digestion are usually weak, and fail to perform their proper functions, with the result that the patient is unable to digest ordinary food, and, therefore, requires special dieting.

1. **Under the advice of the doctor, distribute judiciously over the day and night the amount of food ordered.** A patient will not, as a rule, need to be given as much nourishment at night as in the daytime, sleep being often more essential than food. It is well to have a diet table showing exactly how much and when food is to be given. A specimen appears on the next page.

2. **Offer the patient his food in an appetising form.** A large bowl of beef tea might destroy all appetite, while a small cupful would be welcome. A rice or custard pudding

Diet Time Table.

Amount to be given in twenty-four hours—two pints of milk, one pint of beef tea, two ounces of brandy, two eggs :—

Day.

Hours.	Fluid, etc.	Amount of Nourishment.	Amount of Stimulant.	Remarks.
7 a.m.	Milk ...	5 oz.		
9 a.m.	Milk ...	5 oz.		
11 a.m.	Milk with beaten up egg and brandy	5 oz. 1 egg	½ oz.	Second feed of milk vomited.
1 p.m.	Beef tea	7 oz.		
3 p.m.	Milk ...	5 oz.		
5 p.m.	Milk ...	5 oz.		
	Brandy	... ...	½ oz.	
7 p.m.	Beef tea	7 oz.		
		Night.		
9 p.m.	Milk ...	5 oz.		
	Brandy.		½ oz.	
12 (midnight)	Beef tea	6 oz.		Patient relished beef tea.
3 a.m.	Milk with beaten up egg and brandy	5 oz. 1 egg	½ oz.	
5 a.m.	Milk ...	5 oz.		

should be brought into the sick-room in a small dish in preference to being ladled out of a large one. A tactful remark will often promote appetite. "Punch" records that a nurse persuaded a soldier to eat a large helping of rice pudding by cutting it in a pointed shape and suggesting that he should "just nibble off the salient."

3. **Consistently with the doctor's orders always have something ready** to be given before the wish for food has passed away.

4. **Never leave food in the sick room.** Bring it in at the right time, and at once clear away any that is left. Water for drinking should always be drawn fresh, as by standing it loses its pleasant taste, and may be vitiated by exposure to the air.

5. **Do no cooking in the sick room,** as the odours upset appetite. Tea may, however, be made there, as its fragrance is refreshing.

6. **If the amount of liquid to be taken is limited, give the exact quantity to be taken.** Many people, especially children, dislike being stopped in the middle of a drink.

7. **In raising a patient to drink, pass the forearm behind the pillow** to support both the head and shoulders, and so avoid undue bending of the neck. A teapot will form an efficient substitute for a feeding-cup.

Quenching Thirst.

Remember that milk is a food as well as a drink, and that, by giving an undue amount of milk, you may overtax the patient's digestion. At times, therefore, substitute plain water or, if ordered, barley water or acid drinks, such as lemon juice or lemonade made from fresh lemons.

Put two tablespoonfuls of the selected beverage into an opaque feeder, which is preferable to a glass, as it conceals from the patient how little he is being given, and urge him to hold the fluid under the front of the tongue, or at the back of the throat. The effect will be a refreshing sensation of coolness, whereas a large draught induces flatulence, and does not so well allay the thirst.

Giving Liquid Food.

The most usual way of giving liquid food to a patient is from a china feeder (Fig. 15). To do this :—

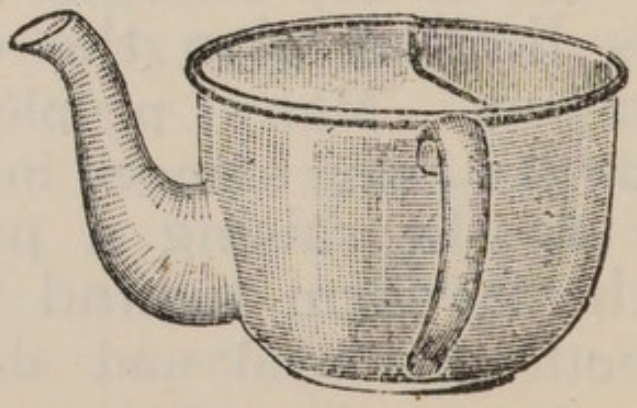


Fig. 15.

1. Put a napkin under the patient's chin if he is lying on his back, or tuck it under the

chin and cheek if he is lying on his side. This will avoid wetting the night-shirt or sheet.

2. Take the feeder in your right hand and—

(*a*) If the patient is lying on his back, place your left forearm behind the pillow and raise his head and shoulders ; or,

If the patient is lying on his side, depress the pillow by the side of the mouth, pass your forearm under the pillow and incline the head towards the feeder.

3. Place the spout of the feeder in the patient's mouth, and tilt the feeder slightly, allowing only a little fluid at a time to pass into the mouth (for fear of choking the patient).

4. Withdraw the feeder from time to time, or, if preferred by the patient, lower the feeder to prevent the further flow of liquid until you have seen the act of swallowing.

5. Withdraw the napkin and wipe the patient's mouth with it.

Some patients take their nourishment better from a small glass tumbler, which should be only a quarter full. If the patient's head is slightly raised he can drink easily. The "Ideal Feeder" (Fig. 16) is recommended by many authorities. A glass tube bent at the

end, a piece of fine rubber tubing, or even a long straw previously sterilized, through which the patient can draw up the fluid himself, may be used. The straw should be burnt after being once used; the glass tube or rubber tubing should be boiled and kept in water. A skilful nurse readily discovers the way of feeding which is most comfortable and least fatiguing to the patient.

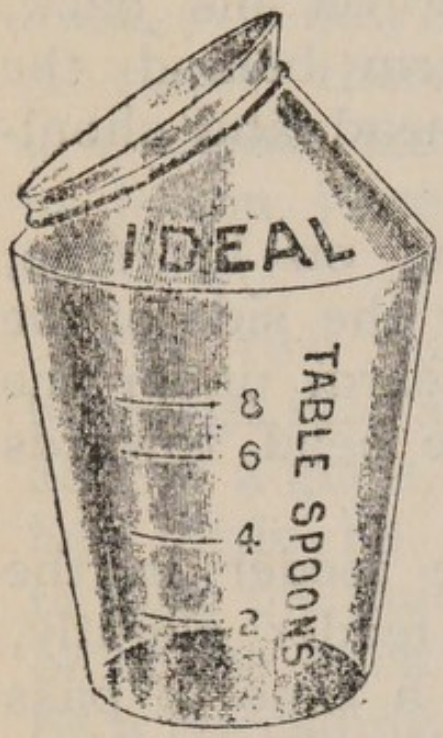


FIG. 16.

If the patient is either unconscious or suffering from injury to the mouth or jaw :—

1. Attach about four inches of rubber tubing (boiling it first) to the spout of the feeder.

2. Place the patient with his head fully turned on one side.

3. Pass the little finger along the inner side of the cheek resting on the pillow and gently pull the cheek away from the teeth.

4. Pass the tubing along the side of the teeth between the cheek and gums, and very gently pour in the fluid (about one tablespoon-

ful) from the feeder, when the patient will swallow without the effort of drawing in liquid into the mouth.

FOOD AND ITS PREPARATION.

Milk contains all the constituents of a complete food, and is so important a part of an invalid's diet that it is desirable to know a good deal of its composition and properties.

Proteid is present in milk in two forms, viz.:— *Lact albumen*, which does not coagulate (form a curd) in the stomach, but does coagulate by heat (161°F); and *Casein*, which does not coagulate by heat, but is coagulated in the stomach, the curd formed often proving difficult to digest.

Fat is present as cream, and mixes with the water and other constituents, so that milk is an *emulsion*. It can readily be separated by being allowed to rise.

Sugar is present, as lactose, and is completely dissolved. It is not so sweet as ordinary sugar, and is rather liable to turn sour.

Salts are present in various forms (lime, soda, etc.).

Water forms most of the bulk of milk.

Amongst the *bacteria* sometimes found in milk as delivered to the customer are those of *typhoid* and *tubercle*, in addition to the lactic acid

bacillus which is almost always present, and is the cause of milk turning sour. The entry of bacteria is encouraged when milking has taken place in septic surroundings and when the milk has been much handled or has been long in transit to its destination, especially in hot weather.

In all cases it must be insisted that all vessels used to hold milk, whether the bucket in which it is drawn, the pan, bowl or bottle in which it is kept, or the cup or glass from which it is drunk, are spotlessly clean.

Furthermore, artificial pasteurization or sterilizing of the milk itself is usually regarded as essential, especially when the milk is to be taken by infants or invalids.

Pasteurization consists in keeping milk at a temperature of 155° to 158° for twenty minutes. This should be done in a double saucepan over a spirit lamp with the aid of a thermometer. The effect is to kill nearly all bacteria, but not the spores from which they grow. No change in the appearance of the milk can be detected, nor is the taste altered; but if the temperature rises to 161° the lact albumen will be coagulated.

Sterilizing in a hot water bath consists in placing the milk in one or more closed recep-

tacles, which are nearly immersed in water that is allowed to boil. After twenty minutes from the time when the water boils the milk will be sterilized, and not only the bacteria but their spores will have been killed. Apparatus for sterilizing in this way can be procured in several forms with full directions. Much the same result is attained by boiling in a double saucepan, a cover being used to prevent scum from forming on the top of the milk. After sterilizing, the milk should be rapidly chilled to a temperature of 45° Fahr., and kept in a cool place in a closely-covered sterile vessel.

Peptonizing Milk.—When milk causes indigestion or leaves the body undigested, it should be peptonized as follows :—

Pour the milk into a clean bottle that has been sterilized by scalding, and add a quarter as much water. Put in peptonizing powder in accordance with the directions regarding the quantity printed on the packet, and maintain the milk at a temperature of about 105° Fahr. by keeping the bottle in a bowl of water as hot as the hand can bear. Stir for twenty minutes and then raise the temperature of the milk to boiling point, to arrest further action of the peptonizer, and so avoid a bitter taste.

Whey is sometimes used as a substitute for

milk, as it is easily digested and affords some nourishment. It contains lact albumen, lactose, salts, and sometimes a little fat, and differs from milk inasmuch as casein (which clots in the stomach) and all or most of the cream have been removed. To make it, add a dessert-spoonful of rennet to a pint of fresh, unboiled, whole or separated milk at a temperature of about 95° Fahr. In about an hour or an hour and a half a curd will have formed, with the result that the milk will now be what is known as **junket.** Place it in an earthenware pudding basin and stand it over a saucepan of boiling water, and by degrees the curd will shrink into a solid mass leaving the whey. Strain before using. Milk may be diluted with whey provided that the latter has been raised to a temperature of 150° to stop the further action of the rennet, which would otherwise coagulate the milk. Care must be taken not to heat the whey up to 161°, or the lact albumen will clot.

Buttermilk is milk deprived of the whole (or nearly the whole) of its fat, and is sometimes ordered in cases of chronic stomach or intestinal disorder. A regular supply can be obtained from a dairy where butter is made daily.

Condensed Milk is cows' milk with a large part of its water removed by evaporation. It

can be obtained as sweetened whole milk, unsweetened whole milk, and sweetened separated milk. The last-named is quite unsuitable as food for infants, and the other forms should never be their sole diet.

Dessicated Milk, or Milk Powder, is portable, and keeps well. It contains all the constituents of cows' milk in a sterile and soluble form.

A teaspoonful of suet, from which all skin has been removed and chopped very finely, may be put into half-a-pint of cold milk to give additional nourishment. The milk must be brought to the boil and strained.

Recipes.

Albumen Water is a most nourishing and at the same time digestible form of food. The proportions are the white of one egg to half-a-pint of cold water. Put the white of egg on a plate, add a pinch of salt, and beat well with the blade of a knife. When well whisked up to a stiff froth, add to it the cold water and allow it to stand for one hour to dissolve. Lemon juice may be used for flavouring.

Barley Water.—Pearl barley, one ounce or one tablespoonful; water, two pints. Put a tablespoonful of barley into cold water, bring to

boiling point, and **pour away the water** (this is called "blanching or washing" the barley). Add two pints of hot water, boil up, and cook in a hot water bath (a jug standing in a saucepan containing boiling water) for two hours and strain. May be flavoured with lemon juice and sugar.

Beef and Cream.—Take a quarter of a pound of fresh lean beef, add four lumps of sugar, and pound in a mortar to a smooth paste. Now add a tablespoonful of cream, and mix thoroughly. Serve in small quantities in a coloured glass as cream.

Beef Tea.—Cut up finely a pound of shin of beef without bone, removing the skin and fat; put it into a stone jar with a pint of cold water, half a teaspoonful of salt, and cover the jar. Let it stand for fifteen minutes, stir well, cook gently in a "hot water bath" for three hours. When cold, skim, strain, and heat up as required.

To make beef tea quickly, cut up finely half-a-pound of shin of beef without bone. Put it into a saucepan with half-a-pint of cold water; bring it quickly to the boil, and allow it to boil for a quarter-of-an-hour.

Bread and Milk.—Remove the crust from a slice of bread, cut in small squares and pour

boiling milk on it; cover the basin and let it stand for a few moments before serving.

Bread Jelly.—Soak a thick slice of stale bread, say a quarter of a pound, in cold water for six hours ; squeeze the water out of it, and boil the pulp with a pint of water in a double saucepan. Strain and rub through a fine sieve into a mould, in which a jelly will be formed when the mixture is cold. It may be flavoured with lemon, and should be given with milk (to which cream may be added) and sugar. Unlike most jellies, it is nourishing, but unfortunately keeps only a few hours.

Gruel (Oatmeal) is sometimes made with milk and sometimes with water. Mix into a paste with water two tablespoonfuls of fine oatmeal or groats in a saucepan ; add a pint of milk or water, as ordered, and boil gently for half-an-hour, stirring frequently. Flavour with salt or sugar.

Lime Water.—Slake two ounces of quicklime by sprinkling water over it; then shake it up in a gallon of cold water for two minutes. Allow it to stand for twelve hours, then draw off the clear liquid with a syphon.

Meat Broth.—Take equal parts of mutton, beef and veal without bone. Remove the skin and fat ; chop finely ; add an equal weight of

water, and proceed as for the first method of making beef tea.

Meat Juices and Essences are valuable for their stimulating properties, but must not be regarded as foods, as they contain little if any nourishment.

Oatmeal Porridge.—Add a pinch of salt to half-a-pint of boiling water. Stir in gradually a handful of coarse oatmeal; boil for half-an-hour, stirring all the time.

Rice Water.—Put three ounces of well-washed rice into a quart of boiling water; boil for an hour; strain and sweeten. Cinnamon may be added.

Sponge Cake.—Take four eggs, the weight of three of them in castor sugar and of two in flour. Beat up the yolks with the sugar, and the whites by themselves. Mix all the ingredients and bake in a slow oven.

Toast Water.—Toast bread crusts till they are thoroughly brown, but not burnt. Put them in a jug with a pint of boiling water and allow to cool.

To keep Ice.—Put a piece of wood into a basin; wrap the block of ice in a piece of flannel and place it over the wood. Use a pointed instrument—not a hammer—to break it.

QUESTIONS ON CHAPER VI.

The numerals indicate the pages where the answers may be found.

CHAPTER VII.

MEDICINE.

Rules for the Care and Giving of Medicines.

While prescribing is entirely the business of the doctor, the care and giving of medicines are generally entrusted to the nurse, who should observe the following general rules :—

1. **Keep outward applications, whether poisonous or not, apart** from medicine for internal use.

2. **Keep Poisons in bottles of a distinctive shape and colour, and be sure they are labelled "Poison."**

3. **In an infectious case,** mark and keep separate the medicine glass, the bowl in which the glass is washed, and the cloth with which it is dried.

4. **For Oily Medicines** keep a special glass.

5. **Before giving medicine always read the label**—never trust to recognising drugs by appearance, smell, or any other signs, or to remembering the dose.

6. **Shake all fluid medicine.** Medicines with sediment, and effervescing medicines, must be taken as soon as they are poured out.

7. **When pouring out medicine,** keep the labelled side of the bottle uppermost, so that no fluid may run over the label. Stand the medicine glass on a **level** surface while pouring out medicine, in order to ensure correct measurement. This is important, as, if the glass is in a slanting position, too much or too little medicine will be given.

8. **Re-cork the bottle immediately.**

9. **See the patient take his medicine.**

10. **Wash and dry the medicine glass after use.**

11. **When no precise directions have been received** as to when medicine is to be taken, give it as follows :—

2-hourly medicines—	2, 4, 6, 8, 10, 12	day and night.
3 ,, ,,	3, 6, 9, 12	
4 ,, ,,	10, 2, 6	
8 ,, ,,	10 a.m., 6 p.m., 2 a.m.	

Three times a day—10 a.m., 2 p.m., 6 p.m., *i.e.*, after breakfast, dinner and tea.

Twice a day—10 a.m., 6 p.m., *i.e.*, after breakfast and tea.

12. **Give "after food" medicines** within twenty minutes after taking food, and **"before food" medicines** twenty minutes before meals.

Hints on Administering Medicine.

Pills.—These are more easily swallowed when placed upon the front part of the tongue instead of on the back part, as is so often done in the belief that it aids swallowing. The plan of putting the pill into a piece of bread half-masticated by the patient and then swallowing the whole is sometimes successful.

To administer **Castor Oil** or **Cod-Liver Oil**, rub a little of the juice of half a lemon (or not too sweet orange) over the inside and edge of a medicine glass, squeeze the remainder into the glass, and pour in the oil, taking care not to let it touch the edge or side of the glass. Give the patient a little piece of the other half lemon to suck, and squeeze the juice of the remainder on to the oil. The patient should then gulp down the contents of the glass.

Capsules.—Small measured doses of medicine can be obtained enclosed in thin gelatine capsules. They render medicine quite tasteless, are readily swallowed, and, moreover, are easily stored and carried.

Patience, ingenuity and tact will generally induce **children** to take medicine. Never use force or deceit, or put medicines into milk or

any essential part of invalid diet, as this might turn a child against his food.

Suppositories are small cone-shaped bodies used for administering drugs by the rectum. The anus and suppository are greased with a little oil or vaseline, and the suppository is inserted point upwards into the anus by the nurse's index finger, which is withdrawn when the suppository is felt to slip away from it.

WEIGHTS AND MEASURES USED IN CONNECTION WITH MEDICINES.

The British weights in use are those known as Apothecaries' and Avoirdupois. There are two different kinds of ounces—the Apothecaries' and the Avoirdupois. When "℥" is written, the apothecaries' ounce is meant; and when "oz." is written, the avoirdupois ounce is meant.

TABLE OF WEIGHTS USED BY APOTHECARIES.

APOTHECARIES'				AVOIRDUPOIS.	
Grains (grs.).	Scruples (℈)	Drachms (ʒ).	Ounces (℥).	Ounces (oz.).	Pounds (lbs.).
20	1				
60	3	1			
480	24	8	1		
437½	—	—	—	1	
7,000	—	—	—	16	1

Example of the Use of the above Table.

How many grains are there in a drachm? Look in the column headed "Drachms," and carry the eye along the line in which 1 appears to the column headed "Grains," where 60 will be found, showing that the answer is 60.

The standard British Fluid Measure is the Gallon (C), which is the volume of ten pounds of water at 60°F. Teaspoonfuls, dessertspoonfuls, and tablespoonfuls should always be measured in glasses or spoons graduated for the purpose, as spoons in general use are not made to standard sizes. A "wine-glass" is a loose term often used to denote two or two and a half fluid ounces.

Table of Fluid Measures.

Minims (♏).	Fluid Drachms (ʒ) or Measured Teaspoonfuls.	Measured Dessert-spoonfuls.	Measured Table-spoonfuls.	Fluid Ounces (℥).	Pints (O).	Quarts (Qt.)	Gallon (C).
60	1	—	—	—	—	—	—
120	2	1	—	—	—	—	—
240	4	2	1	—	—	—	—
480	8	4	2	1	—	—	—
9,600	160	80	40	20	1	—	—
19,200	320	160	80	40	2	1	—
76,800	1.280	640	320	160	8	4	1

To make up a solution of a given strength, say a pint of Carbolic 1 in 40. Divide 1 pint by 40, when it will be found that one measured tablespoonful of Phenol (the liquid form of Carbolic Acid) will be required. In the same way, if the solution is to be 1 in 30, 5 drachms, 20 minims will be required.

Numbers of ounces, drachms, etc., are written in Roman figures, as follows:—

1 ... i or j	6 ... vj	11 ... xj	16 ... xvj
2 ... ij	7 ... vij	12 ... xij	17 ... xvij
3 ... iij	8 ... viij	13 ... xiij	18 ... xviij
4 ... iv	9 ... ix	14 ... xiv	19 ... xix
5 ... v	10 ... x	15 ... xv	20 ... xx

The sign for half is the old form of double-s (ſs).

The above are written after the symbols shown in the tables to which they relate—for example, ℥iv means 4 drachms; ℥iij means 3 ounces; Oſs means half-a-pint.

Owing to its simplicity, the *metric system of weights and measures* is in almost general use abroad, and its use in the British Empire is becoming frequent.

Inhalation. When it is desired to introduce medicine in the form of vapour into the lungs, an Inhaler is used. A useful form is known as Nelson's Inhaler (Fig. 17), which is made of earthenware. Very hot water

is poured in up to the lower end of the spout, and the drug ordered is added. The cork, through which the mouthpiece passes, is then inserted. The patient closes his mouth over the mouthpiece and inspires deeply, his head, shoulders and the inhaler being all enveloped in a shawl or towel during the process.

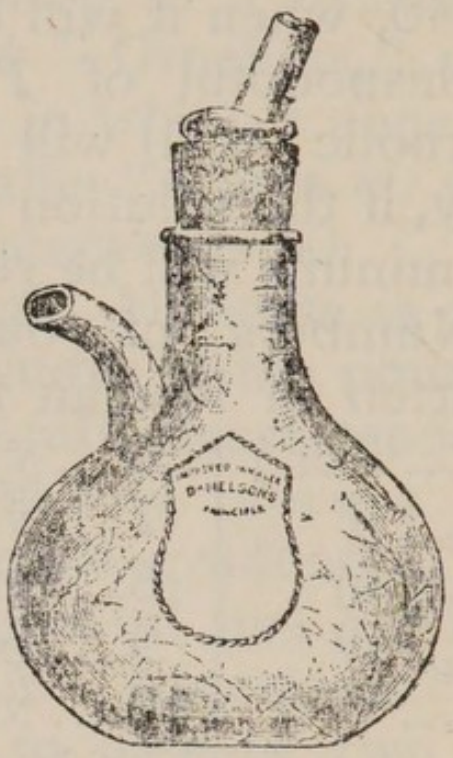


FIG. 17.

SPRAYING. Sprays are used to distribute liquids in small particles over a part. The apparatus can be obtained in a great variety of forms.

To spray the throat :—

1. Seat the patient with his head upright.
2. Cause the patient to open his mouth wide and to hold down his tongue with a depressor placed well over it, and instruct him to draw in his breath.
3. Expel a little fluid from the spray to ensure that the apparatus is in working order.
4. Instruct the patient to breathe quickly through the mouth.

5. Use the quantity of fluid ordered.

To spray the nose:—

1. Seat the patient with his head upright and his mouth open. Direct him not to blow through the nose.

2. Expel a little fluid from the spray to ensure that the apparatus is working properly.

3. Insert the nozzle about half an inch into each nostril in turn, pointing it towards the patient's face, not upwards, and use the quantity of fluid ordered.

SYRINGING. Syringes are used to propel fluids with more or less force in one or more jets. Their injudicious use is accompanied by grave danger, and it must be laid down as a rule that the home nurse is never to syringe such parts as the ear or nose except under the direct instructions of the doctor.

ENEMA. An enema (plural, enemata) is a liquid preparation introduced into the rectum.

The apparatus for the administration of enemata is usually a Higginson's syringe, or a funnel, tubing and catheter.

A Higginson's syringe (Fig. 18) consists of (1) a bone nozzle about three inches long; this may be introduced into the *rectum*, or a *catheter* may be attached to it, to enable fluid

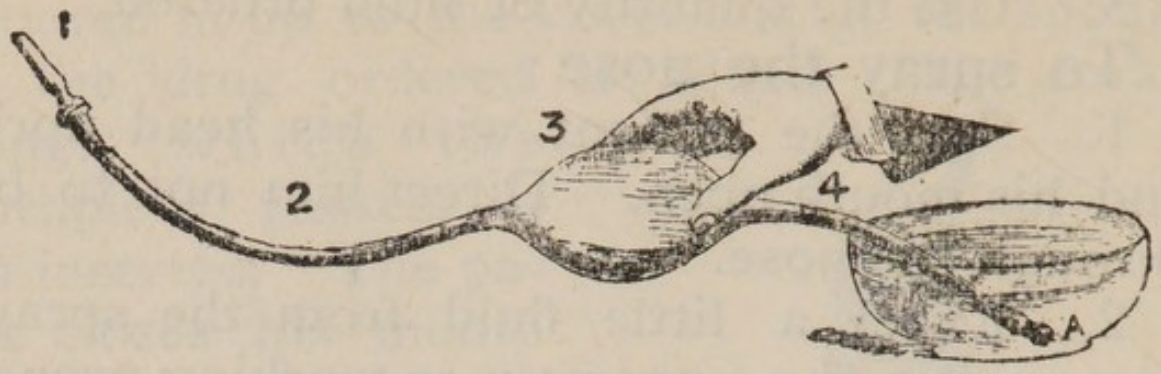


FIG. 18.

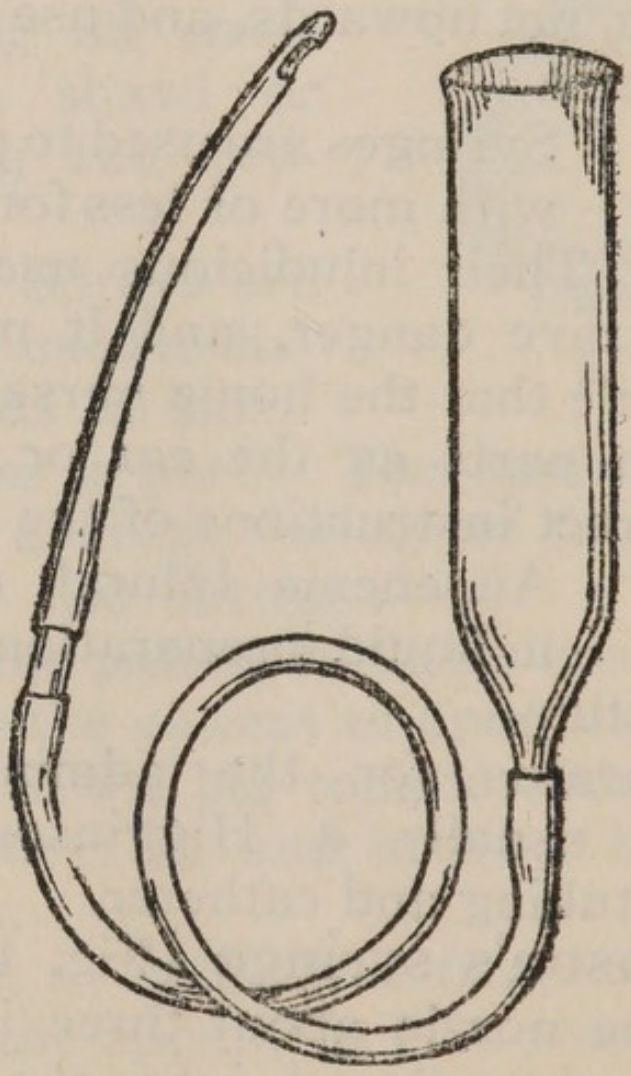


FIG. 19.

to be injected higher into the *rectum:* (2) a length of indiarubber tubing: (3) a bulb: (4) a shorter length of tubing fitted with a metal valve (A).

Before using the syringe, insert the valve end into the bowl containing the fluid to be injected, and pump some of it through the syringe to expel the air. When the fluid flows through noiselessly it is safe to proceed with the enema.

Funnel, tubing and catheter (Fig. 19). Connect a glass funnel with a Jacques' rubber *catheter*, No. 10 or 12, by means of a length of rubber tubing and a glass union. Test for leakage at the joints by running some water through. Pour the liquid into the funnel, causing it to flow slowly by pinching the rubber tubing.

General Directions for Administering Enemata.

1. **Ensure privacy** by the use of a screen or otherwise.
2. **Cover with a cloth and bring to the bed-side to your right-hand side the bowl containing the prepared fluid, with the apparatus.**
3. **Put under the patient** a mackintosh draw-sheet, with a warmed linen draw-sheet folded in four over it.

4. **Turn down the bed-clothes and cover the patient with a blanket,** which can be easily folded back to leave the buttocks free.

5. **Let the patient lie on his left side and draw up his knees ;** then, placing your hand under his hips, draw his buttocks to the edge of the bed, and raise them on a pillow.

6. **Smear the nozzle (or catheter if used) with oil or vaseline, and gently insert it into the anus,** slightly backwards and upwards. Inject the fluid, which, unless ordered to the contrary, should be at a temperature of 100°, very slowly (a pint in five minutes), **never allowing the valve end of the syringe to get uncovered** lest air rush in. If the patient cannot be turned on his side, the enema can be administered as he lies on his back as follows. Raising, if possible, his right leg, pass your hand under it and insert the nozzle into the rectum, standing the basin containing the fluid between his thighs.

7. **Before withdrawing the nozzle,** nip the rubber tubing near it between the thumb and finger, to prevent any escape of fluid into the bed.

8. **Press the buttocks together, or press a clean towel against the anus,** to assist retention of the enema.

9. **Wash the syringe** by pumping clean water through it, and hang it up with the nozzle downwards by means of a small loop of tape at the valve end of the syringe.

10. **Wash the catheter** (if used) by holding it eye uppermost under a cold water tap, and boil it before putting it away.

Medicinal Enemata.

Soap and Water Enema is used as a purgative.

To prepare it.—Pour two and a half pints of warm water into a basin and stir thoroughly into it one ounce of sliced yellow soap. Two pints only should be given, the remaining half-pint being left to cover the valve of the syringe. A child should be given two ounces for every year of his age.

To administer it :—

1. Make sure that the hot-water bottle in the bed is really hot, as patients sometimes collapse after an action of the bowels.

2. Place the bed-pan (see page 59) under the bed, or draw a night-commode close to the bed. Unless the stool is to be saved for inspection, immerse the bed-pan in hot water, wipe the outside dry, and leave hot water in the pan to keep it warm.

3. Administer with a Higginson's syringe, following the general rules.

4. Encourage the patient to try not to use the bed-pan immediately, but never refuse it when asked for.

5. Remove the bed-pan after use, placing it under the bed, covered over, while you wash between the buttocks.

6. Repeat the enema if you do not think the bowel has been sufficiently cleared.

Olive Oil Enema.—This is given when the rectum is full of hard *fæces*. The amount ordered—usually six ounces—is warmed by standing the jar containing it in a basin of hot water. It is administered by a funnel, tube, and catheter, and is followed in half-an-hour by a soap and water enema.

Glycerine Enema.—Used largely as a purgative for children. One or two drachms, warmed by standing the glass holding it in a basin of hot water, are given by means of a small glass or vulcanite syringe.

Starch Enema.—Used to check **diarrhœa.** A teaspoonful of starch is mixed smoothly with two ounces of cold water. It should be slightly warmed by standing the cup containing it in a basin of hot water. It is administered with a funnel, tube and catheter.

Saline Enema.—Used in collapse—one teaspoonful of table salt to a pint of water. The addition of half-an-ounce of glucose is sometimes ordered. Administer by funnel, tubing and catheter.

Nutrient Enemata.

Before administering any food by the rectum it is necessary that the lower bowel be clear of fæces, so warm water or boracic lotion (ten grains to one ounce) is slowly poured in with a funnel, tubing and catheter. By lowering the funnel before it is quite empty the water runs out again, and as soon as it returns clear the enema may be given. Patients continuously fed by enemata should, in addition, have the bowel washed out by warm water once in every twenty-four hours.

As the gastric juices and other digestive agents are not directed into the large intestine, beyond which a nutrient enema does not reach, it is necessary to treat specially any nourishment given by the rectum. The following directions for the preparation of these enemata must therefore be strictly followed :—

Egg and Milk Enema.—Beat up the yolk of one egg with four ounces milk and heat to 140° ; add twenty grains bicarbonate of

soda, thirty grains of salt, and one ounce pancreatic solution. Let the mixture stand one hour. Administer by funnel, tubing and catheter.

Egg, Milk and Brandy Enema. — Add half-ounce brandy to three and a half ounces of the above, immediately before giving. Administer by funnel, tubing and catheter.

Peptonized Beef Tea Enema.—Add a teaspoonful of pancreatic solution and twenty grains bicarbonate of soda to a pint of beef tea. Let it stand in a warm place for two hours, stir occasionally, then boil and strain. Administer four ounces at a time by funnel, tubing and catheter.

QUESTIONS ON CHAPTER VII.

The numerals indicate the pages where the answers may be found.

CHAPTER VIII.

LOCAL APPLICATIONS.

INFLAMMATION. To understand the reasons for applying cold and heat to parts of the body, the nurse should have a knowledge of the changes which take place when, from injury or disease, a part is inflamed.

Inflammation is the result of one of Nature's ways of fighting against septic matter which has entered the body.

There is dilation of the blood-vessels with a considerable flow of blood to the affected part. White corpuscles and *serum* come out of the blood-vessels into the tissues, there to attack the germs or poison, the blood-vessels become blocked with corpuscles (mostly red) and clotting ensues.

