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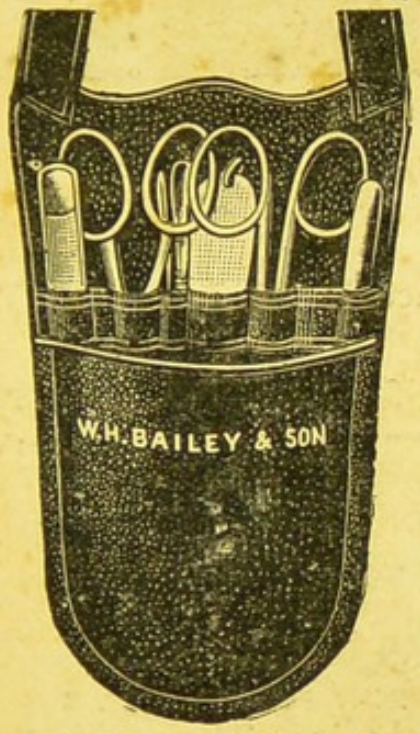

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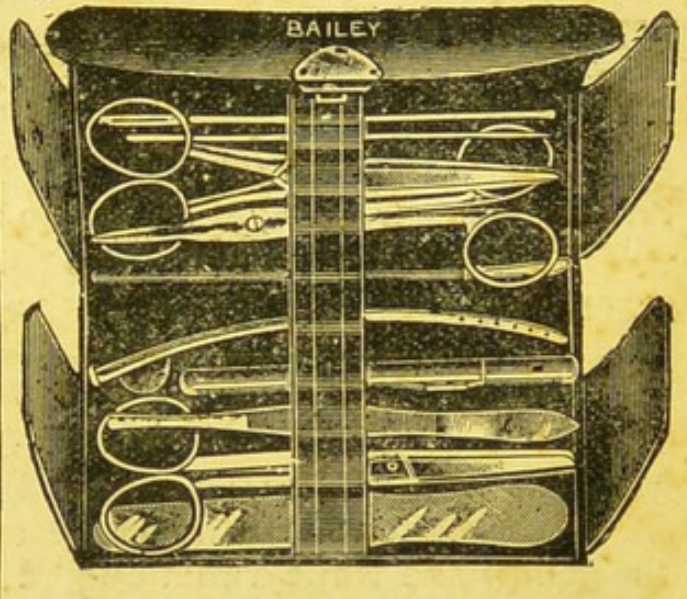

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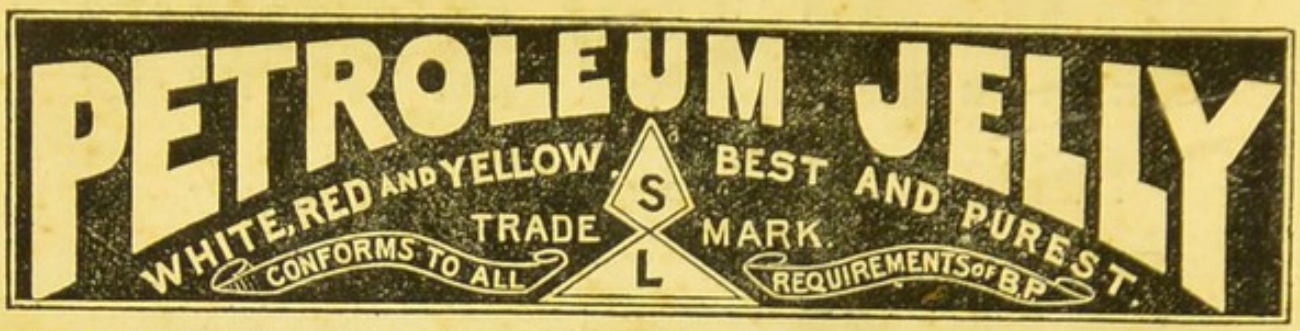

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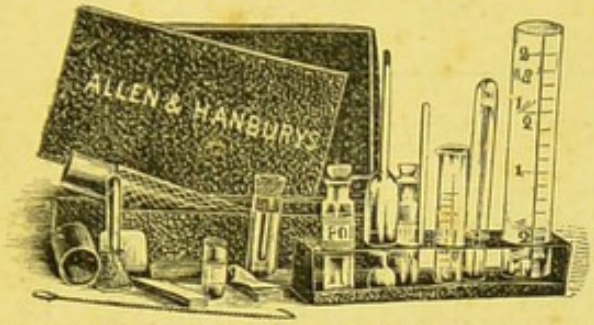

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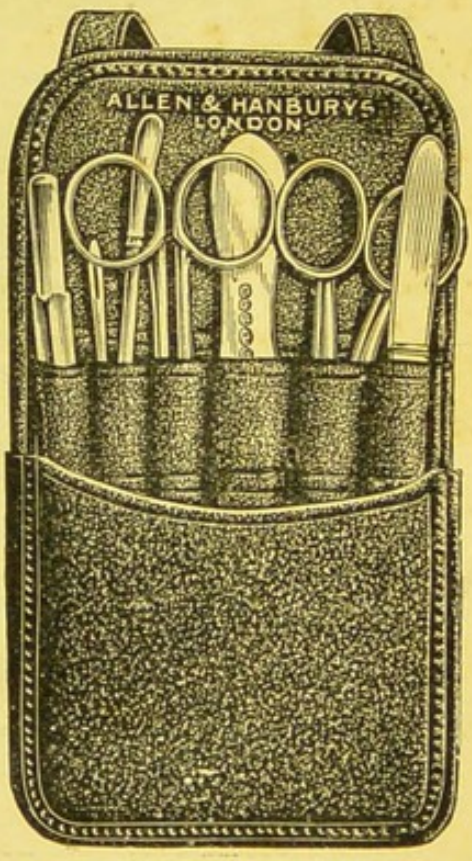

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NURSING

ITS THEORY AND PRACTICE

BEING

A COMPLETE TEXT-BOOK

OF

MEDICAL, SURGICAL, AND MONTHLY NURSING

BY

PERCY G. LEWIS, M.D., M.R.C.S., L.S.A., A.K.C.

Honorary Medical Officer to the Victoria Hospital, and Honorary Surgeon to the St. Andrew's Convalescent Hospital, Folkestone

LATE SENIOR HOUSE PHYSICIAN AND OPHTHALMIC ASSISTANT TO KING'S COLLEGE HOSPITAL; SENIOR RESIDENT MEDICAL OFFICER TO ROYAL HOSPITAL FOR DISEASES OF THE CHEST; ASSISTANT HOUSE SURGEON TO THE SALOP INFIRMARY; RESIDENT SURGEON TO THE ROYAL INFIRMARY, SOUTHAMPTON

AUTHOR OF PAPERS ON

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TO

MY FRIEND,

JOHN FRAIL HARRIES

LATE HOUSE SURGEON TO KING'S COLLEGE HOSPITAL AND TO

THE SALOP INFIRMARY.

PREFACE.

In this edition have been added three chapters on Monthly Nursing, together with additions to the chapters on Blood Diseases, on Antiseptics, on the Nursing of Children, and on Private Nursing. Under these headings will be found a short account of the new aseptic system, the antitoxin and serum treatments, and the treatment by thyroid extracts. The author hopes that by this means the work will be rendered more complete, and up to date.

PERCY G. LEWIS.

6 Bouverie Place,
Folkestone.

PREFACE TO THE FIRST EDITION.

THE design of this book, written in response to the desire of my many Nursing friends, is to furnish a Text-book of the Theory and Practice of Medical and Surgical Nursing. It is not in any way intended to be a substitute for practical instruction in the wards, but to bring clearly before nurses what the different diseases are, the chief points to attend to in them, the possible complications, and the reasons for the different things they are called upon to do; it aims at enabling them to work intelligently instead of by rule of thumb. The book embodies the course of instruction which I was in the habit of giving in a series of lectures at the Salop and Southampton Infirmaries, and from the way in which a few of these lectures, recently printed in *The Hospital*, were received, I feel that no apology for publishing it is necessary. Possibly it may be found of use to those who have to lecture to nurses, and to those of the public who wish to understand something of the reasons for various methods of treatment.

PERCY G. LEWIS.

6 BOUVERIE PLACE,
FOLKESTONE, *June, 1890.*

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THE THEORY AND PRACTICE OF NURSING.

CHAPTER I.

SUBJECT—NURSING. WARD NURSING. DUTIES OF PROBATIONERS UNDER THE NIGHTINGALE FUND. METHOD OF OBSERVATION. GENERAL REMARKS. BEDS AND BED-MAKING.

It is impossible to define in a few words what a nurse is. It is commonly supposed that those who wait on the sick are nurses, and in each family there will generally be found one who is said to be the born nurse, and who is supposed to have been born with a complete knowledge of how to nurse skilfully any case of illness. The born nurse does not exist, any more than the born doctor or engineer. People may be born with some of the necessary qualities which make it easy for them to acquire the skill and knowledge necessary to become good nurses. Nursing, as any other profession, is very much a matter of brains, hard work, and common-sense. There are, however, a very large number of minor qualities which are of great importance. "Conciseness and decision are, above all things, necessary with the sick. Let what you say to them be concisely and decidedly expressed. What doubt and hesitation there may be in your mind must never be communicated to them, not even (I would rather say, especially not) in little things. Let your doubt be to yourself, your decision to them. People who think outside their heads, who tell everything that led them towards this and away from that, ought never

to be with the sick." "All the results of good nursing may be spoiled or utterly negatived by one great defect, viz., by not knowing how to manage that what you do when you are there shall be done when you are not there." So writes Miss Nightingale; and these two quotations tend to show strongly the nature of a nurse's work. Miss Nightingale created the art of nursing; invented, in fact, what may be called a new science, of which people before had no notion, no more than they had of the phonograph before Edison invented it. A few more extracts from her writings may be given with advantage. "A good nurse can apply hot bottles to the feet, or give the nourishment ordered, hour by hour, without disturbing, but rather composing the patient." "Unnecessary (although slight) noise injures a sick person more than necessary noise (of a much greater amount). A nurse who rustles is the horror of a patient. The crackling of starched petticoats, the rattling of keys, the creaking of stays and shoes, will do a patient more harm than all the medicines in the world will do him good." "A good nurse will always make sure that no door or window in her patient's room shall rattle or creak; that no blind or curtain shall, by any change of the wind through the open window, be made to flap—especially will she be careful of all this before she leaves for the night." All these directions show immense thought and consideration for the people under her care; and though of course everyone cannot be a Miss Nightingale, nurses should remember that she is the kind of woman doctors require as nurses. It must be understood that nursing is not a pleasant pastime, to be taken up merely as something to do, but

that it is a profession involving hard work and immense responsibility, and possession of ability at least above the average. Obedience is one of the things which most often goes against the grain with those commencing their nursing career. Yet it is most essential, especially in relation to the doctor's orders, in which nurses cannot often possibly follow the reasoning which led to them. In speaking of obedience, it must be pointed out that it is not blind, but intelligent, obedience which is required. For instance, the author saw recently in a provincial hospital two men brought in who had been crushed under a falling house. They were suffering from very severe injuries (fractures) and shock. The nurses' rules were to wash every patient on admission; so these poor men had to go through the process of being washed, shock notwithstanding. They both died within a few hours; he wondered whether either would have been saved had the intelligence of the nurses directed their zeal in a more useful direction. Often and often in a nurse's career will lives depend on what she does, or does not, at certain times. Let those who take up nursing think well before entering on it.

A nurse who is a good organiser has an immense advantage, and can, if she chooses, command eventually the highest post which nurses can attain to, viz., the matronship of a large hospital. Good organisers are generally good nurses, but not by any means are all good nurses good organisers. Head nurses of wards (now more commonly called Sisters) have, in addition to the patients, under-nurses and probationers to look after and teach. The secret of good ward management is *order* and *punctuality*. Meals and medicines, changes of poultices

and fomentations, dressings, washings, dustings, everything that takes place in a ward, should have a fixed time, and should be done to the minute; one or two things done late, or after the time, may throw everything else out of gear. Should the medicines be five or ten minutes late, and a bad accident or two bad accidents come in, making a call on all the staff of the ward; how much later then will the medicines be? Of course, it is often very difficult to make everyone as punctual as oneself, but it can, and should be done. In the arrangement of the ward, neatness and cleanliness are the chief points to attend to. There should be a place for everything. All medicines should be kept in one place, all stock medicines and poisons in another. The bedclothes must be so arranged that the nurse can see under each bed. The lockers should be turned out and systematically inspected at least after every visiting day; the closets and sinks should be well flushed out at least night and morning. No soiled dressings or linen should be allowed to remain an instant in the ward after removal from the patient. When a nurse goes off duty, she should see her successor, explain the nature of any new cases or symptoms, and give *in writing* any instructions she may have received. The second nurse should then initial the order sheet, as a sign that she has received and understood the orders. All these things are mentioned here as instances of the kind of things sisters and nurses are required to do and organise. At the end of this book will be found some rules for nurses, which, with some slight alterations to suit local requirements, might well be adopted in most hospitals and infirmaries.

The following is what is required of probationers who enter under the Nightingale Fund. In this book all the subjects mentioned will be found fully gone into.

"*You are required to be* sober, honest, truthful, trustworthy, punctual, quiet and orderly, cleanly and neat, patient, cheerful, and kindly.

"*You are expected to become skilful—*

"1. In the dressing of blisters, burns, sores, wounds; in applying fomentations, poultices, and minor dressings; in the administration of subcutaneous injections.

"2. In the application of leeches, externally and internally.

"3. In the administration of enemas for men and women, and the use of the catheter for women.

"4. In the management of trusses, and appliances in uterine complaints.

"5. In the best method of friction to the body and extremities.

"6. In the management of helpless patients, *i.e.*, moving, changing, personal cleanliness of, feeding, keeping warm (or cool), preventing and dressing bed sores, managing position of.

"7. In bandaging, making bandages, rollers, lining of splints, etc.

"8. In making the beds of the patients, and removal of sheets whilst patient is in bed.

"9. You are required to attend at operations.

"10. To be competent to cook gruel, arrowroot, egg flip, puddings, drinks for the sick.

"11. To understand ventilation, or keeping the ward fresh by night as well as by day; you are to be careful that great cleanliness is observed in all the utensils, those used for the secretions as well as those required for cooking.

"12. To make strict observation of the sick in the following particulars:—

"The state of secretions, expectoration, pulse, skin, appetite; intelligence, as delirium or stupor; breathing, sleep, state of wounds, eruptions, formation of matter, effect of diet, or of stimulants, and of medicines. To 'take' the temperature, pulse, respiration.

"13. And to learn the management of convalescents."

It is one of the most important duties of a modern nurse to be able to give an intelligent report of a case; but it is also that duty which a nurse is longest in acquiring, and which requires, perhaps, more hard work to attain perfection in than anything else which a nurse has to do. Formerly, with the old style of nurse, a doctor thought himself lucky if he could rely on the nurse's statement that the patient had been a "little better" or a "little worse"; now, however, that nurses are taken from a class with more brains, a detailed and accurate report of all that happens in his absence is expected. This power of giving accurate reports is not to be acquired in a day, and is apt to be looked upon by new probationers as an insurmountable difficulty. It can, however, be learnt by all, though it entails continuous work over a considerable period, observing every little detail and duly entering them

in a note-book kept for the purpose. "Attention to details" is the key-note of modern nursing, as it is of modern surgery.

All who wish to cultivate the power of observation should keep a book wherein, when they go off duty, they may jot down anything they have observed during the day. They should commence with only one case, and note everything they can about it. At first, of course, will be put down a good deal of unnecessary matter, and possibly omitted that which is most important. Still, they should not be discouraged, but keep on day after day, and soon they will be able to put down all that is necessary in the fewest words and in the right order.

Nurses frequently waste much valuable time because they are afraid to show their notes to the matron or sister, who is willing to help them by correcting mistakes or giving hints for future use. They should not think that, because perhaps they forget to volunteer this assistance, they are, therefore, unwilling to undertake it. Nurses must, of course, choose the right moment for consulting them, not intruding when they are otherwise employed. It is best to ascertain from the one they wish to consult what time of the day or week she could spare a few moments to look over them for her.

In order to learn quickly, the following rule should be adhered to, viz., "When on duty always be doing something". Nurses are too apt to think that all their work is in the order book; but there can hardly be a greater mistake. When not carrying out orders they should "observe"; and as an aid to this they should talk to, and amuse patients. Many symp-

toms are not obvious until the patient commences to talk or move, or a delusion which has been carefully hidden may be brought out by a nurse in a little friendly conversation. Patients will often tell a good deal more to a nurse than to a doctor, and a little sympathy will sometimes form very good medicine. Any nurse, after the first month, is liable to be put on "special" duty with a patient, so that she cannot begin her habit of observation too soon. It is best in all cases to observe on a definite plan. It does not matter much what plan is adopted if the observations are done systematically. For "special" cases most hospitals have a special nurses' report paper to make this easier.

Observations should commence directly the patient comes into the ward, or much valuable information may be lost. Observations should come under three heads:—

First, then, is there anything obvious, *e.g.*, Can he walk? If so, does he limp? Can he move both arms? Does he droop one shoulder? Is he bleeding? Does he suffer from shock? Does he smell of alcohol? or of anything? Is he sensible? Can he speak? and, if so, is his voice peculiar? Next take his face and special senses. Can he see? Are his pupils large or small? equal or unequal? Is he deaf? Is there any special colour about his face? *e.g.*, cyanosed, pale, or jaundiced. Do you see any difference between the two sides?

Secondly, observations must be continued while undressing him and putting him to bed. The skin is to be noted as to colour, moisture, dryness, if hot or cold, if any eruptions. It is most important also to note if

there are any bruises, and, should there be any, care should be taken that the medical officer sees them at his next round. Patients, especially in poor-law infirmaries, often bring accusations against nurses, pointing out bruises which they say were inflicted on them in hospital; unless, therefore, they were noted at the time of admission, the accusation would be very difficult to disprove. It should be noted if there are any ruptures or swellings, ulcers or scars—or, in fact, anything abnormal.

The *third* division of the observations will be done under the headings of the various "systems," as they are called, of the body, commencing always with the organs affected, and as long as the case remains in the hospital the nurse will carry out her observations from day to day in the same manner.

Nervous System.—Under this heading she would note whether there was any delirium or coma, or irritability of manner, trembling, convulsions, wandering, amount of sleep.

Respiratory System.—State of the breathing, if regular or irregular, if difficult or spasmodic. If any cough or hæmoptysis. Amount of expectoration. Rate of breathing.

Circulatory System.—If any pain or palpitation in the heart. If any large veins or pulsation in veins. Learn to count the pulse.

Digestive System.—Note the appetite; if pain in the stomach, flatulence, nausea, or vomiting. If any vomit, save it until a doctor can see it, but note if its character changes on being kept, *e.g.*, whether frothy at first and not so after. State of the bowels, character of the

stools, which should always be kept in cases of doubt.

Urinary System.—If water is passed too frequently, if with difficulty or with pain. If incontinence or retention. State of urine, as to general appearance and quantity passed in twenty-four hours. Learn how to test roughly for albumen and sugar if an opportunity arises.

Uterine System.—Menstruation, regular or irregular, character and amount. If any abnormal discharge. Leucorrhœa.

Cutaneous System.—Temperature, abnormal dryness or moisture, œdema, rashes, etc., etc. If a wound, amount of discharge, colour, swelling around, etc.

Of course, everything that she may meet with under the several headings has not been mentioned, although a sufficient number of examples have been given to show the sort of observations nurses are required to make. The whole of the headings will not always be required; such as are must be mentioned in the order named. A perfect report contains the greatest amount of information in the fewest words, with the absence of all unnecessary information.

Reports should always be written in the simplest language, and facts, not opinions, stated. For instance, a nurse would say she observed "a red blush an inch wide all round the ulcer" when she dressed it, but she would not give her opinion that the "ulcer was inflamed," or that "erysipelas had set in".

Although all this seems very simple and obvious, in practice it is only acquired by continually working at it and noting case after case, day after day. It need not be

said that the more a nurse works and the more knowledge she acquires, the better nurse she will be, the higher rank she will take, and the better the appointments which she will get. This is not of course put forward as more than one of the many inducements for nurses to work, still it is one of those reasons which bring so many in increasing numbers into the nursing profession. There is perhaps no profession where hard work means increased pay with so much certainty as in the nursing world. With regard to training in most hospitals, lectures are given, and teaching in the wards takes place. Still, it depends to a great extent upon oneself. A nurse should learn from everyone with whom she comes in contact. If a nurse has been partially trained at another hospital, she will doubtless be able to teach nurses at her second hospital many things or different ways of doing things which they would not see otherwise. The author has himself learnt many valuable hints from nurses and even from patients who have been in other institutions. Nurses should never be too proud to learn, no matter from what source. They should get into the way of doing their very best for each patient, putting themselves (mentally) in the patient's place, and doing what they have to do for him, as they would like it done for themselves. A slovenly way of doing things is easily acquired, but very hard indeed to get rid of. If nurses would only think more, there would be less unnecessary noise in hospital wards where many patients are suffering from diseases which make any disturbance very difficult to bear. In a provincial hospital, nurses have exceptional advantages, in that dressings, hypodermics, extensions, and many other

things which in hospitals attached to medical schools are done by students, there fall to the lot of the nurses. Let them make the most then of their opportunities.

To sum up then, success in nursing means work, work, day after day; always doing their best; "always, when on duty, doing something".

A few words on bed-making and bed-arranging, which is one of the first things a nurse will have to learn. On the subject of beds, Miss Nightingale writes: "Feverishness is generally supposed to be a symptom of fever—in nine cases out of ten it is a symptom of bedding". "If you consider that a grown-up man in health exhales by the lungs and skin in the twenty-four hours three pints at least of moisture, loaded with matter ready to putrefy; that, in sickness, the quantity is often greatly increased, the quality is always more hurtful—just ask yourself next where does all this moisture go to. Chiefly into the bedding, because it cannot go anywhere else. And it stays there; because, except perhaps a weekly change of sheets, scarcely any other airing is attempted." Let a nurse carry this graphic description always in her mind, and never lose an opportunity of thoroughly drying and airing a bed. For the same reason, after washing a patient, his night-dress should be warmed before a fire, as this dries and airs it at the same time.

In order to make a bed without moving the patient from the horizontal position, the following procedure must be adopted. Without removing the bedclothes, glide the patient to the edge of the bed next the fire. Place three or four chairs along the side of the bed with their backs next the fire. On the chairs lay a bolster

or pillows, until this temporary couch is on a level with the mattress. The nurse or nurses now gently roll or slide the patient on to the chairs, where, covered over with a blanket or rugs, he remains while the bed is being made. They must remember to make the process as little tiring as possible. If he is well enough to be moved out of bed (and leave from the doctor should always be obtained in doubtful cases), he must be warmly wrapt up, and the bed should be made as quickly as possible.

In making a bed, the bedclothes should not be turned back in a lump, but each blanket, etc., should be turned back separately over chairs. The mattress should be turned or well shaken, to prevent it getting hard, and air should be allowed to circulate all round and through it. When the bed is made, the patient may be returned to it in the blanket in which he was wrapt, and this should not be removed until the bed has again become warm. To change sheets with the patient in bed, warm and air the clean sheet; roll it up lengthwise; lay it thus rolled on one side, say the right, of the bed. Pull the soiled under-sheet from below the bolster, roll it up lengthwise, and unroll the clean sheet up to the patient's right side. The nurse goes round to the left side of the bed, turns the patient on his left side, and continues the process of rolling up and unrolling the sheets up to the patient's left side. Then replacing the patient, he lies on the clean sheet, and the two appearing at his left side, the soiled sheet is removed and the clean one tucked in. In certain cases, when a patient must not be turned on his side, the changing of sheets can be done from above downwards, instead of from side to side. In

changing the top sheet, the clean one must be placed over the patient before the old one is withdrawn.

Rules.

1. Never shake sheets or blankets or pillows *over* the patient's bed, but always away from it.
2. Never put sheets and blankets over a patient's head in making the bed.
3. If sheets or blankets are too long, never fold them back over the patient's chest, nor tuck them in at the end, but fold them back over the feet.
4. Make beds as quickly as possible.
5. Air and dry sheets, blankets, and mattresses as often as possible.
6. Never put a blanket between a mackintosh and the patient.

CHAPTER II.

SUBJECT—DRUGS. MEDICINES AND THEIR ADMINISTRATION. POISONING AND ITS TREATMENT. RULES TO SUIT ALL CASES.

DRUGS are substances derived from various sources, which are used in the treatment of disease. The term includes an enormous number of things—in fact, anything taken for any ailment. In order that people may know which are the best, the Government publish from time to time an Official Pharmacopœia, or list of drugs, whose reputation has been established by experience. The number of new drugs, however, is very great; but only a few find their way finally into the official list, a great number being puffed one year to be forgotten the next.

Drugs are sold and dispensed in certain well recognised forms and strengths called "Preparations," as follows: The aceta or vinegars, aquæ or waters, cataplasmata or poultices, chartæ or papers, confections or conserves, decoctions made by boiling, emplastra or plasters, enemata or injections, essences, extracts which may be solid or liquid, glycerines, infusions, hypodermic injections, lamellæ or discs, liniments or embrocations, liquors or solutions, lotions, mella or honeys, misturæ or mixtures, mucilages, oleates, oleums or oils, pilulæ or pills, pulveres or powders, spiritus or spirits, succi or juices, suppositories, syrups, tablets, tinctures or alco-

holic solutions, trochisci or lozenges, unguenta or ointments, vapores or inhalations, vina or wines.

Collyria are eye-washes; gargarismata, gargles; linctuses, thick treacley fluids swallowed in small doses.

The table of weights in use in medicine is the Apothecaries:—

60 grains	make	...	1 drachm.
8 drachms	,,	...	1 ounce.
16 ounces	,,	...	1 pound.
20 grains	,,	...	1 scruple.
3 scruples	,,	...	1 drachm.

Scruples are not now much used. The symbols used to express these are as follows:—

gr.	=	1 grain.
ʒi.	=	1 drachm.
℥i.	=	1 ounce.
℈i.	=	1 scruple.

The measure used is:—

60 minims or drops	=	1 fluid drachm.
8 fluid drachms	=	1 fluid ounce.
20 fluid ounces	=	1 pint.

And the symbols used to express them:—

m.	=	1 minim.
Oi.	=	1 pint.

The fluid drachms and ounces being represented in the same way as the solid:—

1 tea-spoonful	=	nearly a fluid drachm.
1 dessert-spoonful	=	,, 2 fluid drachms.
1 table-spoonful	=	,, half a fluid ounce.
1 wine-glassful	=	1½ or 2 fluid ounces.
1 tea-cupful	=	about 5 fluid ounces.
1 breakfast-cupful	=	about 8 fluid ounces.
1 tumblerful	=	10 fluid ounces or half-a-pint.

Drops must always be measured in a minim measure.

Drugs are used :—

(1) For their local action, such as the various ointments used in surgery.

(2) For their action in or on the blood, such as the various preparations of steel.

(3) For their specific action, as the various purgative medicines.

(4) For their remote local action, such as the resins and balsams, which, after being swallowed, are absorbed into the blood, and being eliminated by the lungs, there exert their required action.

A *Prescription* is a careful selection of one or more drugs, for the purpose of treating a special case. From this definition it is obvious that the common practice of causing a prescription which has done one patient good, to go the round of many friends and acquaintances is not only absurd, but is at times positively dangerous.

Medicines are ordered to be taken either statim (immediately), or t. d. s. = ter die sumenda (to be taken three times a-day), or b. d. s. = bis die sumenda (to be taken twice a-day), or two, three or four hours, 2 ^{dis}, 3 ^{bus}, 4^{tis}, horis; f-m at the end of a prescription means, let the

mixture be made (fiat mistura); R. at the top means take (recipe), m. simply means mix (misce). As a rule, the various preparations, and the names of the drugs, are abbreviated to save time in writing: thus, ac. hydrocy. dil. stands for acidi hydrocyanici diluti, etc., etc. Post cibos = after meals, ante cibos = before meals, and so on.

However medicines are ordered, it is the nurse's duty to see that the instructions are correctly and rigidly carried out. When medicines are ordered to be taken three times a-day, nurses should try to get the intervals as equal as possible. It is intended that the second dose shall be given before the effect of the first has worn off. Of course, they would never think of giving a double dose to make up for one they had forgotten. It is often necessary to give the maximum dose of a drug short of producing poisonous symptoms, and the effect of doubling the dose might be disastrous.

RULES.

1. Always read the label on a bottle before pouring out a medicine, no matter how often it has been done before.
2. Always pour out the medicine with the bottle held with the label *uppermost*, which prevents soiling of the label should a drop run down the side of the bottle.

It will be well now to mention briefly some of the various classes of drugs, and afterwards to consider individually the more important ones.

Aromatics are used to relieve pain or spasm chiefly in the stomach or intestine and to stimulate the digestive

juices. Peppermint, cinnamon, cloves, horse-radish, etc., are good examples of this class.

Emetics are drugs which induce vomiting, either by acting directly on the stomach, or after absorption by injection into the blood. A table-spoonful of mustard to a tumbler of warm water is a good emetic, so are 15-20 grains of sulphate of zinc, or one or more tea-spoonfuls of ipecacuanha wine. Apomorphia is given in a hypodermic form.

Purgatives are drugs which increase the secretions of the intestines and cause them to expel their contents. There are a large number of these, as calomel, castor oil, rhubarb, Epsom salts, cascara, etc.

Cholagogues are drugs which act on the liver, as calomel, podophyllin, jalap, enonymin, etc.

Astringents are drugs which lessen secretion, as logwood, sulphuric acid, chalk, tannic acid, alum, sulphate of copper, etc.

Alteratives are drugs which affect the nutrition of the body generally, as cod liver oil, iodide of potash, arsenic.

Hæmatinics are drugs which improve the quality of the blood, as the various preparations of iron.

Cardiac stimulants are substances which stimulate the action of the heart, as digitalis, strophanthus, alcohol, and ammonia.

Cardiac depressants are drugs which depress the force or frequency of the heart, as antimony, ipecacuanha, aconite.

Expectorants are drugs which favour the discharge of secretions from the respiratory passages, as squill, senega, ipecacuanha, acetate of ammonia.

Stimulants are drugs which increase the activity of the heart or nervous system, as alcohol, ether, ammonia.

Anodynes are drugs which relieve pain, as opium.

Hypnotics are drugs which cause sleep, as opium, chloral, bromide.

Sedatives are drugs which depress vital action, as opium and bromide.

Diuretics are drugs which increase the amount of the urine, as nitre, squill, and broom.

Diaphoretics are drugs which induce sweating, as opium and ipecacuanha.

Ferrum.—Iron or steel is used in a large variety of forms, as pills, liquors, syrups, and in combinations with other chemical substances, as ammoniated tincture and tartrated iron. Locally, iron in the form of perchloride is used to stop bleeding, or as an astringent for sore throats, etc. Given internally, it should be administered *after* meals, as it is then less likely to upset the stomach; for the same reason other drugs, as arsenic, quinine, and cod liver oil, are only given then. The most important effect of iron is to restore the colouring matter to the red corpuscles when from any cause, such as in anæmia, this has been diminished. Independently, however, of this action, iron is a powerful tonic, and has a specific curative action in erysipelas and diphtheria. Iron has the effect of turning the motions black, as also do bismuth and charcoal.

Hydrargyrum.—Mercury is used in medicine in many different forms and for many different purposes. As red precipitate ointment, it is used in eye affections (ung. hydrarg. ox.). As white precipitate ointment, to destroy pediculi (ung. hydrarg. ammon.). As liq. hydrarg. pernitratis, it is used as a caustic. As a disinfectant and antiseptic, this is discussed in another chapter. Mercury

is also in the form of calomel a powerful purgative. Chiefly, however, mercury is used as an alterative or absorbent of the products of various low forms of inflammation. Popularly speaking, it is used to "disperse" inflammations and glandular tumours or swellings. If mercury is taken for a long time in too large doses, in fact in some people after a very short time, it induces profuse secretion from the salivary glands, with great swelling and ulcers of the gums and mouth. Diarrhœa rapidly follows, and, unless the drug be stopped, symptoms known as "mercurialism" set in. These are muscular tremors and paralysis, pains, anæmia, and mental disturbances. Should any of the above bad effects of mercury be noted by nurses, they must at once draw the attention of the doctor to them. Children can take much larger amounts of mercury than adults, without bad effects.

Arsenic is used as an alterative in many chronic affections, as skin diseases, St. Vitus' dance, neuralgia. The symptoms of too much arsenic are headache, soreness of the eyes, weakness, and muscular trembling. An alterative is anything which alters diseased action and tends to restore health.

Iodine is much used internally in the form of iodide of potash for an immense number of affections, chiefly chronic ones. It may give rise to symptoms of "iodism," somewhat like a severe cold. They consist in a profuse watery discharge from the nose sneezing, intense headache, swellings of the gums, and cough. Locally, it is used as iodine paint, to cause absorption or counter-irritation.

Strychnia or *Nux Vomica* is a powerful tonic, espe-

cially used in cases of chronic paralysis. It is mentioned here on account of its poisonous symptoms, which have been known to arise during its medicinal use. The first effect of too much, which should be the indication to the nurse for stopping the medicine, consists in twitching of the muscles and difficulty in swallowing. The further symptoms resemble those of tetanus (*q. v.*).

Belladonna and its active principle, atropine, are very much used in medicine, both internally and externally. Externally belladonna is used as a local anæsthetic and anodyne, as belladonna plaster, or as glycerine and belladonna. It is also of great use in diseases of the eye, under which heading the symptoms of poisoning by this drug will be found.

Opium (*morphia* its active principle) is more used than any other drug. Full doses make the tongue dry and foul, and cause thirst. After the first time of taking opiates, or after a hypodermic injection, it often happens that the patient suffers from vomiting. Opium is given to relieve pain arising from almost any cause, and especially if the pain is in the stomach or intestines. It is used to produce sweating after chills, and also to abolish the automatic movements of the bowels in strangulated hernia and in obstruction. On the brain opium acts as an anodyne and hypnotic, causing deep and prolonged sleep. If a patient is in great pain, he may take much larger doses than otherwise, in fact he may take sufficient to kill him at any other time, without sleep even being induced.

Children are very susceptible to the influence of opium, as are also the subjects of kidney disease.

If very large doses of opium are taken, the patient

passes from deep sleep into profound insensibility, the pulse becomes slow, the respirations may go down to three or four a minute, the pupils are very much contracted, sometimes even to a pin's point. If the dose has been larger still, stertorous breathing takes place; the patient cannot be induced to show any signs of vitality after violent shouting at or shaking. Even at this stage, however, the patient may be roused by proper means, and as cases are often brought into hospital in this condition, it is important that nurses should know what may be required. The objects are :—

(1) To empty the stomach.
(2) To keep up the respiration.
(3) To prevent failure of the circulation.

The first is met either by an emetic, by the stomach pump, or by the siphon.

There is often great difficulty in getting an emetic to act in these cases, owing to the blunted sensibility of the stomach.

The best emetic to use is a good heaped-up tablespoonful of mustard in a tumbler of warm water, or thirty grains of sulphate of zinc in two ounces of water. If the emetics fail to act in fifteen minutes, they may be repeated. Large draughts of warm water are given between the acts of vomiting, so as to thoroughly wash out the stomach. In hospitals, the stomach-pump is mostly used instead of emetics, and plenty of warm water will be wanted to wash out the stomach with. It is also usual, when the washing out has been done, to inject into the stomach about half-a-pint of warm strong coffee as an antidote.

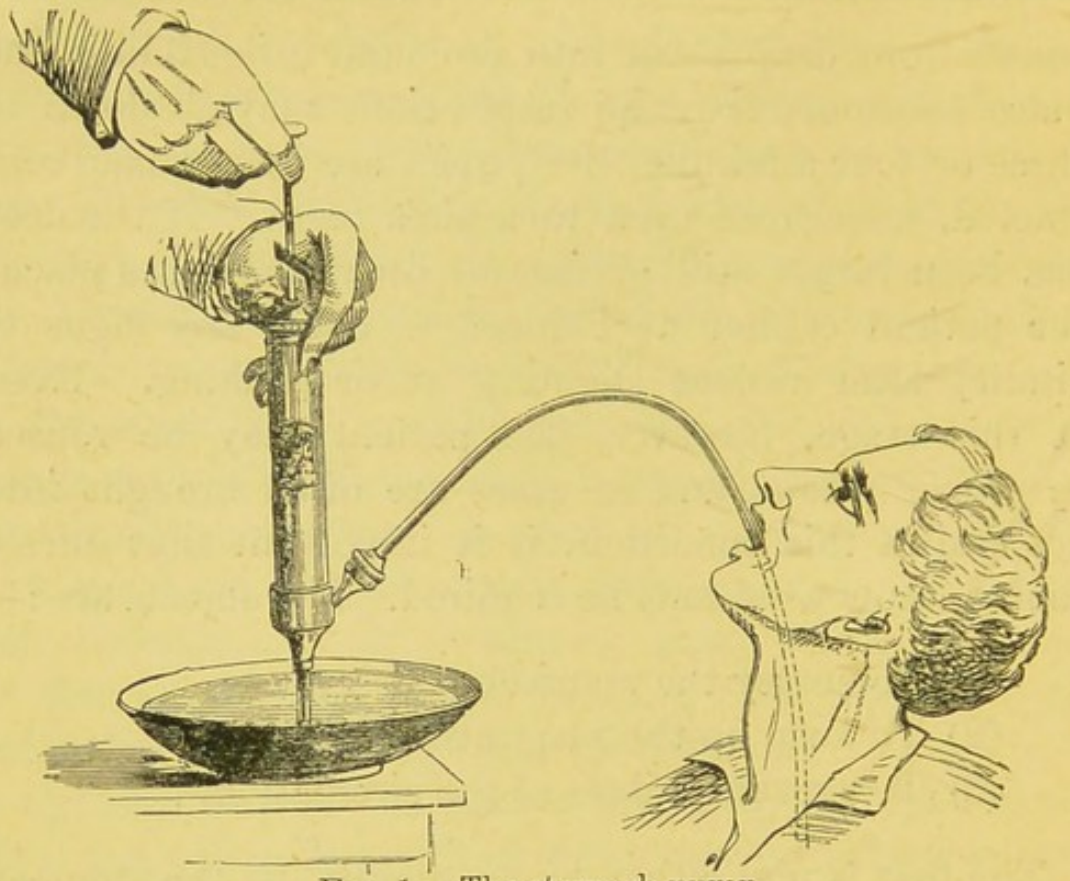


FIG. 1.—The stomach-pump.