If the corpuscles are quickly successful they return to the blood-vessels and inflammation at once subsides. They may, however, have to fight hard, and the casualities of the combat may lead to permanent enlargement of the part; or pus may be formed from the dead bodies of the corpuscles and their enemies, or even tissue may die and a slough be formed.

Treatment.

1. When inflammation does not arise from a wound (possibly some distance from the seat of inflammation) apply cold to contract the blood-vessels and so diminish the blood supply.

2. When blood has clotted and blocked the blood-vessels apply moist heat.

3. If the formation of pus has actually begun, apply moist heat to hasten the process, to ease the pain and to draw the pus to the surface.

Cold Applications.

Cold Compress.—Wring three or four folds of linen nearly dry out of cold water and bandage in position. The compress must be frequently renewed.

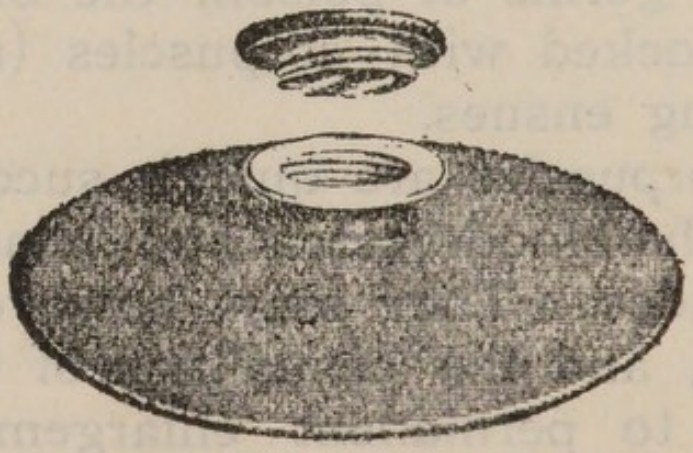


Fig. 20.

Ice Bag.—Break up with a pointed instrument (needle, hat pin, skewer, etc.) sufficient

ice to half fill the rubber bag (Fig. 20). Do not apply the ice-bag direct to the skin, but first put a piece of lint over the part.

Evaporating lotions depend for their action upon the principle that when a liquid evaporates heat is carried off. To apply evaporating lotions, soak a piece of doubled lint in a lotion made of **one part of methylated spirits to three parts of water**, and lay it on the inflamed part. Do not cover the lint. A second piece of lint should be soaking in readiness to take the place of the first when dry.

Hot Applications.

Dry Heat is applied by means of hot flannels heated before the fire, by hot-water bottles wrapped in flannel, or by bags filled with hot salt, hops, bran, etc.

Moist Heat is applied by means of Fomentations and Poultices.

Fomentations.—Take a basin, place a towel over it ; lay upon the towel a piece of flannel folded several times until it is of the size to cover the area to be fomented. If the flannel extends much beyond the edges of the basin it must be further folded. Pour boiling water upon the flannel until it is completely saturated, and roll it up in the towel. Then turn the ends of the towel in contrary directions until all the

water is wrung out of the flannel into the basin. This is important, as any water left in would mean blistering the patient. The towel may have wide hems at the ends, through each of which a stick is run to afford more power in wringing.

Shake out and re-fold the flannel; lay it on the part to be treated; cover it with jaconet extending for half an inch beyond the edges of the flannel; cover the jaconet with cotton wool extending beyond its edges; finally secure the whole by a bandage, or, if the abdomen or chest is being treated, by a large towel carried round the body and fastened with safety pins.

To ensure the fomentation being hot, always bring the bowl and hot water to the patient's bed-side and wring the fomentation out there.

Fomentations cool quickly, and so require frequent renewal, especially when pain is acute.

Boracic Fomentation.—Use Boracic Lint instead of flannel for the fomentation.

Poppy Head Fomentation.—Break up and boil five or six poppy heads in a pint of water for an hour, strain and use the hot liquid.

Turpentine Fomentation or Stupe.—Sprinkle a teaspoonful of turpentine **evenly all over** a hot water fomentation directly it **is wrung out.**

Poultices, especially in surgery, have been almost entirely superseded by Fomentations, but they are still used in Home Nursing for deep-seated inflammation. Never use a poultice when the skin is broken.

Linseed Poultice.—The requisite materials are crushed linseed, a basin, a kettle of boiling water, a spatula or table-knife standing in hot water, a piece of lint cut slightly larger than the area to be covered, some jaconet, cotton wool and bandaging, and a board or wooden table. Swirl boiling water round the basin to heat it, and empty it. Pour more boiling water into the basin, and shake the linseed into it, stirring at the same time. When the linseed is mixed quite smoothly, and is thick enough for the spatula to stand upright in it, empty it out on to the piece of lint on the board or table, and spread to the thickness of half an inch. Constantly dipping the spatula in the hot water in the jug helps the spreading. Fold the overlapping edges of the lint neatly over the edges of the poultice and draw it on to the palm of the hand, linen side downwards; turn it gently over on to the patient's skin; cover it with jaconet, then with cotton wool or flannel, and hold in position with bandages.

If the poultice has to be made out of the

patient's room, carry it in between two hot plates.

When the poultice has to be changed, undo the bandaging, but do not take off the cold

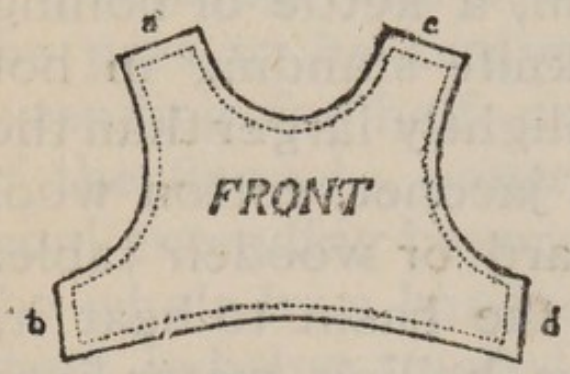


FIG. 21.

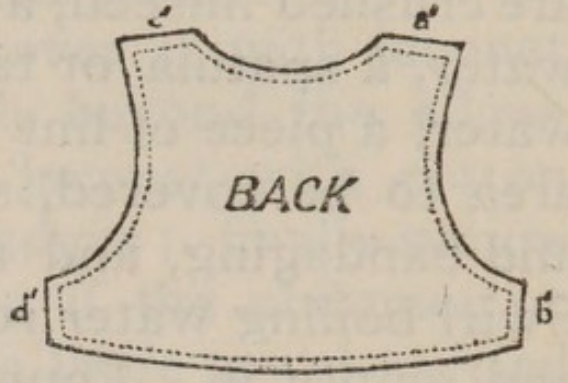


FIG. 22.

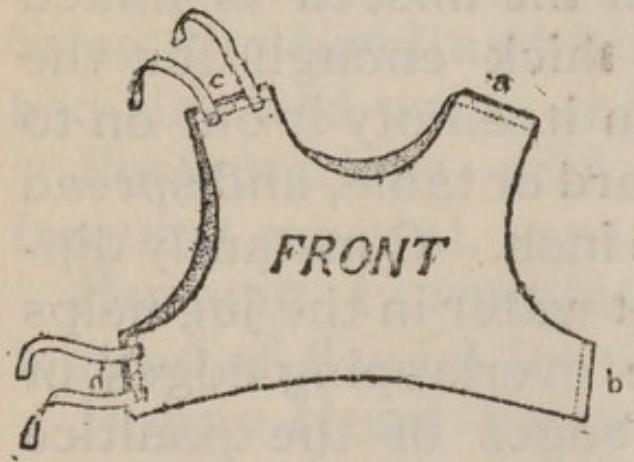


FIG. 23A.

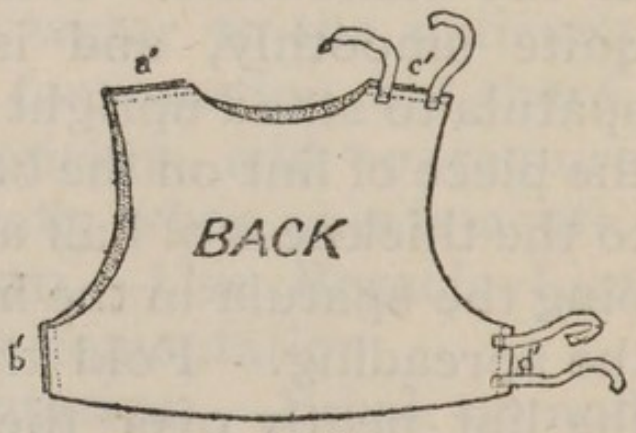


FIG. 23B.

poultice till the fresh one is ready to go on. Poultices need changing at least every four hours.

Jacket Poultice.—Cut out two pieces of linen—one for the front and a larger one for the back of the chest—shaped as Figs. 21 and 22, of sufficient size to overlap at the shoulders, but not to extend below the edge of the ribs.

The back half is spread and the patient is laid upon it; the front half is then applied. The parts a, b, c, d, are pinned to a′, b′, c,′ d′.

Place over the jacket poultice a jacket (Figs. 23A and 23B) made of a layer of cotton wool between two pieces of gauze (Gamgee, tissue), sewn a to a′ and b to b′; fasten with tapes c to c′ and d to d′.

Mustard Poultice.—Stir mustard into a paste with luke-warm water; prepare crushed linseed as above. Mix the two thoroughly, one part mustard to two of linseed for an adult; one to five for a child. After removing the poultice dry the part, and see that no particles of mustard are adhering to it. Dust with powder and cover with cotton wool.

Bread Poultice.—Shake bread crumbs into boiling water and stir well. Pound the mixture well, cover it over, and put it over a saucepan of boiling water to swell for at least fifteen minutes. Squeeze the water out of it, and then spread it with a hot spatula on a piece

of warmed linen. To prevent the bread sticking, a little oil or vaseline can be spread over it.

Whenever the use of moist heat is stopped, a thick layer of warm cotton wool is laid over the part that has been treated.

Local Bath.—Place the limb in a small bath hollowed out at one end. Elevate the limb, and insert a pad under any part of it that would otherwise rest on the edge of the bath. To keep the bath hot (100 to 110° Fahr.) cover it over and frequently add more of the hot fluid, being careful not to scald the patient.

COUNTER IRRITATION.

Counter Irritation is a method for lessening the pain of deep-seated inflammation by drawing blood to the surface and so relieving congestion in the deeper parts. It may be limited to a mere reddening of the skin, or it may involve raising a blister.

Counter irritation may be induced as follows :—

(1) **Mustard Leaf.** — Dip the leaf in cold water, lay it upon the skin and lightly cover it.

(2) **Mustard Plaster.**—Mix cold water and mustard flour into a paste, spread it upon a

piece ot doubled linen, and cover it with a piece of butter muslin. Boiling water would drive off the essential oil, which is the active part of mustard, and the leaf or poultice would not "bite."

Lay the plaster upon the inflamed part (muslin side downwards), and leave it on, generally for from ten to fifteen minutes. But children, old people, and anyone with a very delicate skin must not have it left on as long as this, or a blister might be raised, and a sore difficult to heal might follow. After the plaster has been taken off, a little vaseline or oil should be smeared over the place, and a square of cotton wool laid over it.

(3) **Raising a Blister.**

(*a*) **Spanish Fly Plaster** is applied, after warming, **directly** to the skin (which should previously be washed and rubbed with spirit). Cotton wool should be lightly bandaged over it. If strapping must for any reason be used, the pieces should be laid loosely over the lint to allow for the rising of the blister. The doctor generally directs where the blister is to be applied—it should never be applied exactly over a joint. It takes from six to twelve hours to raise a blister.

(*b*) **Blistering Fluid** is painted on with a camel's-hair brush, the space to be blistered being first outlined with vaseline. Lint is put over it when the fluid has dried. If a blister has not formed in half an hour hasten the process by a fomentation.

Dressing Blisters.—A Blister needs dressing every twelve hours with boracic ointment on lint or boracic wool cut to the size of the blister. When it has quite risen, it is snipped with sterilized scissors and gently pressed (the skin of the bleb being left on). The fluid pressed out is caught in a spoon or on absorbent wool, as it must on no account be allowed to irritate the healthy skin.

QUESTIONS ON CHAPTER VIII.

The numerals indicate the pages where the answers may be found.

CHAPTER IX.

FEVER.

Fever (also called the febrile state) as a rule develops to a greater or less degree in proportion to the increase of the patient's temperature above normal (98.4° Fahr.). When the temperature rises above normal, the condition is known as Pyrexia, which means fever. With a temperature between 99½° and 101° the patient is "feverish." When the temperature rises to 103° there is "moderate fever," and from that point up to 106° the temperature indicates "high fever." A temperature above 106° is called Hyperpyrexia, and the patient's life is in very great danger. A temperature below 98° is called subnormal; collapse may accompany a further fall.

An important part of the treatment of the febrile state is to reduce the temperature by promoting perspiration and the action of the kidneys and bowels. When the temperature is very high, the doctor may order the application of cold to the whole or part of the body.

To encourage perspiration in the case of a "feverish" patient, give a hot bath (see page 65), or put the feet in mustard and water (three tablespoonfuls of mustard to three gallons of water), and put the patient to bed

between blankets, with hot-water bottles and an extra covering of blankets in a warm room. Also give him hot drinks, avoiding alcohol unless ordered by the doctor. A brisk rub down after the hot bath will clear the pores of the skin, and so assist the sweat glands.

The following remedies are to be applied only under medical advice:—

SPONGING.

Sponging with hot, tepid or cold water, with ice, or with water first hot, and cooler and cooler (graduated sponging), is frequently ordered.

The temperature of the patient should be watched with great attention, as a fall of four or five degrees may be a symptom of collapse, and should at once be reported. A fall of two degrees should be considered satisfactory.

The temperature of the water should be, for **hot sponging** 105°; **tepid sponging** 85° to 92° (the addition of vinegar may prove refreshing). **Cold sponging**: The water is neither warmed nor iced. In **Ice sponging** a lump of ice is held in the sponge to the patient's skin. **Graduated sponging** is begun with water at a temperature of 98°, which is gradually reduced to that of cold water. In sponging proceed as follows:

1. Use water of the appropriate temperature for the sponging ordered.

2. Lay the patient on a blanket over a mackintosh sheet, and cover him with a blanket.

3. Sponge first the face and then downwards, neck, arms, trunk, etc., to the feet, lifting the blanket as necessary with one hand and sponging with the other.

4. Keep the sponge fairly full of water and use no soap. (The object of sponging is to reduce temperature, not to cleanse the patient).

5. Handle the patient carefully.

6. As a rule continue for twenty minutes.

7. After sponging do not rub the skin quite dry. It should be left moist—not wet.

8. Put the patient to bed in dry clothes; give him a drink of cold water, and encourage him to sleep.

Hot Pack. Place a blanket over a mackintosh sheet on the bed. Wrap the patient in a sheet just wrung out of hot water, over which place dry blankets and surround him by hot-water bottles for half an hour. Copious perspiration having set in, rub the patient down with hot flannel, and after putting him into warm woollen night-clothing, put him to bed.

Cold Pack.

1. Place a blanket over a mackintosh sheet on the bed.

2. Remove the patient's night-shirt and wrap him in a sheet wrung out of cold water. Ice is sometimes ordered to be placed outside the sheet in the armpits, and groins, and against the spine.

3. Cover the patient by placing over him a cradle with a quilt laid upon it.

4. When the first sheet becomes warm, substitute a second sheet wrung out of cold water.

5. Watch carefully for signs of faintness (taking the temperature **in the mouth** frequently), and should any shivering be noticed, remove the cold sheet and substitute warm blankets and hot-water bottles.

6. Observe strictly instructions given as to the time for which the patient is to be left in the pack.

Iced Bath.

This must be given only under direct medical supervision. The patient, who would probably be delirious and quite unable to get into the bath, must be lifted in on a strong sheet by four persons.

The water should at first be at the same temperature as that of the patient. Cold water is gradually added, and is followed

by ice until the water is so cold as to permit of lumps of ice remaining unmelted. Cooling of the water may be hastened by baling some of it out before adding cold water.

Hot Air Bath. In the absence of regular appliances, this may be given by the following method, provided that proper care is exercised, and that the patient is quite sensible :—

1. As perspiration will be profuse, lay the patient on a blanket, with a mackintosh sheet under it.
2. Place over the bed a second mackintosh sheet covered by two blankets, and supported by a large body cradle.
3. Remove the patient's night-shirt, and distinctly caution him to lie quite still with his legs apart.
4. Place between the patient's legs, below the knees, an electric heater or hot water bottles.
5. Tuck in the upper blankets below the lower one and round the patient's neck.
6. As a general rule, allow the patient to remain like this for twenty minutes.
7. Remain in attendance the whole time ; from time to time make sure that the heating apparatus is not scorching anything.

8. Feel the pulse of the patient at the temporal artery from time to time, to ascertain if there are signs of faintness; if there are, discontinue the bath.

9. After removal of the apparatus, cover the patient with blankets for half an hour, and then rub him down well before putting him to bed in the usual way.

10. Keep records of the duration of the bath, the response of the skin, and the effect on the patient (whether depressed, etc.).

Vapour Bath. This may be given by any means that provide for the patient, with the exception of his head, being surrounded by steam.

The safest method of improvising a vapour bath is to place a foot-bath containing boiling water beneath a wooden chair, on which the patient sits with his feet on a foot-stool. He is covered, with the exception of his head, with a sheet reaching to the ground. Bricks should be heated in a fire and put into the water from time to time to maintain its temperature.

Summary of General Fever Nursing. The general nursing of all fever cases proceeds on very similar lines. Patients, if infective, have to be isolated, put to bed, fed on

"low" but nourishing and plentiful diet, and protected from chills. The mouth, tongue and teeth have to be thoroughly cleansed before and after food. Bed coverings have to be few and light. A four-hourly temperature chart should be kept. Special variations have to be made in the case of each disease.

QUESTIONS ON CHAPTER IX.

The numerals indicate the pages where the answers may be found.

CHAPTER X.

INFECTIOUS DISEASES.

INFECTION.

The world around us teems with minute organisms variously known as microbes, germs, *bacteria*, or parasites. They are so tiny that only under a powerful microscope can they be seen, and they are capable of such rapid multiplication, that in twenty-four hours each one may have increased to millions.

The great majority of them are not harmful, but it is by entrance into the body of such as are harmful, and by the body's reactions upon them, that infectious disease is caused. The thick skin which envelops our bodies, protects us in great measure from their attacks. The same can be said in a lesser degree of the fine mucous membrane which lines all the openings into the body; but here bacteria more easily secure a foothold, so that our weak points will be found to be the throat, windpipe, *lungs*, *stomach*, *intestine*, *vagina* and *urethra*. Moreover, entrance may be effected by bacteria through a scratch or cut of the skin **however small.**

To prevent entrance is better than fighting the bacteria when they have actually entered

the body, and to do this effectively, it is necessary to know where disease-producing bacteria are to be looked for. Such places are :—

The Air.—It is usual to speak of bacteria being conveyed by air, but ordinarily pure air —mountain air for instance—is remarkably free from them, as in air organisms have no food to live on, and further are exposed to sunlight—one of the very best *bactericides*.

Germs find no food in pure air, and therefore do not live in it, but they can and do feed on dust. **The enemies of dust are the DAMP duster and the vacuum cleaner.**

Earth.—Germs would naturally be expected to abound in the soil, since it is constantly receiving the excretions of men and beasts, and these excretions, when given off by the diseased, are full of bacteria. The surface of the earth affords all the necessary conditions for bacterial development, and it is this surface that gets broken and blown about as dust. The germ of *tetanus* is particularly to be dreaded should manured earth enter the human tissues, and very great care must be exercised to cleanse all mud and grit from wounds into which these have penetrated.

Water.—Bacteria found in the soil may

make their way into water, especially surface water. It is therefore advisable to boil water about the purity of which there is any doubt, no matter for what purpose it is used. Many an outbreak of typhoid fever has been traced to contaminated water in which milk cans have been washed.

The Human Body.—The external surface of even the healthy body, particularly in parts which are moist and warm, such as the armpits and groins, is an abiding place of disease germs.

Flies breed on filth and delight to feed on it. On leaving the filth they come into houses and taint everything they touch—often with disease germs—with the result that they are most formidable distributors of infection.

To Combat the Fly Pest :—

1. **Ensure sanitary surroundings to the house** by insisting on the removal of manure heaps, by permitting no decaying matter to accumulate, by having all dust-bins kept covered and frequently emptied, and by making sure that excreta in earth-closets are kept properly covered with earth and periodically cleared away and deeply buried.

2. **Keep all milk and other food covered.** Squares of muslin, weighted at the corners with beads, are useful for covering tumblers, etc.

3. **Poison the flies** by using fly-papers, or by distributing formalin in glasses of water (a teaspoonful to the pint) freely about the house

How Bacteria may Invade the Body.

1. **Through the Skin.**—As any wound or abrasion of the skin, or of the mucous membrane makes the entrance of harmful bacteria easy, the nurse must ensure absolute cleanliness of all skin surrounding any wound, as well as of everything likely to come into contact with it. This includes keeping her own hands as well as surgical dressings aseptic.

2. **Through the Lungs.**—Thorough ventilation and the constant removal and destruction of all dust, and of all infective discharge lessen the danger of infection.

3. **Through the Intestines.**—The bacteria which invade the intestines are generally conveyed there by means of infected water or food, particularly milk, oysters, or watercress.

Thus a nurse in attendance on a typhoid fever case, communicated the disease to the night sister of her ward by cutting bread and butter

for her one night. Without the nurse being aware of it some of the patient's urine had come into contact with her hand, and that hand had clasped the loaf. The incident emphasises the necessity of a nurse always washing her hands before she herself eats, or handles food intended for others.

Immunity.—The question arises—Why, if the bacteria of disease are so universal are we not all continually suffering from the diseases they produce? The answer to this is that many people enjoy a **natural immunity** from certain forms of disease; many **obtain immunity** through having once had the disease; while others **procure immunity** by means of inoculation with the appropriate *vaccine* or *serum*. Inoculation is a process by which something is introduced into the blood which gives the power of resisting the attacks of the disease against which the inoculation is directed.

How Bacteria are Combated.

Bacteria are attacked in two ways—(1) By Physical means—Sterilization; (2) By Chemical means—Disinfection.

Physical Means.—The best germ destroyer of all is **Heat,** especially Moist Heat in the form of steam raised from water boiled under pressure of 15 lb.

Another great sterilizer is **Sunlight.** No opportunity should be lost of taking advantage of sunlight. Windows should be kept clean, and should not, without sufficient reason, be covered by curtains and blinds.

Chemical Means.—Certain chemicals, called **Antiseptics**, render bacteria harmless for the time being. Others destroy bacteria absolutely, and these are **true disinfectants**, also appropriately called **Germicides** (Germ killers) or **Bactericides** (Bacteria killers).

Deodorants, such as scents, aromatic pastiles, burning brown paper, etc., **are not to be confused with antiseptics and germicides.** They merely serve to counteract a disagreeable smell without having any effect on the germs associated with the smell. Not only are they useless, but they are positively harmful, for they conceal the warning which the bad smell gives that there is a danger spot requiring attention.

The germicides and antiseptics chiefly used in infectious diseases are :—

1. **Carbolic Acid.**—The strength used is 1 part in 20 parts of water as a germicide and 1 in 40 or 1 in 60 as an antiseptic. On account of its poisonous character the careless use of Carbolic Acid is attended with grave risk.

2. **Preparations** such as **Lysol, Izal, Creolin, Cyllin, Sanitas, etc.** These possess several advantages.

3. **Formalin,** 1 in 100, often used as a spray for disinfecting rooms after infectious cases. A formalin lamp is used for the same purpose.

4. **Sulphur,** which may be burnt in a room for the same purpose.

5. **Permanganate of Potash,** used for disinfecting stools, etc.

6. **Boric Acid** (saturated solution) is not a strong antiseptic, but is frequently used as an eye lotion.

PRECAUTIONS AGAINST THE SPREAD OF INFECTION.

In dealing with an infectious case, the following precautions must be taken whenever it is necessary to isolate the patient:—

DURING THE COURSE OF THE DISEASE.

1. **At the outset of the disease** hang a sheet soaked in disinfectant outside the sick-room door, allowing the lower part to trail in a bath containing further disinfectant.

2. **Mix all excretions with strong disinfectants,** and allow them to stand in the disinfectant as long as the doctor directs before finally dealing with them.

3. **Burn in the fireplace in the sick-room** all rags, cotton waste, tow or cotton wool used for discharges, also all dust taken up in the sick-room.

4. **Place in a pail of disinfectant for one hour at least,** all bed linen and body linen, including handkerchiefs, before being boiled.

5. **Keep your patient, yourself and your surroundings in a state of perfect surgical cleanliness.**

6. **Keep a basin of Lysol solution** (1 in 100) **near the bed-side,** but out of the patient's reach, in which to wash your hands every time you have done anything for him.

7. **Keep another basin of the same Lysol solution and a clean towel and overall just outside the door** for the doctor's use.

8. **Save the doctor as much as possible from having to touch the patient.**

Disinfecting the Patient.

1. **When the patient is declared free from infection give him a disinfecting bath,** not omitting to wash his head.

2. **Put him into a dressing gown which has not been kept in the sick-room.**

3. **Move him into another room and give him another bath**; also spray his nostrils and throat with a disinfectant.

4. **Dress him, and if the weather is favourable, take him out of doors for an hour at least.**

Disinfecting the Sick-room.

1. **Open all cupboards and drawers, and hang up dressing-gowns and blankets on poles or cords stretched across the room.**

2. **Paste paper over** the fireplace, the framework of the windows, and all other crevices except those about the door.

3. **Paste ready for use** the strips of paper required for the door and the keyhole.

4. **Place a formalin lamp** on a metal tray (used as a precaution against fire) raised from the floor; ignite it, and leave the room quickly. To disinfect a large room several lamps placed about it will be required.

Another plan is to boil solution of formalin; eight ounces of formalin in one and a half pints of water to be used for every thousand cubic feet of the space to be disinfected.

Small pieces of sulphur placed in a flower-pot partly filled with earth and resting on the tray, or on iron bars or coal tongs laid across

a bucket partly filled with water, will answer as a substitute for formalin, but the fumes will cause serious damage to all metal fittings. Methylated spirit may be poured over the sulphur to make it burn freely.

5. **Cover the crevices** about the door and the keyhole with the prepared strips of paper.

6. **Keep the room closed for twelve hours.**

7. **Re-enter the room,** open windows wide, uncover fireplace and allow the room to remain in this state for another twelve hours.

8. **Send the bedding and mattress to be stoved.**

9. **Burn all books, letters, etc.,** which have been in the room.

The best plan of all is to call in the aid of the sanitary authority.

After nursing an infectious case a nurse must undergo quarantine as directed by the doctor before going to another case of illness.

COURSE OF INFECTIOUS DISEASES.

All acute infectious diseases pass through a series of five stages — Infection, Incubation, Invasion, Defervescence, and Convalescence. In those accompanied by a rash there is a sixth stage called Eruption, which comes between Invasion and Defervescence.

Infection.—The words *contagion* and *infection* are used alternatively to denote the introduction of disease germs into the body, in circumstances favourable to their development and multiplication.

Incubation is the period, varying in different diseases, and even in different cases of the same disease, during which the germs are developing and multiplying. It is sometimes marked by a train of warning symptoms, listlessness, apathy, poor appetite and a general feeling of indisposition which, though individually they may seem unimportant, are significant when occurring together and when gradually increasing.

Invasion is marked by a gradual increase of the warning symptoms, or it may be sudden and sharp. Typical symptoms during invasion are :

1. Dry furred tongue ; 2. Thirst ; 3. General feebleness ; 4. Headache ; 5. Sometimes vomiting and diarrhœa ; 6. Rigors (shivering fits) ; 7. A rapid full pulse ; 8. Quickened respiration ; 9. Rising temperature.

These symptoms indicate that the patient should be isolated.

Eruption.—Next in eruptive diseases comes the rash, appearing at an interval after the

invasion, which varies in different diseases. The length of this interval materially helps a doctor in his diagnosis.

Defervescence is the period during which feverishness abates, and the temperature comes down to normal, either suddenly—by *crisis*, or slowly—by *lysis*.

Convalescence lasts until a normal state of health is regained.

Specific Infectious Diseases.

Objects of these Notes.

Infectious diseases are, with certain exceptions, not usually nursed at home. Many of them are, moreover, to be reported at once to the proper Authority, the responsibility for doing which may directly or indirectly fall upon the nurse.

A nurse should know how to recognise an infectious disease, or at least realise that certain signs and symptoms should be treated with grave suspicion, so that when they are observed the proper steps may be taken.

The following notes are intended :—

1. To show the conditions under which the various diseases are prevalent.

2. To indicate the general characteristics of the diseases, so that they may be recognised.

3. To show how long the patient should be isolated. As a rule a convalescent ceases to be infective as soon as a definite period has elapsed; there are, however, others, known as carriers, who appear to have been completely cured but are yet capable of conveying infection to others.

4. To give hints on nursing diseases not infrequently treated at home. Consumption and Typhoid Fever are dealt with somewhat fully.

Unless otherwise stated, periods are reckoned from the first day of **invasion.**

CHICKEN-POX.

Prevalence.—Chiefly in children, uncommon in persons over thirty.

Infection.—Usually direct, but may be conveyed by a third person, books, clothes, etc.

Symptoms. — The rash is frequently the first indication of the disease. It comes out in crops on the first and two subsequent days, consists of small reddish pimples which become filled with pus, while later scabs form. Fever is usually slight.

Nursing. — Relief from itching may be afforded by the application of an oily or greasy substance.

Isolation.—Until all scabs have fallen off—not less than three weeks.

CONSUMPTION. Consumption, also known as Pulmonary Tuberculosis or Phthisis, is an infectious disease due to the development within the body of a specific germ. The germs are found in the air; food which has been infected with them and the *sputum* of a consumptive person abound with them.

In consumption the lungs are affected, and the bowel, brain, bones, kidneys and bladder and glands, especially those of the neck, are also susceptible to attack.

Consumption is not hereditary, but the children of a consumptive patient are less immune to it than others. Insanitary damp surroundings, lowered vitality and indulgence in alcohol always increase the danger of infection, and should be particularly avoided by those who have inherited a special liability to the disease. Thin people should take plenty of fatty food, such as cream and cod liver oil.

A consumptive person owes a duty to mankind to check the spread of infection from himself, by never coughing without holding a handkerchief to his mouth, and by never spitting except into a "spit-flask" containing a disinfectant solution.

The use of the same crockery as a consump-

tive must be carefully avoided, and special care must be exercised in ensuring that milk given to children is not from tuberculous cows.

Treatment of the Consumptive at Home.

1. **Provide a separate room.**—The room should be sunny and dry, if possible on the ground floor, so that the patient can easily walk or be carried into the garden. The floor should not be carpeted, but should be polished or covered with linoleum, and should be washed each day with soap and water. The damp duster used for dusting should be boiled after use.

A shelter in the garden is preferable to a room in the house. Facilities for obtaining these are provided by many local sanitary authorities.

2. **Provide abundance of pure air.**—Keep the windows open night and day, or better still, remove them and substitute Venetian shutters. Night air is not dangerous, and draughts may be stopped by screens. Curtains are dust traps and not permissible.

3. **Insist on the patient wearing woollen underclothing.**

4. **Destroy sputum.**—Cause the patient to use a proper sputum-flask (Fig. 24); empty

it frequently and burn the sputum. Wipe the patient's mouth after expectoration with a rag or Japanese paper, which must be burnt at once.

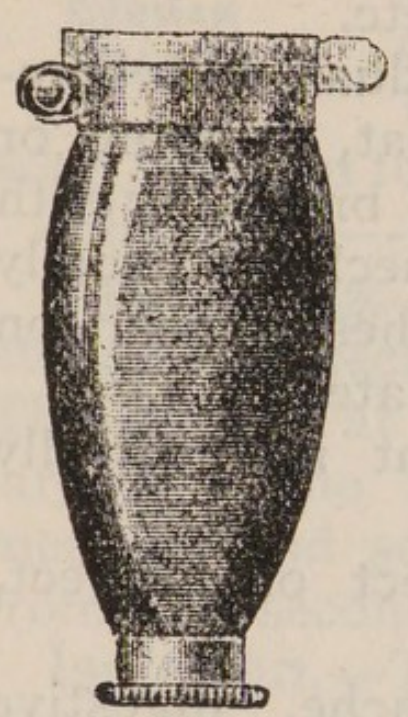


FIG. 24.

5. **Encourage the patient to lead an out-of-door life.**—Regulate his rest and exercise to avoid over-fatigue on the one hand and sedentary habits on the other. Tasks graduated according to his strength should be allotted to him. If his temperature rises to 100° F. he must have complete rest in bed.

6. **Give a plentiful diet of wholesome food daintily served.**—Burn anything remaining on the patient's plate after a meal. Leave no food or crumbs lying about; these attract flies, which are great spreaders of infection and must not be tolerated in the room. Wash the patient's plate, knife, fork and spoon in boiling water and soda.

DIPHTHERIA.

Prevalence.—Chiefly in temperate climates during the autumn and winter. Commonest during the first ten years of life.

Infection.—Usually by contact with the patient, also by drinking cups, etc.

Symptoms.—Invasion is gradual, with soreness and swelling of the throat, running or soreness of the nose, "croupy" breathing with hoarseness. The glands of the neck are usually enlarged. Greyish white patches appear on the *tonsils*, *uvula*, and soft palate.

Isolation.—Until the patient is medically certified as non-infective.