To keep the patient awake, walking, flicking with a towel, shaking, shouting, the use of the electric battery, and other means of this sort, are adopted. Once the patient has been awakened, he may be left to the nurse to keep awake. If he should go to sleep before the doctor gives leave, all the trouble of awakening him again will have to be gone through.

The cold douche is an excellent method of rousing the patient; the head and shoulders are supported over a wash tub and cold water dashed on the chest. Artificial respiration and injections of atropine have often to be resorted to.

There are many substances which are occasionally taken as poisons, and although the responsibility of treating them does not fall on nurses, yet it is important for them to know what to do in cases of emergency

until a doctor can arrive. Poisons may be divided into three classes:—

(1) Acids and corrosive irritants, such as sulphuric acid, ammonia, phosphorus.

(2) Active principles of drugs and rapid poisons, such as atropine, strychnia, hydrocyanic acid.

(3) Articles of food which occasionally act as poisons from having undergone some unusual chemical change, either inside or outside the body. Cheese, mussels, pastry, may thus act as poisons.

In the first class one must *never* give an emetic, but give oil or white of egg freely, so as to protect the stomach from further action of the irritant.

In the second class emetics followed quickly by stimulants, such as brandy, which may be given with the emetic. Twenty grains of sulphate of zinc may be administered in brandy and water. Hot bottles and a warm bed will afterwards be required.

In the third class emetics first, and purgatives afterwards, is the usual treatment.

It will be seen that the two first classes—acids and drug poisons—are the really urgent ones, so that the treatment becomes simple from a nursing point of view, viz., in irritant poisoning, oil and white of egg should be given; in vegetable and prussic acid poisoning, emetics and brandy.

Doctors will give substances called "antidotes," which neutralise the effect of the poison either chemically or by having an opposite effect on the tissues: thus, atropine in opium poisoning, lime in acid poisoning; but this is beyond the nurse's province.

CHAPTER III.

Section A.

SUBJECT—THE CHEST. RESPIRATION. AIR. ANATOMY. THE HEART. THE AORTA. DISEASES OF THE CHEST. HEART DISEASE.

Commencing with the nursing of chest cases, the chest will first be described. The chest is the upper part, almost the upper half, of the trunk, which contains the organs of respiration and circulation. The uses of respiration and circulation are as follows. Briefly, respiration is the process by which air enters the chest, and so into the blood; the circulation of blood carries food and air to, and removes waste products from, the different parts of the body.

Air is a mixture of three gases—oxygen, nitrogen, and carbonic acid; oxygen being the most important, for without it we could not exist. Nitrogen simply dilutes the oxygen, as the latter is too strong to be taken undiluted. Carbonic acid gas in ordinary air is in very minute proportion. There is always more or less watery vapour mixed with the air. By respiration men and animals give out carbonic acid and absorb oxygen; should the supply of oxygen be cut off from any cause, death inevitably results. The consequence directly or indirectly of most chest diseases is to limit the means by which air, *i.e.*, oxygen, enters the blood, and finally,

perhaps, to cut it off altogether; hence the importance of this branch of the subject.

Very briefly indeed will now be noticed the rough anatomy of the chest and its contained organs. The chest is an elastic box, of the shape of which one will be able to get an idea by looking at a skeleton. It will be seen that it is formed almost entirely of ribs, which are attached behind to the spine, and in front by means of short elastic pieces of gristle (cartilages) to the sternum, or breast-bone. It is not open at the bottom in the skeleton, but is closed by a dome-shaped muscle called the "diaphragm," concave towards the abdomen, and convex on the chest side. The diaphragm is attached to the inner sides of the lower ribs and their cartilages, extending up in front to the lower end of the breast-bone and backwards to the spine. This is a most important muscle of respiration, as by its contraction the capacity of the chest is alternately increased or diminished. The upper opening of the chest is closed by the tops of the lungs and by the structures entering the chest

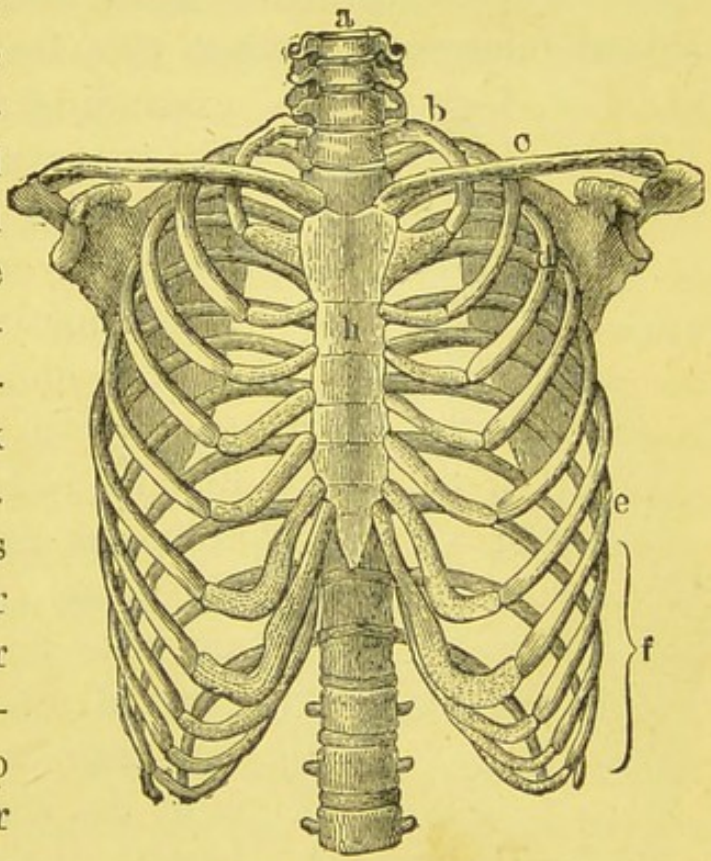


FIG. 2.—The chest.

from the neck. The ribs are joined together by small muscles called intercostals, and are covered on the outside by various large muscles, mostly those used in moving the arm, head, or spine.

The organs of respiration contained in the chest are part of the windpipe, with its many branches, and the two lungs. The windpipe (trachea) leads from the larynx, or voice box, into the chest, where it at once divides into two smaller tubes (bronchi), one for each lung, and these again and again divide until they become almost microscopic, when they leave off dividing, each expanding into a little bladder-like structure called an air cell. The ending of these small bronchi resembles one of those squeaking toys, consisting of a small bladder on the end of a short hollow tube with a reed in it. The bladder is blown out, and as it collapses gives rise to a squeaking noise. Each of these little air cells is filled with air and covered on the outside with very minute blood-vessels. It is by the accumulation of numberless little air cells together that the lungs are formed.

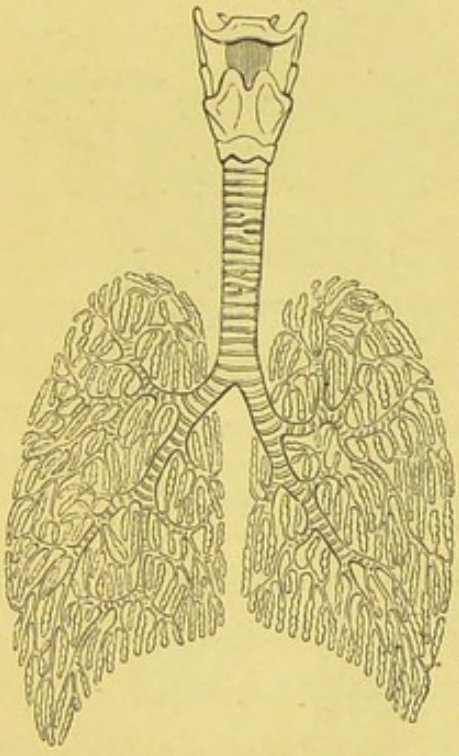


FIG. 3.—The lungs and trachea.

The windpipe, as felt in the neck, is a more or less rigid tube ; the very small bronchi already described are almost entirely muscular tubes capable of contracting or expanding so as to allow more or less air to enter into the air cells, *i.e.*, the lungs. It is in the air

cells that the exchange between the blood and the air takes place, the air giving up oxygen, receiving instead carbonic acid and watery vapour with varying amounts of excrementitious matter. This latter, when in excess, gives that peculiarly offensive odour to the breath in some patients so marked.

The lungs are covered on the outside with a membrane called the pleura. This consists of two shining smooth surfaces, one of which covers the outside of the lung, and the other the inside of the chest wall. The two surfaces being united at their edges form a closed bag, the sides of which are in contact. The object of the pleura is to allow the lung to move freely against the chest wall in breathing. It is lubricated by a little watery fluid which it manufactures itself. There is a separate pleura for each lung. In shape, the lungs are somewhat conical; they fill up most of the cavity of the chest, one occupying each half. From a nursing point of view, wherever rib is found, there is also lung underneath it, consequently can be seen from the skeleton how far down they extend behind, a point beginners are long in appreciating. The lungs meet in the middle line in front behind the sternum, except where the heart separates them, and, roughly speaking, their lower edges follow the margins of the ribs and their cartilages obliquely to the spine, without however extending quite so far down. Above they extend up an inch or more beyond the collar-bone, which explains the bulging one will often notice in this region during an attack of coughing.

The heart is the muscular pump, which by alternately contracting and relaxing, keeps up the circulation of

the blood. It contains four compartments, two for receiving blood—auricles, and two for propelling blood — ventricles. In order to make the blood go in a definite direction, valves are placed in it. The two most important, the mitral and the aortic. The blood is taken to the different organs by vessels called "arteries," distributed to the component parts of those organs by minute vessels called "capillaries," and brought back again to the heart by vessels called "veins". In order that the heart may contract and expand without friction, it, like the lungs, is covered with a structure called the pericar-

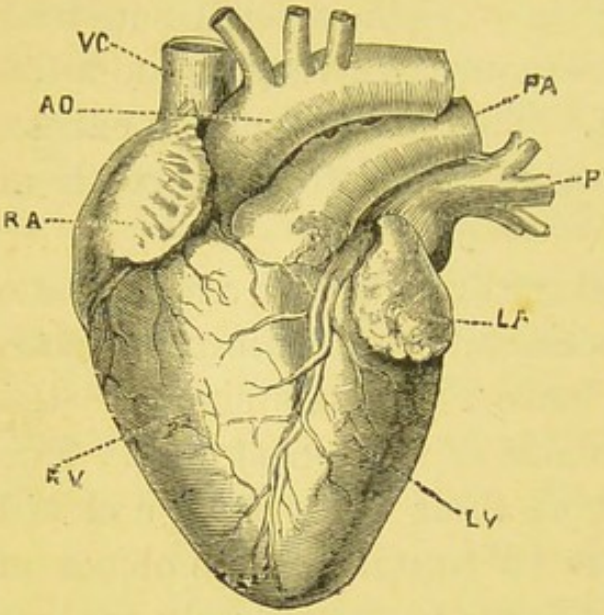


FIG. 4.—The heart.

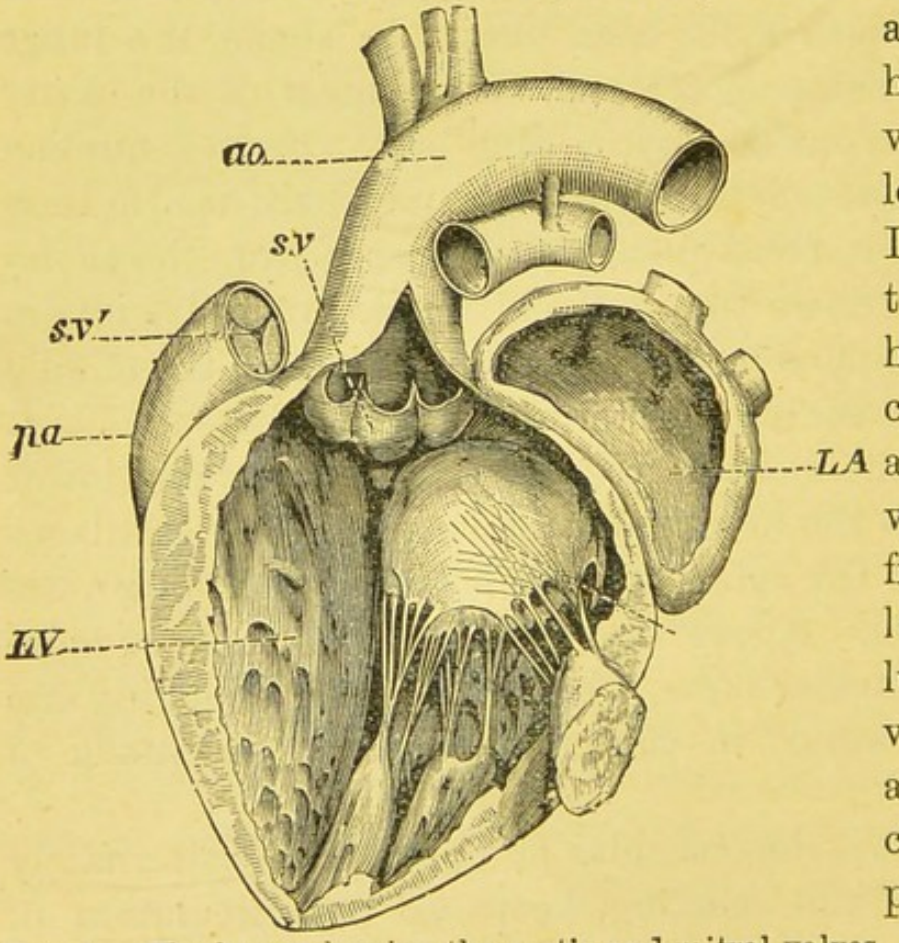


FIG. 5.—The heart showing the aortic and mitral valves.

dium, having an arrangement and uses similar to those of the pleura.

The position of the heart may be represented by the closed fist of the left hand laid across the front of the chest, so placed that the little finger rests exactly on the lower end of the breast-bone; the knuckles will then only project slightly to the right of the middle line, most of the hand being to the left of it. The extreme outer limit on the left side can be ascertained by noticing in the space between the fifth and sixth ribs, the point where the beating of the heart ceases to be felt. This is called the "apex," the upper limit of the heart being called the "base".

One other organ in the chest may be mentioned, that is the great artery of the body—the aorta. This arches back from the base of the heart over the division of the trachea, to reach the spine, in contact with which it is continued down into the abdomen.

All that is necessary for nurses to know of these organs has now been described. They should not waste time trying to master the mechanism of the circulation and other complicated things in physiology until they have learnt the rudiments of nursing. Nurses should remember that they have to learn nursing and not physiology. Often are nurses met who have acquired a good knowledge of anatomy and physiology who yet cannot be trusted to do the simplest thing in nursing, thereby making themselves ridiculous, and giving outsiders a chance of jeering at the profession. Avoid falling into this error. Nurses will hear enough of elementary anatomy and physiology in lectures to give them an interest in their cases, and enable them to

work intelligently, which is as much of both as a nurse is expected to know.

The smaller air tubes already described regulate the amount of air going to the lungs. From various circumstances these sometimes contract too much, causing the patient to become half-suffocated, and to fight and struggle for breath; this is called asthma. The tubes may become inflamed, and filled with secretion—bronchitis; or dilated, secretion accumulating and putrefying in them—bronchiectasis. The air cells may become dilated and thickened, so that the whole lung is larger and less useful—emphysema; or they may become filled with a solid exudation from the blood, changing the lung tissue from its natural consistence of a sponge to that of a piece of liver, and thus rendering a large portion of it useless—pneumonia; congestion is an early stage of pneumonia. Small portions of the lungs may be affected in this way, subsequently breaking down to form cavities, and being coughed up with varying amounts of secretion—phthisis or consumption. Large portions of the lungs may die and putrefy—gangrene. The pleura may get inflamed and filled with fluid—pleurisy with effusion. This fluid may be converted into matter or "pus" as it is called—empyæma. Air may get into the pleura—pneumothorax.

Heart disease generally means disease of the valves, either narrowing them—stenosis—or widening them, thus allowing blood to partially flow the wrong way—regurgitation. The disease is called after the valve affected, *e.g.*, a patient is said to have "aortic regurgitation," or "mitral stenosis". The pericardium may be-

come inflamed and perhaps filled with fluid—pericarditis with effusion.

The aorta may from disease become weak in one part, then the pressure of the blood inside expands it more and more until it presses on neighbouring organs, interferes with the functions, and may probably burst —aneurism.

Section B.

SUBJECT—SYMPTOMS OF CHEST DISEASES. COUGH. EXPECTORATION. RATE OF BREATHING. DYSPNŒA. ASTHMA. PAIN. HÆMOPTYSIS. CYANOSIS. PALPITATION.

Next will be discussed the symptoms of chest disease, with which a nurse should be well acquainted.

Cough is generally present in chest diseases—it is, in fact, for cough that a patient often first comes to the hospital. The physician's duty is to find out the cause, and lay down the appropriate treatment; the nurse's duty is to note the presence or absence, frequency and character : whether it keeps the patient awake, whether the patient's account of it is accurate or not, and whether it comes on at any special time; if asked, to give her opinion as to whether it is better or worse from day to day. Patients often state that they have no cough because it is so slight that they become accustomed to it. Sometimes cough occurs only on wakening in the morning; at other times only on lying down or going to bed. The character of a cough varies; it may be dry, moist, loud, clanging, brassy, or barking.

It may occur in paroxysms, after meals, or in particular positions. It may be associated with retching or vomiting, with crowing, breathing, or bleeding from the nose, eyes, and ears, as in whooping-cough. The object of cough is to get rid of irritation or abnormal accumulation somewhere in the throat, air tubes, or chest. The commonest cause is excessive secretion of mucus, "sputum," or "expectoration," as it is called. In every case the sputum must be kept for the physician to see at his next visit. After he has once seen it, a little strong carbolic acid solution or some other antiseptic must be kept constantly in the spittoon.