ERYSIPELAS.

Infection.—Direct or indirect, by clothing, etc.

Symptoms. — Chills, headache, digestive disturbance, rapid rise of temperature, pulse frequent, full and strong; some delirium.

The skin becomes red, swollen, smooth, shining, and painful. Usually the disease attains its height on the second or third day, with defervescence about the end of the first week.

Nursing.—Cuts or cracks on the skin make the nurse very liable to receive infection. If so affected, avoid nursing a case of erysipelas, but if this is impossible paint any abrasions of your skin with collodion. In any case at once wash your hands after attending to the patient, and burn all dressings removed.

Isolation.—Until the rash has disappeared and peeling has finished.

GERMAN MEASLES.

Prevalence.—Usually in epidemics between March and June. It most commonly attacks persons between fourteen and thirty.

Infection.—Usually by direct contact.

Symptoms.—Slight indisposition, headache, stiffness of neck. Some rise of temperature. The glands at the back of the neck are enlarged. The rash, something like those of measles and scarlet fever combined, appears from the second to the fourth day.

Isolation.—Ten days from the appearance of the rash.

INFLUENZA.

Prevalence.—General.

Infection. — Chiefly by the breath, discharges from the nose and expectoration; also by clothes, etc. Patients are infective early in the attack.

Symptoms.—Invasion is sudden and marked by fever, headache, pains in the back or all over the body. (Various types.)

Nursing.—Rest in bed in a warm room. Diet as liberal as the character of the disease will allow.

Isolation.—Until three days after temperature becomes normal.

MEASLES.

Prevalence.—Most frequently in childhood, but all ages are liable.

Infection.—Mainly through the secretions of the throat and nose, especially during the early stage.

Symptoms. — Invasion is gradual and marked by shivering, running at the eyes, sneezing and cough. The temperature rises. A dusky red rash appears on the fourth day behind the ears and on the forehead ; it then spreads over the body and limbs.

Nursing.—Keep the patient in bed in a warm room until quite convalescent, carefully avoiding draughts. Frequently cleanse the eyes, if inflamed, with warm boracic lotion (saturated solution).

Isolation.—Not less than three weeks after the appearance of the rash.

MUMPS.

Prevalence.—Chiefly in temperate climates during cold, wet weather.

Infection.—Direct.

Symptoms. — Chilliness, stiffness, and swelling of the face below and in front of the ears.

Nursing.—Rest (in bed for the first few days at least) in a warm room.

Isolation.—Not less than three weeks from invasion, or seven days from the disappearance of the swelling.

SCARLET FEVER. SCARLATINA.

Prevalence.—Principally in the autumn ; uncommon in those over fifteen.

Infection.—Mainly by discharges from the nose, throat, or ears. It is often carried by a third person, or by clothes, books, etc., which may remain infective and a real source of danger for years.

Symptoms.—Invasion is sudden and marked by sore throat, headache, shivering and vomiting. The rash appears on the second day on the chest and neck, and spreads rapidly over the trunk and limbs. A sharp rise of temperature accompanies the rash and is maintained, to fall gradually as the rash disappears. Peeling of the skin (desquamation) follows.

Isolation. — Six weeks—or longer if discharge from ears, nose or throat continues.

SMALL-POX.

Prevalence. — Persons of all ages and in all countries are liable. Vaccination very greatly reduces the risk. Everybody should be vaccinated in infancy and re-vaccinated every seven years up to twenty-one. It is of the utmost importance for those who have been in contact with a small-pox patient to be re-vaccinated, if it is more than seven years since this was done.

Infection.—By direct contact—the patient is infective during the whole course of the disease—by third persons, clothes, books, insects, and even by the air.

Symptoms.—Sudden invasion with headache, pain in the back and loins, raised temperature, shivering and often vomiting. The rash appears on the third day as pimples (papular stage). Vesicles containing clear fluid form on them (vesicular stage). This fluid changes to pus (pustular stage), when there is a further rise of temperature. About the twelfth day the pustules begin to dry up and form scabs.

Nursing.—Small-pox should never be nursed at home; the patient should be sent to a special hospital.

Isolation.—Until the skin is completely healed after the falling off of every scab.

SPOTTED FEVER (CEREBRO-SPINAL MENINGITIS).

Prevalence.—Cold and overcrowding predispose to epidemic outbreaks.

Infection.—Usually by carriers, also by drinking cups or other *fomites*.

Symptoms.—Sudden invasion with vomiting, headache, shivering, fever, pain, and delirium; especially in the later stages stiffness of the back and neck with drawing back of the head. Unnecessary handling, cold and

excessive light cause discomfort. Temperature is very irregular. The spots may be large, small or even absent.

Isolation.—Unnecessary, provided there is no over-crowding.

TYPHOID OR ENTERIC FEVER.

Infection.—The germs enter the mouth with food or drink contaminated by the fæces or urine of some sufferer from the disease.

Incubation.—Usually fourteen days, but may last for any period from seven to twenty-eight days.

Invasion is very gradual. The pulse is not so rapid as in other fevers, nor does the temperature run up as quickly. During the first week the patient suffers from headache, has vague pains, and perhaps bleeds from the nose, but can generally lead his usual every-day life. During the second week his pulse quickens, his temperature rises and remains at about 103°. Diarrhœa with offensive "pea soup" stools occurs, but at times there will be constipation, and perhaps retention of urine. The germs attack the intestines and cause ulcers. **These may eat into the wall of the intestine and reach a large blood-vessel, causing severe hæmorrhage, or they may even perforate the wall of the intestine,**

thereby allowing its contents to escape into the abdominal cavity, often with fatal results.

Eruption.—Small rose-coloured spots on the middle part of the body appear in the middle of the second week after invasion. Each spot fades away at the end of three days, and is liable to disappear on pressure. After the end of the third week the spots no longer come out unless the patient has a relapse, in which case they and all other symptoms recur.

Defervescence is by *lysis*, and begins usually early in the third week.

Convalescence begins in mild cases during the fourth week, but may be delayed for another week or ten days. Relapses, sometimes repeated, occur in many cases.

Special Precautions.

1. **Guard against hæmorrhage or perforation of the intestine :—**

(*a*) **By extreme care in diet.** Liquid food, or food that will become liquid before it reaches the ulcerated surfaces of the intestines, is the only food permissible for a typhoid patient. Hard, undigested food, by scraping the ulcers, would in all proba-

bility cause hæmorrhage or perforation. When the digestive powers are much impaired, whey, or milk and water, and albumen will be given; but when the digestive organs are in a better state, the doctor will probably order a more liberal diet.

A return to milk or whey diet must at once be made if there is a relapse.

Milk must not be left standing at the patient's bed-side, nor must the patient be allowed more than ten minutes in which to drink it. Clearly if he delayed drinking one feed for say three-quarters of an hour, and drank the next punctually, the proper interval which is absolutely necessary to allow of digestion of one feed before the next is taken would be curtailed.

Should milk not be digested, as would be evidenced by the appearance of curds in vomit or stools, substitute whey.

Hard chocolate is often given to chew, as, besides providing nourishment, it causes saliva to flow, thus reducing thirst and helping to clean the mouth.

By the modern method of feeding the craving for food, which was formerly so distressing a feature in typhoid, is to a

great extent prevented. Nevertheless this craving is felt most when the ulcers clear up—precisely the time when undigested food is most likely to prove fatal.

Should either hæmorrhage into or perforation of the intestine occur, a sharp fall in the patient's temperature accompanied by collapse will result. **It is the nurse's duty instantly to send for the doctor.**

(*b*) **By saving the patient all exertion, and keeping him in a recumbent position.** This extreme care is necessary from the first, although the patient may not appear to be very ill.

On no account must he be permitted to do anything whatsoever for himself. He must not, however, be allowed to lie always in the same position, partly for fear of bed-sores, and partly because, if he continually lies on his back, the blood in the lower part of the lungs will stagnate and congestion of the lungs will be set up. At least twice a day, the patient must be turned with the utmost care from one side to the other, and if very weak he must be supported by pillows. If he is ordered to be moved to another bed, the removal must be on a stretcher.

2. **Disinfect all Excreta.** — Unless the doctor gives orders to the contrary, put strong disinfectants, such as carbolic 1 in 20, in the bed-pan and urinal before they are given to the patient, and add more after use, and always cover the bed-pan with a cloth wrung out in disinfectant. In no circumstances keep a used bed-pan in the room.

As Typhoid excreta, while fresh, are capable of infecting anyone, they should be kept standing in contact with the disinfectant for two hours ; and in constipated Typhoid, break up all large lumps of fæces to ensure contact with the disinfectant. It is highly important that the disinfectant covers the motion completely, and that the amount used exceeds the quantity of urine passed, otherwise the solution will be so much diluted as to be ineffectual. Stuff the hollow handle of the bed-pan with tow wrung out in carbolic 1 in 20, or perchloride 1 in 1,000, and cover the lid with a cloth wrung out in the same. After emptying the bed-pan, scald it out and immerse it in the disinfecting solution.

When the patient is too ill to be put upon the bed-pan, pads of tow or absorbent wool must be used, and these must be burnt at once when withdrawn.

3. **Allow no fæcal matter to dry either on linen, or on the patient's or nurse's skin.** Fæcal matter left to dry on linen or skin is capable of conveying infection; therefore carefully examine all linen, and when it is soiled, however slightly, or wet with urine, bring a suitable receptacle containing plenty of 1 in 20 carbolic to the side of the bed and withdraw the linen, and soak it in the disinfectant for a couple of hours; then roughly wash it and send it to the laundry. The draw-sheet should be small, and be removed when soiled. Fæcal matter dried on skin is equally dangerous, therefore wash the patient every time after attending to him, and protect your own skin by wearing rubber gloves, which should be boiled after use, and by washing your hands every time you attend to the patient, no matter how often you have to do so. Keep your finger nails short and scrupulously clean.

TYPHUS.

Prevalence.—Under conditions of dirt, starvation and overcrowding. Almost unknown in the British Isles; comparatively rare in Europe.

Symptoms.—Sudden invasion with rise of temperature, and some delirium. The rash, a mulberry-coloured mottling, appears on the fifth day.

Isolation.—Four weeks after the first appearance of the rash.

WHOOPING COUGH.

Prevalence.—Mainly during the late winter and early spring in temperate climates.

Infection.—Usually by contact.

Symptoms.—Usually those of bronchitis tor a week, followed by the characteristic "whoop."

Isolation.—For five weeks, provided the whoop has ceased for two weeks.

QUESTIONS ON CHAPTER X.

The numerals indicate the pages where the answers may be found.

CHAPTER XI.

SURGICAL NURSING.

Sepsis and Asepsis.

Before Lister's and Pasteur's time, putrefying wounds, or "stinking wounds" as they were often called, were common.

It was taken as a matter of course that wounds should first inflame, then *suppurate* (have their edges kept apart by the formation of pus), next granulate (form small, round, fleshy masses), and lastly cicatrice (make scars).

The mortality from *gangrene* and *septicæmia* was appalling in those days.

Now, however, surgeons treat wounds in accordance with the principles of **Asepsis**, and operative wounds mostly heal by first intention. In other words, the edges of the wound, when drawn together, do not get separated by *pus*, and at the end of ten days the wound will heal completely, and leave quite an inconsiderable scar.

If surgical wounds seldom suppurate nowadays, it is because surgeons have found out what it is that causes suppuration. Suppuration takes place because pus-producing germs get access to the wound, and when a wound is infected with these it has become **septic**.

At first, with Lister, every surgeon sought to

destroy these organisms in the wound itself, and trying to do this came to be known as the **Anti-septic Method of surgery**, from "anti" (against), and "sepsis" (rottenness, poison). But later on it was seen that the anti-septic chemicals which destroyed the germs damaged the *leucocytes*, skin and tissues, and often poisoned the general system.

This gave rise to the **A-septic Method of surgery**, by which efforts are made to prevent septic germs from getting into the wound. "Aseptic" is derived from "A," the Greek for "without," and "sepsis."

An aseptic wound is one without infection from disease-producing organisms. "**Septic disease**" is due to infection by germs, and "**Septicæmia**" means that these germs are not confined to one particular part of the body, but have passed into the blood.

In the most modern surgery Asepsis is combined with Antisepsis.

Asepsis is secured by allowing nothing to touch or come near the wound, unless it has been freed from living septic germs by sterilization or disinfection. (See pages 154, 155).

This applies to the surgeon's hands, the nurse's hands, the patient's skin, the instruments, dressings, ligatures, towels, water,

vessels holding water, bowls, operating table, surgeons' overalls, nurses' aprons, etc.

Fortunately the germs most frequently met with are killed by a few minutes' boiling. In the absence of regular appliances this can readily be done in an ordinary copper or fish kettle, and in co-operating with the surgeon to make everything aseptic, the nurse must boil everything that will not suffer by the process, and must only fall back upon dry heat and chemicals in the case of those things which boiling would injure.

Amongst the chemical disinfectants in use for surgical nursing are :—

(1.) **Perchloride of Mercury** (Corrosive sublimate).—Used as a germicide 1 in 1,000 and in weaker solutions as an antiseptic. It is even more poisonous than Carbolic Acid. Solutions of Perchloride of Mercury should be coloured. It should not be used for disinfecting metal instruments as the mercury forms a black deposit on them, and blunts the edges of knives.

(2.) **Biniodide of Mercury.**—Used in the strength of 1 in 500 for hands and patient's skin, 1 in 1,000 for ligatures. It is in many ways preferable to Perchloride of Mercury, but is expensive.

(3.) **Iodine.**—The mild tincture of iodine is much used as a dressing for wounds and in the preparation of a patient's skin before operation. As the spirit readily evaporates it is necessary to keep the tincture in hermetically sealed vessels or glass-stoppered bottles; otherwise, owing to evaporation, the proportion of spirit becomes less and less, leaving too large a proportion of iodine.

(4.) **Iodoform.**—A yellow powder with a strong smell, used as an antiseptic or germicide.

(5.) **Alcohol,** which may be used in the form of Methylated Spirit.—A germicide used to make the hands and skin aseptic.

(6.) Preparations such as Lysol, Izal, Creolin, Cyllin, Sanitas, etc.

Amongst the antiseptic gauzes, wools, and lints in use are—Double Cyanide gauze (dyed lavender), Sal Alembroth gauze and wool (dyed blue), Boric Wool and Lint (dyed pink), Salicylic Wool (usually of a pale pink tint), Iodoform Gauze (pale yellow). The use of these is by no means so frequent as formerly, aseptic dressings having largely, but not entirely, taken their place.

Duties of a Surgical Nurse.

The principles already explained with regard to general nursing apply also to surgical nursing,

but in addition there are special duties to be performed before, during, and after an operation.

I. TO MAKE THE NURSE'S HANDS ASEPTIC.

1. Wash your hands and forearms up to the elbows with very hot soap and water, changing the water several times, and paying special attention to the nails with a sterilized nail-brush and between the fingers.
2. Rub well your hands and forearms with methylated spirit or gauze soaked in spirit, and afterwards rinse them either in sterile water or a weak antiseptic.

These rules must be followed even if rubber gloves are to be worn.

Rubber gloves must be boiled for five minutes before use, and must also be filled with sterile water to make sure that there are no holes in them. Boil and sterilize the gloves after use before putting them away.

II. TO PREPARE THE PATIENT.

(A) By affording proper Rest and Diet, and by giving such Medicine as is ordered.

1. Arrange, if practicable, for him to take up his quarters in the sick-room two days

before the operation. He thus gets accustomed to his surroundings and nurse, and so a great deal of the mental agitation accompanying the thought of the operation quiets down.

2. Adopt an attitude of gravity touched with an assured optimism, and on no account evince an indifferent way of regarding what the patient no doubt anticipates with dread.

3. Note carefully during the two days the pulse, temperature, respiration, and the amount and character of urine passed. Put up a specimen of the urine the first morning.

4. Promote activity of the bowels. This is a highly important part of the preparation. Usually two tablespoonfuls of castor oil are given in the early morning and an enema in the evening of the day before the operation.

5. Give the patient a hot bath (temperature 100°F.) on the evening before the operation. This should precede the enema, which sometimes leaves the patient slightly faint.

6. Carefully follow the surgeon's instructions as to diet. A long fast is a bad preparation for an anæsthetic, and a light meal is generally ordered four to eight hours before the operation. If the operation is to be on the throat, no solid food must be given on the day of the operation.

(B) By Preparing the Site of the Operation.

If only one nurse is available, she should so arrange that it will not be necessary for her to touch septic things after she has made her hands aseptic. If she does touch anything septic, she will have to disinfect her hands and forearms again before touching anything aseptic.

1. Shave the site of the operation and for a considerable distance around the limits of the incision that will be made. Take great care in passing the razor over any irregularities of the surface, such as the armpits, folds of the groins, or under the breasts.

2. Wash the shaved area well with soap and water and dry it.

3. After making your hands and forearms aseptic, rub the shaved area with a sterilized *swab* dipped in spirit, so as to remove all grease. Use several swabs, as no swab that has once been used must be again dipped into the ether. Next proceed by one of the following methods:

(*a*) **The Iodine Method.**—After the shave, cleanse with acetone and ether and paint with the mild tincture of iodine, both lengthwise and across, so as to give the area two coats of the tincture.

Re-paint in the same way with the iodine solution an hour before the operation, and cover with a sterilized towel. Paint again immediately before the operation, and yet again after the last stitching, when a collodion dressing is also to be applied.

(*b*) **The Perchloride of Mercury Method.**—The night before the operation, cover the area with a sterilized towel wrung out in a 1 in 1,000 solution of Perchloride of Mercury. Place jaconet over it, and secure the dressing with a bandage. Repeat the process the next morning, and keep the dressing on till the time of operation.

(c) By Attention to General Details.

1. Clothe the patient in a warm and loose garment. A flannel nightgown opening all the way down the front is suitable for many operations. Long woollen stockings reaching halfway up the thighs are advisable.

2. If the operation is on the face, and the patient is a woman, plait the hair into two pigtails and cover it with a sterilized cloth.

3. Make certain, quite irrespective of any statement by the patient, that no false teeth remain in his mouth. After removal place them in water.

III. TO PREPARE THE ROOM FOR THE OPERATION.

1. Avoid giving the room a real turn-out unless a clear day will elapse before the operation, or unless a vacuum cleaner is used. There will otherwise be danger of disease germs being stirred up to float in the air, and eventually to settle on the wound, thus inducing septic poisoning. The carpet, if not removed, may be covered with clean dusting sheets, over which has been sprinkled a germicide, such as Lysol (1 in 100).

2. Take all necessary precautions against the room being overlooked during the operation by stretching short muslin curtains across the lower half of the window, or by having the glass whitened.

3. Ensure sufficient light. It is well to provide against failure of electric light by having two well-trimmed lamps in readiness.

4. If the operation has to take place in the room in which the patient is to be nursed, push the bed into a corner well out of the way, and take steps to conceal the terrifying instruments connected with the operation. A screen will mask the preparations, and a sterile sheet will cover everything when these preparations are completed.

5. If a regular operating table is not available, provide a long narrow table—for example, the kitchen table. Thoroughly scour, not only the top, but also the legs and under the top, with soft soap and water and sand, and then wash the whole table with 1 in 20 carbolic or 1 in 40 Lysol.

When the table is dry, fold one or two blankets to the width of the table, and wrap them in a sterilized sheet. Place them on to the table to serve as a mattress, and secure them by tapes or strips of bandage (previously boiled) tied round each end and the middle of the table.

Next spread a long mackintosh sheet over the improvised mattress. Lay a sterilized sheet over it, and secure the sheet by safety pins, previously boiled.

In the absence of a sufficiently large table, use two small high ones of equal height lashed together by the legs.

Avoid using low tables, as having to stoop much would seriously impede a surgeon.

Provide a small pillow for the head, and lay over it a piece of sterilized jaconet. If, however, the operation is on the head, wrap the entire pillow in jaconet and lay a sterilized towel over it.

As a rule, place the operating table in the middle of the room with the foot towards the window

6. Provide three other tables. Of these place one with a chair for the Anæsthetist on the right-hand side of the head of the operating table. A bowl to receive vomit should be placed on this table. The second table is for the surgeon's instruments, and the third for dressings, swabs, towels, lotions, sterilized nail-brushes, etc. Scour and disinfect the three tables in the same way as the operating table, and cover each with a sterilized towel or cloth. Under the third table place a zinc pail or foot-bath to receive soiled lotions, water, etc.

7. Boil overnight four large bath cans of water, plug the spouts of the cans with sterile wool, and cover the lids with cloths wrung out in 1 in 20 carbolic.

Boil more water on the morning of the operation, and make arrangements for a continuous supply of boiled water being at hand throughout the operation.

IV. TO STERILIZE OR DISINFECT THE INSTRUMENTS, DRESSINGS, ETC., FOR USE DURING THE OPERATION.

1. Sterilize instruments, with the exception of knives and needles, by immersing them in

boiling water, to each pint of which a tablespoonful of washing soda has been added, and keep at boiling point for twenty minutes. Wrap knives and needles in lint and boil them for two minutes only. Some surgeons prefer knives to be immersed in a strong disinfectant such as undiluted Lysol for an hour instead of being boiled. Lift each instrument out of the boiling water with sterilized forceps.

2. Sterilize dressings, after cutting them to the necessary length, and swabs by putting them in a tin box or drum, and baking them for an hour in an oven heated to 270°F. Do not open the boxes or bags until the dressings are needed.

3. Sterilize towels and overalls in a similar manner.

V. TO ASSIST THE SURGEON DURING THE OPERATION.

1. Make your hands, finger-nails, and forearms perfectly sterile.

2. Cover your hair with a sterile cap and wear a sterile overall.

3. If, as will frequently be the case, you are the only nurse to wait upon the surgeon, you may often have to do things which will make

your hands surgically unclean. In this event, at the first possible moment dip your hands into a 1 in 1,000 Biniodide of Mercury solution, a bowl of which should be at hand. If you are wearing rubber gloves, and these touch anything not sterile, wash your gloved hands in soap and water and dip them into the Biniodide of Mercury solution.

4. Handle all dressings and swabs, clean or soiled, with sterile forceps and not with your fingers.

5. Place sterile towels all round the part to be operated on and over the patient's clothing.

6. Keep sterilized swabs in the tin in which they were baked. If it has not been possible to sterilize them keep them in a bowl of antiseptic lotion, wringing each one out quickly as the surgeon asks for it.

7. Hand the instruments to the surgeon as he requires them.

8. Keep count of the swabs used. To do this write down the number with which you start, and should the surgeon cut one in two make a note of the fact.

The gravest consequences would ensue if a swab were left in the wound, as might easily happen in abdominal cases, seeing that the

surgeon is too much occupied to keep account.

9. After the operation clean all the instruments, taking apart for that purpose all those that take to pieces, and carefully scrubbing rasped edges, teeth or points.

VI. TO GIVE THE NECESSARY CARE TO THE PATIENT AFTER THE OPERATION.

(A) By affording proper Rest and Diet and by giving such Medicine as is ordered.

1. Put the patient into a bed. Prepare beforehand as follows:—

(*a*) Place hot-water bottles, one at the foot of the bed, one at each side and one immediately below the bolster. Take care that they cannot possibly burn the patient.

(*b*) Dispose the top bed-clothes envelope fashion, that is, instead of tucking them in, fold their edges neatly back, so that they can be removed altogether.

(*c*) Put no pillow on the bed until the patient has recovered from the effect of the *anæsthetic*.

2. Provide the following when necessary:—

(*a*) A bed-cradle, to keep off the pressure of the bed-clothes.

(*b*) A sand-bag, to steady a limb that has been operated on.

(*c*) A hard pillow covered with jaconet, for use if a leg has been operated on ; it will keep the heel off the mattress and prevent a bed-sore.

(*d*) A jaconet pillow-case, to place under the ordinary pillow-case, if the operation has been on the face or ear.

(*e*) A hard pillow to place beneath the knees in abdominal cases.

3. As the patient will generally vomit after the anæsthetic, turn his head on one side and spread a towel over the top sheet and pillow, and draw it in under the chin. Also place a basin under the chin. Small pieces of ice are often given to the patient to suck, with the object of checking vomiting.

4. Do not leave the bed-side even for an instant until the patient has recovered consciousness, and keep very careful watch for the first twenty-four hours, especially against choking, collapse and hæmorrhage.

Choking may arise from the patient inhaling vomit into the *larynx*.

Collapse may follow the shock of the opera-

tion, and will show itself by a subnormal temperature, a feeble pulse and a peculiar pallor. Keep the patient warm, but not hot, by means of hot-water bottles and extra blankets. After abdominal and chest operations, prepare for collapse by raising the foot of the bed on blocks. Ascertain what the surgeon would wish done in the event of collapse occurring when he is not present.

Hæmorrhage after an operation is of two classes—Primary and Secondary.

Primary hæmorrhage may be due to the increased action of the heart as the patient recovers from the shock of the operation, in which case it is seldom more than a slight oozing from the smaller blood-vessels (reactionary hæmorrhage). It may, however, be due to the slipping of a ligature, in which case it often is serious. Primary hæmorrhage may come on very soon after the operation, but should especially be looked for from six to twelve hours later.

Secondary hæmorrhage, which is usually due to a septic condition of the wound, does not come on until a considerable time after the operation. It is at times very serious.

Be always on the alert to notice any blood soaking through the bandage after an operation,

and report at once to the surgeon should any be seen. Pending his attention, cover the bandage with sterile cotton wool.

On no account give stimulants without the surgeon's instructions, as anything which increases the heart's action increases the hæmorrhage. Keep the patient quiet, and should he learn of the hæmorrhage, tactfully soothe any excitement aroused.

Concealed, or Internal, Hæmorrhage is not uncommon, especially in chest and abdominal operations, and can be detected only by the signs and symptoms :—

1. A quickened pulse. 2. Faintness. 3. Increased pallor, with pinkness of the lips. 4. Shallow, sighing respiration. 5. A fall in temperature.

Instantly inform the surgeon of these signs and symptoms, and make all necessary preparations in case he considers it necessary to open up the chest or abdomen to tie the bleeding vessels. Precisely the same aseptic precautions will be necessary as for the original operation.

5. If all is going well, twelve hours after the operation sponge the patient's limbs with warm water and make his bed.

6. Give an aperient the second night after the operation.

7. Diet the patient as follows :—

(*a*) Water to drink and milk feeds as soon as vomiting has stopped.

(*b*) After the aperient has had satisfactory results, jelly, custard pudding, lightly-boiled eggs.

(*c*) On and after the tenth day, ordinary diet.

(B) By Dressing from Time to Time the Wound Caused by the Operation.

Aseptic surgical wounds generally heal by first intention, and do not need re-dressing for several days unless a drainage tube has been introduced, in which case the dressing may require to be changed daily.

Sometimes, however, the wound becomes infected by pus-forming bacteria at the time of the operation, and subsequently suppurates.

Temperature shows when a wound is suppurating. There is always a slight rise of temperature after an operation until twenty-four hours have passed, but when there is suppuration, the rise is maintained until on the third day the temperature may reach 104° Fahr. Suppurating wounds have to be dressed every day.

To dress a wound, whether septic or aseptic :—

1. Prepare yourself as though you were going to assist at an operation.

2. Prepare the necessary appliances as follows. Sterilize and put in 1 in 50 Lysol solution on a sterile tray a pair of scissors, two pairs of forceps (one dissecting forceps), a probe and a syringe. Put the necessary number of swabs in a bowl of 1 in 50 Lysol solution, or, if preferred by the surgeon, in hot sterile water. Have at hand a jug of hot sterile water, sterile towels and the box of sterile dressings.

3. Turn down the bed-clothes and cover them with a thin dressing mackintosh. Remove the bandages and outer wool from the wound.

4. Wash your hands and dip them in the bowl of 1 in 100 Lysol solution. Put the sterile towels round the wound; remove all the soiled dressings with forceps and put them at once into the receptacle prepared for them—never lay them on the bed or table.

5. Cleanse the wound. and apply fresh sterile dressings in the manner ordered.

6. If you are called away in the middle of dressing a wound, or if the surgeon requires to see it, cover it with a piece of sterile gauze for the time being.

7. On no account omit to wash your hands and dip them in the 1 in 100 Lysol solution after dressing a wound.

QUESTIONS ON CHAPTER XI.

The numerals indicate the pages where the answers may be found.

CHAPTER XII.

NURSING OF CHILDREN.

SPECIAL LINES OF NURSING.

The details of general nursing apply to a great extent to children, but to become a really good children's nurse requires qualities of a different order from those necessary to make an efficient nurse of adults.

"Little people" differ from adults in language, manners, and especially in feelings and thoughts, so their nursing requires special study, training, and care; with the addition of endless patience and sympathetic observation.

As patients, too, for several reasons, they require modification of treatment.

1. They are growing.
2. Their vitality is less.
3. Their food is different.
4. Their diseases run a different course. There seems to be a closer union between the parts of a growing body, and so diseases spread rapidly from one organ to another.
5. They are subject to many diseases from which adults are exempt.

The first step to success is to win the child's confidence and affection. Having done this the battle is half won, and subsequent intelligent

efforts will, in all probability, be crowned with success.

The bringing up of a child shows itself in illness. Early training to obedience will probably make a good patient, while a spoilt child will generally be difficult to manage. A nurse will have to take a sick child as she finds it and humour its whims, leaving the correction of its faults to a more opportune time.

The speech of an infant consists largely of crying, and it is in this way and by gesture that it makes known its wants and indicates its troubles. It is therefore essential to understand the "language of crying," and to note, not only its degree and character, but also the actions which accompany it. The following examples will serve to explain this:—

1. The cry of **hunger** is usually accompanied by clenching the hands and bending the limbs.

2. **Intestinal troubles** are evinced by prolonged crying, at times greatly intensified, and by restless movements of the body.

3. **Earache** should be suspected when, in addition to constantly crying, the child presses its cheek against its mother's breast.

4. Hoarse feeble crying probably denotes **inflammation of the air passages.**

5. Tearless crying is frequently due to

bodily pain, while a flow of tears more frequently arises from **mental causes.**

6. Absence of crying may be a sign of **exhaustion** or of **serious disease.**

The **posture in bed** requires careful attention.

1. **A healthy child** usually lies partly on the side with his cheek on the pillow.

2. **In exhaustion or serious diseases** the posture is generally on the back with the face upwards and the eyes closed.

3. Lying on the side with the head partly drawn or thrown back, is suggestive of **brain affection**, or, if associated with difficult breathing, of **trouble in the air passages.**

4. The prone position (back upwards), with the face pressed into the pillows, or lying supine (on the back), with the face and legs flexed on the abdomen, may indicate **abdominal trouble.**

Note any alteration from the clear and fresh complexion of a healthy infant.

1. **Colour**, such as sudden pallor, lividity, muddy colour.

2. **Expression**—whether haggard, the brow contracted or the eyes hollow.

INFANTILE DISEASES.

Several infantile diseases develop so quickly that some knowledge of what to do until professional

help arrives should be possessed by all who have to nurse or bring up children.

Diarrhœa.—This may be due to errors in the diet of the child, or in children at the breast to errors of the mother's diet. A small dose of castor oil or rhubarb may be effective, but if the diarrhœa continues, or is accompanied by vomiting or much feverishness, at once seek medical advice.

Costiveness.—The expedient of passing a pencil of ordinary yellow soap once or twice up the anus frequently has the desired effect Strong purgatives are not permissible except under medical advice.

"Croup."—This is a symptom, not a disease. The peculiar sound known as "Croup" arises from the passage of air moving through an obstructed windpipe. This may be a symptom of *catarrhal inflammation* of the *larynx*, or by the narrowing of the passage by choking or diphtheric secretions. The point to bear in mind is that "Croup" may be a very serious symptom indeed, and that when it occurs **a doctor should at once be sent for.**

Convulsions.—These are often preceded by contractions in a limb, such as drawing the thumb tightly across the palm of the hand. The best immediate treatment is :—

1. Support the child in a warm bath slightly above the temperature of the body (98.4°), so that the water reaches to the middle of the trunk, for fifteen to twenty minutes.
2. Keep a sponge frequently dipped in cold water on the top of the head as long as the child is in the bath.

The object of this treatment is to dilate by warmth the blood-vessels away from the head and to contract those within the skull. Insufficient cold applied to the head is worse than useless, as the effect is simply to contract the superficial blood-vessels and actually cause more pressure on the vessels within the skull, the result being exactly the opposite of what is desired.

"**Accidental overlaying**" frequently means nothing less than culpable homicide. A child should never be allowed to sleep with an adult, as —quite apart from the danger of overlaying—air, of vital importance to all, is of supreme necessity for children, to whom air contaminated by the emanations from the lungs and skin of another is most injurious. Almost equally bad and dangerous is allowing a child to sleep with his head under the clothes. A cradle or cot sufficiently warmed by blankets or a down quilt meets all requirements.

Artificial Feeding of Infants.

1. **Cow's Milk, properly prepared,** is in the vast majority of cases by far the best substitute for human milk. It differs, however, in some respects from human milk, and should be made as nearly as possible similar to it. As it is richer in proteids and contains less sugar, it must be diluted with water, and sugar must be added. Barley water or lime water is often added; either serves to break up the clot.

2. **Artificial Foods** frequently contain an excess of starch and sometimes of sugar. This accounts for many cases of illness in early life.

3. **The Diet should be:—**

For the First Month or Six Weeks.

Cow's milk, sterilised, one part; boiled water, one part; barley water (or, if the child has diarrhœa, lime water), one part. Sweeten with sugar (preferably with sugar of milk) and, unless the milk is rich, add a little cream, say half-a-teaspoonful to the quarter-pint feed.

After Six Weeks.

Increase, **very gradually,** the milk and lessen the water and barley water, until at six months the child is taking pure cow's

milk. Be careful that the temperature of the food is 98° F.

4. **Regularity in giving meals** must be observed. They must not be given just when the baby cries.

5. **The proper method of feeding is—**

(*a*) Use a boat feeding-bottle (Fig. 25)

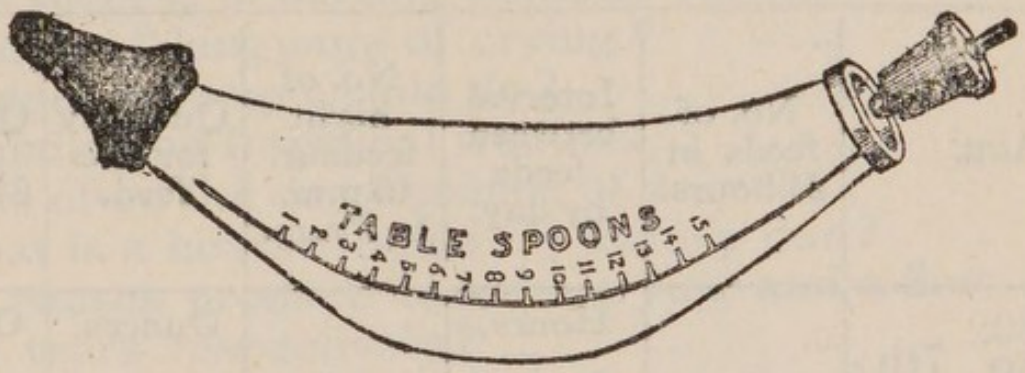


FIG. 25.

with a teat, not one with a long rubber tube. At least two bottles and teats should be in use, and they should be kept scrupulously clean. To clean the bottles, rinse in cold water, wash with soap and hot water, and again rinse. Wash the teats well and soak in boracic solution (*saturated*).

(*b*) Hold the child in the arms while feeding.

(*c*) Do not allow more than twenty minutes for one feeding.

(*d*) Never allow the child to go to sleep with the teat in its mouth.

(*e*) Do not warm milk up a second time for a subsequent feeding.

(*f*) When the child is seven months old feed with a spoon.

TABLE FOR FEEDING HEALTHY INFANTS DURING THE FIRST YEAR.

(From Holt's "Diseases of Infancy and Childhood.")

AGE.	No. of feeds in 24 hours.	Interval between feeds by day.	No. of night feeding, 10 p.m. to 7 a.m.	Quantity for one feed.	Quantity for 24 hours.
		Hours.		Ounces.	Ounces.
3rd to 7th day ...	10	2	2	1—1½	10—15
2nd and 3rd weeks ...	10	2	2	1½—3	15—30
4th and 5th weeks ...	9	2	1	2½—3½	22—32
6th week to 3rd month	8	2½	1	3—4½	24—36
3rd to 5th month ...	7	3	1	4—5½	28—38
5th to 9th month ...	6	3	0	5½—7	33—42
9th to 12th month ...	5	3½	0	7½—9	37—45

QUESTIONS ON CHAPTER XII.

The numerals indicate the pages where the answers may be found.

CHAPTER XIII.

THE ROLLER BANDAGE AND ITS APPLICATION.

THE ROLLER BANDAGE.

Roller bandages may be made by tearing appropriate material into strips of the desired width. These strips should be tightly rolled and the loose threads at the edges removed, or they may be bought ready made. A variety of

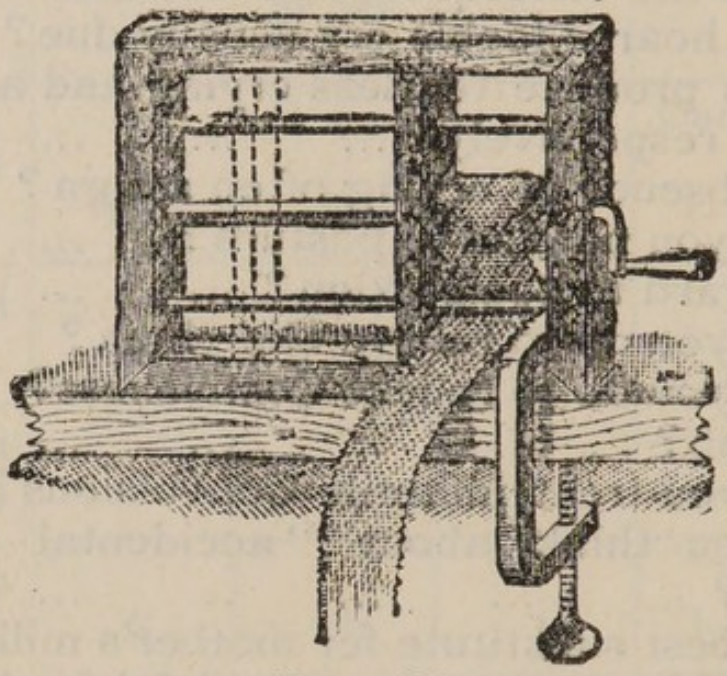


FIG. 26.

materials, such as closely woven cotton, open woven cotton, gauze, domette, flannel, stockinette, etc., may be used, each having its special advantages for special purposes. They may be rolled by hand or by means of a machine (Fig. 26). When a bandage is partly unrolled the

roll is called the head, and the unrolled part the free end.

General Rules for Application.

1. See that the bandage is tightly and evenly rolled before attempting to use it.
2. Apply the outer side of the free end to the skin.
3. Never allow more than a few inches of the bandage to be unrolled at a time.
4. Bandage from below upwards.
5. As a rule, to which the figure of 8 bandage for a limb is an exception, each layer of the bandage should cover two-thirds of the preceding one.
6. Apply the bandage firmly and evenly, but not tightly enough to stop the circulation. If, on running the hand down it, the edges turn up, the bandage is too loose. If, after the bandage is taken off, red lines are seen, it has not been evenly applied.
7. When the bandage is finished, fix it securely by pinning or stitching.

Roller bandages are used :—

1. To retain splints or dressings in position.
2. To afford support to a part, for example, a sprained or dislocated joint. or a limb with varicose veins.

3. To make pressure on a part, for example, to reduce or prevent swelling; or,

4. To drive the blood from a part of the body bandaged, as in the case of extreme collapse from hæmorrhage.

Methods of Application.

There are three principal methods of applying the roller bandage :—

1. **The simple spiral,** which is made by encircling the part with the bandage several times.

This method should only be adopted when the part to be bandaged is of uniform thickness, as, for instance, a man's chest, the finger, the wrist and a short portion of the forearm above it.

2. **The reverse spiral.**

This is used in bandaging parts of the limbs where, owing to their varying thickness, it is impossible to make a simple spiral lie properly. (See Fig. 38.)

3. **The figure of 8.**

The figure of 8 bandage consists of a series of double loops, and is so named from its resemblance to the figure 8. It is used for bandaging at or in the neighbourhood of a joint —the thumb, the breast, groin, and other parts. It may also be used instead of a reverse spiral

for a limb. Certain bandages applied by the figure of 8 are called spicas.

When the principle by which parts are covered is understood, no difficulty should arise in bandaging any part of the body. The points to which attention should be directed are evenness and firmness of application rather than making a completed bandage correspond exactly with the illustration of it—it will, in fact, be found that differently shaped limbs require slight modifications of the bandage.

Application of the Roller Bandage.

When reading the course of the various bandages, it must be remembered that **the patient is supposed to be standing with his upper limbs hanging by his side, the thumbs turned outwards.** This will seldom, if ever, be the position in which he is actually placed to be bandaged.

Capeline Bandage for Head.—Take two 2 or 2½ in. bandages four yards long and join them in the middle. Standing behind the patient, who should be seated, apply the join to the middle of the forehead just above the eyebrows, heads of the bandage inwards. The bandage in the right hand is called the vertical bandage, and that in the left hand the horizontal bandage. Bring both rolls to the back of the head and cross them (Fig. 27). Carry the vertical bandage forwards over the

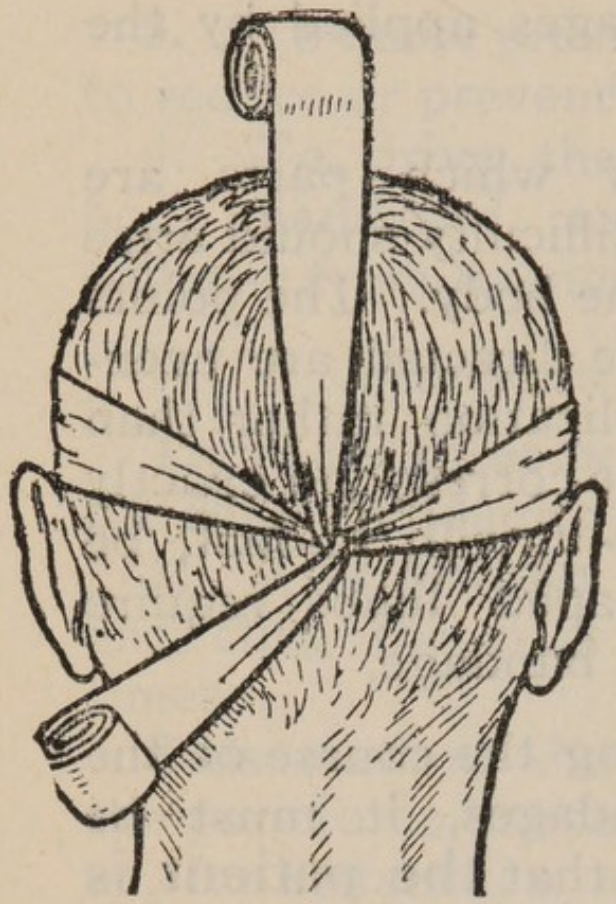


FIG. 27.

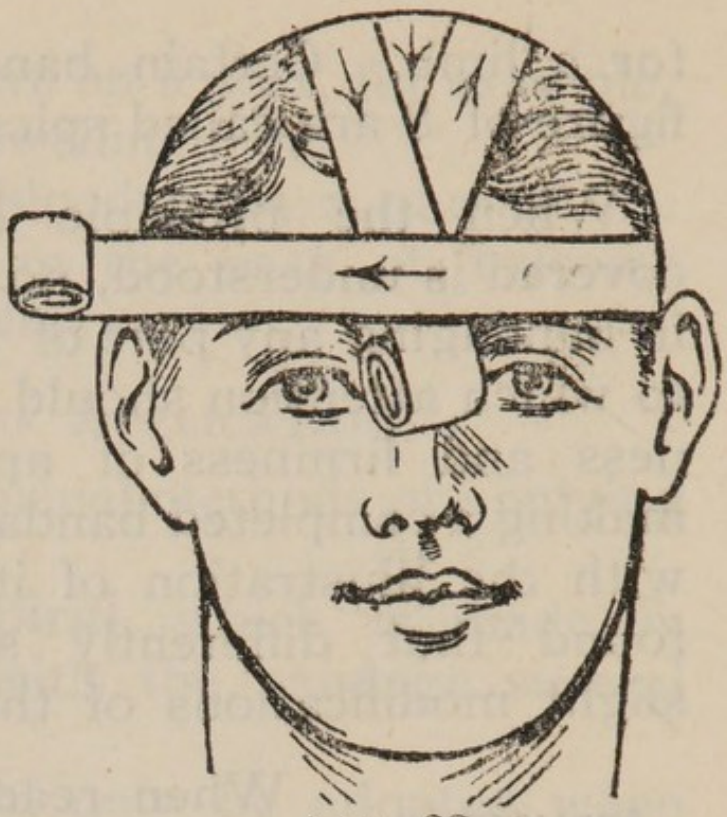


FIG. 28.

head, and the horizontal bandage round the head and over the vertical bandage in front. (Fig. 28 shows the vertical bandage carried twice forwards and once backwards.) Continue to pass the vertical bandage backwards and forwards each time a little to the left and right alternately, locking it with the horizontal bandage. Finally, pass the horizontal bandage twice round the head, and pin in front. (Fig. 29).

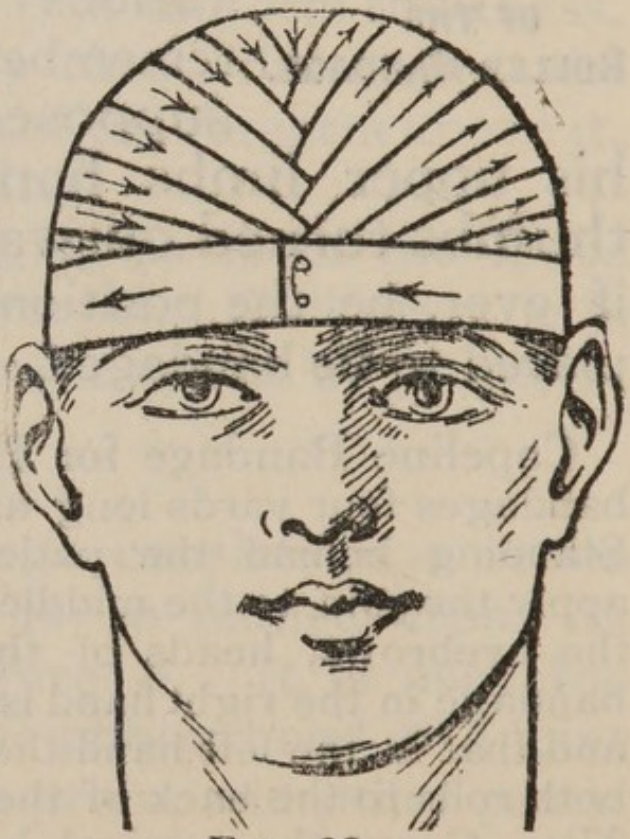


FIG. 29.

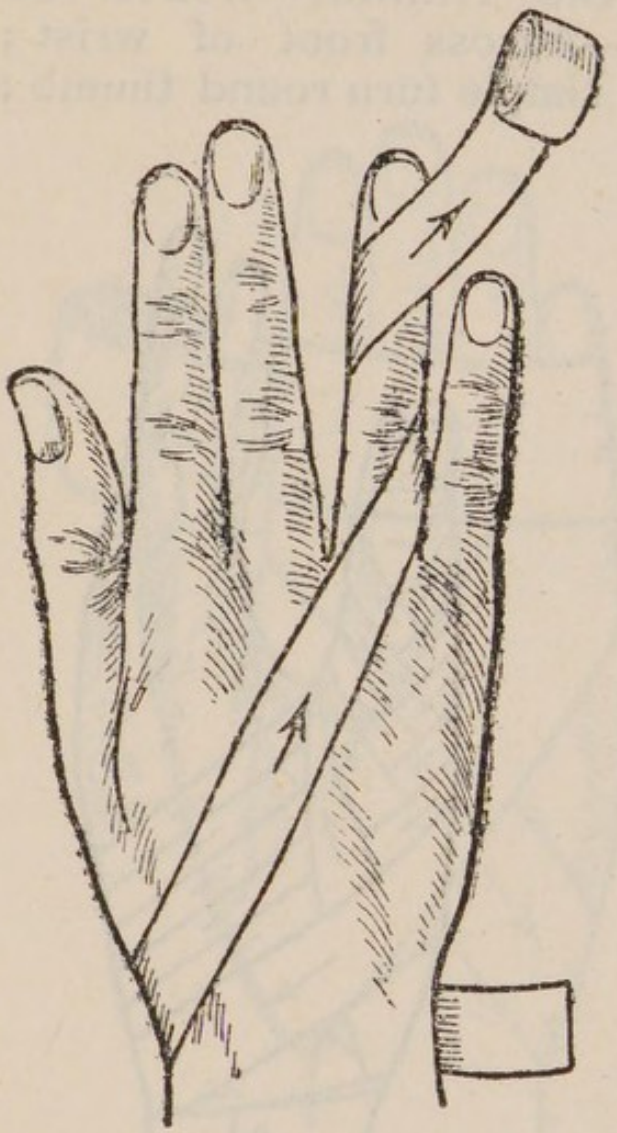


FIG. 30.

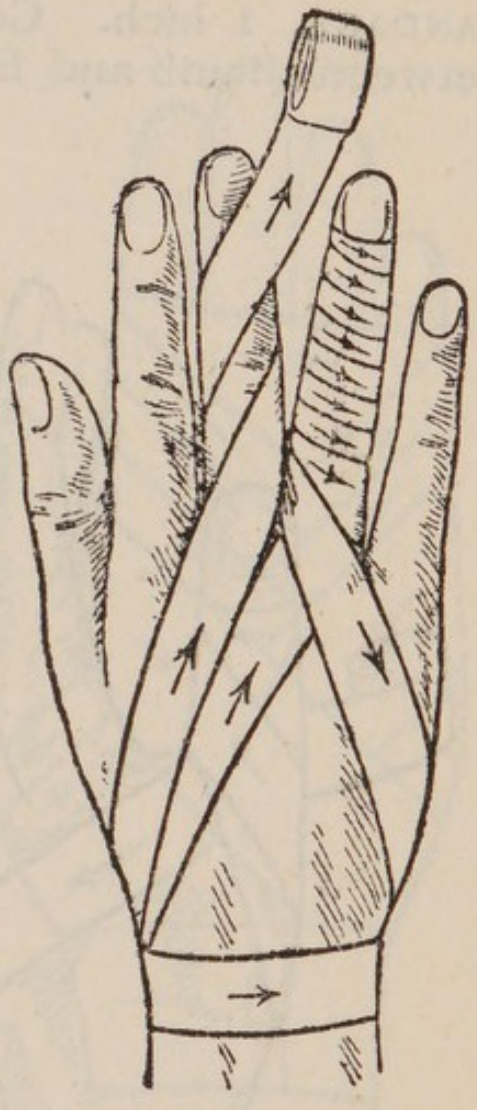


FIG. 31.

For the Fingers.—WIDTH OF BANDAGE, $\frac{3}{4}$ or 1 inch. COURSE.—Outer to inner side of front of wrist, a sufficient length being left for tying; across back of hand to inner side of finger to be first bandaged (bandage the fingers in order from the little finger side), by one spiral to root of finger nail (Fig. 30); round finger by simple (or if necessary reverse) spirals; thence to root of little finger and round wrist. Tie to free end left for the purpose or continue to the next finger. (Fig. 31.)

Spica for the Ball of the Thumb.—WIDTH OF BANDAGE, 1 inch. COURSE.—Across front of wrist; between thumb and finger; simple turn round thumb;

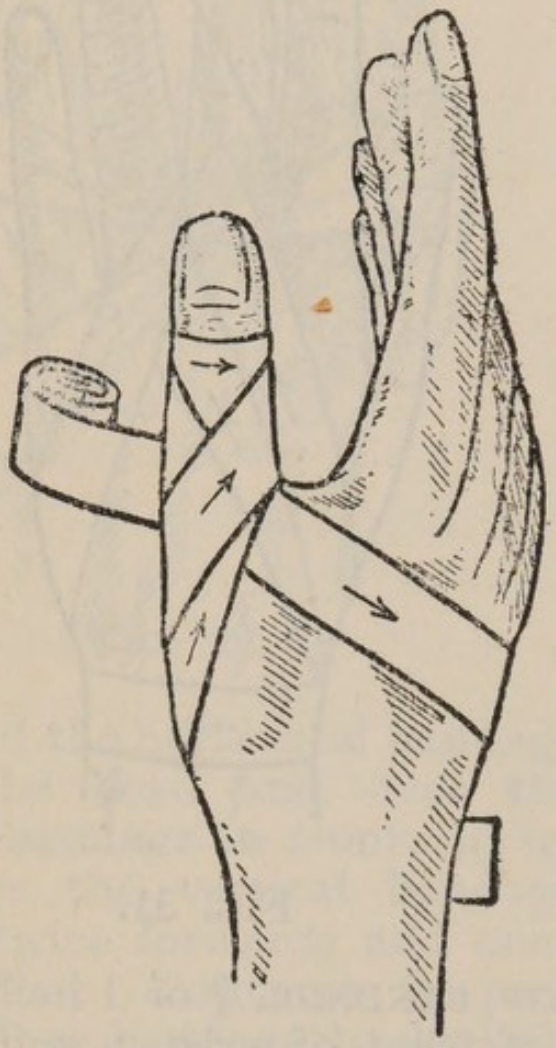


FIG. 32.

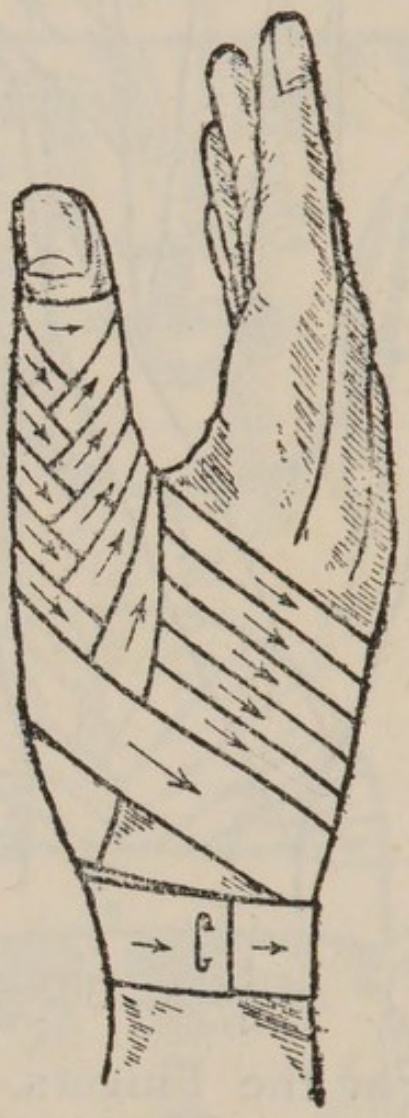


FIG. 33.

diagonally across front of thumb; across back of hand to wrist; across palm and round thumb (Fig. 32); continue until the ball of the thumb is covered. Finish by a turn round wrist and secure. (Fig. 33.)

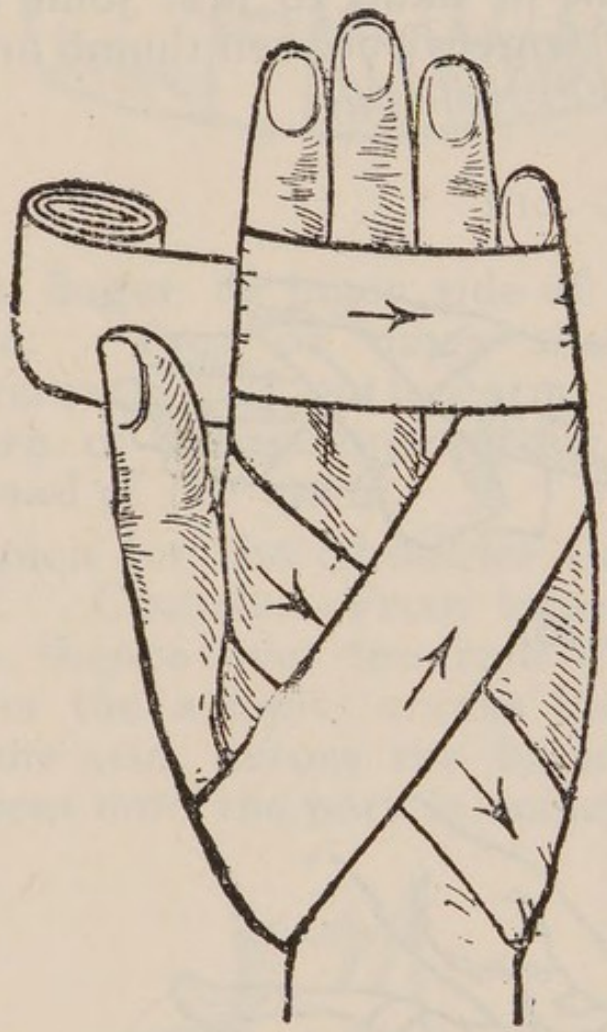


FIG. 34.

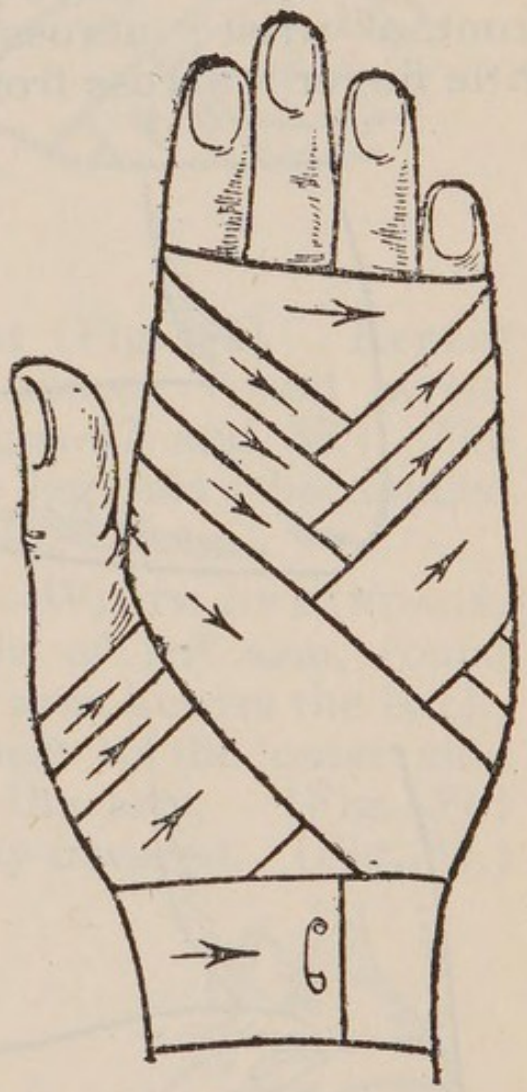


FIG. 35.

Bandage for the Hand.—WIDTH OF BANDAGE, 2 or 2½ in. COURSE. — From between thumb and finger across back of hand, front of wrist and back of hand to fourth finger nail; once round fingers (Fig. 34). Figure of 8 round hand. Repeat figures of 8 until the hand is covered, thence round wrist and secure (Fig. 35).

Reverse Spiral for the Forearm.—WIDTH OF BANDAGE. 2 or 2½ in. COURSE.—From inner to outer side of front of wrist; across back of hand to first joint of little finger; across front of fingers between thumb and

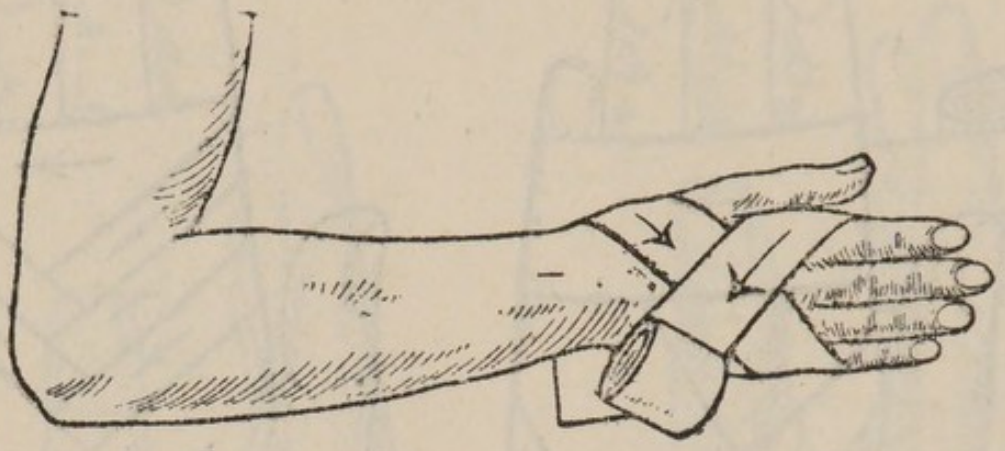


FIG. 36.

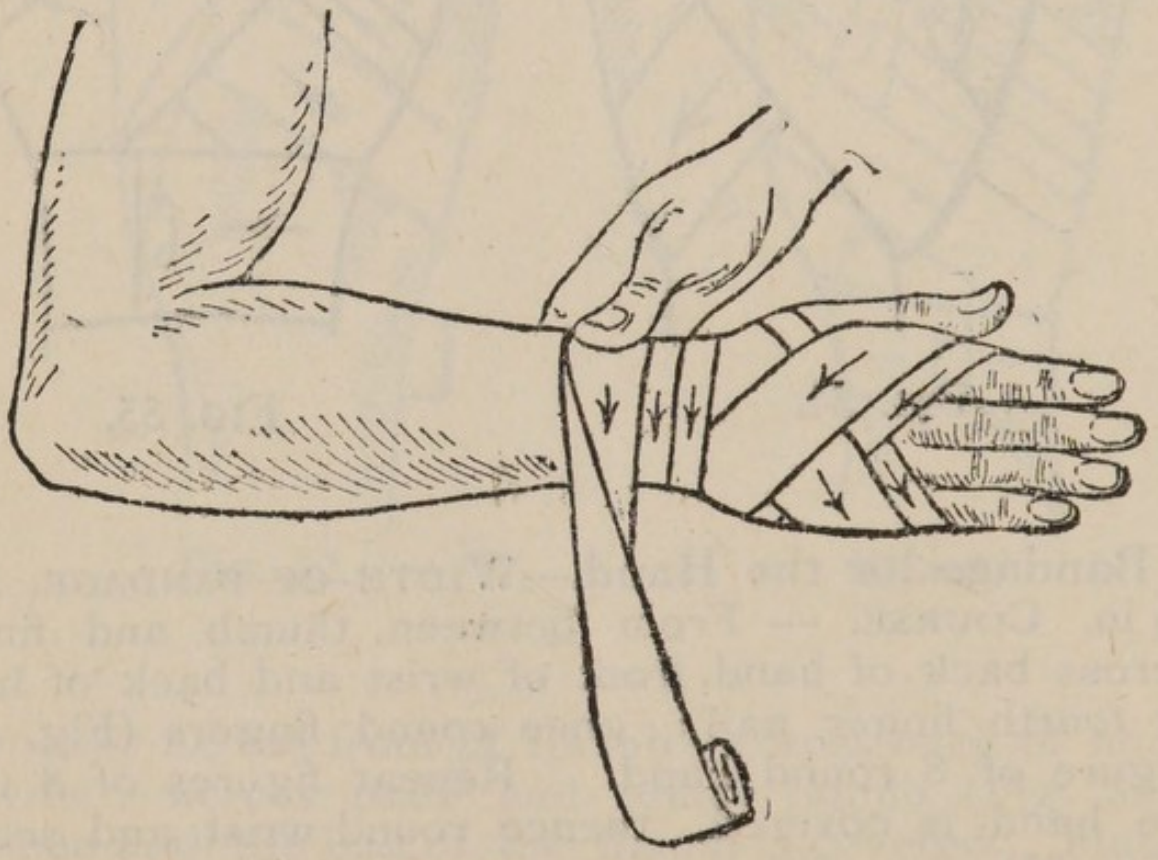


FIG. 37.

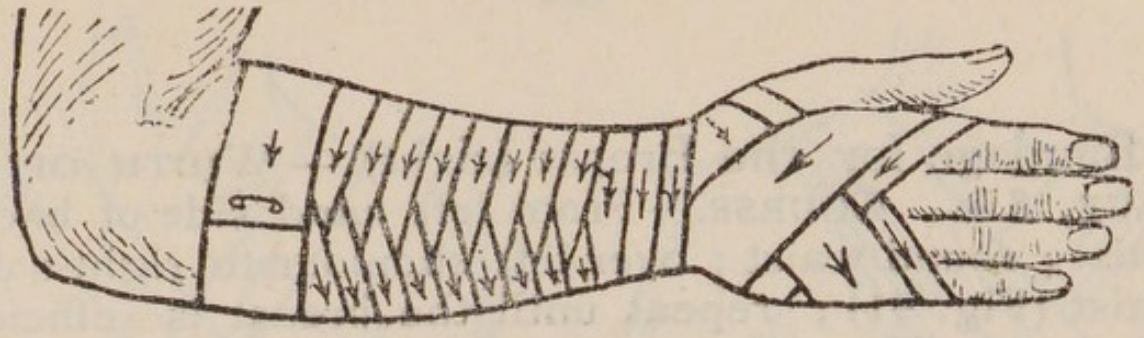
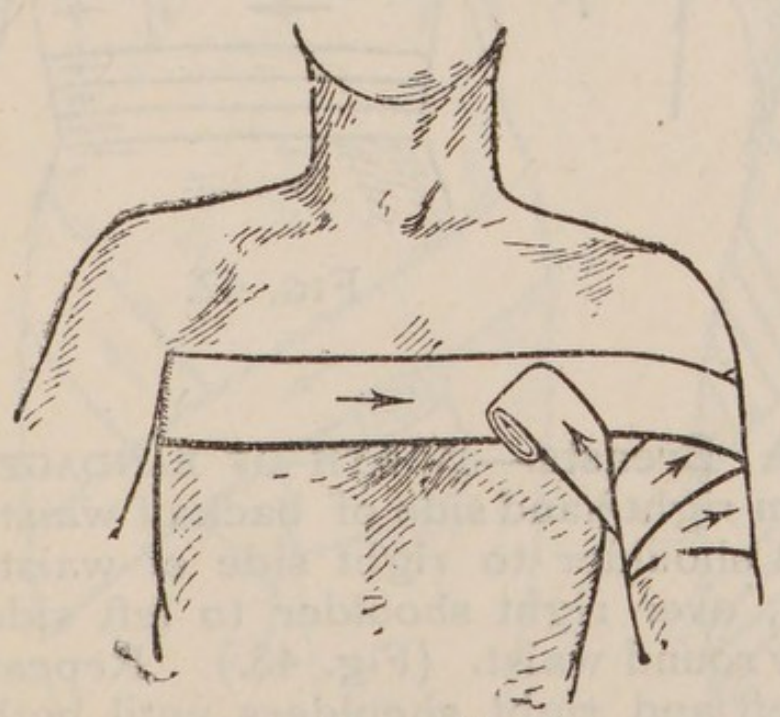


FIG. 38.

first finger to inner side of wrist (Fig. 36). Repeat once. Two or three simple spirals round wrist. Reverse spirals on forearm. (Figs. 37 and 38.) The figure of 8 bandage, as for the leg, may be applied instead of the spiral.