Expectoration has to be noted as to whether it contains blood or not; whether frothy when first coughed up, becoming watery only on standing; whether it has any smell; how much is expectorated during the day; and whether in small or large quantities. Nurses should endeavour to be extremely accurate in all measurements. It is often noticed that amounts of sputum are always reported as being six, seven, or eight ounces, never six and a half or seven and three-quarters. Should a nurse notice any abnormal colour suggestive of tobacco, sweets, or other forbidden articles, she should at once institute a search of the patient's bed and locker, in order to prevent any further harm resulting from his indulging in them, and should she be successful, report it. In pneumonia, the sputum is described as "rusty," or "prune juice". This should be shown to the physician if it occurs.

The normal rate of breathing varies from twelve to twenty respirations per minute. When there is any difficulty of breathing the rate becomes materially

altered. Dyspnœa, or difficulty of breathing, is a common and most important symptom in the class of diseases we are now considering. It may depend on a variety of causes, as in cases of heart, lung, or kidney affections. Nurses must note its presence, and be able to describe it as it occurs during the absence of the physician. Nurses should be able to tell by a patient's breathing whether he is awake or asleep. This is very difficult at first, although with practice and continual observation it is very soon attained.

Dyspnœa may be continuous or come on in definite attacks. Nurses should learn to count the respirations per minute. In bad cases to do this often and keep a note of it. They should not count them just after an attack of coughing, as this will give an erroneous idea of their rapidity, and should try not to let the patient know they are being counted, or he at once alters the rate. This difficulty is got over by holding the hand and pretending to count the pulse, while really watching the breathing. They should note whether the breathing is accompanied by any abnormal sounds, such as gurgling, crowing, or wheezing. If the dyspnœa occurs in paroxysms, observe how often they come on, if they are brought on by anything special, the position assumed by the patient during the attacks, whether they are accompanied by much distress or sense of suffocation, and whether they come on suddenly or gradually. Often when the dyspnœa is bad, especially in heart and aneurism cases, it is impossible for the patient to lie down ; he may, indeed, be compelled to sit up for days and nights together, even a semi-recumbent posture inducing a sense of impending dissolution.

In more serious cases still, they cannot even remain in bed, but spend all their time in a chair, in order to give their chests the freest possible play.

The rhythm of breathing may be altered, being increased or slowed and interspersed with sighs, or alternately quick and slow, changing every few minutes, as is observed in some hysterical conditions.

It is important that nurses should be able to recognise what is called "Cheyne-Stokes" breathing, which "consists in the occurrence of a series of inspirations increasing to a maximum and then declining in force and length until a state is produced when apparently no breathing is taking place. In this condition a patient may remain for such a length of time as to make his attendants believe he is dead, when a low inspiration followed by one more decided marks the commencement of a new ascending and then descending series of inspirations." It should be mentioned that Cheyne-Stokes breathing is not always so typical or well marked as here described ; still, the description will be sufficient to enable anyone to recognise it.

In asthma patients are often ordered an inhalation, or a capsule, or a draught, to be taken at the commencement of an attack. It is extremely important that the remedy should be ready to be applied at a moment's notice. Often the attacks can be cut short if the remedy is given directly the patient begins to feel difficulty of breathing, but when once the attack is well established the remedy may be found useless.

Cyanosis is a condition depending on some interference with respiration or circulation. By cyanosis is meant lividity, duskiness, or blueness of the face—or,

indeed, of any part, but the face shows it most. Its duration and degree must be noticed, for it may only come on with an asthmatical or coughing attack; or, on the other hand, may exist for days. People, when under the influence of laughing-gas, always exhibit more or less of it.

Pain in any disease is always to be reported, and without giving the nurse's opinion as to the cause. Pain may be of different kinds and degrees: it may be described as sharp, shooting, aching, stabbing, catching, dull, griping, throbbing, etc.

When a patient spits up blood, he is said to have hæmoptysis. The amount may vary from a few isolated streaks to a rush of blood so large that the patient dies in a moment. When in any quantity, it is all-important to note whether it is vomited or coughed up. This helps to determine whether it comes from the chest or stomach. The relations of a nurse to a case of hæmoptysis are most important. First of all—and this applies equally to all cases—she should never appear flurried or anxious, but be firm and matter-of-fact. In default of orders to the contrary, the patient must be kept perfectly still and quiet. He must not be allowed to raise himself, or make the simplest exertion, without the permission of the doctor. The nurse on duty must never let him out of her sight for a minute; and, should he be one of those excitable people, she must sit by him and do everything in her power to keep him quiet. These people take advantage of any relaxation on the part of the nurse, for they are often slow to appreciate the extreme danger of their position. Any remedies ordered to be given in case of hæmoptysis coming on must always be

kept close at hand; not a moment is to be lost when the attack occurs. If, for instance, it is a hypodermic injection which is to be given, one nurse will go for the house surgeon, while another will be getting the syringe out of its case and filling it with the solution; a second or two lost may make all the difference between life and death.

This is only one of the many instances in which the lives of her fellow-creatures may be entirely in her hands. She should not, therefore, regard her responsibilities lightly.

Palpitation or irregular action of the heart occurs in a variety of diseases, chiefly, however, as might be expected, in heart diseases. It can easily be felt by placing the hand over the patient's heart. Remedies to be given when the attack comes on should be kept where they can be quickly obtained.

Section C.

SUBJECT—BEDCLOTHES. POULTICES. ICE-BAGS. BLISTERS. LEECHES. ARREST OF HÆMORRHAGE AFTER LEECHES. IODINE PAINT. LINCTUS. INHALATIONS. PARACENTESIS. CUPPING. VENÆSECTION.

With regard to covering in bed, chill is the chief thing to be avoided. It is a physiological fact that cold applied to the surface of the body produces congestion of the internal organs by driving the blood from the surface into them. Congestion is the first stage of inflammation, and although in a healthy person a slight

temporary congestion is unimportant, in one whose internal organs are already inflamed its effect can hardly be over-estimated. A slight chill in a person suffering from bronchitis or pneumonia may just be the determining factor as to whether that patient shall live or die. Flannel should be worn in some form, either as a vest inside or flannel jacket outside the night-dress. If the former, it should be changed at least every three days, and where possible the patient should have one for night and one for day. The bedclothes should be in sufficient quantity to keep him warm without being excessively hot. They should not be so heavy that they press on the chest and embarrass the breathing.

How to make poultices will be learnt practically in the wards; still there are a few special points of which mention may be made. Chill should be avoided in applying and removing them. With this object, some physicians are in the habit of ordering two layers of flannel to be placed between the skin and the poultice, one layer only being removed with the latter. By this means not only is the patient protected from chill, but also from the unpleasant sensation of having the poultice next his skin, a point specially useful in children. A poultice must not stick to the skin, should be half-an-inch thick, and put on as warm as it can be borne. The patient should be got ready as much as possible before the poultice is brought to him, but he should remain covered with the bedclothes until the poultice is absolutely at the bedside. The skin should be rubbed dry with a warm towel when one poultice is removed and before applying the next. This prevents itching, and to a certain extent also that troublesome thing known as

"poultice rash". The time for a large poultice to remain on is two to four hours; for a small one, one to two hours. A jacket poultice is one which is applied to the whole surface of the chest, front and back. It should be made in two halves, which can be united by strings at the corners, so that it is not necessary to uncover the front of the chest while applying the first half to the back. Mackintosh and jaconet outside a poultice make it retain its heat considerably longer. When poultices are discontinued cotton wool must be worn by the patient for some days after, but should be left off a day or so before he goes out of hospital. The nurse should ask if she has any doubt about it; it is a point which the house surgeon, with his many duties, is apt to forget.

An ice-bag to the chest is frequently ordered. Here again, although it may seem paradoxical to say so, it is important to avoid chill. Because cold is to be applied to a certain part of the chest, it is not necessary to expose a larger portion of its surface than is required for the ice-bag. A blanket should cover the patient under the bedclothes, and touch the bag all round its circumference. An ice-bag is meant to apply cold; if, however, all the ice melts, not being at once replenished, the bag of water rapidly becomes warm, and acting like a poultice, does of course more harm than good. It takes a long time to remove the bad impression which a doctor gets of a nurse when he finds his cold applications transformed into hot ones.

Blisters are used chiefly in chronic affections. They are applied either with blistering plaster—emplastrum lyttæ—cut the size and shape required; or blistering

fluid—liquor epispasticus—is painted on. Briefly, the special points in applying blisters are as follows. The natural grease of the skin should be removed by washing the part first with soap and warm water. When applied, the plaster or fluid should be covered with a little cotton wool retained in its place by a few strips of sticking plaster about $\frac{1}{4}$ in. wide. In using the fluid, in order to prevent it running, a circle of oil should be painted around the part to which it is to be applied; also a piece of wool should be placed in the direction in which it might run, should this accident happen in spite of precautions. It looks bad to see a nurse's fingers covered with blisters, for, having forgotten to place the wool in position, her first impulse is to stop it running with her fingers. A blister should rise in from five to six hours. Should it not do so, a small poultice applied over it will generally bring about a satisfactory result. To dress a blister, a receiver, or piece of absorbent wool, should be placed underneath; the most dependent part snipped with scissors, but the cuticle should not be cut off; and when the fluid has all run out the blister should be dressed with boracic ointment. If the blister is ordered to be kept open, then the cuticle should be cut off and dressed with the irritant ordered. This must be spread on lint cut exactly the size of the blister, and no larger.

Leeches are much more used in some hospitals than others, and there are several details in applying them which it is necessary to know. The part to which they are to be applied is to be well washed first. The leeches are to be handled as little as possible. They are best placed in a wine-glass, which is then inverted

over the spot where they are wanted to bite. If they refuse to bite, the surface should be smeared over with milk, or sugar and milk, or cream, or another leech should be tried. A nurse is not justified in pricking or scratching any patient's skin under any circumstances, as is sometimes recommended, in order to make them bite. To ensure them biting at an exact spot, as behind the ear, she should half fill a test tube with cotton wool, then drop the leech tail first into it, and invert over the spot required. A nurse may be frightened of a leech herself—if so, she should not let the patient notice it, as fright is catching—but familiarity, especially with a leech, breeds contempt. Nurses frequently have great difficulty in knowing which is the head end of the animal. The head is the more pointed end, which a nurse may find out by letting him "walk". A leech always moves head first. When replete they drop off of themselves, but should they be tardy in doing so, it is only necessary to sprinkle on them a little salt. A leech must never be pulled off, or their teeth will be left in the wound, and the patient will be hurt. After the leeches have dropped off, it is as a rule only necessary to apply a little absorbent wool to stop the bleeding; a very vigilant watch must, however, be kept on the punctures for some hours after, for they sometimes bleed profusely. Should they continue to bleed, there are several things a nurse may do before sending for a doctor. It may be quite sufficient to wash the part clean with warm water, and expose it to the air. Other methods are simple pressure with the finger for a few minutes, either before or after stuffing the little holes with cotton wool, bringing the edges together with

strapping, painting the punctures with collodion or tincture of perchloride of iron, and the application of ice. Supposing, however, all these have been tried and failed, she must send for a doctor. Probably he will touch it with caustic, the end of a hairpin heated to redness in a spirit lamp, or even pass a harelip pin under it.

It has been shown how the apices of the lungs extended up above the collar-bone. When an apex is to be painted with iodine, the proper area to paint will be the space covered by the hand when the tips of the fingers touch the collar-bone, and the palm of the hand rests on this part. It is generally ordered to be done every day, but the nurse must be careful to ask whether it shall be continued, should the skin get very tender or red in the neighbourhood. The base of the lung is the part between the lower angle of the shoulder bone —scapula—and the last rib.

A linctus is a cough medicine of more or less syrupy consistency. Doctors often order a tea-spoonful to be given "occasionally" when the cough is troublesome. As many of these medicines contain opium, an interval of an hour and a half should be allowed to elapse between each dose, unless more definite orders are given.

Various substances are used as inhalations in chest diseases. An inhalation is a vapour of some drug or mixture of drugs. They are said to be used "moist" or "dry". Moist inhalations are those which are ordered to be added to boiling water and inhaled with steam two or three times a-day. An inhalation is said to be dry when, although it is a liquid, it is used with one of Dr. Burney Yeo's oronasal

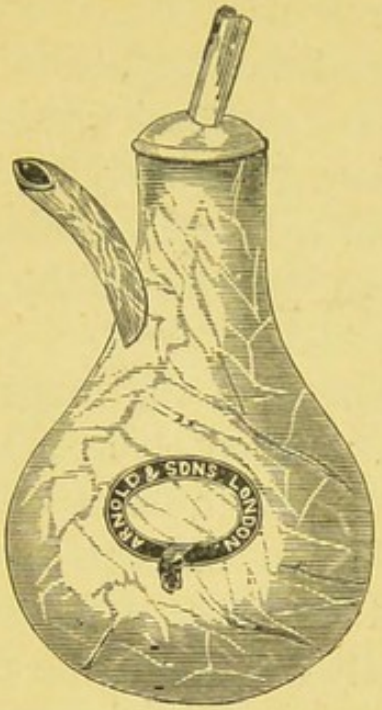


Fig. 6.—Steam inhaler.

inhalers and inhaled continuously. The inhalers consist of little triangular boxes of perforated zinc, fitting over the patient's mouth and nose, containing a small piece of sponge, and fastening behind the patient's ear with elastic. The inhalation is poured (about ten or twenty drops at a time) on the sponge, and must be renewed as soon as it has evaporated, which will be about every twenty minutes or so. It is usual to give the patient the bottle and teach him to replenish it himself.

Some chest hospitals have what is called a compressed air bath, which is really a chamber in which the patient is enabled to breathe air in a more or less condensed form, or this is combined with an arrangement for breathing into rarefied air. In some diseases, too, patients are given inhalations of oxygen gas.

Powders may have to be ignited and the smoke inhaled. If there is great difficulty in igniting them, a little saltpetre should be added, when they will burn merrily. Other substances, such as nitrate of amyl, are kept in glass capsules, which have to be broken when required. Full directions are, however, always to be found on the box. These last two sets of remedies, powders and capsules, are used chiefly in asthma. *All remedies for asthma should be ready at a moment's notice.* Emetics are occasionally given in bronchitis,

because the act of vomiting helps the expulsion of secretion from the chest, nurses should understand the reason of it, should they see it done at any time.

There are a few medical operations, so called because they mostly fall to the lot of the house physician, which we will describe here.

Paracentesis thoracis, or aspiration of the pleura, is done for pleuritic effusion or for empyæma, or more rarely for blood or air. Some operators prefer the patients sitting up, others prefer them lying down because of the danger of fainting. The nurse will find out of course which he wishes, and so arrange the patient that he can get at him; for instance, if he is to be lying down, she will bring him to the edge of the bed, well supporting the chest underneath with pillows, thus making him convex on the uppermost side, that is, separating the ribs. The operation is done with an aspirator and conducted antiseptically. The carbolic lotion is apt to cause the fluid drawn off to coagulate in the needles and block them; to obviate this, the needles should be washed in boracic lotion after being well purified in carbolic.

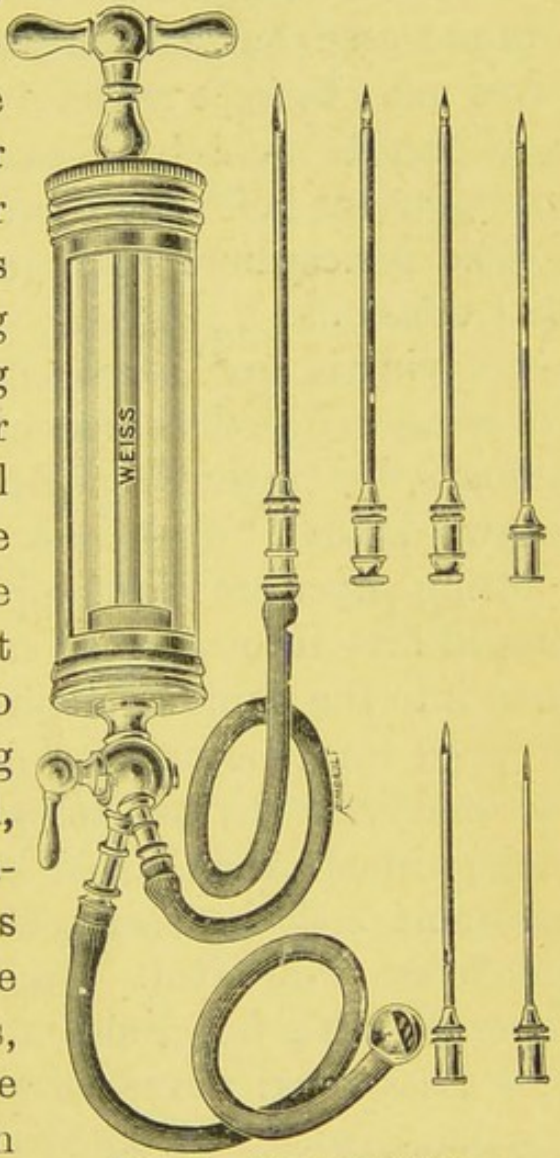


Fig. 7.—The aspirator.

Several receivers will be required to measure the fluid abstracted, as several pints may be drawn off. The dressing will probably consist of a graduated compress of dry boracic lint, kept in place by a large round of strapping, and covered over with a broad (six-inch) flannel bandage. Anæsthetics, except local anæsthetics, are not used, but, as fainting may occur, all the restoratives must be kept ready.

N.B.—It should always be seen that the needles are clean and pervious before being given to the operator to use.

The pericardium is sometimes aspirated in pericardial effusions.

Cupping is an old treatment, formerly much used for relieving congestion of deep-seated parts, as lungs or kidneys, by drawing blood to the surface. Cupping is of two kinds: "dry" and "wet". Small pieces of blotting paper are picked up with a needle on a handle, dipped first into a saucer containing methylated spirit, then into the flame of a spirit lamp to ignite them, and dropped into the cupping glass, which is immediately inverted over the part to be cupped. The flame being extinguished, the heated air in the glass cools and contracts and the skin rises in the glass, the edges of which are well oiled. To detach a cupping glass, the tip of the little finger should be inserted under its edge. The glass must never be removed by pulling, for this would cause great pain. When the cupping is successful large circular bruises are left. In wet cupping, a number of small incisions are made with a scarificator before the glass is applied. From this description the

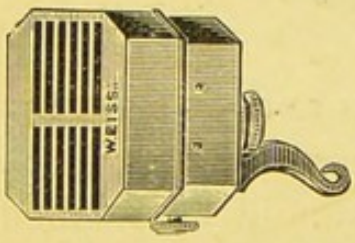


Fig. 8.—Scarificator.

nurse will be able to see what will be wanted when cupping is to be performed; the oil is the thing nurses are most apt to forget.