Spica for the Shoulder (left).—WIDTH OF BANDAGE, 3 in. COURSE.—From inner side of left arm, round arm, thence over the front of the arm, across the back, under the armpit, across the chest to the outer side of the arm, across the back of the arm. (Fig. 39.) Repeat until the part is sufficiently covered. (Fig. 40.)



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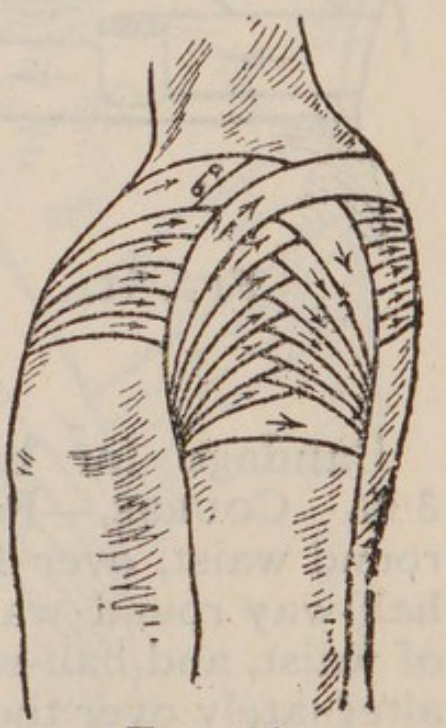


FIG. 40.

Bandage for the Breast (right). — WIDTH OF BANDAGE, 3 in. COURSE.—From left hand side of back of waist; round waist; over left shoulder to right side of waist (Fig. 41); repeat until the breast is sufficiently covered. (Fig. 42).

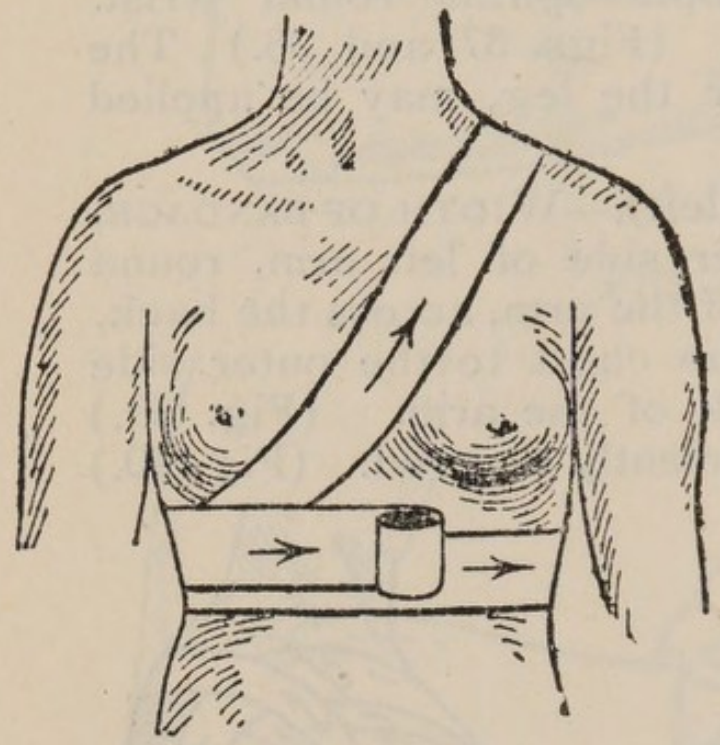


FIG. 41.

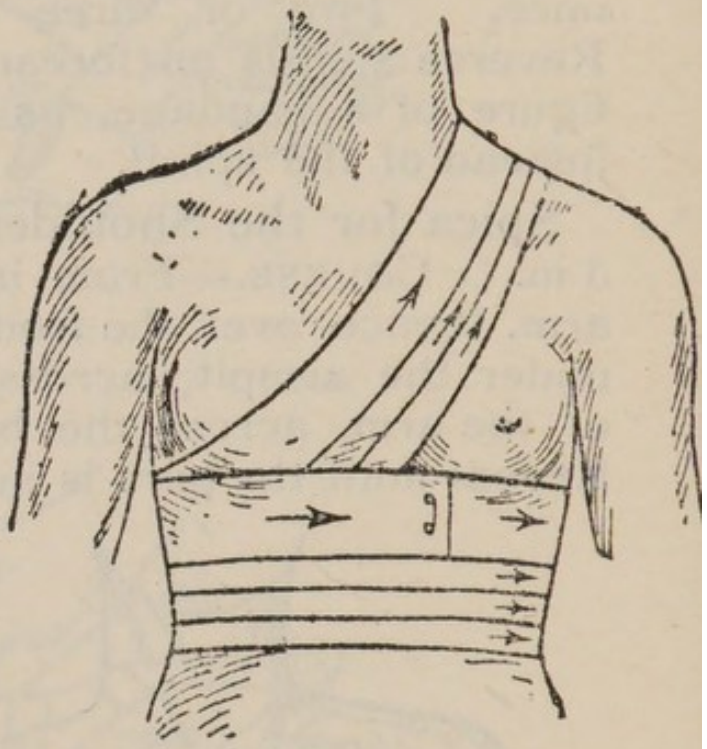


FIG. 42.

Bandage for both Breasts.—WIDTH OF BANDAGE, 3 in. COURSE.—From right hand side of back of waist, round waist, over left shoulder to right side of waist, half-way round waist, over right shoulder to left side of waist, and half-way round waist. (Fig. 43.) Repeat alternately over the left and right shoulders until both breasts are covered. (Fig. 44.)

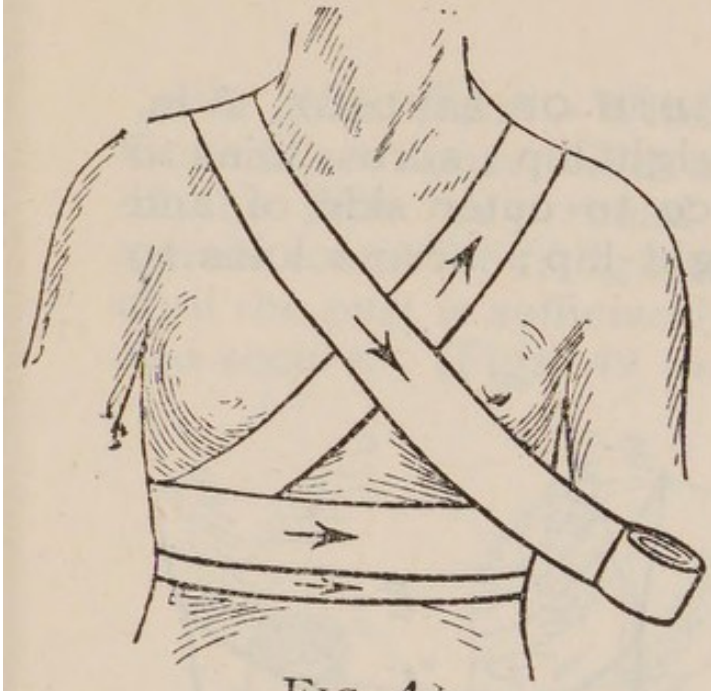


FIG. 43.

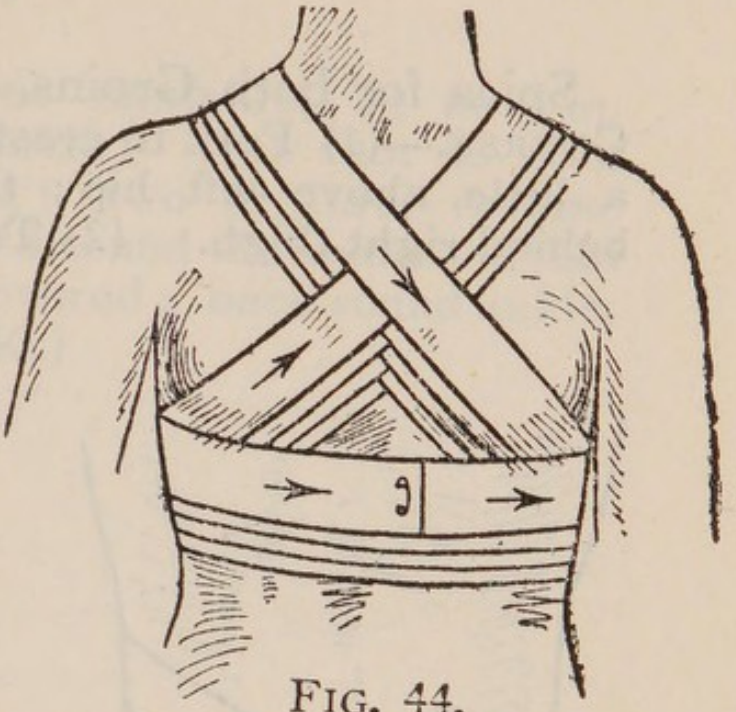


FIG. 44.

Spica for (right) Groin.—WIDTH OF BANDAGE, 3 in. COURSE.—Fork to crest of right hip; across loins to left hip; thence to outer side of and behind right thigh (Fig. 45). Repeat until the groin is sufficiently covered (Fig. 46).

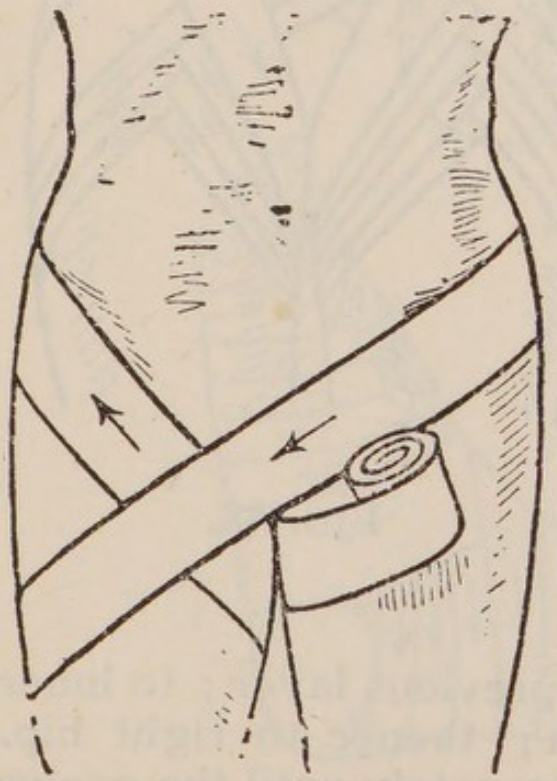


FIG. 45.

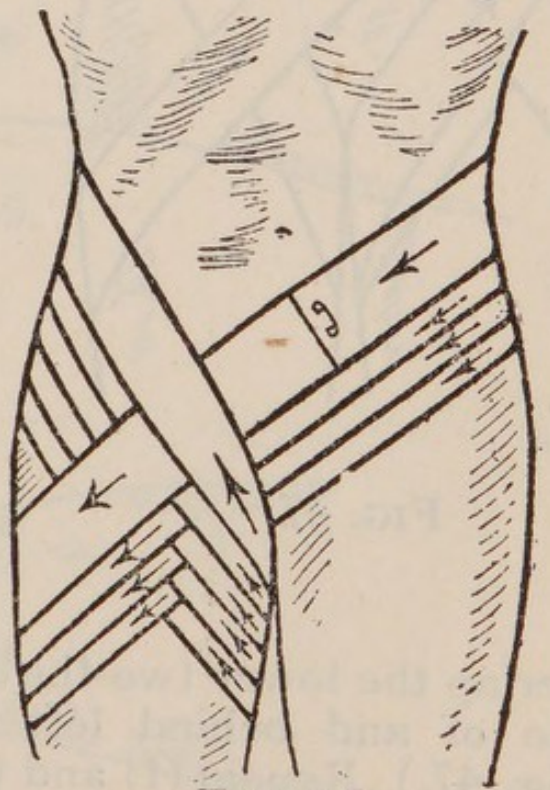


FIG. 46.

Spica for both Groins.—WIDTH OF BANDAGE, 3 in. COURSE.—(1) Fork to crest of right hip; across loins to a little above left hip; thence to outer side of and behind right thigh. (2) To right hip; across loins to

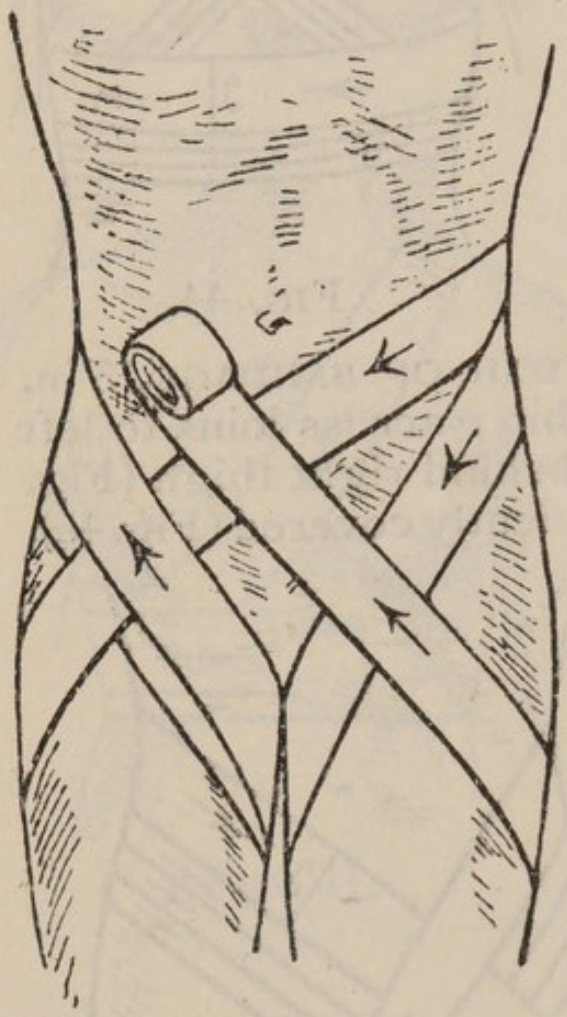


FIG. 47.

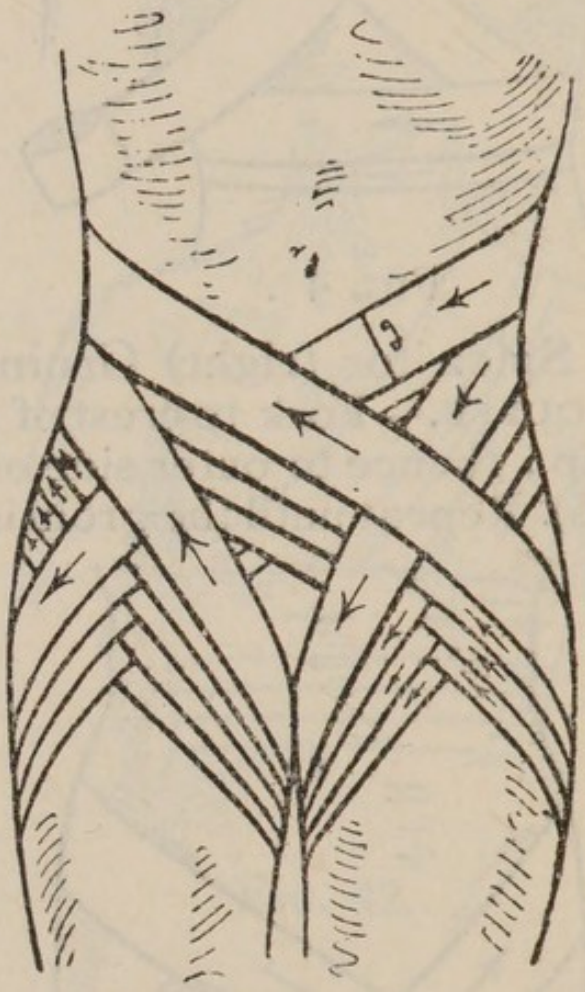


FIG. 48.

overlap the lower two-thirds of previous layer; to inner side of and behind left thigh; thence to right hip. (Fig. 47.) Repeat (1) and (2) alternately until the groins are sufficiently covered. (Fig. 48.)

For the Foot.—WIDTH OF BANDAGE, 2½ or 3 in. COURSE. — Inner side of ankle; over foot to root of the fifth toe; round foot; two or three reverse spirals round foot; figures of 8 round the ankle and foot until the part is sufficiently covered; once round ankle, and secure. (Figs. 49 and 50.)

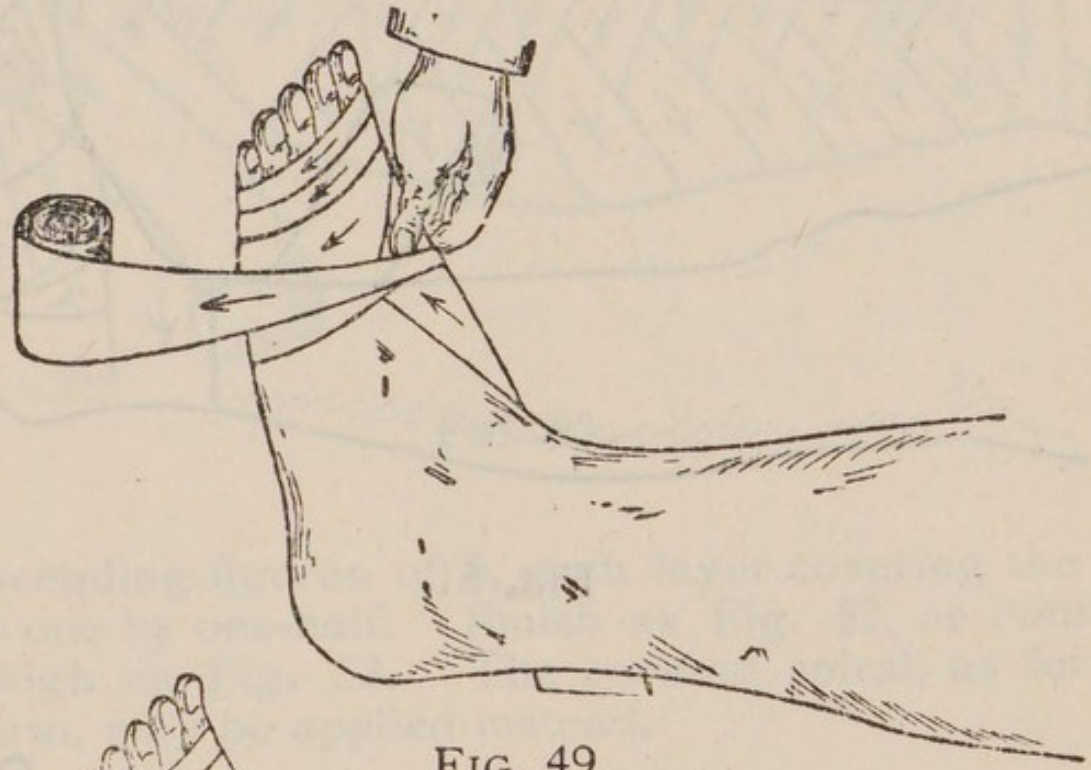


FIG. 49.

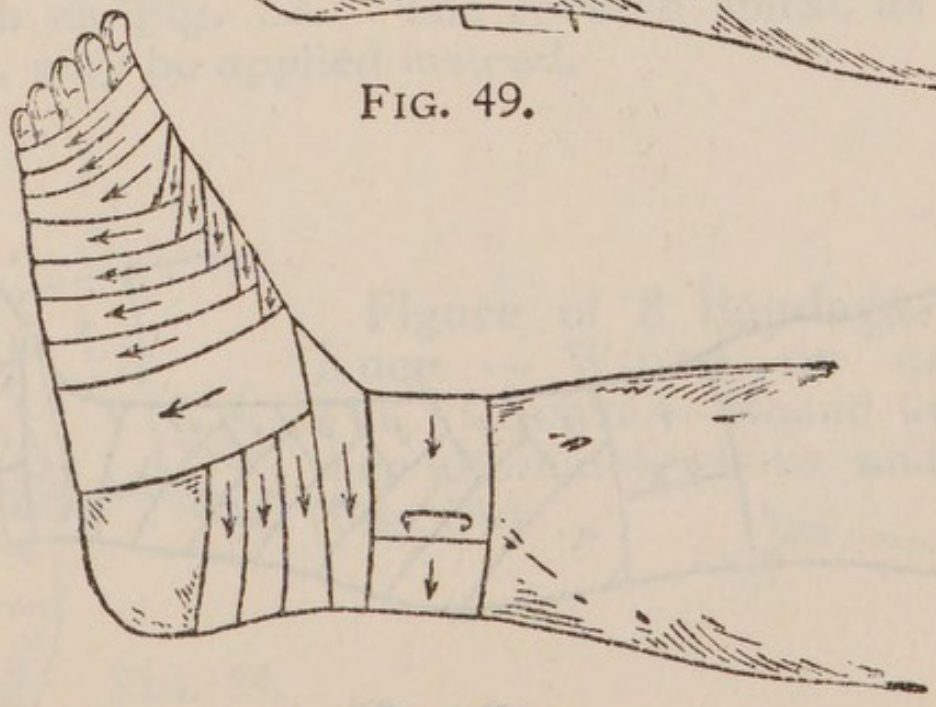


FIG. 50.

Figure of 8 Bandage for the Leg.—WIDTH OF BANDAGE, 3 in. COURSE.—From inner side of ankle to outer side of foot; round foot; round ankle (Fig. 51); again round foot and ankle; and thence up the limb

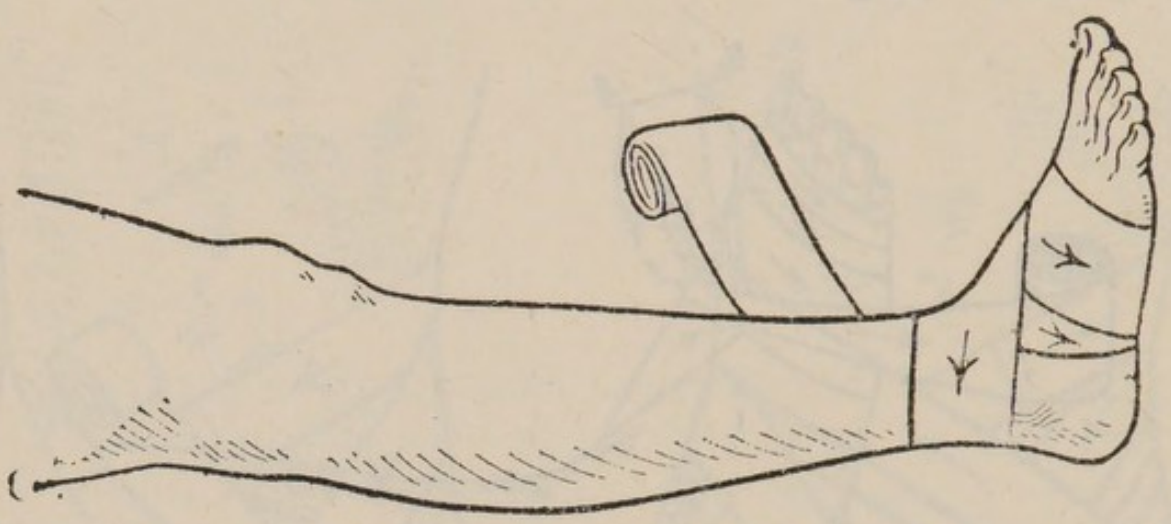


FIG. 51.

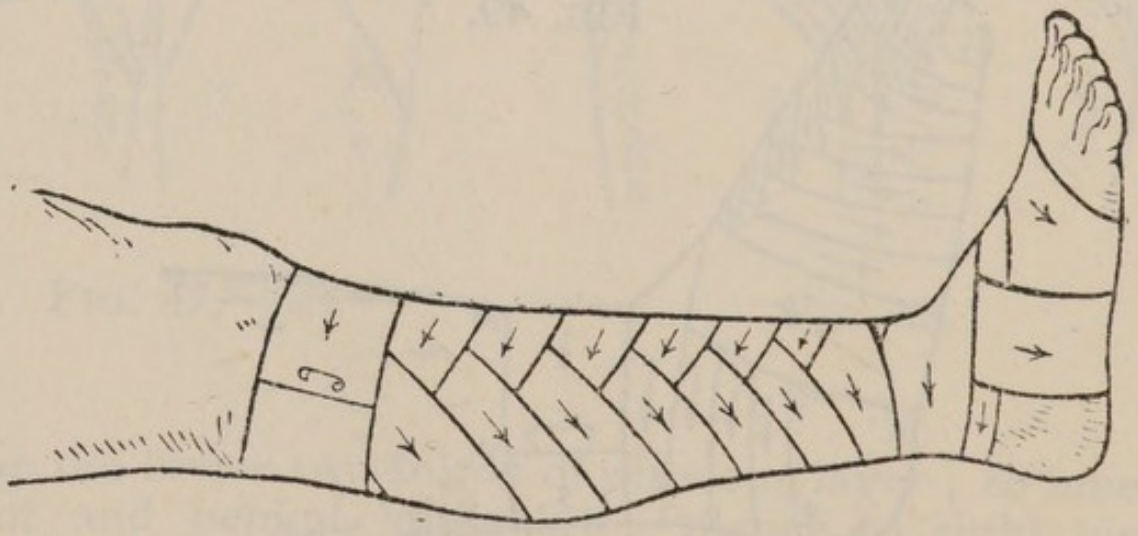


FIG. 52.

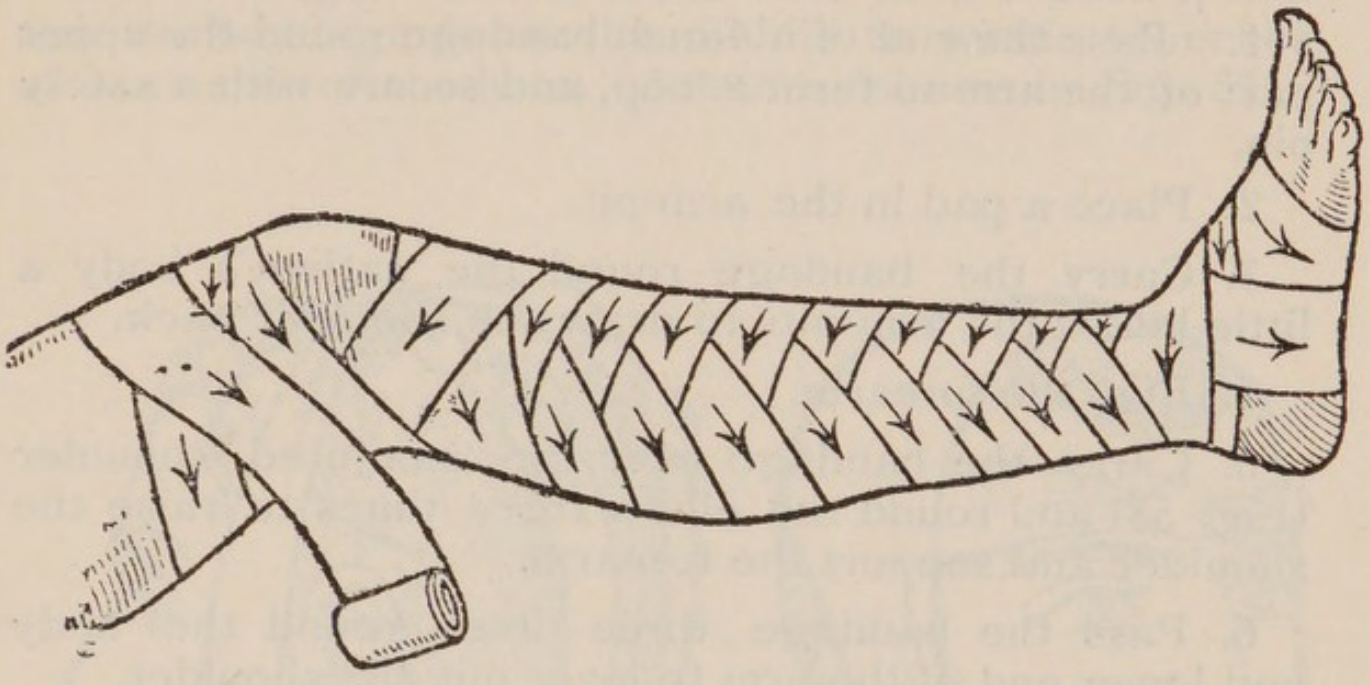


FIG. 53.

by ascending figures of 8, each layer covering the previous one by one-half. Finish as Fig. 52, or continue up thigh as Fig. 53. The reverse spiral, as for the forearm, may be applied instead.

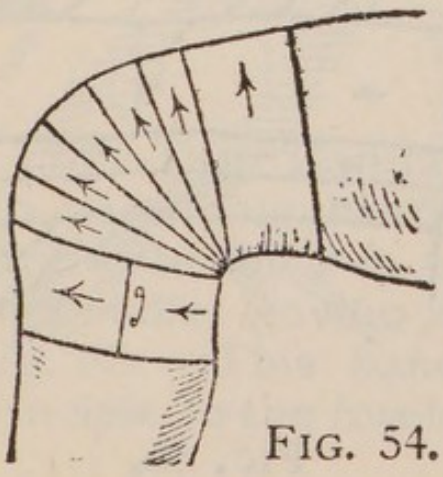


FIG. 54.

Figure of 8 Bandage for the Knee. — WIDTH OF BANDAGE, 3 in. COURSE.— Round knee and then alternately above and below. (Fig. 54.)

Bandage for a Broken Collar-Bone :—

1. Pass the end of a 4-inch bandage round the upper part of the arm to form a loop, and secure with a safety pin.

2. Place a pad in the arm-pit.

3. Carry the bandage round the patient's body a little below the arm-pits to draw the shoulder back.

4. Flex the forearm.

5. Carry the bandage over the uninjured shoulder (Fig. 55) and round the elbow three times to raise the shoulder and support the forearm.

6. Pass the bandage three times round the body and lower end of the arm to lever out the shoulder.

7. Secure with a safety pin. (Fig. 56.)

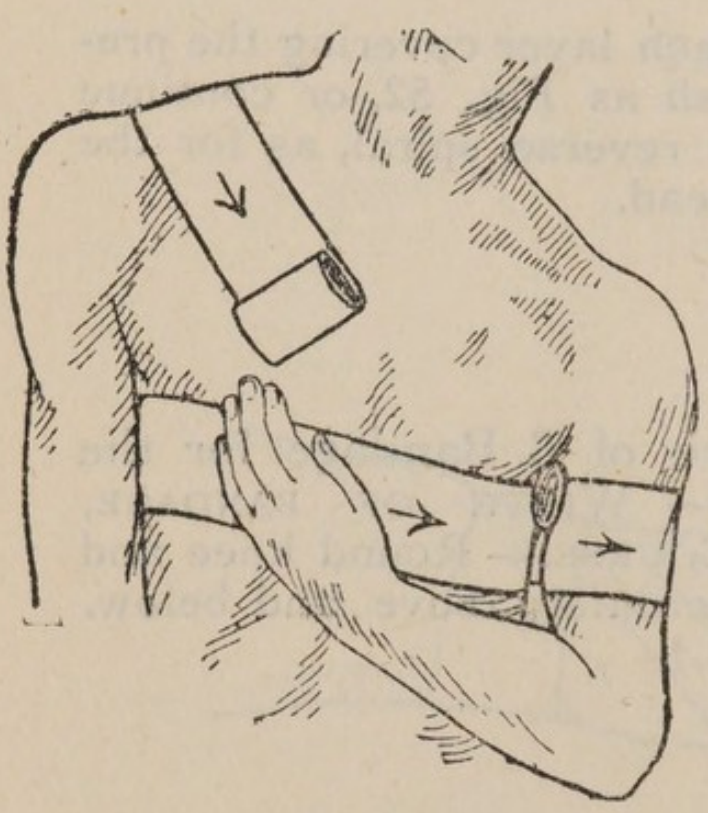


FIG. 55.