Bleeding or venæsection is another old-fashioned treatment, which, however, is of great use in certain conditions of the chest. It is performed as follows: A bandage is tied round the arm tight enough to make the veins of the fore-arm start out; one of the more prominent at the bend of the elbow is selected and opened with a lancet. Should the flow of blood be insufficient, the patient can increase it by grasping a stick or piece of bandage in his hand, on which he keeps working his fingers. Sufficient having been withdrawn, the constricting bandage is loosened, and a pad of boracic lint fixed on the wound with a few figure of 8 turns of a bandage

Section D.

SUBJECT—DANGER OF HEART CASES. SYMPTOMS OF HEART CASES. DYSPNŒA. RESTLESSNESS. WHAT TO DO IN SYNCOPE. BRAIN SYMPTOMS OF HEART CASES. PHYSICIAN'S VISIT.

The special danger to look out for in heart cases is a fatal syncope or faint from patients suddenly getting up or exerting themselves. These are trying cases to nurse, as they are frequently excitable people, whom it is very difficult indeed to keep still. The author has several times seen patients die suddenly in the wards from some exertion, or getting out of bed, although strict

orders to the contrary have been given. Now and then this will happen, in spite of the utmost vigilance and care on the part of the nurse, though, generally speaking, the more vigilant a nurse is, and the more she has her patients in hand, the less likely are these undesirable occurrences to take place. Nurses will find it very difficult to get these patients comfortable in bed. Different cases want to be propped up at different degrees, and are constantly slipping down and requiring to be raised again. In these diseases it is important that the props should be so arranged as to support the patient chiefly *below* his chest, otherwise his breathing will be made more difficult. Many cases of advanced heart disease and aneurism will be found much relieved if they are able to be supported leaning forward. A very good "forward rest" can be made of two perpendicular pieces of wood a foot wide, half-an-inch thick, and about six inches higher than the bed, connected by a plank a little longer than the bed is wide. This bridge is placed across the bed, and a pillow placed in the centre of it, so that the patient can rest his elbows and fore-arms on it when sitting up. It is also very useful for patients of this class who are allowed to sit in chairs, or can be used as a bed-table or book-rest.

To raise patients in bed, two nurses are in most cases required. One stands on either side, and putting one hand under his buttock, or upper part of his thigh, and the other under his back in the scapular region, both lift together. It is very distressing to see a nurse vainly endeavouring to drag up a heavy dropsical patient by the shoulder, to say nothing of the discom-

fort to which it puts the patient. Nurses have been known to attend very carefully to orders that these patients must be kept lying down, but to think it quite right to sit them up in a chair for several minutes every morning while they made their beds. This is a most dangerous proceeding. Patients with heart disease are not generally nice cases to deal with; they are hardly ever satisfied, and are constantly making complaints. Often nurses will find it very hard to keep their temper with them, and attend to them with that cheerful, even manner which they should always strive to maintain.

Dyspnœa is almost as common a symptom of heart disease as it is of lung disease. It depends on the inability of the weakened heart with incompetent valves to get sufficient blood to the lungs to be aerated. Nurses may relieve this form of dyspnœa to a certain extent by simply fanning their faces. All cases of bad dyspnœa, on whatever cause depending, should be saved the exertion of talking as much as possible. They must not be bothered with unnecessary questions, but nurses should get into the way of finding out their wants without asking them, and of anticipating them. It is a difficult power to acquire, but "practice makes perfect". When their attacks of dyspnœa are specially bad, they should be protected as much as possible from the gaze of the other patients by screens, without, however, entirely shutting them off from the rest of the ward or the nurses' continual supervision.

Restlessness is a symptom common to many diseases, depending, however, very often on slight and removable causes, such as too many bedclothes. A patient

who has been tossing about half the night will frequently drop off to sleep on removing one of his blankets. Cold feet is another cause which should be met by hot water bottles. In giving these it is not sufficient to simply put them in the bed; they must be wrapped up in flannel or a blanket and put close to the patients' feet, without of course burning them. Perhaps, however, the cause most likely to be forgotten is a distended bladder. This should always be borne in mind; which again is an example of the importance of observing systematically.

In case of a sudden faint or syncope, what must be done? In hospital the patient should be left lying down, the house surgeon sent for, and while this is being done stimulants should be got ready. No stimulants should ever be administered in hospitals, where a doctor is always available, without orders. Supposing, however, that the nurse is a long way away from medical aid, what should she do? It is not every case of syncope which requires stimulants, for internal bleeding gives rise to syncope, and internal bleeding may take place in a variety of diseases, as heart disease, ulcer of stomach, aneurism, etc. Syncope is Nature's way of arresting the bleeding; to give stimulants in these cases is only to renew the hæmorrhage. If, then, the nurse suspects that the faint is due to hæmorrhage *she must not give stimulants.* In any case she must withhold them as long as possible. It will nearly always be safe to lay the patient down, loosening the things round his neck, fanning his face, putting hot water bottles to his feet, smelling-salts to his nose, and in opening the windows. If when a little liquid is poured

into his mouth he makes no effort at swallowing, but only a gurgling sound, it in all probability only goes into his lungs, and, therefore, no more should be given. When fainting is expected, the nurse will of course have all the restoratives within reach.

A nurse must never take the responsibility of bathing a heart patient without the doctor's leave, which, when the case is getting worse, should be renewed often, and she must not allow heart cases to lock themselves in the lavatory; for, if an emergency occurs, it may be hours before they can be got at; in fact, the door should not be even shut, and a nurse should be close by the whole time the patient is there. Better still, bed-pans or night-stools should be used with similar precautions, for the straining at stool is a fertile source of fatal syncope. In some hospitals there is a rule that patients who can get up are expected to help in the general ward work, but under no circumstances should a heart case do so, for rest is the chief reason for which they are admitted.

Cases of pleurisy with large effusions have been known to die of syncope from sudden exertion just as heart cases do. They may, in fact, be regarded as heart cases, for the fluid is pressing on the heart and impeding its action; until tapped they should be kept very quiet. Aneurism cases also should be treated as heart cases, the danger of exertion being, if anything, greater. These cases are treated in various ways, either by operation or medically. Tufnell's treatment consists in keeping the patient at absolute rest in bed for several months, avoiding all exertion of any kind, and, with this view, the regular administration of

laxatives. Also in cutting down the diet to the least quantity required to maintain life. Tufnell's treatment is spoken of as the "starvation" treatment.

From interference with the circulation of the brain, cases of heart disease are apt to wander, or even have violent delirium. Cases, too, occur where they become permanently insane—the insanity of heart disease. Other organs may get affected for the same reason; patients may go blind, have hæmorrhage from the lungs, stomach, or kidney, have jaundice, dyspepsia, dropsy, etc. This class of cases will get fits of depression, fancying they are going to die, and perhaps even refusing food. A nurse can do a great deal for these patients if she will take the trouble, by cheering them up, amusing them, and doing anything which will occupy their thoughts, and so prevent them thinking of themselves. A large number of the cases of heart disease which are treated in hospital improve sufficiently to go on with their work for several years, especially if they are able to lay up occasionally for a week or so to rest, a fact which gives sufficient grounds for raising their hopes. Ventilation will form the subject of a future chapter. For the present it may be mentioned that a ward should be maintained at an even temperature—for chest cases about 60 deg. Fahr.; draughts should be avoided, but the air kept pure.

There is one occasion when nurses are apt to get flurried, and that is at the visit of the physician. Everything should be done quietly, and in an orderly and business-like manner. If he is in the habit of sitting down at a bed, a chair should be provided at each. Poultices should be so timed that they require removing about

the time of his visit. As he comes to each bed he should find the patients undressed ready for him, but well covered by the bedclothes; thus he is not kept waiting. It is easy to find out from the house surgeon in the morning what cases he is likely to want to examine. When a physician says he is going to examine a chest, he wants to see the whole of it. From what has been stated of the extent to which the lungs reach upwards and downwards in the chest it will be quite obvious that it is of no use to either open the night-shirt a button or two at the top, or to pull it from below. Only the part which he wishes to examine, such as chest or abdomen, should be uncovered at a time; still, nurses should not go to the other extreme of pushing blankets, etc., unduly in his way. All windows near the case being examined must be closed. The most perfect silence must be maintained throughout the ward, no one allowed to walk about or even speak, for the sounds which doctors have to listen for are very feeble, and easily obscured by chattering voices or squeaky boots. Should it be a cold day, hot water must be ready in the basin on the table, so that the physician may warm his hands before applying them to the chest. A nurse should have ready a measuring tape and a blue aniline pencil, with a little water in a medicine glass to moisten it, in order that the physician may mark out various things on the chest, which should on no account be washed out without permission. A soft towel should also be ready, in case he wishes to place his ear to the chest without the intervention of a stethoscope.

CHAPTER IV

Section A.

SUBJECT—THE ABDOMEN. ANATOMY AND PHYSIOLOGY OF THE DIGESTIVE ORGANS.

The abdomen is the largest compartment of the body, and contains most of the digestive organs. It is bounded behind by the spine and back muscles, in front by the abdominal muscles, at the sides by the ribs and abdominal muscles, above by the diaphragm, and below by the pelvis and its contained organs. The abdomen is, in popular language, called also the stomach. This is a mistake; for the stomach is only one of the organs contained in the abdomen, and its size is comparatively insignificant. It is placed in the upper part of the abdomen, and only coming in contact with the abdominal walls at a part called, in popular language, the pit of the stomach, *i.e.*, between the angles of the ribs; and at the left side, especially when distended, it is in contact with the ribs. If the left hand be placed on the ribs about a hand's breadth above the hip bone it will just about cover this latter part. In medical language the pit of the stomach is called the "epigastrium".

The stomach is a hollow organ composed chiefly of an outside muscular coat, and an inside lining called "mucous membrane," containing the small glands which make the gastric juice. At one end is the

opening of the œsophagus or gullet by which food comes from the mouth; at the other is the opening of the small intestine. When empty, the stomach has a capacity of about a pint, but it may be distended by food to hold three or four more. The œsophagus, stomach, and intestines are spoken of collectively as the "intestinal canal"; they measure about thirty feet. The object of the length is to increase the surface of absorption, a surface still further augmented in the small intestine by minute velvety processes called "villi," with which the whole mucous membrane is covered. The small intestine, which is the longest part, is divided into three: the duodenum, the jejunum, and the ileum. Like the stomach and large intestine, it is composed of muscular coats and mucous lining, with multitudes of little glands.

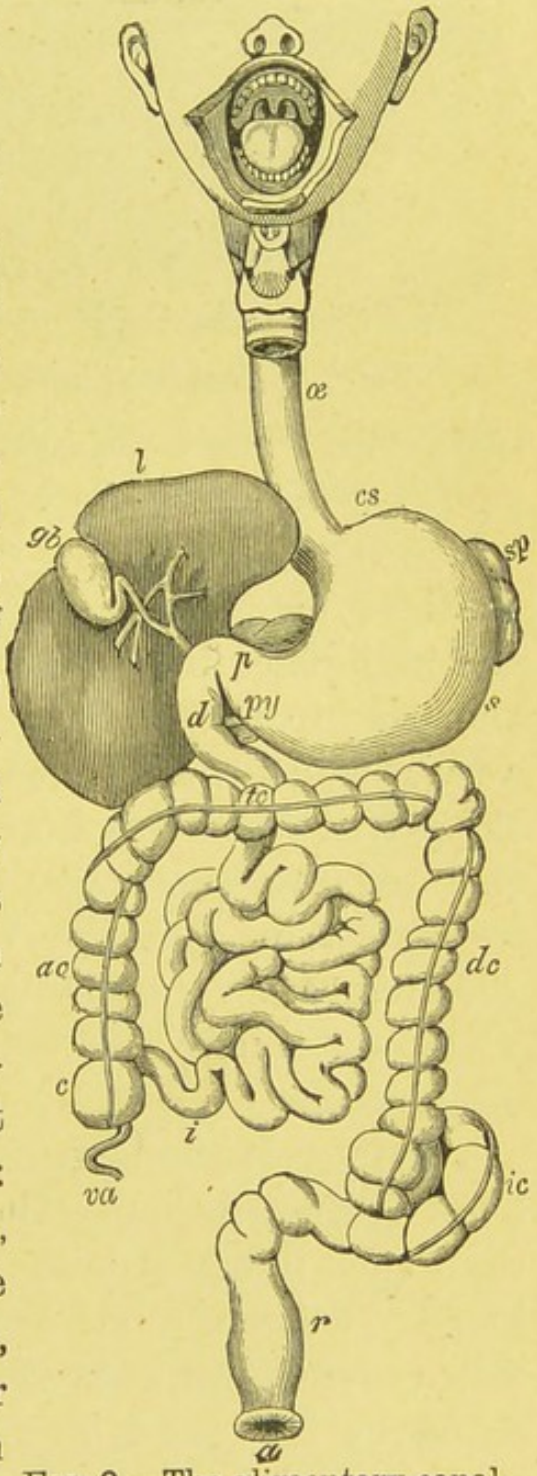


FIG. 9.—The alimentary canal.

Into the duodenum open the ducts of the liver and pancreas. The ileum, or third part, is the seat of ulcers in typhoid fever, of which more will be said later on.

It ends in the large intestine in a valve called the "ileocœcal," so arranged that food can go from the small into the large, but not *vice versâ*. The small intestine occupies chiefly the middle part of the abdomen. The large intestine commences close to the right hip bone in a rounded end called the cœcum, into which the ileum opens; from this it goes straight up to the ribs (ascending colon), crosses the abdomen above the umbilicus (transverse colon), and then descends to the left hip bone (descending colon). There it makes a twist called the sigmoid flexure, and then passes into the pelvis, when it is known as the rectum. In order that the intestines may move on each other without friction, they and the various other organs in the abdomen are covered, like the lungs and heart, with a smooth shining membrane, in this case called the peritoneum.

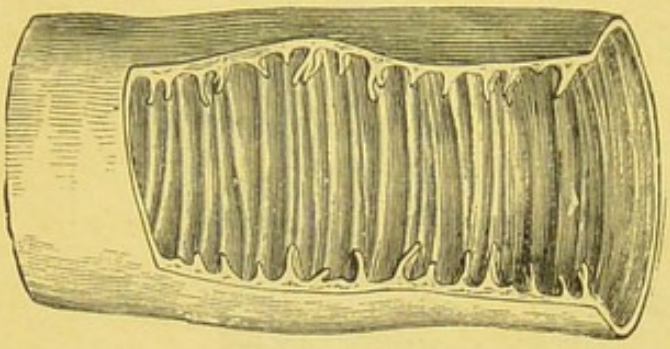


FIG. 10.—Section of intestine.

The liver is the large gland which manufactures the bile. Situated under the diaphragm, chiefly on the right side, it has attached to its under surface the gall bladder, where the bile secreted is retained until wanted. For nursing purposes the upper limit of the liver is found by drawing a line from the lower extremity of the sternum transversely to the right; the lower limit being about a hand's breadth below this. A nurse may be told to apply leeches or poultices to the liver, so should know where to put them. The pancreas is so far away

from the surface that for nursing purposes it may be neglected.

The physiology of the digestive organs will next be considered. The object of food is to nourish the different organs—that is, to repair the waste which is continually going on from use. The process by which food is turned into a condition in which it can be taken into the blood is termed digestion. The organs being discussed are the digestive organs. Food is divided into the following classes: starches and sugars—as bread, vegetables, sugar; albumins—as meat, fish, curds of milk; fats—as butter, fat, cream; salts—as common salt; extractives—as beef tea, coffee, tea; and water. It is necessary for health that each of these classes should be represented in a diet, and that they must be digested in order to be of any use. The different classes get affected in different ways in different parts of the intestinal canal. In the mouth all the solids get more or less broken up by the teeth and softened with the saliva. But the saliva has another action: it changes the starch, which cannot be absorbed, into sugar, which can; in fact, digests it. In the stomach the fats get changed into oil; and the meat gets partially dissolved by the action of the gastric juice—or, rather, by its active principle, called pepsin. After a longer or shorter stay in the stomach, according to

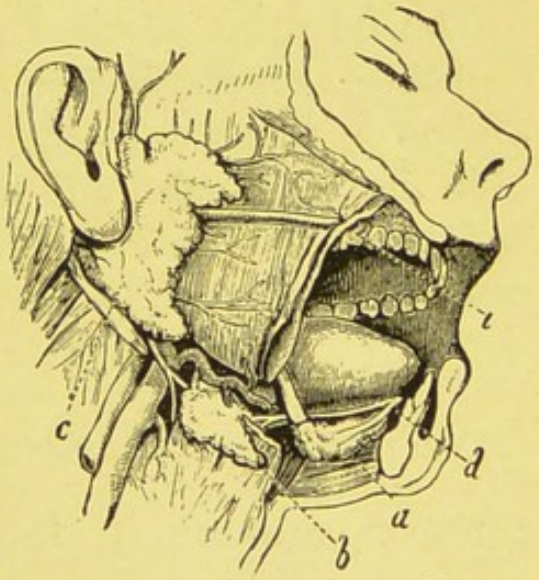


FIG. 11.—Salivary glands.

circumstances, the food is passed on—first the liquid, and then the solid—into the small intestine. Here it meets the bile, which acts chiefly on the fats, and dissolves them; also the pancreatic juice, which acts on the starches like saliva, and on the albumins like gastric juice. Thus, by the time the food reaches the large intestine, it is nearly all liquid. Although there has been absorption of the water taken with the meal all the way along the stomach and small intestine, yet the amounts of the gastric and pancreatic juices and of the bile are so large that the food or "chyme" is always liquid at the ileocœcal valve. The chyme does not even represent all the solids of a meal, for they also have been partly absorbed on the way down. In the large intestine the remainder of the liquid is absorbed, and the indigestible and undigested matter goes on to form the fæces or motions.

The intestine has also another function: it excretes —that is, separates from the blood substances which are no further use to it. The fact is taken advantage of in kidney disease, and in the treatment of biliousness and headache, where the excreting function of the intestine is increased by purgative medicines.

Section B.

SUBJECT—ABDOMINAL DISEASES AND THEIR SYMPTOMS. MUSTARD LEAVES. FOMENTATIONS.

The organs of digestion are subject to different diseases, which will now be considered. If all the different parts of the alimentary canal do their work properly, people

are quite unconscious of digestion, but if some parts are out of gear, pain, flatulence, etc., result—in a word, indigestion. But the stomach and digestive organs are liable to an important series of diseases independently of indigestion. The stomach may be inflamed—gastritis, or the small intestine—enteritis, the cœcum—typhlitis, the large intestine—dysentery, the rectum—proctitis, the peritoneum—peritonitis. Ulcers or cancers may form in any part. Dropsy of the peritoneum is called ascites, tubercle of the peritoneum tabes mesenterica or consumption of the bowels. From various causes, such as cancers, twists, internal blocking with hard fæces, etc., the intestine may get obstructed, giving rise to "intestinal obstruction," popularly called "stoppage".

The special symptoms to be noted in abdominal diseases are the appetite, vomiting, pain, flatulence, hiccup and the motions.

The appetite is affected more or less in most diseases, and is a symptom which it is always important to note. Nurses should get into the habit of estimating by the eye how much by weight a patient takes. For instance, in a report she would not put down "appetite a little better" or "a little worse," but about how many ounces of the different articles of food the patient had taken. She will notice also at what times he feels most inclined for feeding. In hospitals it is especially necessary to keep a record of whether patients eat their food or not, for when they leave they frequently make complaints against the food, which complaint gets taken up by some well-meaning person, and which it is very difficult to disprove unless it is all recorded. When vomiting

occurs it should be noted how soon after food it takes place, whether preceded or followed by pain, whether the food is digested or not, whether frothy or any special colour; also if it is brought on by anything special, such as syringing an ear, painting the throat, any special article of diet, or by any special position, as lying on the left side, or on first rising in the morning. Vomiting, in fact, depends on a variety of causes, in the finding out of which an intelligent nurse may render the medical man great assistance. Vomit should always be kept for a doctor to see, and the quantity measured. The stomach may get blocked at the further end, and owing to this the organ gets gradually dilated. In this condition the food may accumulate for days until it amounts to several quarts, when it gets vomited. If the intestines get obstructed so that nothing can pass at all, the contents of the bowel are regurgitated into the stomach, and fæcal vomiting results. If the food is fermented in the stomach a frothy vomit is formed. In some diseases, as gastric ulcer, or gastric congestion in heart or liver disease, blood is poured into the stomach and vomited. When in large quantity it is brought up quickly, its nature being obvious; but when in smaller quantities it becomes altered by the gastric juice, and from being a bright red it is changed to a dark brown or black. In small quantities it is described as coffee grounds. Vomiting of blood is called hæmatemesis.

Pain may be associated with vomiting, as happens when a stone passes from the gall bladder or the kidney. Sometimes pain is relieved by pressure, but at others the abdomen is so tender that even the weight of the bedclothes cannot be borne. This is the case in peri-

tonitis, when it is necessary to have a cradle to keep off the weight of the bedclothes. Colic is a painful spasmodic contraction of the intestine, brought on chiefly by indigestible food. Pain in the abdomen may be due also to many other conditions, as abscess, tumours, aneurisms, etc., which is mentioned to emphasise the importance of noting and accurately reporting. In a hospital the house surgeon should always be sent for if a patient is in pain. No house surgeon will object to come to a patient in pain at any time; still, nurses must use judgment, and not send for him every time an old woman gets the wind.

Flatulence, when it accumulates instead of being passed or brought up as eructations, is called tympanites. It may be so extreme as to make the patient's abdomen as hard as a drum, and cause death by pressure on the heart.

Hiccup is only of importance when prolonged, as it may be in obstruction of the bowels.

With regard to the motions, a nurse must become well acquainted with the different special characters associated with different diseases. As a rule she is not expected to give her opinion as to whether they are typhoid or dysenteric, etc., but to describe them according to their colour and consistence. Often, however, a doctor will ask her opinion as to whether she thinks they are typhoid or dysenteric, etc., for the nurse's opportunities of learning this point are such as to render her opinion valuable; in nursing a case of typhoid, for instance, she will see the motions every day, and should therefore become well acquainted with all the different forms and colour which they may assume in this dis-

ease. It must be noted whether they are formed and of natural size, watery, or worm-like, which happens in some cases of obstruction. In colour they may be black, green, clay colour, pea-soup colour, etc. When black and of tarry consistence there is probably a good deal of blood, altered by the intestinal secretions, mixed with them. Should the blood be much in quantity and unaltered, it has been poured out into the intestine quickly, and is probably still being poured out. In this case the nurse must send at once for a doctor, and in the meantime keep the patient as quiet as possible. Various medicines, such as iron, bismuth, and charcoal, also produce this black effect. Sloughs have to be looked for in typhoid; they are difficult to describe, but once seen they will always be recognised again.

In every disease the nurse should notice the motions, not necessarily for reporting, but so that she may be able to answer if questioned on this point.

In children, especially, must look-out for undigested food be kept. Large quantities of mucous and streaks of blood are passed in dysentery; shreds of membrane, which are also passed in this disease, may be mistaken for worms. Pus occurs from abscesses bursting into the bowel.

Worms are pretty obvious, particularly round worms. Thread-worms are very small, but can readily be recognised, if alive, by their movements. Tape-worms for the most part come away in small pieces or segments, which will readily be recognised again if they have once been seen.

When medicine is given to expel worms they must be kept for the doctor to see, in order that there may

be no doubt about size and number, while with tapeworms it is important to see if the almost microscopic head has been ejected.

The medical diseases of the liver are not very interesting from a nursing point of view. It may become enlarged in heart disease, or contracted, "cirrhosed," from excessive use of alcohol. In the latter case it is often associated with dropsy, or bleeding from the nose. Jaundice is produced from retention of bile in the blood, generally from some obstruction in the bile ducts. The obstruction may be due to different causes, as catarrh or swelling from chill, tumours, and wedging of gallstones. In doubtful cases this can only be determined by an examination of the fæces for gallstones. The fæces should be mixed with some strong carbolic solution, broken up with a stick, and then passed through a sieve. Hard masses resisting this process may be well washed by leaving the sieve under the tap for some time, when their nature will become apparent.

Abscesses of the liver are common in tropical countries, but cases will frequently be seen in patients who come from India to be cured. If not operated on, these abscesses may open on the abdominal wall, into the stomach, when the pus will be vomited, or into the lungs, when it will be coughed up.

Hepatic colic is the pain produced by the passage of a gallstone down the duct which connects the liver with the duodenum. The pain is at times simply agonising, the features becoming pinched and expressive of great suffering, the skin cold and covered with perspiration; vomiting commonly accompanies it. As

a rule the pain is not continuous, but recurs again and again until the stone passes into the intestine.

The most important part of the nursing of abdominal cases is included under the head of feeding, which forms the subject of the next chapter. Reference will now be made to three minor points. Mustard is used for purposes of counter-irritation, as poultices mixed, or not, with linseed, or as the ready-made preparation called mustard leaves, in which form it is mostly ordered. These are moistened in tepid water, covered with cotton wool, and fastened with a bandage. They should not be left on more than half-an-hour, and after removal should be replaced by cotton wool. Fomentations should be changed every half-hour at least—oftener if the nurse has only one case to attend to. If turpentine is ordered, about thirty or forty minims is the right quantity to sprinkle on them. Fomentations should be covered with mackintosh or jaconet, which should everywhere overlap the flannel. In using spongiopiline for fomentations or liniments, it must be remembered that it can be used a great number of times, and is very expensive.

CHAPTER V.

Section A.

SUBJECT—FEEDING. MEALS. FOOD. MILK. BEEF TEA. STIMULANTS.

It is in feeding patients that the difference between trained and untrained nurses comes out so markedly. Nurses can contribute in a very large manner to a patient's welfare in this matter, for the way in which food is given makes all the difference as to whether a patient takes it or not. If food is given in an untidy fashion, the first glance will set the patient against it; it should be in the middle of the plate, and not allowed to soil it all over, nor should a meal be taken to the patient until everything is ready for him to begin; he should not be kept waiting for bread or knife or spoon, nor should he be given more than enough. Most people have perhaps had a feeling of disgust excited when, being a little out of sorts, they have come to dinner and got a big helping. How often have they gone away without eating when they would have finished a smaller portion easily? It is the same with patients. Food should never be kept in the sick-room or ward, nor, as much as possible, patients allowed to see food which they may not have. Meals should be given most punctually; as much as is ordered, and nothing more. Miss Nightingale says that patients frequently only

manage to get their appetites up for certain hours of the day—generally when they expect their meals—and that a few minutes' waiting will destroy it. Nurses should not talk to patients at their meals, or allow anything to go on in the wards which would detract their attention from their food. Food should never be left by a patient's side, in case he should feel inclined to take it. This is a custom against which Miss Nightingale has entered a most emphatic protest. Should a patient express a wish for any special article of diet, the nurse should remember to ask the doctor at the next visit. Cold water may be generally given in small quantities at a time, but thirst will be best relieved by a tea-spoonful of cold coffee or a slice of lemon. Perhaps, however, the best prevention of thirst is to keep the mouth scrupulously clean. If necessary, the doctor may be asked to order a mouth-wash; the glycerine of borax, commonly used, is, from its sweet taste, often disagreeable. Ice is useful, but makes the patient more thirsty afterwards, and occasionally causes flatulence. It should be kept at the patient's side in a vessel on the soap-dish principle, so that the water may drain off as it melts. The practice of keeping it on flannel has rather a tendency to make the ice taste of the flannel, or of the soap with which it was washed. The best way to break ice is to split off small pieces with a large pin. It is best always to have instructions as to whether to wake a patient for food. If none have been given, it is left to the nurse's judgment. Should the case be one which does not get enough sleep, of course he must not be awakened. On the other hand, nurses need have no scruples in waking

a patient who is a chronic case and sleeps well at night. Some nurses only wake their patients partially—just sufficiently to take their food—after which they quickly fall asleep again. This is a great accomplishment, and one well worth learning.

It has been noted that foods were divided into sugars, albumins, fats, extractives, salts, and water; the body is also composed of the same materials, and, as the body is always wasting, the necessity constantly arises for these substances to be constantly taken in as food. A perfect article of diet would, therefore, be one which contained all these substances; in fact, one would be able to live on such a substance. Such a diet exists. Most people have lived their first nine months on such a diet, viz., milk. Milk contains all the materials necessary for life, and in a liquid, easily-digestible state. Many adults suffering from kidney and other diseases live for several months, and grow fat, on milk alone, feeling all the time in the best of health. Special stress is here laid on the nutritive value of milk, because patients often think that they are being starved when kept on this diet; and a sympathetic nurse, unless she understands this point, is apt to agree with them. It need hardly be said that a nurse should never express an opinion adverse to that of the doctor in charge, or in any way do anything calculated to lessen the confidence of the patient in him. Loss of confidence in the doctor often means loss of hope of recovery, and, if nothing worse, is sure to retard it. A doctor spends years in learning thoroughly what a nurse has only an inkling of; and, as he is sure sooner or later to hear of any disloyalty to

him, the nurse lays herself open to dismissal, for she may be sure that neither hospital nor institute authorities would ever defend her. Milk forms the diet of babies because their digestions are too feeble to stand anything else. For the same reason, milk forms the chief diet in most acute diseases, for in them the digestion is always more or less out of order. The state of the tongue gives the clue as to how it is affected, which is the reason why doctors look at it. The gastric juice is an acid juice. The effect of adding an acid, such as vinegar or lemon juice to milk, is to form curds. Cows' milk forms very large curds in the stomach, which are very indigestible. Small digestible curds are substituted for large ones by boiling the milk or diluting it with soda water, in one of which forms it is generally given to the sick. Another way of making milk digestible is to pre-digest it before it is swallowed by adding different digestants to it, such as Benger's liquor pancreaticus, Benger's food; the latter is a starchy food, which has the digestant mixed with it.

In hospitals a diet-table is drawn up for convenience in ordering and in making up the accounts. The diets are so arranged that they form a sliding scale from fever diets, through soup, farinaceous, and fish diets, up to ordinary diets, starting with nothing but milk, and approaching nearer and nearer to health diet until full diet is reached. They are arranged in meals at stated times, with the exception of fever diets. These latter must be spread out over the twenty-four hours—so much, so often. For instance, fever diet No. 1, consisting of three pints of milk, does not mean three meals of a pint each, but two and a half ounces every

hour. The object of cooking food is to make it more digestible; and although in hospitals the cooking is all done before coming to the ward, yet every nurse should be a bit of a cook, as every surgeon should be a bit of a carpenter. If nurses get a chance of learning a little invalid cooking, they should not throw the chance away.

The public have great faith in jelly, so that it is as well for nurses to know that it is almost of no use as a food. It has been found by experiment that animals fed on jelly alone died just as soon as animals not fed at all. When made with milk it is only of as much value as the milk it contains.

Another popular delusion exists as to the value of beef tea. With reference to this subject, the following is a quotation from the late Dr. Fothergill's book on dietetics. This is what he says: "Beef tea is not a food, it is a stimulant"; "to give beef tea alone to a sick person is to give him a stone when he asks for bread. Grateful and acceptable to the palate and stomach, possessing stimulating properties, beef tea has its value. But, all the same, as regards its food value, it is but a jackass in a lion's skin." And, again: "The mistaken views about the nutritive value of beef tea have been murderous. All the bloodshed caused by the warlike ambition of Napoleon is as nothing compared to the myriads of persons who have sunk into their graves from a misplaced confidence in the food value of beef tea. As a food, it is but as the mirage of water seen by the thirsty traveller in the desert: there is no real water. So with beef tea; it is not a food."

These rather lengthy quotations have been given because nurses should understand this point thoroughly, and because it is right that they should be able to speak authoritatively on the subject.

Stimulants are not foods, but are substances which enable the individual to make use of energy stored up in his body in the shape of fat, muscle, etc. They enable us, in fact, to feed upon ourselves. As it is obvious that this process could not go on long, they are chiefly used temporarily to tide over a critical period in an acute disease, or to stimulate digestion in a chronic one. Alcohol is not now used to the large extent formerly the practice, and which still lingers in some hospitals. But alcohol is not the only stimulant; beef tea is one, so are tea and coffee, and extracts of meat such as Liebig's. Stimulants are given in small quantities at a time and at such intervals that the second dose is given before the effect of the previous one has worn off; hence the importance of the most absolute punctuality.

Dieting is a complicated subject. Nurses think doctors insist on this or withhold that article of diet out of mere caprice. It is nothing of the sort. Each substance is considered not only as to its digestibility, but also as to its complex chemical composition. The nurse's part of dieting consists in a most loyal carrying out of the instructions she receives from the doctor in charge of the case.

Section B.

SUBJECT—FOOD GIVEN OTHERWISE THAN BY THE MOUTH. BY NOSE. BY SKIN. NUTRIENT ENEMATA. OTHER USES OF ENEMATA. CLASSIFICATION OF ENEMATA.

Under different circumstances food may be given otherwise than by the mouth; for instance, with patients who refuse food it may be necessary to feed them through the nose. This is done by passing a small flexible tube into the nose until it reaches the back of the throat. To the end of the tube a funnel is attached into which the food, which must be liquid, is poured in small amounts, viz., one or two tea-spoonfuls at a time. Once the food is in the throat, the patient must swallow it, for swallowing is not under the control of the will; a larger quantity of food at a time might get into the larynx. Milk and oil have been injected under the skin with a hypodermic syringe, and milk has been injected directly into a vein in cases of sudden loss of blood from hæmorrhage. In some cases the skin is used to absorb milk by putting patients for an hour in a milk bath. At chest hospitals it is a common practice to rub patients, especially children, with ℥ss. of warm oil several times a day, the part to be rubbed being first well washed with soap and warm water; or cod liver oil is used in the same way, the little patient wearing a flannel night-shirt, which, gradually becoming soaked with the oil, keeps the skin always oily, so that absorption is continuous.

The most usual way, however, of giving food otherwise than by the mouth is by enemata, or injections

into the lower part of the bowel. On the subject of nutrient enemata there are different opinions among doctors, as regards composition and as regards size. Most perhaps hold that the nutriment should be artificially digested before being administered, for they say that that is the condition in which food normally reaches the rectum, but others hold that the rectum can absorb milk and other fluids without artificial digestion, for which there is therefore no need. The author is inclined to agree with the latter, for he has seen many cases live for days on milk enemata only and not lose flesh. Almost any form of liquid nourishment may be given, beaten-up eggs, beef tea, milk, cream, gruels, etc., mixed together in different proportions with or without brandy; also the same substances digested. Most doctors will say that a nutrient enema should not exceed four ounces, whereas others expect much larger ones to be given. Some doctors do not consider it unreasonable to order a nutrient enema of one pint, and are inclined to attribute inefficiency to the nurse if it is not retained. The author has several times successfully given a nutrient enema of a pint when a nurse had assured him that it was impossible, and had privately imparted to others her opinion of his ignorance in ordering anything so absurd. Of course it requires great care and gentleness; the first attempt may not be successful, but it is a very valuable means of treatment and has saved many lives.

The special points to attend to are, that the bowel should have been well emptied previously with an evacuant enema, soothed with an opium suppository; the nutriment must be injected gently at a rate not ex-

ceeding an ounce a minute, the tube withdrawn very slowly, while the buttocks are pressed together, and the patient must lie in the same position for a good hour afterwards, any attempt at moving being probably followed by ejection of the nutriment. Another way in which these large enemata are given is by passing a soft flexible tube, to which a funnel is attached, eight or ten inches up the rectum, so that the fluid flows into the sigmoid flexure, from which it is prevented from returning by raising the pelvis on pillows or administering it in the genu-pectoral position.

By giving a pint three times a day, a much larger amount of food is got in than by giving three or four ounces every three or four hours.

Food may also be given by fixing in the rectum a small tube, to which is connected a reservoir containing the nutriment, so arranged that the fluid only comes out very slowly in drops, and is thus absorbed as fast as supplied.

As enemata are given for other purposes than feeding, it will be as well just to give a list of them.

Enemata.

Evacuant—Soap and water, olive oil, glycerine.
Purgative—Castor oil, aloes, Epsom salt.
Antispasmodic—Turpentine, assafœtida.
Anthelmintic—Turpentine, salt, quassia.
Astringent—Starch and opium, nitrate of silver solution.
Emollient—Starch, linseed, barley water, warm water.

Stimulant—Brandy.
Sedative—Opium.
Nutrient—Food.
Medicinal—Medicines.
Forced—Air, water.

Evacuant enemata are given to empty the bowel in cases of constipation where fæces accumulate. The soap-and-water enema consists of a pint or a pint and a half of warm water well mixed with soap. It acts partly by softening the retained fæces and partly by its bulk stimulating the bowel to contract. In chronic cases, where the mass of fæces is very hard, it is usual to inject first six or eight ounces of olive oil, which, after being allowed to remain for an hour or so, is followed by a soap-and-water injection.

Where there is not much retention, but simply sluggishness of the bowel, glycerine enemata are used, a tea-spoonful being injected with a special syringe.

Purgative enemata have some purgative drug mixed with them. The castor oil enema consists of one or two ounces of castor oil mixed with four ounces of gruel and water, or soap and water, which is injected first, and followed without withdrawing the tube by a simple one of soap-and-water. Enemata of aloes and Epsom salts, being pharmacopœia preparations, are made up in the Dispensary, and consist of ten and fifteen ounces respectively.

Antispasmodic enemata are given chiefly for flatulence. Properly made, a turpentine one consists of one ounce of turpentine with fifteen ounces of mucilage of starch, which will be the composition if made in the Dispensary.

In the wards it is made in a similar manner to the turpentine enema above described. Assafœtida enemata are not often used.