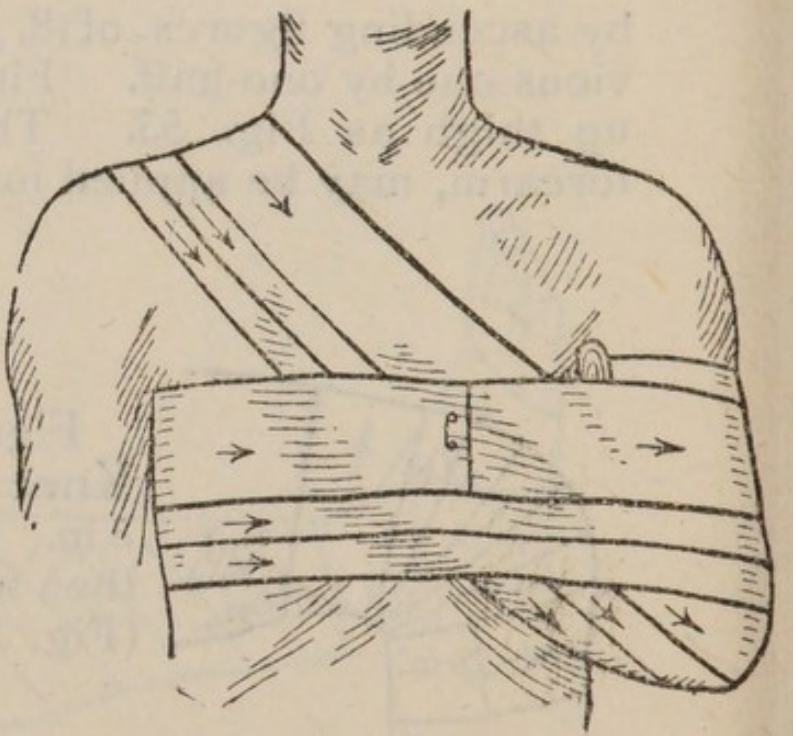


FIG. 56.

Four-Tail Bandage to the Jaw.—Take one yard of 3-inch bandage. Cut a small hole in the centre, and tear the bandage down the middle to within 1½ inches of each side of the hole. APPLY as shown in Fig. 57.

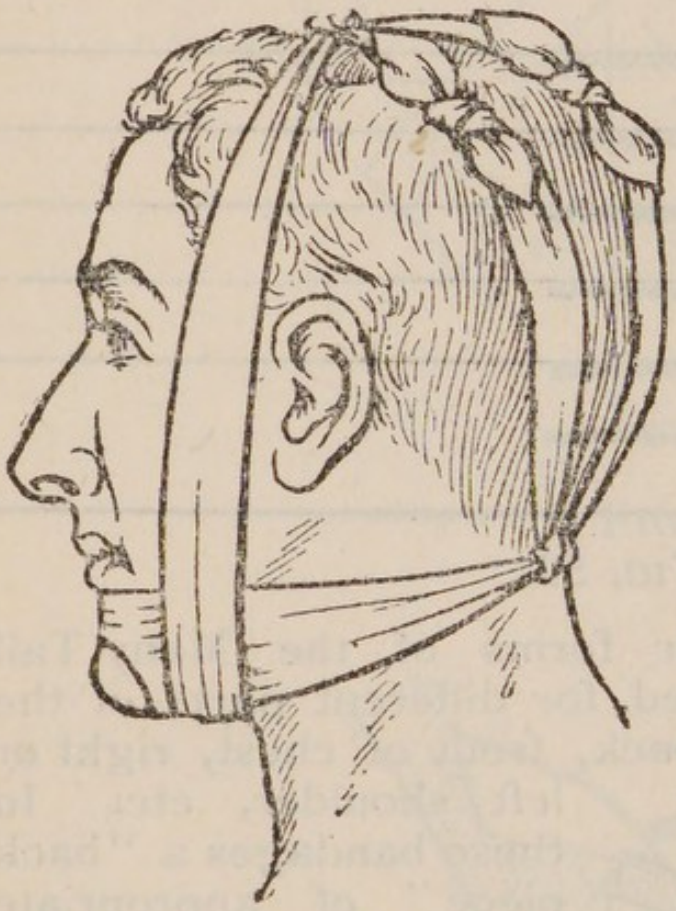


FIG. 57.

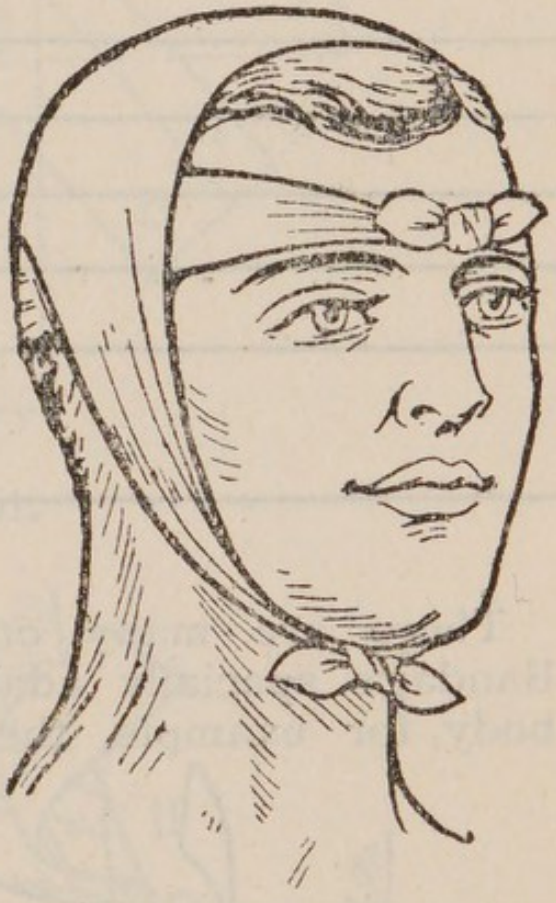


FIG. 58.

Four-Tail Bandage for any part of the Head.—TO MAKE THE BANDAGE take a piece of calico about 6 in. wide and 2 ft. 6 in. long. Tear the bandage down the middle, leaving about 12 inches untorn. APPLY as Fig. 58. This bandage may be applied on the same principle to the forehead or dome of the head.

Many Tail Bandage. — TO MAKE THE BANDAGE, feather-stitch together six strips of calico 3 inches wide, and in length about one and a half times as much as the circumference of the limb. (Fig. 59.) APPLY as Fig. 60, securing the upper tails with a safety pin.

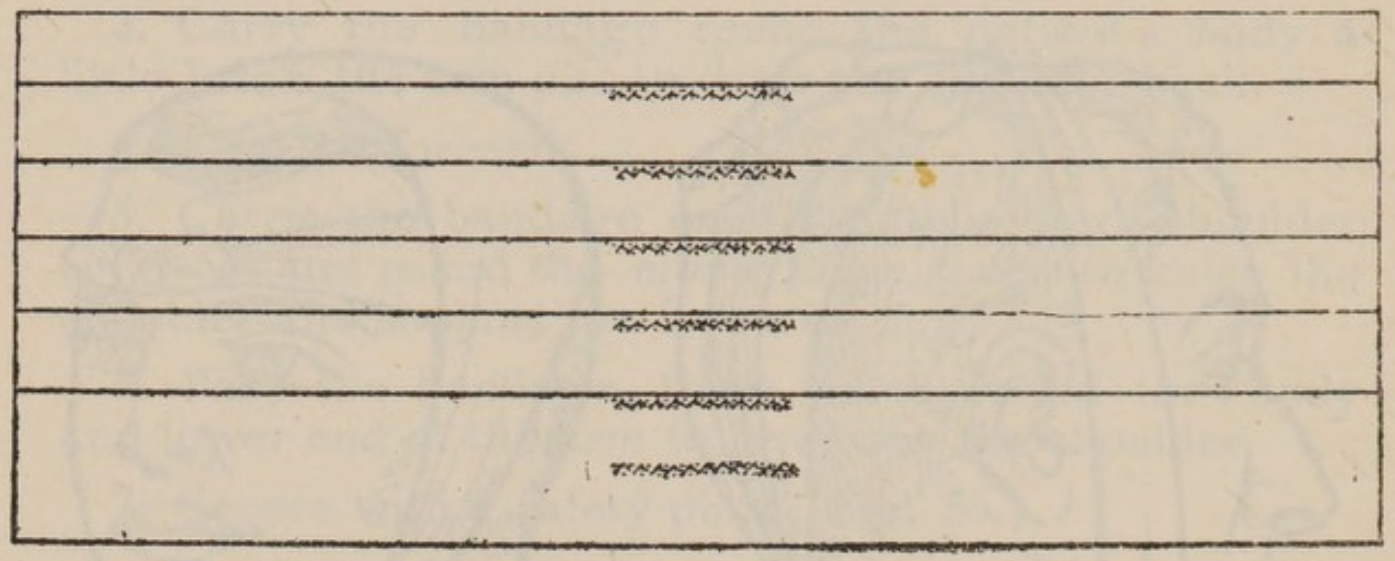


FIG. 59.

There are many other forms of the Many-Tail Bandage specially adapted for different parts of the body, for example, the back, front of chest, right or left shoulder, etc. In these bandages a "back piece" of appropriate shape is made to serve as the foundation for the tails. The chief advantage of this form of bandage is that a wound can be examined or a dressing changed without undue disturbance of the patient.

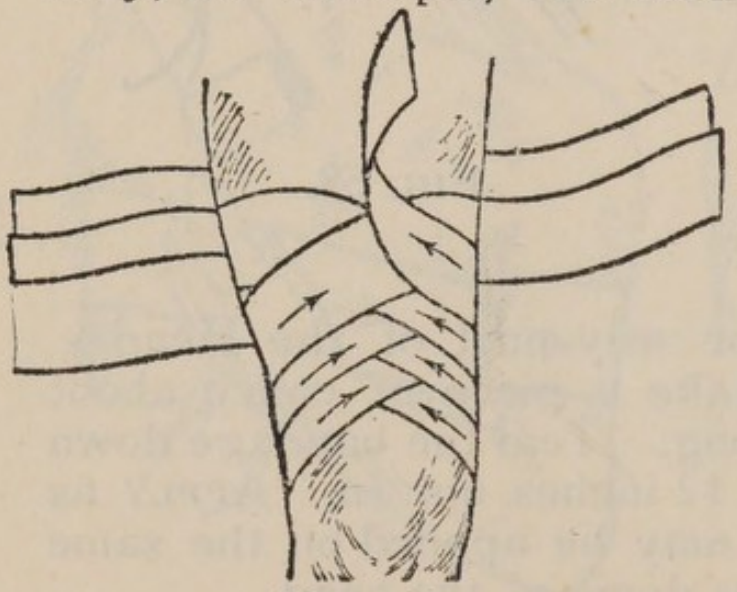


FIG. 60.

Many-Tail Bandage for the Stump of a Limb.—MAKE THE BANDAGE as Fig. 61, from 3-inch calico and apply as Fig. 62.

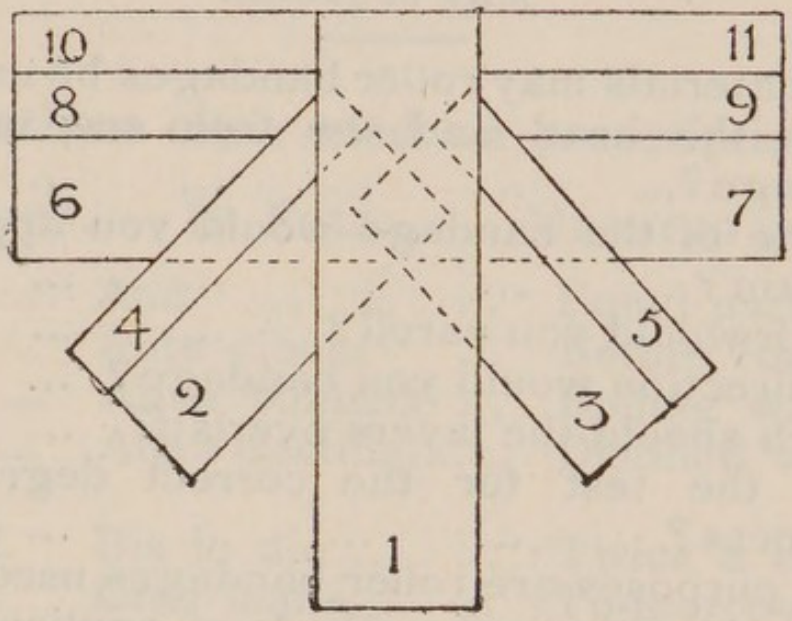


FIG. 61.

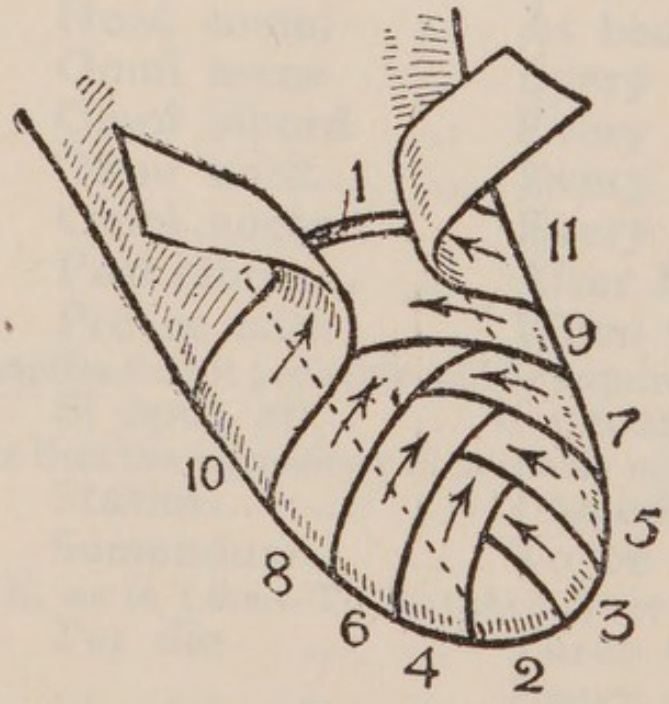


FIG. 62.

QUESTIONS ON CHAPTER XIII.

The numerals indicate the pages where the answers may be found.

GLOSSARY.

Abbreviations often used on prescriptions :—

Abbreviation.	In Full.	Meaning in English.
$\overline{aa}$.	Ana	Equal parts of each.
a.c.	Ante cibum ...	Before food.
aq. bull. ...	Aqua bulliens ...	Boiling water.
aq. dest. ...	Aqua destillata...	Distilled water.
b.i.d. or bis in d.	Bis in die	Twice a day.
c.m.	Cras mane... ...	To-morrow morning.
c.n.	Cras nocte... ...	To-morrow night.
h.m.	Hac mane... ...	This morning.
h.n.	Hac nocte	This night.
h.s.	Horâ somni ...	At bed-time.
o.m.	Omni mane ...	Every morning.
omn. bih. ...	Omni bihorâ ...	Every two hours.
omn. hor. ...	Omni horâ... ...	Every hour.
o.n.	Omni nocte ...	Every night.
p.c.	Post cibum... ...	After food.
p.r.n. ...	Pro re nata ...	When required. (Implies that it probably will be required.)
s.o.s.	Si opus sit... ...	If necessary. (Implies that the necessity will probably not arise.)
st. or statim	Statim...	Immediately.
sum.	Sumendum... ...	To be taken. (also written s., as in t.d.s.—To be taken three times a day.)
t.d.	Ter die	Three times a day.
3tis horis ...	... ...	Every three hours.
4tis horis ...	... ...	Every four hours.

Abdomen.—The lower cavity of the trunk.

Abnormal.—Different from the usual condition.

Abscess.—A localised collection of *pus.*

Acid.—A sour-tasting substance which, in combination with an *alkali* (which it neutralises) or metallic body, forms a *salt.*

Acute.—Sharp. An acute disease is one that runs a short but serious course—the opposite to *chronic.*

Alimentary.—Pertaining to food.

Alkali.—A soapy or acrid tasting substance which, combining with an *acid*, neutralises it and forms a *salt.* An Alkali combining with a fat *saponifies* it.

Anæmia.—A condition caused by a deficiency of blood or of its red *corpuscles*, and characterised by pallor, loss of energy, etc.

Anæsthetic.—A drug which produces loss of the sense of feeling, either local or general. It is usually inhaled, injected, or applied externally to a part.

Anatomy.—The science dealing with the structure of the body, its organs and parts.

Anterior.—Situated in front.

Antiseptic.—Destructive of germs, and thereby preventing putrification and decay.

Anus.—The orifice of the *rectum.*

Aorta.—The great central artery of the systemic circulation. It arises at the left ventricle of the *heart*, gives off branches to all parts of the body, and terminates on a level with the *cartilage* between the fourth and fifth lumbar *vertebræ* by dividing into the two iliac arteries.

Apoplexy.—Insensibility caused by *effusion* of blood into the brain.

Appendicitis.—Inflammation of the *Appendix.*

Appendix, vermiform.—A worm-like pouch of the

cæcum, from three to six inches long. It is situated near the right groin.

Artery.—Any one of the vessels that carry blood from the *heart* to the *capillaries*.

Articulate.—To form a joint.

Asepsis.—Surgical cleanliness.

Aseptic.—Free from poisonous germs. Surgically clean. Sterile.

Aspect.—(1) Position with regard to the points of the compass. Example: A room facing south has a southerly aspect. (2) Part of a surface that may be seen from any particular direction. Example: The anterior aspect of the arm is that part which may be seen from the front.

Asphyxia.—Suspended animation due to interference with respiration. Suffocation.

Aural.—Pertaining to the ear.

Bacillus.—See Bacterium.

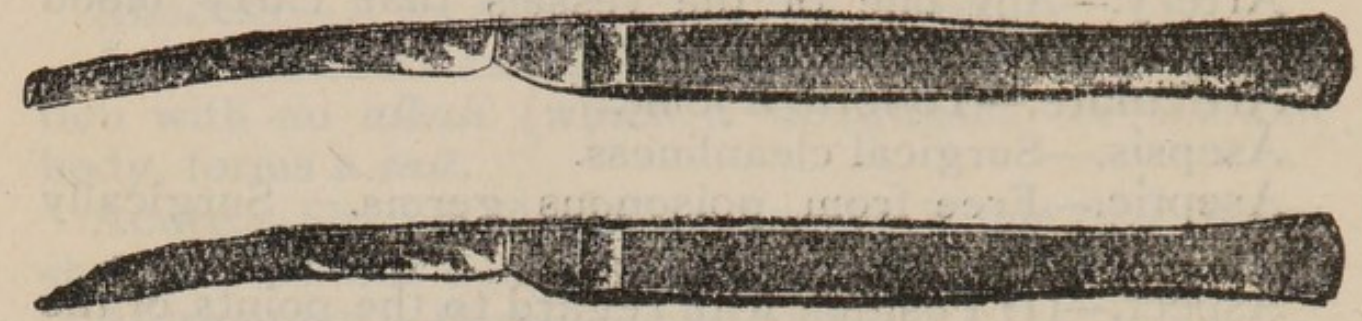
Bactericide.—That which destroys bacteria. A true disinfectant.

Bacterium (pl. Bacteria), also known as a germ or microbe.—Any vegetable micro-organism, consisting of a single *cell*. Most of them are quite harmless, but some may cause disease when they enter the body. They are classified according to their shape as follows:—

Bacillus (pl. Bacilli).—Rod-shaped.
Coccus (pl. Cocci) or Micrococcus.—Ball-shaped.
Diplococci.—Cocci joined in pairs.
Staphylococci.—Cocci joined in clusters.
Streptococci.—Cocci joined in wreaths.
Spirillum (pl. Spirilla).—Spiral-shaped.

Bile.—A digestive alkaline fluid secreted by the *liver* and stored in the gall bladder, whence it passes through the bile duct into the small intestine.

Bistoury.—A narrow surgical knife having a straight



or concave cutting edge, and either a sharp or blunt point.

Bladder.—The reservoir for urine, situate in the front of the pelvis.

Bone.—The material of the *skeleton*. It consists of an outer layer of dense structure, called the Compact Tissue, and an inner layer consisting of slender interlaced fibres, called the Cancellous or Spongy Tissue, which contains large marrow cavities. Its composition is partly animal matter containing gelatine, and partly earthy matter, chiefly phosphate of lime.

Bougie.—A slender solid rod for introduction into the *urethra*, *rectum*, or other orifice, to remove obstructions.

Brain.—An organ situated within the cranium. It is composed of nervous matter and comprises four parts—the cerebrum, cerebellum, pons varolii, and medulla oblongata.

The cerebrum is the largest part, and is divided into the right and left hemispheres. It occupies the upper portion of the *cranium*, contains the centres of sensation and voluntary motion, and is the seat of the intellect, will, and emotions.

The cerebellum is situated below the back portion of the cerebrum, and is concerned in regulating muscular movements.

The pons varolii is a broad, arched band which serves to connect the cerebrum, the cerebellum, and the medulla oblongata.

The medulla oblongata is the connecting link between the brain and the spinal cord. It contains the vital centres of circulation, respiration, and swallowing.

Bronchial.—Pertaining to the bronchi and their branches.

Bronchial Tubes.—Branches of the *bronchi.*

Bronchitis.—Inflammation of the *bronchi* and *bronchial tubes.*

Bronchus (pl. Bronchi).—Either one of the two main branches of the windpipe.

Buttock.—The rump, or either half of it.

Cæcum.—The first part of the large intestine, situated in the lower part of the abdomen on the right side.

Calorie.—See Heat.

Capillary.—Any one of the vessels that connect the arteries and the veins. Their size is so small that they are invisible except under a microscope. Through their delicate walls the interchange of gases, fluids, and waste products takes place.

Carbo-Hydrate. — Any compound of *carbon* with *hydrogen* and *oxygen* in proportion to form water. Sugars and starches are carbo-hydrates.

Carbon.—An inflammable solid, very widely distributed in combination with other substances, for example, coal, black lead (graphite or plumbago), etc. In combination with hydrogen it enters into the formation of all organic (animal and vegetable) substances.

Carbon Di-Oxide, also known as carbonic acid gas. —A gas, half as heavy again as air, which consists of one part of carbon with two of oxygen.

Cardiac.—Pertaining to the heart.

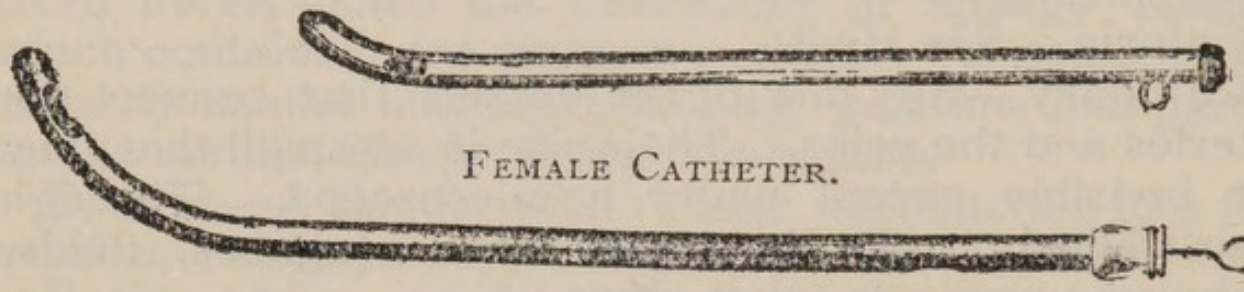
Carpus.—The wrist as a whole or the eight carpal bones in it.

Cartilage.—Smooth elastic *tissue*, softer than bone, also known as gristle. It supplies the smooth caps to the ends of bones at the joints. Another of its uses is to stiffen the walls of certain organs and channels and projecting parts, such as the ear and *epiglottis*.

Casein.—The principal *proteid* found in milk. The basis of cheese.

Catarrh.—Inflammation of a *mucous membrane*, with discharge of *mucus*.

Catheter.—A slender tube for evacuating *urine* from the bladder. The end to be inserted into the *urethra* is more or less curved, with the tip closed to form a blunt point. Near the tip are holes to permit the passage



FEMALE CATHETER.

MALE CATHETER.

of urine. When not in use a metal wire is kept in the tube. Material: Metal, gum-elastic, indiarubber (Jaques), etc. Sizes: smallest, 1; largest, 12.

Cell.—Any one of the microscopic living units of which *tissues* are built up.

Cervical.—Pertaining to the neck.

Chemistry.—The science dealing with changes in the composition of matter and with the properties of matter due to its composition.

Chronic.—Continuing in a non-acute state for a lengthened period.

Chyle.—The digested fatty matter absorbed by *lacteals* from the small *intestine.* It mixes with *lymph* and is carried up the *thoracic duct,* whence it is discharged into veins at the left side of the root of the neck.

Chyme.—Partially digested food as it is passed from the stomach into the intestine in a semi-liquid state before absorption.

Cicatrix.—A scar.

Clavicle.—Collar Bone.

Clinical.—Pertaining to the bed-side.

Coccyx.—The lowest part of the vertebral column, formed of four united *vertebræ.* The tail-bone.

Colitis.—Inflammation of the *Colon.*

Colon.—The part of the large intestine that extends from the *cæcum* to the *rectum.* It is divided into three parts. (1) The Ascending Colon extends upwards on the right side of the abdomen from the *cæcum* to the transverse colon. (2) The Transverse Colon extends across the abdomen immediately below the liver and stomach. (3) The Descending Colon extends downwards on the left side of the abdomen from the transverse colon to the rectum.

Coma.—Profound insensibility.

Compound, Chemical.—The combination by chemical means whereby two or more substances form a single and different substance.

Constipation.—Retention of the *fæces.*

Contagion.—*Infection.*

Convalescence.—The stage of an illness during which recovery takes place.

Convulsion.—An involuntary contraction of a voluntary muscle. In clonic convulsions muscles are

contracted and relaxed alternately; in tonic convulsions they are persistently contracted.

Cornea.—A transparent structure in front of the pupil and iris of the eye.

Corpuscles, Blood.—Living *cells* in the blood, either red or white. The red corpuscles are the means whereby oxygen is conveyed from the lungs to the tissues. They also assist in carrying *carbon-dioxide* from the tissues to the lungs. The white corpuscles, also called *leukocytes* or *phagocytes*, serve to protect the body by destroying harmful *bacteria* and other *septic* matter.

Costiveness.—*Abnormal* dryness and hardening of the *fæces*, causing constipation.

Cranium.—That part of the skull which contains the brain.

Crepitus (bony).—The grating produced by the rubbing together of the fragments at the seat of a fractured bone.

Crisis.—The turning-point in a disease. In fevers it is either fatal or accompanied by a rapid fall in temperature and abatement of symptoms.

Cuticle.—The epidermis or outer layer of the skin.

Cyst.—Any bag-like structure containing liquid or semi-liquid matter.

Cystitis.—Inflammation of the bladder.

Defervescence.—The period during which *fever* abates.

Delirium.—Temporary mental derangement caused by *fever*, injury or disease, and marked by delusions, excitement and restlessness.

Dental.—Pertaining to the teeth.

Dermis.—The true skin.

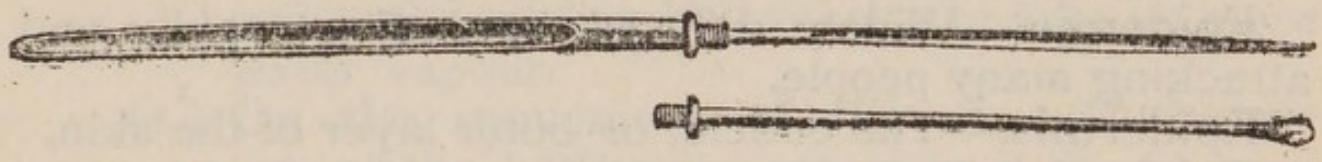
Desquamation.—Peeling of the skin, as in the later stages of scarlet fever.

Diagnosis.—The determination of the nature of a case of disease.

Diaphragm.—The muscular and membranous partition separating the *thorax* from the *abdomen*.

Diphtheria.—An *acute* infectious disease attended by *fever* and formation of membrane on the larynx and pharynx.

Director.—A grooved instrument to guide a knife



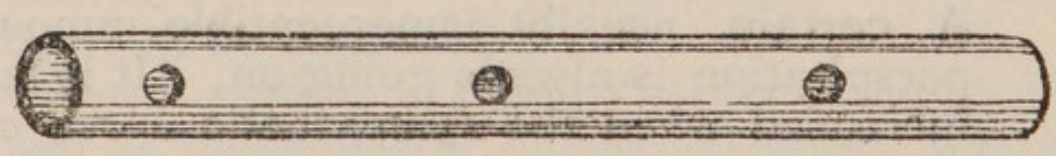
in surgery. Often combined with an ear scoop, eye, hook, etc.

Distal.—Furthest from the centre. Example: The distal side of a wounded blood-vessel is that away from the heart.

Dorsal.—Pertaining to the back of the body or of any part of it.

Dorsal vertebræ.—Twelve vertebræ, which are placed between the cervical and the lumbar vertebræ, and support the ribs at the back.

Drainage Tube.—A tube to facilitate the escape of fluids from a wound. Material: India-rubber, vulcanite,



glass. May be plain or perforated. Sizes: Smallest, 1; largest, 16.

Duct.—A tube for the passage of *excretions* or *secretions*.

Duodenum.—The first part of the small intestine. It extends from the *pylorus* to the *jejunum*.

Effusion.—The escape of fluid into a *tissue* or part.

Emulsion.—A milky liquid made by mixing oil or fat with water. This mixture is only possible by adding another substance which makes oil compatible with water. Oil or fat so treated is said to be emulsified.

Endemic.—Prevalent in a particular district.

Enema (pl. Enemata).—An injection by the *rectum*.

Epidemic.—Widely diffused, spreading rapidly and attacking many people.

Epidermis.—The cuticle, or outer layer of the skin.

Epiglottis.—The flap guarding the entrance to the *larynx*.

Epilepsy.—A disease of the brain, giving rise to insensibility with convulsions.

Eruption.—Breaking out. The stage in an eruptive disease when the rash appears.

Eustachian Tube.—The passage from the middle ear to the *pharynx* above the soft palate.

Evaporation.—The conversion of a liquid (or solid) into vapour.

The rate of evaporation of sweat from the skin depends—

(1.) **On the rate at which sweat is secreted.**—A certain, usually imperceptible, amount of perspiration is always going on. It is largely increased when the sympathetic nerve centre learns that the body is getting too hot, because messages are then at once sent by the nerves controlling the sweat glands causing them to increase their activity. As the body cools, these orders are countermanded and the activity of the sweat glands is decreased.

(2.) On the dryness of the air, as the less water vapour it contains, the more it can take up.

(3.) On the temperature of the air, as the hotter the air is, the more water vapour it can take up before it becomes saturated, that is to say, before it has taken up all the water vapour it can hold. For this reason a fire dries the air in a room, not by decreasing the amount of water vapour present, but by warming the air and so increasing its capacity to take up more water vapour.

(4.) On the movement of the air.—If the air around the body were stagnant it would soon become saturated, but when there is movement, the moist air is constantly passing away and drier air taking its place.

Excrete.—To throw off from the body.

Expectoration.—Any matter discharged from the air passages by spitting. *Sputum.*

Fæces.—The excretion from the bowel.

Fat.—A substance containing carbon, hydrogen and oxygen, but the hydrogen is more than twice as much as the oxygen, and therefore the whole of it does not combine with the oxygen to form water. Fats and oils are hydro-carbons.

Febrile.—Feverish.

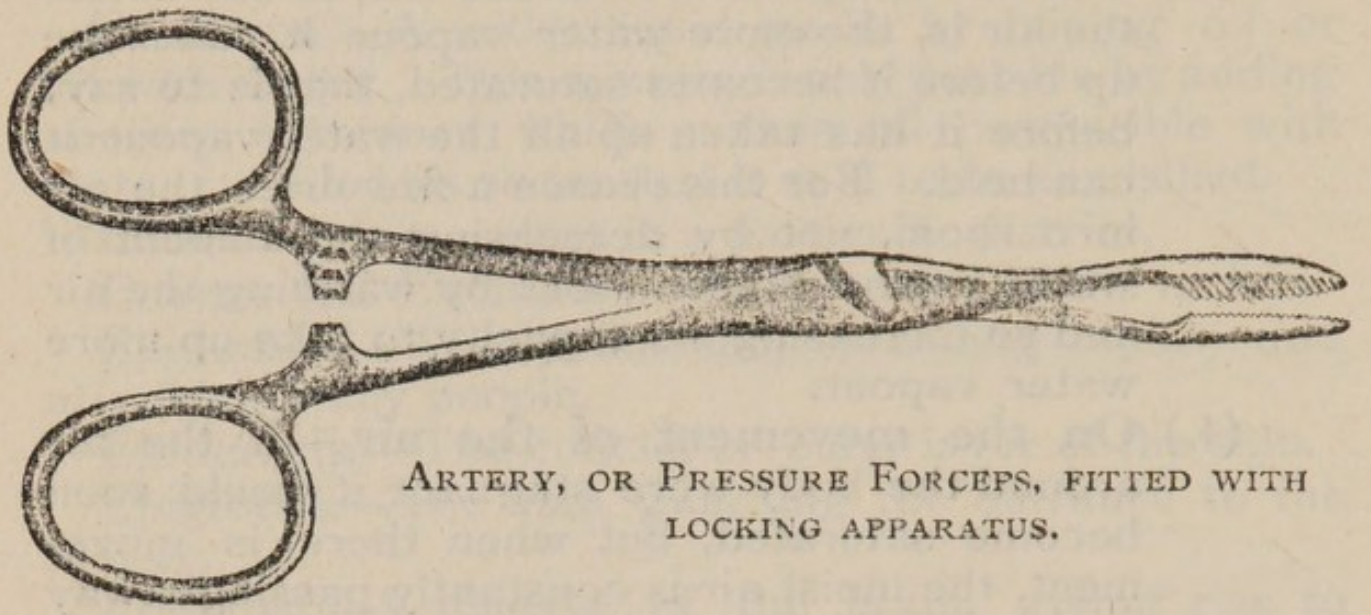
Femur.—The thigh bone.

Fever.—A *morbid* condition, characterised by marked increase in temperature, quickened pulse, wastage of *tissue*, restlessness, and frequently delirium.

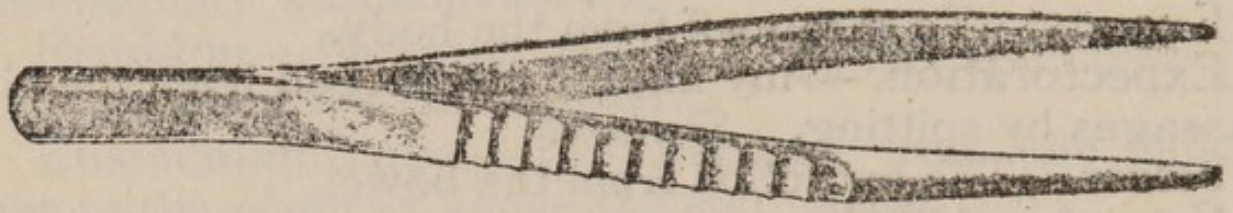
Fibrin.—A substance in the *plasma* of the blood, which, when blood escapes from a blood-vessel, forms a network to ensnare the blood corpuscles and so makes a clot.

Fibula.—The smaller of the two bones of the leg.

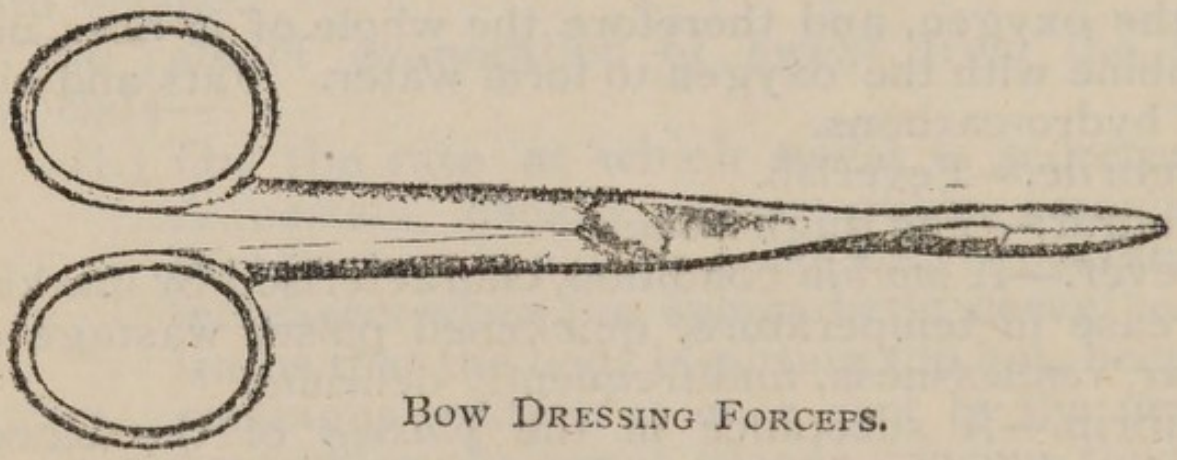
Fomite.—Any substance that carries infection.
Forceps.—An instrument used for grasping.



ARTERY, OR PRESSURE FORCEPS, FITTED WITH LOCKING APPARATUS.



SPRING DRESSING OR DISSECTING FORCEPS.



BOW DRESSING FORCEPS.

Gall-bladder.—The reservoir for the storage of *bile* (gall) situate below the liver.

Ganglion (pl. Ganglia).—Any mass of grey nervous substance that serves as a nerve centre.

Gangrene.—The death of a part. Mortification.

Gastric.—Pertaining to the stomach.

Germicide.—That which destroys germs. A true disinfectant.

Gland.—An organ for the *secretion* of fluid from the blood.

Glottis.—The opening into the larynx.

Gullet.—The canal descending behind the windpipe from the *pharynx* to the *stomach*. The Œsophagus.

Hæmoglobin.—The colouring matter of the red *corpuscles* of the blood. It freely absorbs *oxygen*, and when charged with that gas it is known as *oxyhæmoglobin*.

Hæmorrhoids.—Dilated veins in the rectum, causing a tumour liable to bleed. Piles.

Heart.—A hollow muscular organ which maintains the circulation of the blood. It lies obliquely within the *thorax*, with the greater part of its bulk to the left of the middle line. It is divided into the right and left sides, in each of which there are two chambers —an auricle and a ventricle. The former serves to receive blood from the veins and to pass it on to the ventricle, which propels it through arteries. The right side is concerned with venous blood and the left side with arterial blood. The heart is contained in a loosely fitting sac, the pericardium. It beats in a healthy adult about seventy-two times a minute, more quickly in children, and more slowly in persons of advanced age. The beat may be felt just below and to the inner side of the left nipple.

Heat.—A form of energy which, when communicated to a substance, either—

(*a*) Adds to the **Temperature** of the substance, and thus becomes apparent to the senses.

(*b*) Is absorbed by the substance as **Latent Heat,** without increasing its temperature.

(*c*) Passes through the substance as **Radiant Heat.**

(*d*) Is reflected.

The **Unit of Heat** is a **Calorie,** which is the amount of heat required to raise the temperature of a given quantity of water 1° Centigrade. The quantity of water should be stated, *e.g.*, Gramme-calorie (the amount of heat required to raise 1 gramme of water 1° C.), Kilogramme-calorie, Pound-calorie, etc.

Hemiplegia.—Paralysis of one side of the body.

Hernia.—Rupture. The protrusion of part of the intestine through the abdominal wall usually at the groin.

Hospital Etiquette (Rules of)—

1. Rise when a superior officer enters the ward.
2. Never address a superior officer when at a distance from him or her.
3. Maintain a professional attitude to all doctors on their visits to the wards, even though you know them well socially.
4. Never talk on the staircase or in the corridors.
5. Never discuss an order in the presence of those affected by it.
6. Never discuss a patient's ailment or treatment in his presence.

Humerus.—The arm bone.

Hydrogen.—A very light invisible and combustible gas. It forms in chemical combination with oxygen two-thirds of the volume of water.

Ileum.—Part of the small intestine. It extends from the *jejunum* to the *cæcum.*

Incubation.—The period in an infectious disease during which the *bacteria* are developing and establishing themselves.

Infection.—The introduction to the body of disease-producing *bacteria* in circumstances favourable to their growth ; also called contagion.

Inferior.—Lower.

Inguinal.—Pertaining to the groin.

Inflammation.—A condition caused by the reaction of *tissues* to irritation. Usually characterised by pain, heat, redness and swelling.

Inoculate.—To introduce through the skin a *vaccine* or *serum* to cure or prevent infectious disease.

Insufflation.—Blowing powder or vapour into a cavity of the body.

Intestine.—That part of the alimentary canal which extends from the *stomach* to the *anus.* It consists of the small intestine, which is about twenty-two feet long, and includes the *duodenum*, *jejunum* and *ileum ;* and the large intestine, which is about five feet long, and includes the *cæcum, colon* and *rectum.*

Invasion.—The onset of disease. The bacteria, having established themselves in the body, become aggressive and produce the characteristic symptoms of the disease.

Iris.—The coloured membrane of the eye surrounding the pupil.

Jejunum.—Part of the small *intestine.* It extends from the *duodenum* to the *ileum.*

Kidneys.—Two *organs* situate one on each side of the back of the abdomen, in front of the lumbar vertebræ. Their function is to *secrete urine.*

Lact-Albumen.—One of the *proteids* found in milk.

Lacteal.—Any one of the *lymphatics* in the wall of the small intestine that take up *chyle.*

Larynx.—The "voice-box." It is situated at the top of the windpipe and below the root of the tongue. Its entrance is guarded by the *epiglottis.*

Lateral.—Pertaining to the side.

Leukocyte.—A colourless cell-mass—especially a white blood corpuscle.

Ligature.—A thread used for tying a blood-vessel.

Liver.—The largest glandular organ in the body. It is situated to the right of the upper part of the abdomen. Its functions are (1) To *secrete bile.* (2) To convert sugar secreted from the *capillaries* passing through it from the portal vein into glycogen, and store it for return to the blood as sugar when required. (3) To convert nitrogenous matters accumulated in the *alimentary* canal into urea. (4) To take part in the formation and destruction of blood *corpuscles.*

Loin.—The part of the back between the thorax and the pelvis.

Lumbar.—Pertaining to the loin.

Lungs.—The organs of respiration. They are situated one on each side of the thorax. Each is enclosed in a double envelope called the pleura, and consists of a number of air tubes arising from one of the bronchi (branches of the windpipe), and terminating in air cells (alveoli) surrounded by a network of capillaries.

The total capacity of the lungs of an adult is about 330 cubic inches.

	Cubic inches.
In ordinary breathing there remains in the lungs after expiration Stationary Air	200
At each ordinary inspiration is drawn in Tidal Air about ¾-pint, or	20 to 30
By a deep inspiration further air—Complemental Air—can be drawn in ...	100
Total about 9½ pints, or ...	330

After each deep respiration the next expiration forces out—

	Cubic inches.
Complemental Air (in ordinary inspiration not taken in, and therefore not forced out at the next expiration) 100	
Tidal Air ... ... 20 to 30	
	130
By forced expiration further air—**Supplemental Air**—can be forced out	100
Leaving **Residual Air** which cannot be forced out	100
Total	330

Lymph.—A fluid which escapes from the blood through the walls of *capillaries* into spaces in the tissues and there serves to bathe and nourish the *cells*. Some of it leaves the body in the form of sweat, and the remainder passes into vessels known as lymphatics, which convey it to the back of the abdominal cavity, whence it is carried either direct or by the *Thoracic Duct* to the veins.

Lymphatic.—A vessel conveying *lymph*.

Lysis.—The gradual abatement of symptoms of fever.

Maxilla.—A jaw bone.

Medulla Oblongata.—See *Brain*.

Membrane.—A thin texture, such as covers the organs, or lines the cavities or vessels of the body.

Meninges.—*Membranes* covering the brain and spinal cord.

Meningitis.—Inflammation of the *meninges*.

Metabolism.—A general term to include the chemical changes which take place in living tissues.

Metacarpus.—Five bones in the palm of the hand extending from the *carpus* to the *phalanges.*

Metatarsus.—The part of the foot with its five metatarsal bones between the *tarsus* and the *phalanges.*

Metric System of Weights and Measures.—The following information will, as a rule, be sufficient for the Home Nurse :—

WEIGHTS.

1000 Milligrammes = 1 Gramme.
1000 Grammes... = 1 Kilogramme.

Approximately—

1 Gramme ... = 15½ Grains.
1 Kilogramme = 2 lbs. 3 ozs.
1 Grain ... = 65 Milligrammes.
1 Oz. ... = 28⅓ Grammes.

FLUID MEASURES.

1000 Cubic Centimetres (C. C.) = 1 Litre.

Approximately—

1 C. C. ... = 16 Minims.
1 Litre ... = 1¾ Pints.
1 Fluid ounce = 28⅓ C. Cs.
1 Gallon ... = 4½ Litres.
3½ Fluid ounces = 100 C. Cs.

MEASURES OF LENGTH.

1000 Millimetres = 1 Metre (100 Centimetres).
1000 Metres ... = 1 Kilometre.

Approximately—

1 Metre ... = 39½ Inches.
1 Kilometre = 5 Furlongs.
1 Inch ... = 25 Millimetres.
1 Mile ... = 1⅔ Kilometres.

Mistura (mist.).—A mixture.

Mixture, Mechanical.—Two or more substances

merely mixed together without any change of their properties being effected.

Morbid.—Diseased.

Mucus.—A slimy fluid *secreted* by the lining of the various channels of the body which communicate with the outside—the mucous membranes.

Muscle.—The red flesh. An organ which by contraction produces movement. **Striated or striped muscles** are those in which contraction is under the influence of the will; also the heart muscle. **Unstriated muscles** are those in which the contractions are involuntary (the heart muscle excepted).

Nasal.—Pertaining to the nose.

Needle.—Straight (Fig. A). Half curved (Fig. B). Full curved (Fig. C). Sizes: largest 1, smallest 30.

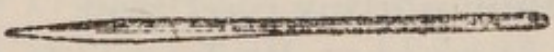


FIG. A.

FIG. B

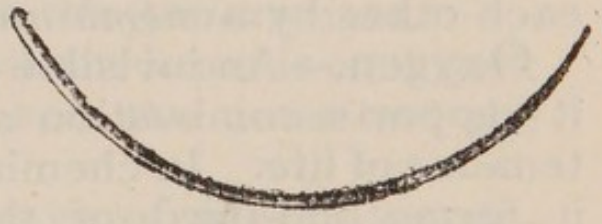


FIG. C.

Needle Holder.—An instrument for firmly grasping a

needle during use.

Nephritis.—Inflammation of one or both of the kidneys.

Nerve.—A pearly white cord-like structure for the conveyance of impulses. **Motor nerves** carry impulses from the nerve centres (brain, spinal cord, and sympathetic *ganglia*) to muscles, thereby causing movement.

Sensory nerves carry impressions to the nerve centres.

Neurotic.—Pertaining to the nerves.

Nitrogen.—An invisible gas which can neither be burnt nor support combustion. In *mechanical mixture* with oxygen and small quantities of other gases it forms about four-fifths of the volume of air.

Œdema.—Dropsy. An *effusion* of serum into the deeper layers of the skin.

Œsophagus.—The canal which conveys food from the *pharynx* to the stomach. The *gullet.*

Ophthalmic.—Pertaining to the eye.

Oral.—Pertaining to the mouth.

Organ.—Any part of the body which performs a special function. For example—the heart, eye, liver, etc.

Osmosis.—The mingling of fluids separated from each other by a *membrane* or other porous partition.

Oxygen.—An invisible gas. It cannot be burnt, but it supports combustion and is essential to the maintenance of life. In chemical combination with hydrogen it forms one-third of the volume of water, and, in mixture with nitrogen and small quantities of other gases, it forms about one-fifth of the volume of air.

Oxyhæmoglobin. — *Hæmoglobin* charged with oxygen.

Palate.—The partition separating the nose from the mouth. The front, bony portion forms the roof of the mouth. The soft palate is the curtain attached to the back of the hard palate looped in the centre to form the *uvula.*

Pancreas.—A large gland situate below the stomach. It secretes pancreatic juice to aid digestion.

Pathogenic.—Disease-producing.

Pathology.—The science dealing with the nature and causes of disease.

Pelvis.—The bony basin-shaped ring formed by the two haunch bones, the *sacrum* and *coccyx*. The haunch bones meet in front at the pubes, but at the back the *sacrum* is placed between them. The pelvis serves to support the trunk and affords sockets for the heads of the thigh bones. The cavi y of the pelvis contains the *bladder*, the *rectum* and, in females, the womb.

Penis.—The male genital organ.

Pepsin.—A ferment found in the *gastric* juice, which aids in the digestion of *proteids* by converting them to peptones.

Peptone.—A *proteid* which has been subjected to the action of pepsin.

Peptonise.—To convert a *proteid* into *peptone*.

Pericarditis.—Inflammation of the *pericardium*.

Pericardium.—The sac in which the heart is enclosed.

Perineum.—The space between the anus and the genital organs.

Peristalsis.—An involuntary wave of worm-like contraction of the muscular coat of the alimentary canal, causing the passage of its contents.

Peritoneum.—The *membrane* lining the *abdomen* and covering several of its organs.

Peritonitis.—Inflammation of the *peritoneum*.

Phagocyte.—Any cell that absorbs and destroys harmful germs. Phagocytes are found as white corpuscles in the blood, when they are known as leukocytes, or they may be fixed to tissue.

Phalanx (pl. Phalanges).—Any one of the bones of a finger or toe.

Pharynx.—The back part of the throat; it forms the upper part of the gullet.

Phlebitis.—Inflammation of a vein.

Phthisis.—Consumption. Tubercular disease of the lungs.

Physics.—The science dealing with the properties of matter due to its form—size, weight, heat, hardness, etc. Matter may be in the form of a solid, a liquid, or a gas, and the change from one of these forms to another is a physical change.

Physiology.—The science dealing with the functions of the organs and parts of the body.

Plasma.—The watery part of blood in which the *corpuscles* float. When deprived of its *fibrin* it becomes *serum*.

Pleura (pl. Pleuræ).—Each of the two pleuræ is a double membrane, the inner fold of which adheres to and encloses a lung, while part of the outer fold is attached to and lines the walls of one side of the *thorax*, and the remainder serves to separate that cavity into compartments. In health the two folds, except for a little lubricating fluid, touch each other, but are not connected except near the spine, where they join to assist in attaching the lung to the *thoracic* wall.

Pleurisy.—A disease characterized by inflammation of one or both of the *pleuræ*.

Pneumonia.—Inflammation of the lungs.

Popliteal.—Pertaining to the back of the knee.

Posterior.—Situated behind.

Probe.—A slender instrument for introduction into a wound or part for purposes of exploration or the introduction of thread, packing, etc.

Prophylactic.—Tending to ward off disease.

Proteid.—An animal or vegetable substance, containing carbon, hydrogen, oxygen, and nitrogen. Proteids are contained in lean meat, white of an egg, the pulses (beans, peas, lentils, etc.), milk, and many other forms of food.

Proximal.—Nearest the centre. Example: The

proximal side of a wounded blood-vessel is that towards the heart.

Pus.—A thickish fluid frequently produced during inflammation.

Pylorus.—The junction of the stomach with the small intestine.

Pyogenic.—*Pus* forming.

Pyrexia.—A *febrile* condition.

Radius—The bone of the forearm on the thumb side.

Rectum.—The lowest part of the large intestine.

Rib.—Any one of the twelve pairs of bones which extend from the *dorsal vertebræ* to or towards the *sternum*. False ribs: The lower five pairs; they are not directly connected with the sternum. Floating ribs: The lowest two pairs, which are attached only to the vertebræ. True ribs: The upper seven pairs, directly attached to the vertebræ and the sternum.

Rigor.—A shivering fit.

Sacrum.—Part of the *spinal column*, formed of five *vertebræ*, united in adults. It lies between the haunch bones.

Saliva.—An alkaline secretion from the salivary glands into the mouth. It has the property of turning starch into sugar; it moistens food and so assists mastication.

Salt.—Any chemical compound formed by the combination of an acid or acid gas with an alkali or metal. Common salt and common soda are amongst the most frequent examples.

Saponify.—To convert or to become converted into soap.

Saturated.—Incapable of holding in solution any more of a given substance.

Saturated Steam.—The vapour of water which has not been heated after it has left the water. Moist steam.

Scalpel.—A surgical knife with a convex cutting

edge.

Scapula.—The shoulder blade.

Scrotum.—The pouch situated behind the *penis* containing the testicles.

Secretion.—The separation of a substance from a circulating fluid such as the blood. Also the substance so separated; for example, *sweat*, *saliva*, *bile*, etc.

Sepsis.—Condition of putrefaction.

Septic.—Conducive or due to putrefaction.

Septicœmia.—Blood-poisoning due to *pathogenic bacteria* and their *toxins*.

Serum.—A colourless fluid which separates from a clot of blood. It is *plasma* deprived of its *fibrin*. The serum of animals previously inoculated with *bacteria* or their *toxins* is used to inoculate human beings, to render them immune to certain infectious diseases.

Seton.—A strip of gauze passed through a wound to keep open a channel for the escape of discharges.

Skeleton.—The framework of the body.

Skull.—The bony framework of the head; it consists of twenty-two bones—eight of the cranium and fourteen of the face.

Spasm.—A rigid muscular contraction. (See *Convulsion.*)

Spatula.—A flat instrument used for mixing oint-

ments, spreading poultices or holding down the tongue, etc.

Splanchnic.—Pertaining to the *viscera.*

Spinal Canal.—A cavity enclosed by the processes of the *vertebræ.* It extends the whole length of the spine and contains the *spinal cord.*

Spinal Cord.—The cord-like structure contained in the spinal canal. It is continuous through an opening in the base of the skull with part of the *brain*, the *medulla oblongata*, and reaches to the second *lumbar vertebra.* Thirty-one pairs of nerves branch off from it, and so impulses between the brain and various parts and organs of the body are conveyed. It is, moreover, the centre for certain nerve impulses.

Spleen.—An organ placed to the left of the upper part of the *abdomen.* Its functions have not been definit ly determined, but it undoubtedly has much to do with the destruction of effete red blood corpuscles and probably with their production.

Sporadic.—Occurring in a few cases; the opposite to *epidemic.*

Sputum.—The substance that is expectorated.

Sterile.—Free from germs. Aseptic.

Sternum.—The dagger-shaped bone in front of the thorax. The breast bone.

Stertor.—Breathing accompanied by a noise like snoring.

Stomach.—An enlargement of the digestive tract, connected at its *cardiac* end with the *gullet*, and at the *pylorus* with the small intestine. It is situated in front of the abdomen just below the diaphragm, rather more to the left than the right side.

Stupor.—Insensibility, more or less complete. The patient can frequently be aroused, or the unconsciousness may deepen into *coma.*

Sub-cutaneous.—Beneath the skin.

Superheated Steam.—The vapour of water heated after it has left the water. Dry steam.

Superior.—Upper.

Suppuration.—The formation of *pus.*

Suture.—A surgical stitch, may be of catgut, silk, horsehair, silver wire, etc.

Swab.—A piece of sterilised wool or gauze.

Sweat.—A clear liquid *secreted* from the tissues and exuded from the pores of the skin. Perspiration. (See *Evaporation.*)

Syncope.—Fainting.

Synovia or Synovial Fluid.—An oily fluid secreted by the synovial membrane to lubricate moveable joints.

Tarsus.—The part of the foot below the bones of the leg, consisting of seven bones which form with the *metatarsal* bones the arch of the foot.

Tetanus.—An *acute* disease, due to a *bacillus* (see *Bacterium*), accompanied by persistent muscular contractions, usually in the neighbourhood of the jaw.

Thermometer.—An instrument for measuring temperature. Centigrade (C.): Freezing point of water, 0°; boiling point, 100°. Fahrenheit (F. or Fahr.): Freezing point of water, 32°; boiling point, 212°. To convert degrees Centigrade into degrees Fahrenheit multiply by 9, divide by 5, and add 32—

Example: 50°C. $\times 9 = 450 \div 5 = 90 + 32 = 122$°F.

To convert degrees Fahrenheit into degrees Centigrade subtract 32, multiply by 5, and divide by 9—

Example: 50°F. $-32 = 18 \times 5 = 90 \div 9 = 10$°C.

Thoracic.—Pertaining to the chest.

Thoracic Duct.—The channel for the transmission of *lymph* and *chyle* from the parts of the body below the diaphragm, and lymph from the left side of the body above the diaphragm. It ascends from the chyle

receptacle in the abdomen to empty itself into large veins at the left side of the root of the neck.

Thorax.—The cavity between the neck and the abdomen. The chest.

Tibia.—The shin bone.

Tissue.—The substance of which the *organs* and other parts of the body are formed. The muscular, bony and nervous tissues are examples. All tissues are composed of *cells*, and differ from each other according to the nature and arrangement of the cells.

Tonsil.—Either of the two glands at the root of the tongue.

Tonsillitis.—Inflammation of one or both tonsils.

Toxin.—Poison produced by the action of *bacteria*.

Trachea.—The tube descending from the *larynx* to the *bronchi*. The wind-pipe.

Tuberculosis.—A disease affecting various organs, produced by the tubercle *bacillus*.

Ulcer.—An open sore.

Ulna.—The bone of the forearm on the little finger side.

Umbilicus.—The navel.

Urea.—A nitrogenous waste product of *metabolism*. It is *secreted* from the blood by the *kidneys*, to be *excreted* as part of the *urine*.

Ureter.—The tube which conveys urine from a kidney to the bladder.

Urethra.—The passage for the excretion of urine from the bladder.

Urine.—The fluid secreted from the blood by the *kidneys*. It passes by the *ureters* to the *bladder*, where it is stored, to be periodically discharged through the *urethra*. The normal discharge of urine is interfered with as follows :—

In Retention, though the bladder is full, no urine is passed, and the patient suffers pain and discomfort.

In Suppression, no urine is passed because the kidneys are not acting, and the bladder is therefore empty, but there is no pain at all.

In Incontinence, the patient's bladder involuntarily empties itself either at intervals of four to six hours, or by a continuous dribbling. There is no pain.

In Retention with Dribbling pain is felt.

Uterus.—The womb.

Uvula.—The small cone of flesh hanging from the soft *palate* above the root of the tongue.

Vaccine.—A preparation of a *bacterium* or its *toxins* for introduction into the body as a preventive of a specific disease.

Vagina.—The passage to the womb.

Vein.—Any one of the vessels that carry blood from the capillaries to the heart.

Venæ Cavæ.—The two great trunk veins of the body, which carry blood to the right auricle of the heart. The Inferior vena cava collects the blood from the veins of the lower part of the body, and the Superior vena cava collects it from the veins of the upper part.

Vertebra (pl. Vertebræ.)—Any one of the thirty-three bones of the spinal column. Each vertebra consists of (1) A front body. (2) Processes projecting backwards, which enclose the spinal canal through which runs the spinal cord. (3) A pair of transverse processes, which in the dorsal vertebra support the ribs. (4) A spinous process, which projects downwards and backwards behind the spinal canal. **Cervical V.** The seven vertebræ of the neck. **Coccygeal V.** The lowest four vertebræ which are united to form the coccyx. **Dorsal V.** The

twelve vertebræ at the back of the *thorax*, and which support the ribs. **Lumbar V.** The five vertebræ between the dorsal vertebræ and the sacrum. **Sacral V.** The five vertebræ united in adults which form the sacrum.

Viscus (pl. Viscera).—Any one of the large internal *organs*.

X-rays.—Rays of electricity used for seeing or photographing bones and foreign bodies through the flesh.

Zymosis.—Fermentation. The development of an infectious disease due to the development of *bacteria* and their *toxins*. Such diseases are called zymotic.

INDEX.

The St. John Ambulance Association

ABRIDGED PRICE LIST.

A complete and reliable Ambulance Equipment is an actual necessity, and experience has proved that employers of labour and others interested in the district readily subscribe for the purchase of such appliances.

The General Price List of the Association is divided into sections, viz.:—**Litters; Stretchers; First Aid Outfits; Badges, Bandages, Dressings and Sundries; Publications; Uniforms; Uniform Badges and Buttons.**

Either or the whole can be had upon application.

Owing to fluctuations in market prices it is impossible to guarantee that the quotations given herein can be adhered to.

Orders value 40s. or over are sent **carriage paid** to any part of the United Kingdom. Carriage is also paid on Book Diagrams, Bandages, etc., returned from classes of instruction.

To save delay, it is requested that an amount sufficient to cover postage or carriage be kindly added to remittances sent in payment of orders of less value. Any excess will be returned.

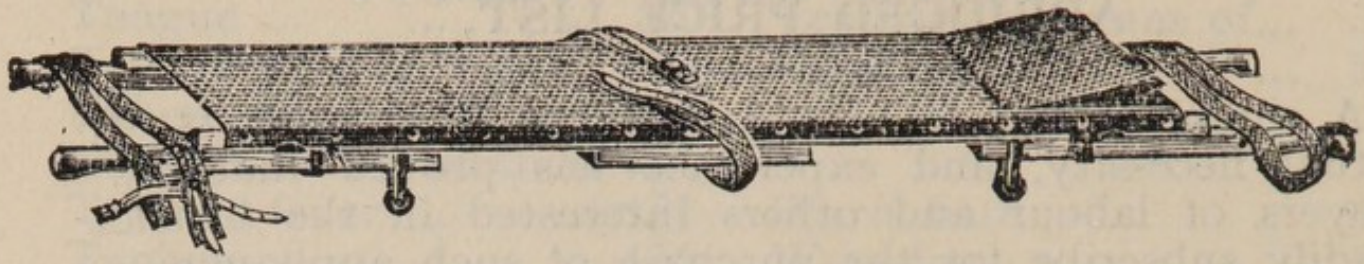
Orders and correspondence should be addressed to the **St. John Ambulance Association, St. John's Gate, Clerkenwell, London, E.C. 1**, where all information regarding the work of the Association can be obtained on application.

Remittances should be made payable to the St. John Ambulance Association, and crossed "Westminster Bank, Ltd., Clerkenwell Branch."

Money Orders and Postal Orders may be made payable at the Clerkenwell Green Post Office.

Carriage Paid on all Orders value 40/- or over in the United Kingdom.

"FURLEY" STRETCHERS.



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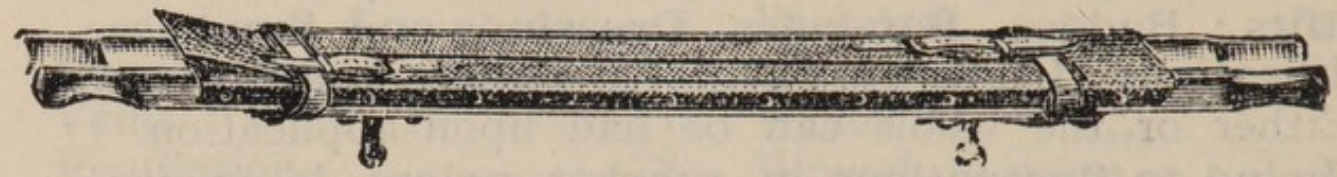

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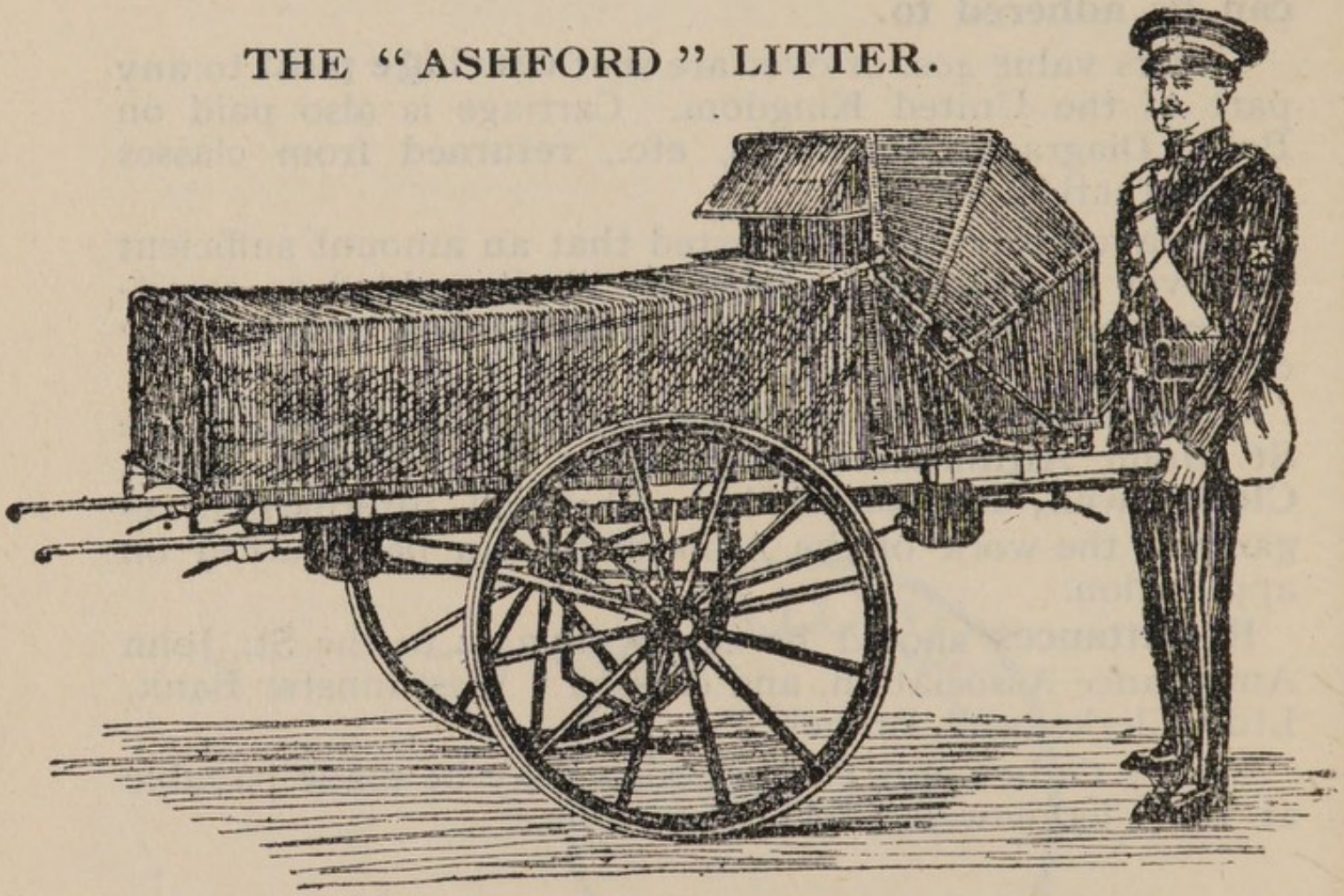
THE "ASHFORD" LITTER.



Carriage Paid on all Orders value 40/- or over in the United Kingdom.