Anthelmintic enemata are used to kill worms in children. There are three ordinarily in use—viz., the turpentine, consisting of three drachms of turpentine, the yolk of an egg, and water to six ounces; the salt, of a very strong solution of common salt; and the quassia, which is the medicinal infusion of quassia.

Astringent enemata are given to reduce chronic inflammation and stop bleeding. The starch and opium consists of two ounces of starch mucilage, with ten to thirty or more minims of laudanum. It is given cold, and with a glass syringe. The nitrate of silver is a solution of five grains to the ounce, given in the quantity ordered, mostly one ounce.

Emollient are given in different acute inflammations of the rectum and large intestine, as in dysentery. They consist in various amounts of mucilage of starch, gum, water, linseed tea, or barley water. Occasionally as much as six pints are used with a long tube. Large injections of warm water have been used in various affections of the kidney with the idea of fomenting them.

Stimulant enemata, consisting of some form of alcohol with water, is chiefly of use in cases of collapse during an operation, or in cases where persistent vomiting prevents stimulants being given by the mouth.

Medicinal enemata simply form one way of giving nauseous medicines or those which are apt to upset digestion. Forced enemata consist in forcing large quantities of water or air into the intestine to overcome some twist or obstruction.

CHAPTER VI.

SUBJECT—ANATOMY AND PHYSIOLOGY OF THE KIDNEYS. THE URINE. DISEASES OF KIDNEYS. URÆMIA. GENERAL NURSING. COMPLICATIONS. DIET. MEDICINES. DROPSY. TAPPING FOR ASCITES.

THE kidneys, two in number, are placed deeply in the abdomen on the posterior wall, so deeply that, from a nursing point of view, they may be considered as being placed in the back, one on each side of the spinal column, and extending from just above the bony pelvis to behind the eleventh and twelfth ribs. They secrete those substances which are of no further use to the body—substances which, if retained, would poison the individual—along with varying amounts of water, the resulting mixture being the urine. From the kidneys the urine is carried as it is secreted to the bladder by two canals, the ureters, and there it is stored until such convenient time as it can be voided by another

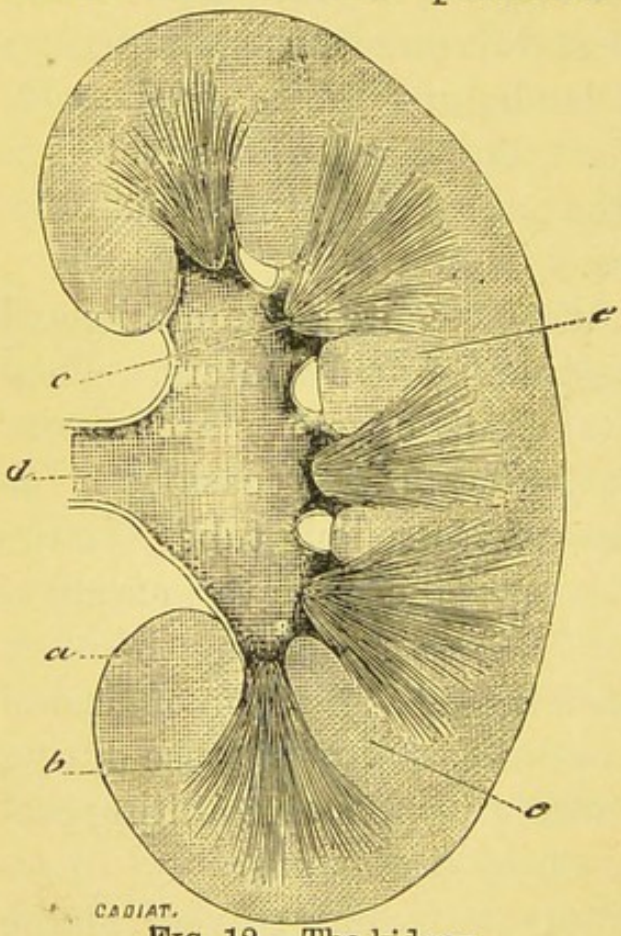


FIG. 12.—The kidney.

canal—the urethra. If the kidneys stop secreting, as in some diseases they do, the patient will become comatose, and, unless relieved, will die.

In structure the kidneys consist of numberless little microscopic tubes, covered on the outside with capillary blood-vessels, and on the inside with cells, having at the extreme end a filtering apparatus, by which the water is strained off from the blood. As the water passes down these small tubes it dissolves and carries with it the solid matter which has been secreted.

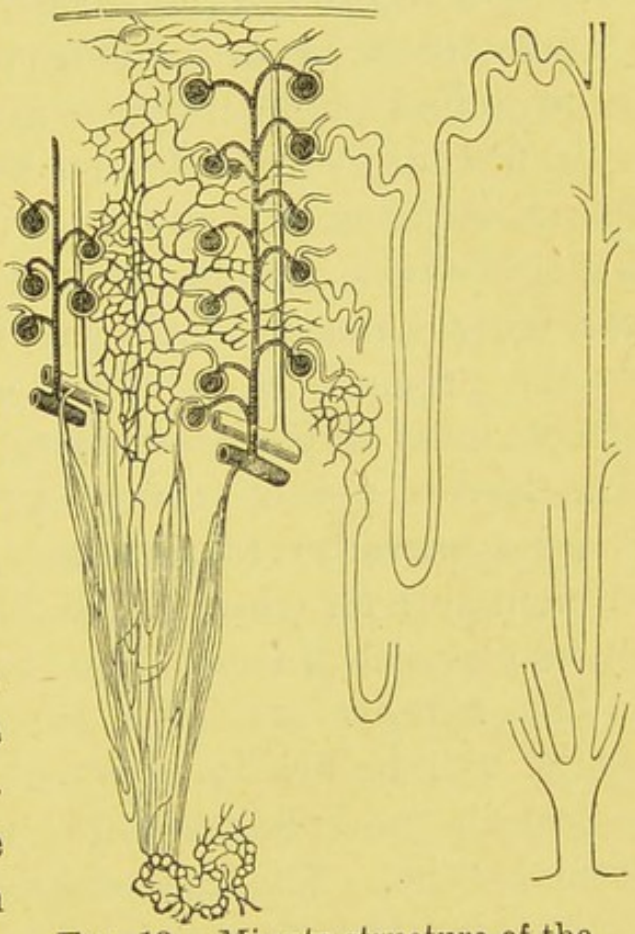


FIG. 13.—Minute structure of the kidney.

The functions of the skin and kidneys are very similar, both secreting water and waste matter. When the skin perspires freely, as in hot weather, the urine is very small in amount. Whereas in winter, when the skin perspires little, the urine is large in amount.

If the kidneys are diseased, doctors endeavour to make the skin do more work, thus relieving the kidneys, and, therefore, putting them in a more favourable condition for recovery.

Healthy urine is a clear yellowish fluid of acid reaction, having a specific gravity of 1015 to 1025 (water

reckoned as 1000), and generally holding in suspension a little mucus. It consists for the most part of water having in solution various salts, of which "common salt," or sodium chloride, is the most important, and other substances derived from the albuminous constituents of the body, or of the food taken. It is these substances, known as urea and uric acid, which the diseased kidneys find so difficult to separate from the blood.

In unhealthy urine various abnormal constituents are found, such as blood, pus, or "casts". The latter are little fibrinous moulds of the uriniferous tubes, and can only be seen with the microscope. But it is to the presence of albumen and sugar that doctors attach most importance, especially if in any quantity. The former points (generally) to kidney disease, the latter (generally) to diabetes. Other abnormal constituents are fat (chyluria) and bile; the latter is known by its greenish tinge.

The kidneys are liable to many diseases, some of which will be briefly noticed. The solid matter may collect in the kidneys, and so increase in amount as to form a stone. This may either remain in the kidney, giving rise to inflammation or abscess, or it may pass on, giving rise to that intense agony called renal colic. It is surprising how so small a stone may give rise to such a great amount of pain—pain often so intense that vomiting and collapse are induced. The nurse must take care that the stone is not lost when passed, for it is important from a diagnostic point of view. The stone may not be larger than a pin's head, and so, to detect it, all the urine from a patient with renal colic must be strained through muslin.

A floating kidney is one which has become detached from its normal position, and is more or less loose in the abdomen. Inflammation of the kidneys is spoken of as Bright's disease, which may be either acute or chronic. The special symptoms of acute Bright's disease are rise of temperature, aching in the loins, hot dry skin, rigors, vomiting, and a reduced quantity of urine containing blood. In chronic Bright's disease, the digestive organs are also out of order; from affections of the blood-vessels the patient becomes liable to hæmorrhages, as nose bleeding and hæmatemesis, and œdema, or dropsy, of various organs or of the whole body.

There is one great danger to which all cases of Bright's disease are liable, viz., uræmia. Uræmia is the state produced by retention of the constituents of the urine in the blood. The object of treatment in these cases is to cause the skin and intestines to do the work which the kidneys are unequal to. As long as the doctor is successful in this, uræmia is avoided. If the secretions from the skin and intestines are stopped by cold or by constipation, the constituents will accumulate in the blood, and uræmia will be produced more or less quickly. As a rule it does not come on suddenly, but is preceded by certain premonitory symptoms, which a nurse should know, be always on the look-out for, and report at once. Treatment applied early can generally ward off the attack, but the later it is applied the less hopeful it will be. Some of these symptoms are so slight that they may be missed altogether by a doctor at a short visit, and unless the nurse had been warned of their importance

she might neglect to report them. The slighter symptoms are headache, noises in the ears, slight impairment of vision, drowsiness, vomiting, and slight—often very slight—twitching of the muscles of the face and hands. These symptoms, if not noted and acted on, will be followed by delirium, convulsions, dyspnœa, insensibility, and death. The insensibility may be continuous and accompanied by fits, or interrupted by periods of sensibility free from symptoms. The author has notes of a case of this sort, who had forty-four fits in one day, and yet recovered under treatment.

Owing to the deficient excretion of water which takes place in kidney diseases, watery fluid is apt to accumulate in different parts of the body constituting "dropsy". Under the skin or in the substance of organs it is "œdema," in the peritoneum "ascites," in the pericardium "hydropericardium," and in the pleura "hydrothorax". The dropsy tends to affect the most dependent parts; therefore, in patients who are up and about the legs will be swollen at night, whereas the face and eyes will be puffy in the morning.

As far as general nursing is concerned, warmth is most essential. A renal patient should have flannel night-shirts, and should sleep between blankets. As these night-shirts soon become saturated with perspiration they should be often changed, and the skin should be daily washed with warm water, a small portion only being uncovered at a time. The vitality of the skin becomes lowered, partly by the excessive work which it has to do and partly by its chronically œdematous condition. On account of its lowered vitality it becomes liable to bed sores, which heal with difficulty, and slight

scratches or cuts are very liable to be attacked with erysipelas.

Cough in renal cases probably points to commencing œdema of the lungs; in fact, any of the symptoms of chest disease become doubly important, and are to be specially looked for and reported. A nursing point frequently forgotten is the position of the patient. As dropsy tends to affect the most dependent parts, it follows that if a patient is up, the legs will be most œdematous; but if he is in bed the brain, lungs, and heart will stand an equal chance, and the danger from this cause will more than counterbalance what is gained by rest and warmth. Such danger is to be averted by making the patient sit up as much as possible in bed, and trying to get him to sleep in this position; at any-rate, for every hour he lies down he should spend an equal time sitting up.

The diet is a very important part of the treatment of kidney disease. As a rule, butcher's meat in any form is to be avoided, and in acute Bright's disease milk and soda water may be the only diet allowed. Patients may be kept on nothing but milk, which in many cases holds out the only hope of cure. In more chronic cases, and especially in private cases where people refuse to take milk diet, there are several articles of food which may be allowed. Fat, for instance, in any form, as bacon, cream, butter; also liver, vegetable stews, biscuits, salads, fruits, tea, coffee, porridge, and milk puddings without eggs. The latter may be flavoured with ginger, cloves, or cinnamon. From this limited dietary it will be necessary to make as many variations in the meals as possible.

The greater variety the nurse can think out, the longer will a patient be content to continue such diet, and the better chance, therefore, of his ultimate cure. Purges are also given to relieve the kidneys, drugs to produce

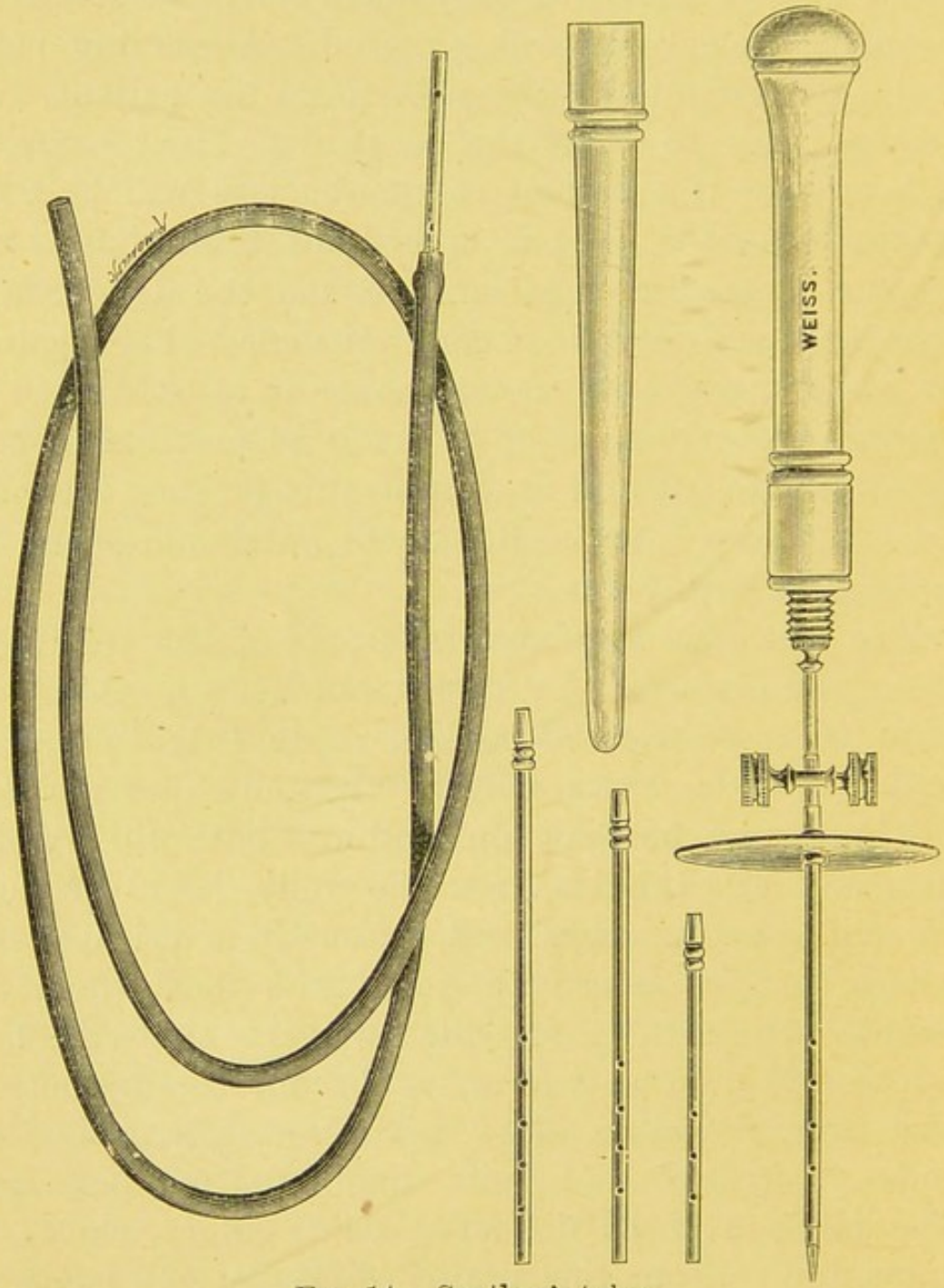


FIG. 14.—Southey's tubes.

sweating, diaphoretics, as they are called; and, lastly, the kidneys themselves are stimulated by drugs called diuretics. When there is much œdema the superfluous water is got rid of by puncturing the legs with a lancet or by inserting little tubes—"Southey's tubes"—through which the water can drain. These measures are supplemented by hot packs, hot-air baths, and other means to be described later on.

For the relief of ascites the operation of tapping, or "paracentesis abdominis," is performed. As the patient is apt to become faint during the operation, the recumbent or semi-recumbent position is generally adopted, stimulants are kept at hand, and the patient closely watched. If the patient is very sensitive to pain, the place of puncture is frozen with ice and salt, or cocaine is injected. The operation is conducted antiseptically. The nurse must see that the patient's bladder is emptied immediately before, or it might be injured by the trocar. A strip of flannel wide enough to reach from the nipples to the pubes, and long enough to go two and a half times round the body, must be in readiness. Each end is to be torn into four or five tails. The middle of the flannel is then applied to the front of the abdomen, and the tails so arranged that they interdigitate with each other opposite the spine. By pulling on the tails on each side a uniform elastic pressure is maintained over the abdomen during the operation, which facilitates the flow of fluid, and diminishes the tendency to fainting. A circular hole is cut in the flannel at the point at which the puncture is to be made. When the trocar is withdrawn the wound is dressed with dry boracic

lint, kept in place by strapping, and the whole abdomen evenly bandaged. When Southey's tubes are used for ascites, the cannula, which is very small, is left in for twenty-four hours, and has a fine india-rubber tube attached to it, which conducts the fluid slowly to a receptacle under the bed.

When any case is admitted, the nurse should, as a matter of routine, have a specimen of urine placed in one of the urine glasses for testing; doctors are often unable to commence treatment until the testing has been done. In taking a specimen, the urine in the utensil must be well stirred up first, or any deposit will be left behind; the specimen glass should be covered by a paper cap, and placed where it will not be moved or shaken until seen by the doctor. When finished with, the glass is to be washed out with carbolic solution, a little of which should remain in, otherwise it will always smell of stale urine. The same remark applies to the utensils in the wards, which, even when empty, often smell sufficiently to taint the whole ward with a stale urinous odour.