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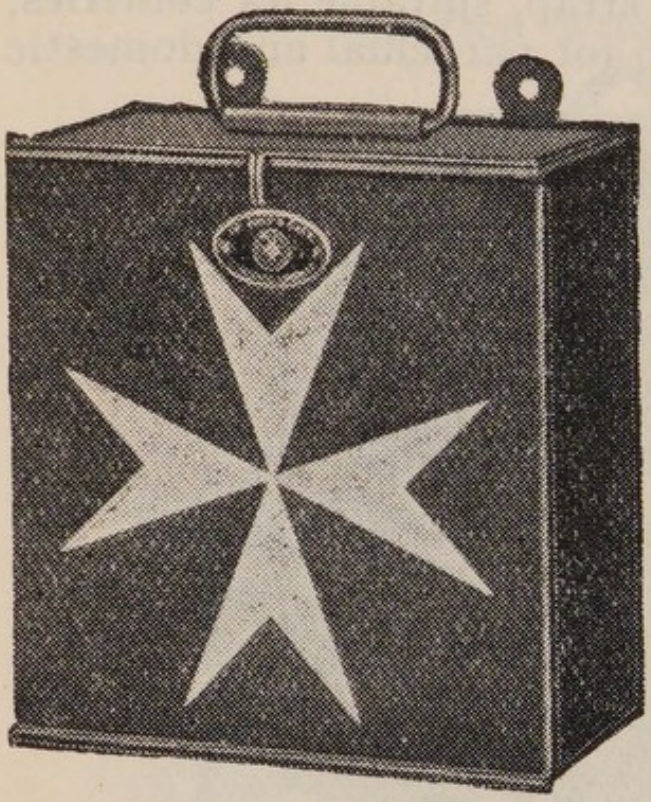

No. 1.—FIRST AID FACTORY BOX.

This outfit is specially fitted to meet the requirements of all classes of Factories and Workshops under the above Order.

Price from £1 8s. to £1 17s.

Descriptive Price List on application.

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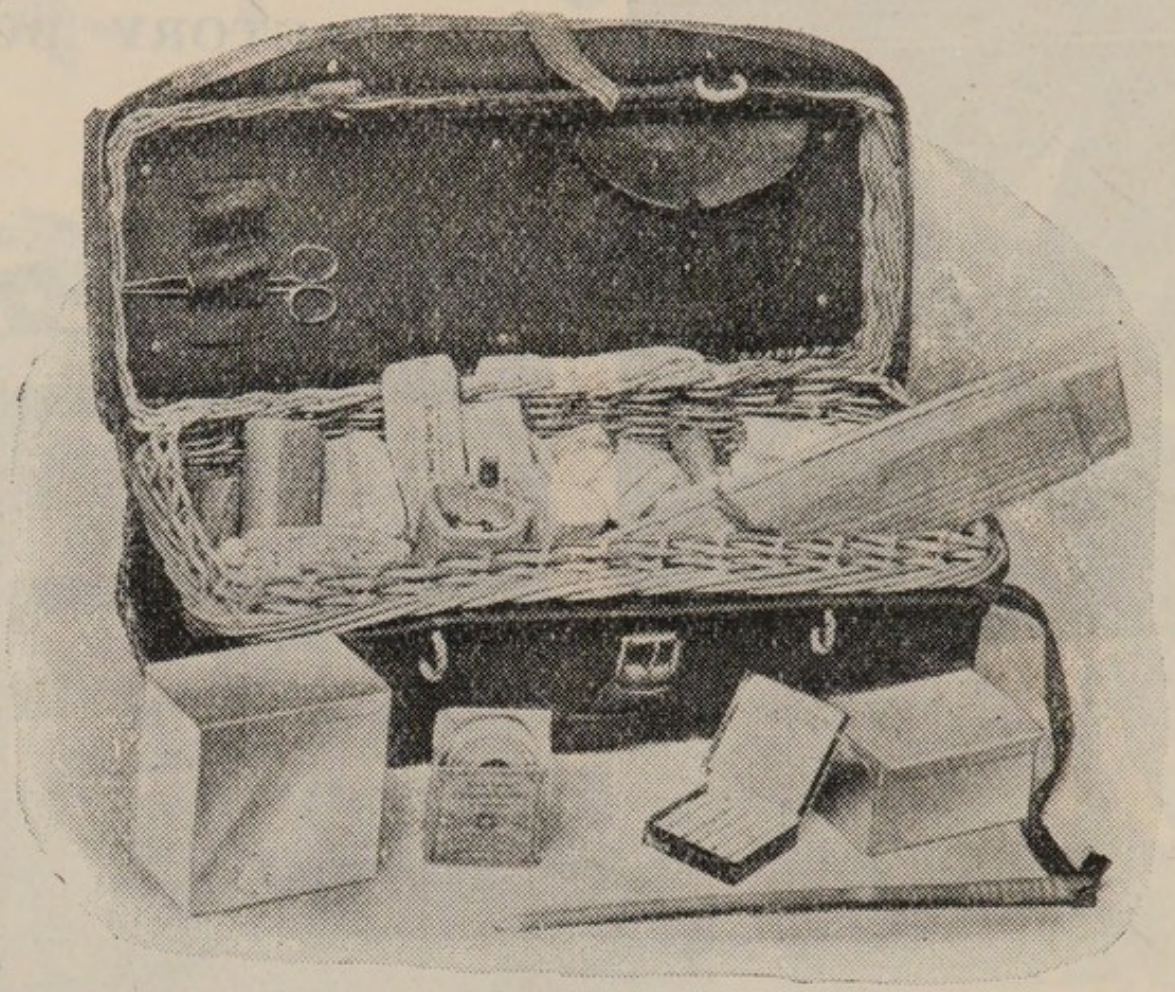
No. 12.—SMALL AMBULANCE HAMPER.

With waterproof cover and strap, suitable for collieries, small ambulance stations, also for parochial and domestic use.



CONTAINING

Set of Splints, Set of Splint Straps, St. John Tourniquet, 1 oz. of Tincture of Iodine, 1oz. Sal. Volatile, 6 Roller Bandages (wide and narrow) 6 Triangular Bandages, Boric Lint, Cotton Wool (two latter in tin cases), 6 Sterilised Finger Dressings, 2 ditto Hand and Foot Dressings, 1 ditto Large Dressing, 1 Small Burn Dressing, 1 Large Burn Dressing, 1 Extra Large Burn Dressing, Spool of Adhesive Plaster, Scissors, Iodine Pen, 1 oz. Sal. Volatile, 2 oz. Medicine Tumbler, 1 Pair Dressing Forceps, Thread, Tape, Needles and Pins.

Weight complete, about 6½ lbs.

Length, 1 ft. 6 in. Depth, 5 in. Width, 7 in. (approx).

Price, £2 8s.

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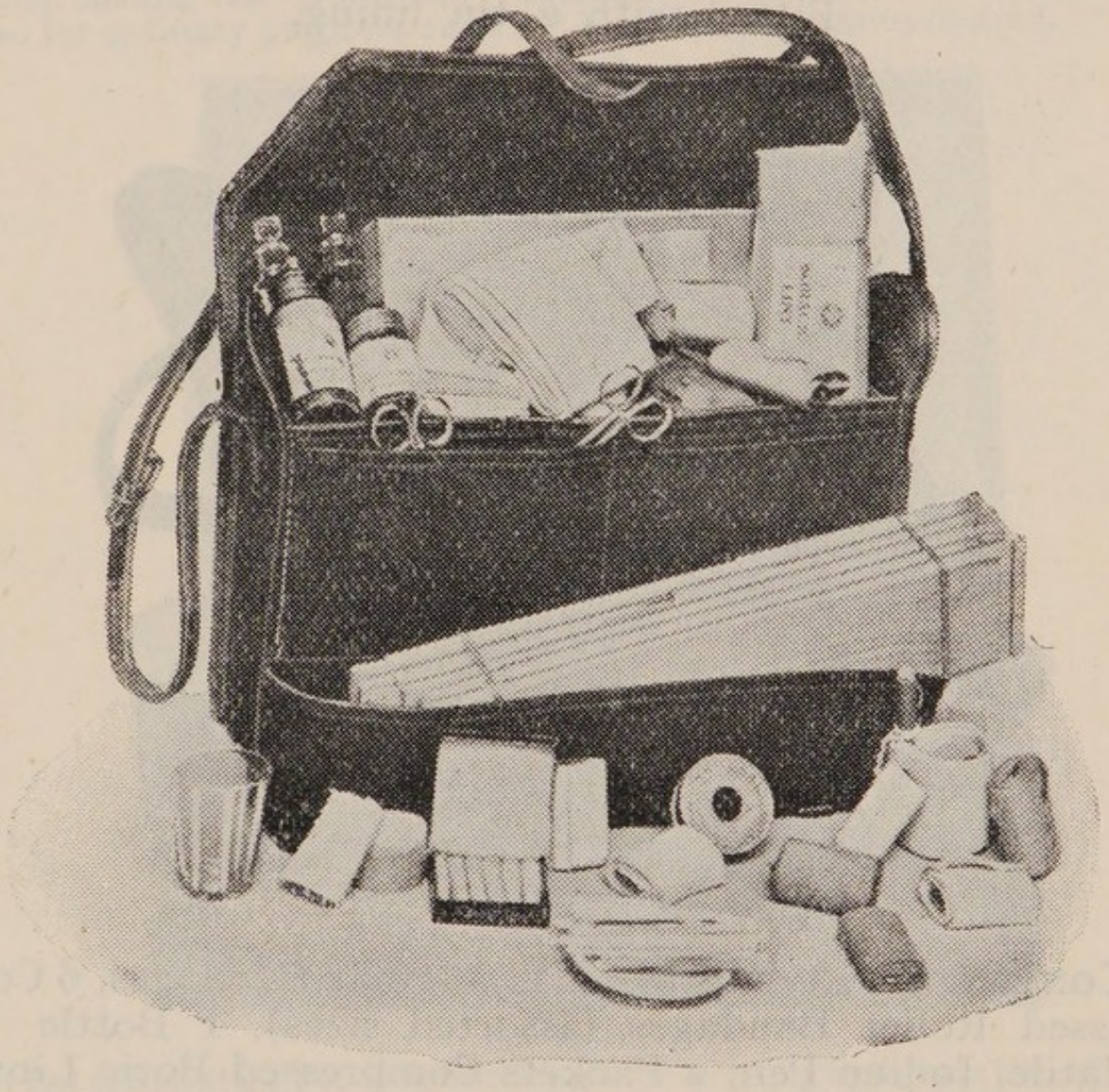
The regulation outfit for the St. John Ambulance Brigade. Fitted with a tin lining.



CONTENTS: 1 Set of Splints, 1 Set of Splint Straps, 6 Triangular Bandages, 12 Roller Bandages (wide and narrow) Cotton Wool, Boric Lint, 1 Roll Adhesive Plaster, 1 Pair Scissors, 2 oz. Tinct. Iodine, 1 Iodine Pen, 2 oz. Sal Volatile, 2 oz. Boric Acid Powder, 1 Dredger, 2 oz. Medicine Tumbler, 1 St. John Tourniquet, Safety and Plain Pins, Smelling Salts. Price £2 5s.

Carriage Paid on all Orders value 40/- or over in the United Kingdom.

No. 16.—NURSES' HAVERSAC.

Fitted with a tin lining.

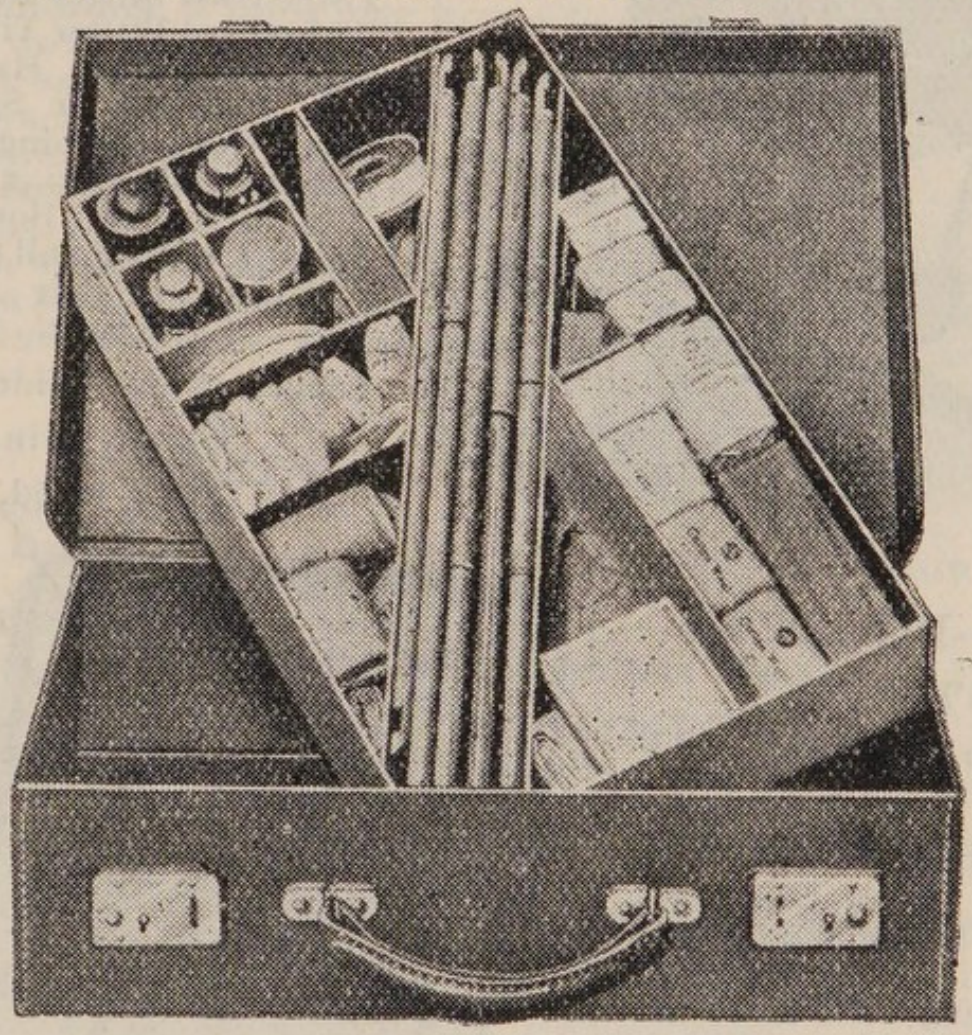
CONTENTS: 2 Compressed Triangular Bandages, 6 Compressed Roller Bandages (assorted sizes), 1 Bottle Sal Volatile, Iodine Pen, 2 Packets Compressed Boric Lint, 2 Packets Compressed Cotton Wool, 1 Box Adhesive Plaster, 2 Sterilised Finger Dressings, 2 Sterilised Finger Tip Dressings, 2 Sterilised Hand and Foot Dressings, 1 Sterilised Large Burn Dressing, 1 Sterilised Small Burn Dressing, 1 Pair Scissors, 1 Pair Dressing Forceps, 2 oz. Medicine Tumbler, Safety and Plain Pins, Smelling Salts.

Price 18s.

Carriage Paid on all Orders value 40/- or over in the United Kingdom.

No. 17.—THE "ATTACHÉ" OUTFIT.

Consisting of an ordinary 14 in. leather attaché case (stock size), and a tin lining holding the "First Aid" equipment, thus allowing the case to be used for ordinary purposes or as a "First Aid" outfit as desired.



CONTENTS :

1 Set of Splints, 1 Set of Splint Straps for securing Splints in lieu of Bandages, 3 Triangular Bandages, 6 Roller Bandages (assorted sizes), 6 Small Packets Absorbent Cotton Wool, 6 Small Packets Boric Lint, 4 Sterilised Finger Dressings, 4 Sterilised Hand and Foot Dressings, 1 Large Burn Dressing, 2 Small Burn Dressings, 1 St. John Tourniquet, 2-oz. Medicine Tumbler, 1 Spool Adhesive Plaster, 1 Packet Boric Lint Patches, 1 Packet Pins and Safety Pins, 1 Pair Scissors, 1 Pair Dressing Forceps, 2 oz. Sal Volatile, 2 oz. Collodion, 2 oz. Tincture Iodine, 1 Iodine Pen, 1 Dredger, Boric Acid Powder, Smelling Salts, 4 Sterilised Large First Aid Dressings.

Price £2 9s.

Carriage Paid on all Orders value 40/- or over in the United Kingdom.

No. 20.—POCKET FIRST AID CASE.

CONTENTS :

6 Ampoules Tincture Iodine, 2 Sterilised Finger Dressings, 1 Sterilised Finger Tip Dressing, 1 Sterilised Hand and Foot Dressing, 1 Sterilised Small Burn Dressing, 1 Roll Adhesive Plaster, 1 Packet Pins, 1 Packet Boric Lint Patches, 1 Pair Small Scissors, 1 Knife, 1 Pair Splinter Forceps.

Length $4\frac{3}{4}$ in. Width $3\frac{1}{2}$ in.

Depth, $1\frac{1}{4}$ in.

Price, 7s. 6d.

No. 21.—POCKET FIRST AID COMPANION.

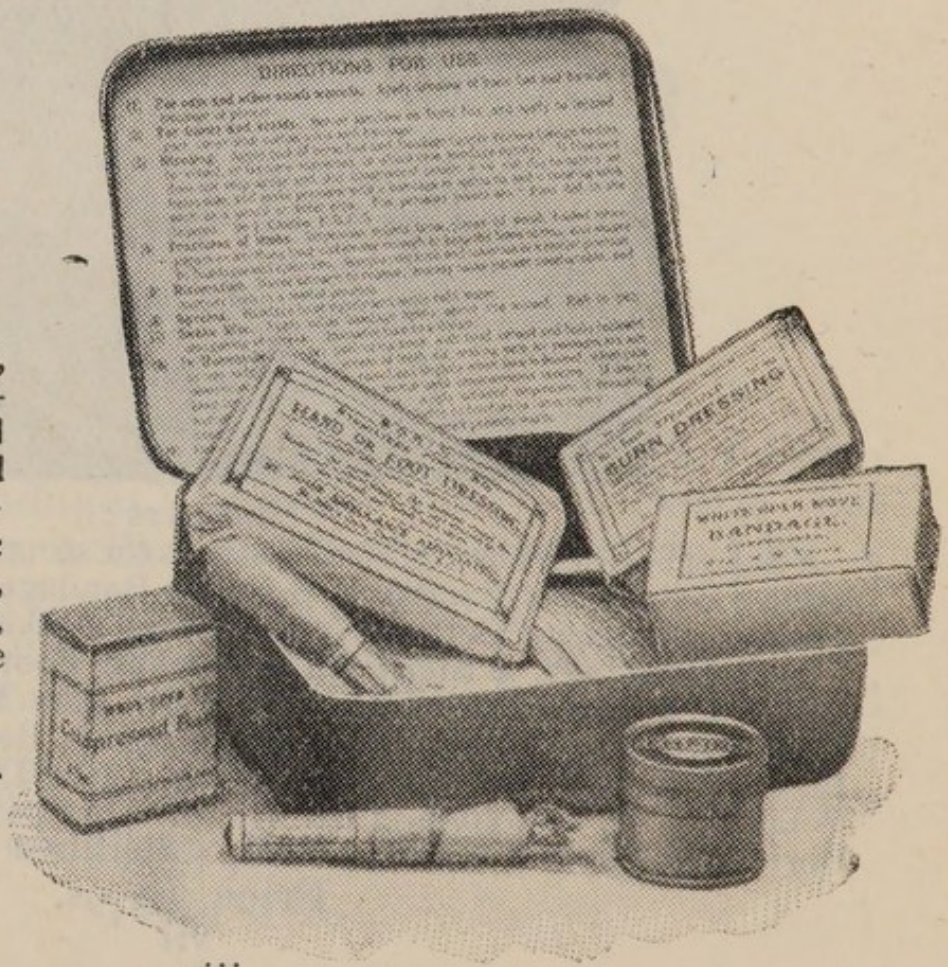
CONTENTS :

1 Sterilised Finger Dressing, 1 Sterilised Finger Tip Dressing, 1 Sterilised Hand and Foot Dressing, 1 Sterilised Small Burn Dressing, 2 Compressed Roller Bandages, 2 Ampoules Tincture Iodine, 1 Packet Boric Lint Patches, 1 Packet Pins, 1 RollAdhesive Plaster.

Length, $4\frac{3}{4}$ in. Width, $3\frac{1}{2}$ in.

Depth, $1\frac{1}{4}$ in.

Price, 1s. 6d.



Carriage Paid on all Orders value 40/- or over in the United Kingdom.

BANDAGES, SURGICAL DRESSINGS and PLASTER.

Roller Bandages, 6 yards long from 1 to 6 inches wide, white or grey, open wove or grey calico.

In assortment, packed in neat cartons. Recommended for class practice, one 1 in.; two 2½ in.; two 3 in.; 6 yards long, grey calico or thick white open wove.

Cotton Wool, absorbent white, in 1, 2, 4, 8 or 16 oz. packets.

Medicated (Boracic), in 4 and 16 oz. packets.

Lint, plain white and medicated (Boracic), in 1, 2, 4, 8 and 16 oz. packets.

Gauzes, in 6-yard length, about 36 in. wide, plain or medicated.

Plaster, Rubber adhesive (Antiseptic), widths ½ in. to 2 in., 5 and 10 yard spools.

Prices of the above on application.

NURSING INSTRUMENTS.

Forceps, spring dressing, full size or small, 1s. 3d.; Artery, 2s. 3d.

Scissors, Dressing, round blades, 5 in., 1s. 9d., 2s.; sharp pointed, large, 2s. 6d.; small, for delicate work, 1s. 6d.

Knife, 2 Blades, 9d.

Spatula, 9d. **Probe,** 6d. **Director, with Ear Scoop,** 1s. 3d.

CLINICAL THERMOMETERS.

Round.—No. 1, ordinary, 1s. 6d.; No. 2, minute, 1s. 8d.; No. 3, half-minute, 1s. 10d.

With Broad Index, will not roll.—No. 7, ordinary, 1s. 7d.; No. 8, minute, 1s. 9d.; No. 9, half-minute, 2s.

In ordering it is only necessary to quote the registered number of the Thermometer required.

N.B.—Minute and half-minute instruments will only register in the time stated under favourable circumstances.

BATH THERMOMETERS.

Japanned, enamel mercury tube, silvered brass scale, 2s., with Dr. Forbes' specification.

"Floating" paper scale to show 140° F., in wood frame, 1s. 4d., with Dr. Forbes' specification.

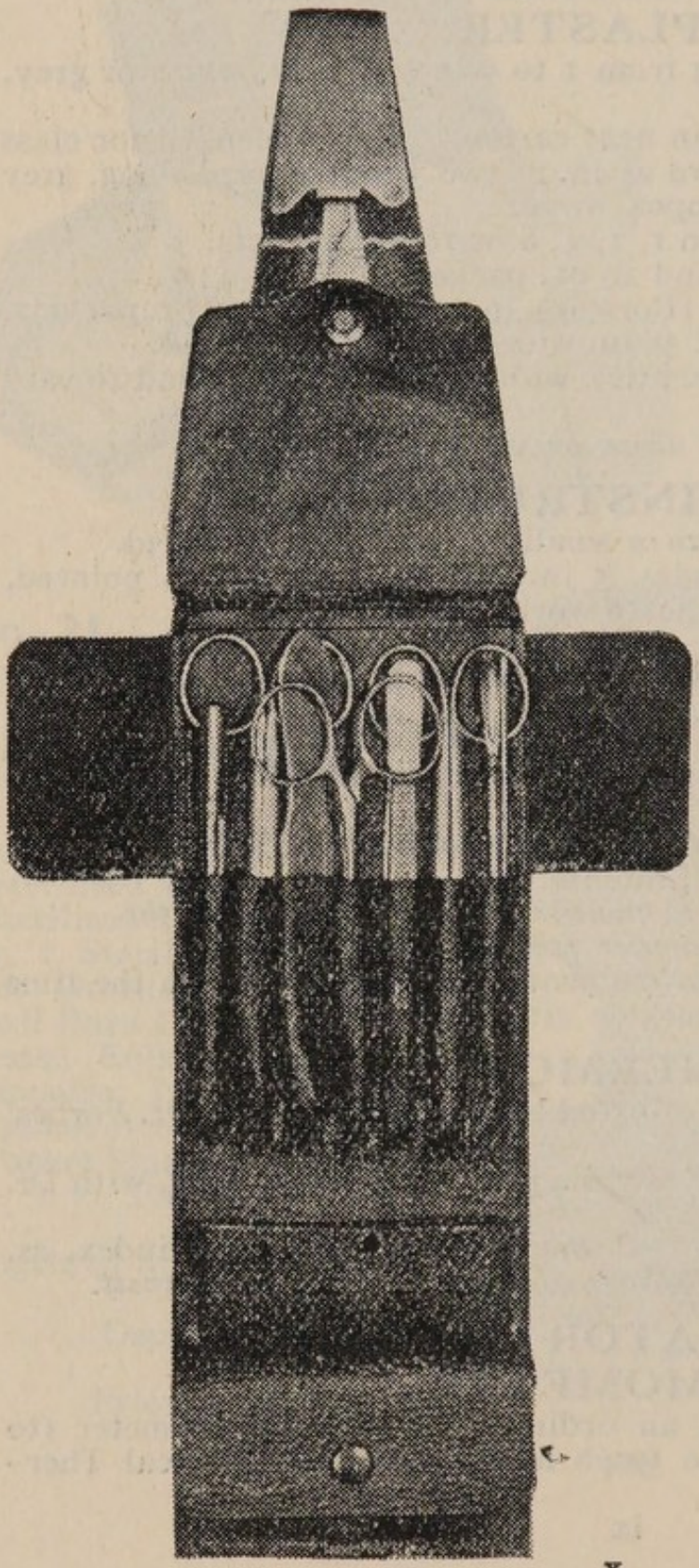
Clinical, in metal case, N.P.L. tested, one minute, magnifying index, 2s.

No liability is taken for breakage of Thermometers in Transit.

DEMONSTRATOR CLINICAL THERMOMETER.

An enlarged Working Model of an ordinary Clinical Thermometer (to scale), useful in assisting to teach how to read the Clinical Thermometer. Price 6d. each.

Carriage Paid on all Orders value 40/- or over in the United Kingdom.



NURSES' WALLETS.

ST. JOHN'S PATTERN.

Without Instruments,
14s. 6d.

Fitted complete, containing Spring Dressing Forceps, Artery Forceps (also useful for dressing), Spatula, Probe, Director with Ear Scoop, 2 pairs Scissors, Clinical Thermometer (minute, round), Pencil, and Safety Pins.

Price .. £1 11s. 6d.

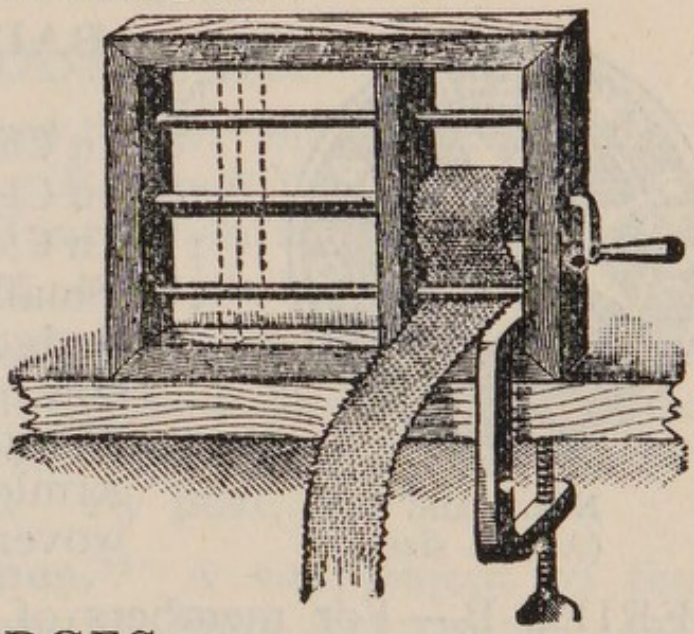
Carriage Paid on all Orders value 40/- or over in the United Kingdom.

ROLLER BANDAGE MACHINE.

Designed by

Dr. A. C. TUNSTALL.

Price 3s.

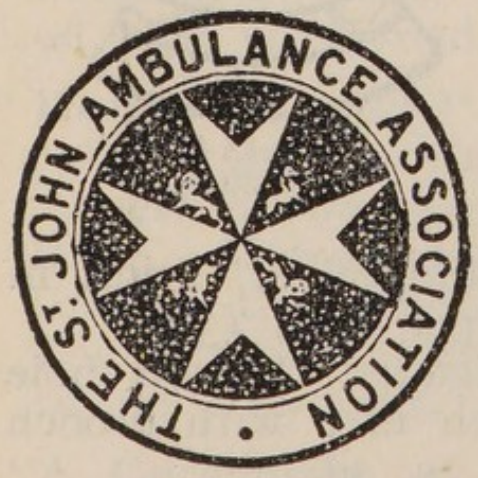


BADGES.

Badges issued under authority as the sole official and recognised Badges of the St. John Ambulance Association and St. John Ambulance Brigade. **N.B.—These Designs are protected.**

SERIES A.—For the use of individual certificated pupils of the St. John Ambulance Association—

No.		dia.		s.	d.
1.	**In Nickel Silver,** Large Size ..	2	in.	0	7½
2.	Do. Small Size ..	1¼	,,	0	6
3.	Do. Small Size for button hole ..	1	,,	0	6
4.	**In Electro Plate,** Large Size ..	2	,,	1	3
5.	Do. Small Size ..	1¼	,,	1	0
6.	Do. Small Size for button hole ..	1	,,	1	0
7.	**In Enamel,** for button hole ..	1	,,	1	0
8.	Do. as brooch ..	1	,,	1	3



Nos. 3 and 6 (Actual size).

Carriage Paid on all Orders value 40/- or over in the United Kingdom.

Nos. 7 and 8.
(Actual size).

BADGES—(*Continued*).

No.		dia.	s.	d.
9.	In Cloth and Silk .	1¾ in.	0	9
10.	In Cloth and Silver	2 ,,	3	0
11.	In Cloth & Cotton	1¾ ,,	0	6
12.	Small Celluloid Badge, for button hole or brooch ..	⅞ ,,	0	2
13.	White Cotton Armlet with woven Badge ..	2¼ ,,	0	8

SERIES B.—For members of the St. John Ambulance Brigade, not wearing uniform, having the name of the Corps or Division annexed on a label, only issued in quantities—

No.

15. In Nickel Silver, 2 ins. in diameter, first doz., £1 4s.; subsequent dozs., 13s.
16. In Electro Plate, 2 ins. in diameter, first doz., £1 16s.; subsequent dozs., £1 4s.
17. In Cloth and Silk, 2 ins. in diameter, per doz., £1 10s.

Nos. 15 to 18.
(Reduced.)

No.

18. In Cloth and Silver, 2 ins. in diameter, per doz., £3.
19. The "Brigade" button hole badge, each 1s.; with brooch pin, each, 1s. 3d.

No. 19.
(Actual size.)

N.B.—These Badges are not to be worn as decorations.

Carriage Paid on all Orders value 40/- or over in the United Kingdom.

TEXT BOOKS, &c.

"First Aid to the Injured." By Sir James Cantlie, K.B.E., M.B., F.R.C.S. (Revised by a Committee, 1919). The authorised Text Book for the First Aid Course. 1s. 6d. By post, 1s. 7½d.

"A Preliminary Course of First Aid to the Injured." Adapted by a Committee from the authorised Text Book "First Aid to the Injured," specially for those under sixteen years of age. 6d. By post, 7d.

"First Aid in Coal Mines." A supplement to the authorised Text Book for the First Aid course. 6d. By post, 7d.

"A Catechism of First Aid." Compiled from Sir James Cantlie's Manual. By J. M. Carvell, M.R.C.S., L.S.A. (Revised 1919). 6d. By post, 7d.

"Problems in First Aid." A companion to the authorised Text Book of the St. John Ambulance Association "First Aid to the Injured." By the late L. M. F. Christian, M.B., C.M., Ed., and W. R. Edwards, A.C.A. 9d. By post, 10½d.

"Home Nursing." Compiled by a Committee principally from the original manuscript, written at the request of the Association by Mildred Heather-Bigg, R.R.C., Matron of Charing Cross Hospital, and Lady of Grace of the Order of St. John of Jerusalem in England. The authorised Text Book for the Nursing Course. 1s. 6d. By post, 1s. 7½d.

"A Catechism of Home Nursing" (based on the authorised Text Book). By J. M. Carvell, M.R.C.S., L.S.A., 6d. By post, 7d.

Carriage Paid on all Orders value 40/- or over in the United Kingdom.

TEXT BOOKS, &c.

"Domestic and Personal Hygiene." By John C. Thresh, M.D., D.Sc., &c. Illustrated. The authorised Text Book for the Home Hygiene Course. 1s. 6d. By post, 1s. 7½d.

"A Catechism of Domestic and Personal Hygiene." Compiled from the authorised Text Book. By W. R. Edwards, O.B.E. 9d. By post, 10d.

"Notes on Military Sanitation." By Lieut.-Col. H. P. G. Elkington, R.A.M.C. 9d. By post, 10d.

"To Restore the Apparently Drowned." Printed in large Type with four diagrams. 3d. By post (including packing), 9d.

"Manual for St. John Voluntary Aid Detachments." By Lieut.-Col. G. E. Twiss, R.A.M.C. (Retired Pay). 6d. By post, 7½d.

"First Aid Principles." Cards of concise directions for waistcoat pocket, ½d. each; 4d. per doz. By post, 5d. Special quotations for large quantities.

"Specimen Examination Papers. First Aid, Nursing and Hygiene Courses." 3d. By post, 4d.

Small Anatomical Diagram. Showing the human skeleton, main arteries, and points where pressure should be applied to arrest bleeding. 2d. By post, 3d.

Directions as to the Restoration of Persons suffering from Electric Shock. Large print, poster size. 3d. each. By post, 4d.

Nursing or Temperature Charts. 6d. doz. By post (including packing), 9d.

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