From the urine is learnt a great deal about the kidneys, both from the quantity and the composition. The quantity is always reckoned by that which is passed in twenty-four hours, and it is extremely important that this should be accurately measured. Suppose it is decided to measure from nine o'clock one morning to nine o'clock the next. The patient should be made to empty his bladder just before starting to measure because, being in the bladder, it was of course secreted by the kidneys *before* the time it was passed. When the twenty-four hours are completed he should again empty his bladder, because the urine in it has been

secreted *during* the time he is under observation and would otherwise be unaccounted for. A careful watch is kept to see that *all* the urine passed in the twenty-four hours is kept and measured. In these cases a special "urine chart" is hung over the bed, on which the amount and composition of the urine is recorded from day to day, usually by the nurse. Occasionally, from one cause or another, some of the urine gets lost, in which case a + is put after the amount measured, thus 64 + means 64 ounces was measured, but that some was lost. This should not be necessary, if a little trouble is taken. It is essential that physicians should know exactly the amount passed from day to day. The colour of the urine varies from very pale, as in chronic Bright's disease, to very deep mahogany, as in febrile cases; it may be greenish from bile, or dark green becoming black from carbolic acid poisoning. Blood in the urine in small quantities gives a smoky appearance; in large, a coffee or even blood-red colour. Patients have been known to purposely put things, such as sugar, milk, colouring matter, etc., into their urines in order to prolong their stay in hospital. Often the fraud is easily detected, but at other times the greatest vigilance is necessary on the part of both doctors and nurses to expose the deception.

Here are a few simple rules for testing urines as used at the Salop Infirmary.

Rules for Examination of Urine.

I.—Take specific gravity; 1015 to 1025 is normal.

II.—Take reaction, *i.e.*, whether acid or alkaline.

Acid urine turns blue paper red, and red paper a still deeper red.

Alkaline urine turns red paper blue, and blue paper a still deeper blue.

Urine which is neutral, *i.e.*, neither acid or alkaline, does not change the colour of either red or blue paper.

III.—Cloudy urine, which becomes clear on boiling, contains urates.

Cloudy urine which remains cloudy on boiling, or clear urine which becomes cloudy on boiling, contains phosphates, or albumen; add a few drops of nitric acid: phosphates disappear, albumen becomes more marked.

To verify the presence of albumen, fill a test tube about ¼ full of wine, to which has been added a few drops of acetic acid. Add to this an equal quantity of picric acid solution; if a cloud appears, albumen is present. Sometimes a cloud appears which is not albumen, but it will disappear on boiling. This occurs when patients are taking quinine, copaiba, or other resinous substances.

IV.—Equal parts of urine and picric acid with one-third of the whole bulk of liq. potassæ added, when boiled for one minute, becomes black if sugar is present.

Equal parts of urine and liq. potassæ with 2 or 3 drops of sulphate of copper turns brick red when boiled if sugar is present.

CHAPTER VII.

SUBJECT — ANATOMY AND PHYSIOLOGY OF THE SKIN. SKIN DISEASES. SOAP. APPLICATIONS. REMOVAL OF SCABS. CHRYSOPHANIC ACID. INUNCTION. HYPODERMICS. BATHS. BED SORES. PARASITES.

THE skin consists of two layers: the true skin, containing the blood-vessels, nerves, glands, and hair follicles; and the cuticle or epidermis covering it. It is the latter which is shed in scarlet fever in large flakes. Normally the outer layers are constantly being shed, or rubbed off by the clothes in fine scales, and being replaced by others. The glands are the sweat glands secreting the perspiration, and the sebaceous secreting an oily substance, which gives to the skin and hair their natural gloss. The nerves end for the most part in microscopic conical elevations of the true skin called papillæ, and are organs of touch. The skin has three functions: it is an organ of sense, of excretion, and a regulator of the heat of the body. In the last chapter it was found that the skin and the kidneys were nearly related in function, and that when the secretion of one was increased that of the other was diminished. Perspiration is always more or less going on, generally so slowly that it evaporates as quickly as produced, and is spoken of as "insensible" perspiration; when, however, it is secreted more quickly than it can be evaporated, it is called "sensible" perspiration.

The skin is subject to many diseases with which, as far as nursing goes, the nurse will have little to do. A rash must be reported whenever it occurs, especially if a patient admitted for something else is found to have a rash. Soap should never be used in skin diseases without permission, as it causes irritation.

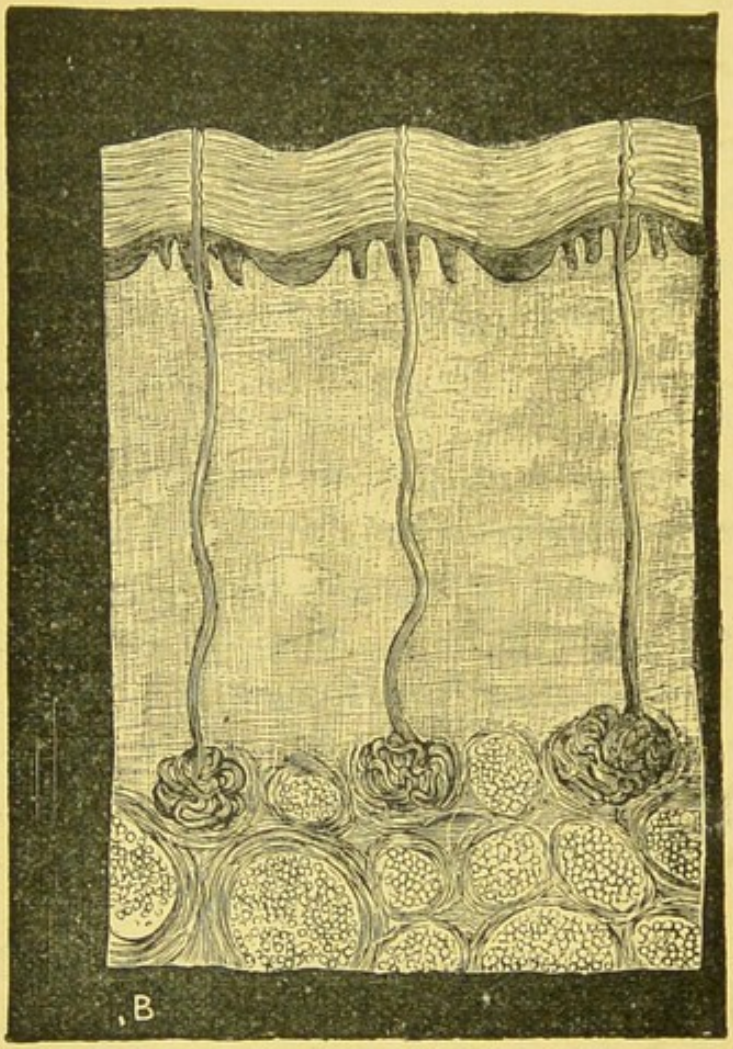


FIG. 15.—Section through the skin showing sweat glands.

Applications used in the treatment of skin diseases may be moist, dry, or greasy. A moist application *is meant to be moist and kept moist*, not allowed to be dry and moist alternately, for this will do more harm than good. Lead lotion and water dressing are used as moist applications, either being allowed to drip continually on lint covering the surface, or the wetted lint is covered with oilskin. Covered with oilskin they form warm applications; uncovered, cold ones.

When told to remove scabs from the skin, in default

of orders to the contrary, nurses should proceed thus: Pour oil on the scabs, and cover with lint soaked in oil for two or three hours; then apply a linseed poultice. On removing this at the end of three or four hours, they will probably find that the scabs can be lifted off without discomfort; they should avoid irritating the skin by picking and pulling at firmly attached ones. Ointments should be spread on lint; not thickly, so as to leave cakes of it on the skin when the lint is removed, but finely and evenly. Over the lint a thin layer of cotton wool should be placed, and the part evenly bandaged, so as to bring the ointment in close contact with the skin. It should be remembered that chrysophanic acid will stain any linen it may come in contact with a bright yellow colour, for which reason it is necessary to keep separate sheets for patients using this ointment. Of course, the better the bandages are applied, the less likely is the ointment to come in contact with the sheets. In diseases of the ear or nose, oil and ointment are applied on the outside by plugs of lint.

Frequently patients admitted are found to be infected with pediculi or lice. At most hospitals there is a rule that such cases are inadmissible, but this rule has frequently to be disregarded. The best treatment when they infect the hair of the head is to shave or cut it all off close; but as nurses are always very ready with their scissors for this purpose, they should know that this is a rather dangerous proceeding, especially with women and children, as the friends may bring an action against them when they leave. Moreover, it is not *absolutely* necessary. Hair should never be cut off

without the consent of the parents, and a witness should be got to that consent; also the leave of the house surgeon should be asked. If such consent is not given, pediculi themselves are easily killed by rubbing in white precipitate ointment over night; the eggs or "nits," however, resist this treatment, and being hatched, renew the supply of lice. Vinegar, or vinegar and water, will dissolve the cement by which they are attached to the hairs, and so detach them. This treatment of ointment and vinegar must be repeated at intervals of a few days, with frequent intermediate washings and combings.

Another parasite of the scalp, though a vegetable one, is the ringworm, which is so very contagious that it requires precautions similar to those used in fever cases to prevent its spreading.

The "itch," or scabies, which depends on the presence of a little animal burrowing in the skin, is easily cured by sulphur ointment. The part is first well washed with soap and hot water, then the ointment is rubbed in, and not removed for several hours. It should not be thought that all rashes which itch are scabies.

The skin requires extra attention in cases such as phthisis, dropsy, or paralysis, where patients have to spend weeks in bed; for they are very liable to be attacked with bed sores. Nurses should know how to prevent bed sores, because it is always considered a sign of bad nursing when one occurs. Pressure must be relieved from all the more sensitive and prominent parts, such as the sacrum, elbows, knees, ankles, by circular pads; these parts should be washed night and morning with soap and water, well dried, and

afterwards dusted with starch or oxide of zinc powder. All moisture, crumbs, and wrinkles in the bed must be avoided; the patient's position must be frequently changed, and water cushions used as much as possible.

If, however, the skin gets red in spite of every care, it must be well washed two or three times a day with spirit, allowing this to dry on. Should the skin break, collodion should be painted over the broken part; spirit should still be used over the unbroken part. In case of the sore getting worse, the responsibility of treating it devolves on the medical man, to whom the nurse will, of course, have announced its first appearance. Parts which cannot possibly be kept dry should be well rubbed over with oil or lanoline.

Many kinds of baths are used in the treatment of skin disease; before mentioning them, however, it will be as well to give the rules which should guide the nurse in giving a bath: (1) Everything should be ready for giving the bath before disturbing the patient; (2) the temperature ordered should be maintained by constantly adding more hot water at the side, and testing with a bath thermometer; (3) never leave a heart case or a convalescing case in a bath by themselves, for both are liable to fatal syncope; (4) the time should not exceed ten minutes, unless specially ordered; (5) avoid chill after the bath by quickly drying and returning the patient to bed.

The temperature of a cold bath should be about 70 deg., a tepid bath 85 deg. to 92 deg., a warm bath 92 deg. to 98 deg., and a hot bath 98 deg. to 110 deg. In hip baths the water will cool much more quickly, consequently they require the hot water added more fre-

quently. It is desirable, in order to prevent the patient's body becoming cold, that a blanket should be thrown over the shoulders. A bran bath is made by boiling 4 lbs. of bran with a gallon of water, straining, and adding the strained infusion to an ordinary warm bath. A salt bath is prepared by adding 1 lb. of common salt to every four gallons of water; a sulphur bath by adding 2-6 oz. of sulphide of calcium; an alkaline bath by adding 2-4 oz. of carbonate of sodium or potash; and a mustard bath by adding a handful or two of mustard to an ordinary bath.

To make a vapour bath, the patient may be seated in a chair and surrounded with blankets from his neck to the ground. Under the chair is placed a shallow basin or dish containing boiling water to the depth of two or three inches, into which red-hot bricks are dropped. A hot air bath may be given in the same way, substituting a spirit lamp with a large flame for the basin and hot bricks; both vapour and hot air baths are, however, more often given to the patient in bed, with a special apparatus which need not now be described. A hot pack consists in wrapping the patient up in a hot,

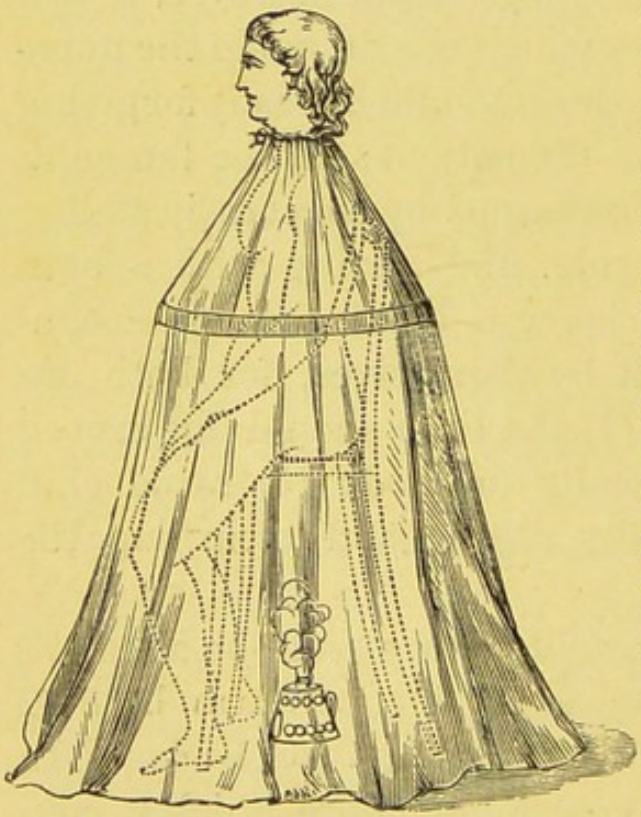


FIG. 16.—Portable hot air bath.

wet blanket or sheet, and covering him with dry blankets, which are tucked in all round him. A cold pack is similar, except that the wet blanket is cold. In both cases a mackintosh covered with a dry blanket is placed between the patient and the mattress, and all body linen is removed before the pack is given. As it is important to avoid chill after the pack is removed, the patient should be kept for half-an-hour or so wrapt up in a dry blanket, then rubbed dry with a warm towel and covered with the ordinary bedclothes.

For any other kind of bath than those mentioned which may be ordered, the nurse will receive special instruction from the medical man in charge of the case.

Some medicines, such as mercury, are given by the skin. When it is desired to get a patient rapidly under the influence of this drug, an ointment, containing it, is rubbed in every day over a large surface, the axillæ and inner sides of the thighs being the parts chosen.

Another way of giving drugs by the skin is the hypodermic method, which consists in injecting solutions of the drugs under the skin by means of a hollow needle. Nurses are not as a rule allowed to give hypodermic injections, because of the powerful nature of the drugs used, such as morphia and strychnia; still, as many doctors expect nurses to be able to do

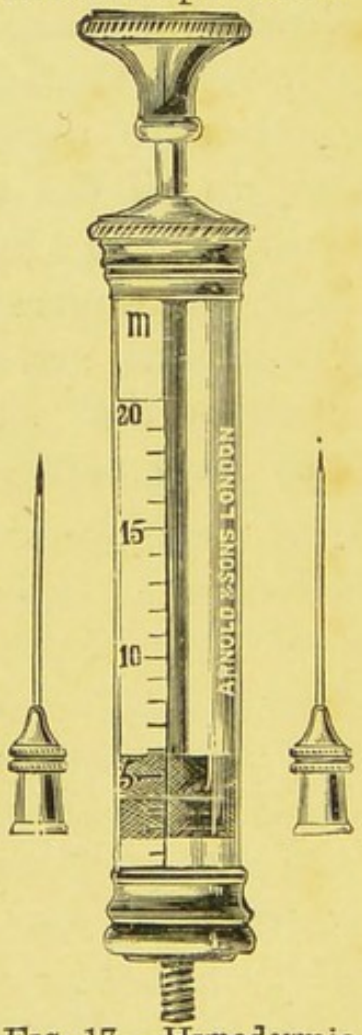


FIG. 17.—Hypodermic syringe.

it, it is as well they should know how. They should be quite certain there is no air in the needle or syringe, by pointing the needle towards the ceiling and gently pushing up the piston until a drop or two of the fluid has come out. Next, they should pinch up a little fold of the skin of the fore-arm, between the finger and thumb of the left hand, and, holding the syringe firmly in the right, push the needle through the forepart of the pinched-up fold of skin till the point of the needle is half-an-inch between the finger and thumb so holding it. Now the skin which is being held may be let go, the amount of fluid required slowly injected, and the needle withdrawn, keeping, however, the finger on the puncture for a few seconds to prevent any escaping. It is not necessary to oil the needle, but it should be well washed with carbolic after use, blown through to get rid of all fluid, and a piece of fine wire kept constantly in it to prevent its getting blocked. It may be as well to mention that after injection of morphia the patient may have very severe itching of the skin.

CHAPTER VIII.

SUBJECT—THE BRAIN AND NERVOUS SYSTEM. DISEASES OF NERVOUS SYSTEM. SYMPTOMS. INVOLUNTARY MOVEMENTS. PARALYSIS. FITS. DELIRIUM. HYSTERIA. APOPLEXY. MASSAGE.

THE brain is the seat of consciousness, and is the organ by which the rest of the body is governed. It consists of innumerable little masses of nervous matter called nerve-centres aggregated together, each little mass having some definite function to perform, and connected with the part over which it exercises its influence by long strands of nervous tissue known as nerves. Some nerves convey messages from the brain to the muscles and make them contract, other nerves bring messages of feeling, sense, or pain to the brain from the skin or other organs. Without nerves connecting the brain with the rest of the body, there could be no feeling or motion ; without the brain there could be neither feeling, motion, nor consciousness. It is because of the great importance of the brain that it is enclosed inside the bony box called the skull. The brain is continued from the skull into the spine as the spinal cord. This consists for the most part of nerve-fibres passing from the brain to the rest of the body, and from the rest of the body to the brain, but it also contains separate centres of its own, controlling definite acts.

If a nerve going to a limb is cut or destroyed by tumours, the limb cannot move or feel, and is said to be paralysed. But it may be paralysed in another way: the centre for motion may be destroyed by tumours, injury or hæmorrhage into it (apoplexy); then, though able to feel, it will not be able to move; or its centre for feeling may be similarly affected, when, though able to move, it will not be able to feel. In the latter case it is said to be anæsthetic. All the different movements and functions of the body are controlled by different nerve-centres; the most important to life, viz., those controlling the movements of the heart, respiration and swallowing, being grouped together in the prolongation of the spinal cord into the part of the brain known as the medulla. Roughly speaking, the brain is divided into two halves, each half controlling the opposite side of the body. When the motor centres on one side of the brain, say the right, get cut off by blocking or rupture of blood-vessels, the left side of the body gets paralysed, and the patient is said to have "hemiplegia". Paraplegia is when both legs get paralysed from some disease or injury of the spine.

The brain and spinal cord are covered over by a bag of membranes containing fluid, so that they rest as it were on a water cushion, which to a great extent protects them from shocks and jars. Inflammation of these membranes is called meningitis. Centres for different movements, as for the arm or leg, may get separately inflamed, giving rise to infantile paralysis, the cause of so many wasted limbs in children. Paralysis may be induced by various poisons, such as lead, mercury, or alcohol.

The symptoms of special importance in nervous disease are paralysis, involuntary movements, rigidity, difficulty in swallowing or in speaking, neuralgic and other pains, headache, vomiting, sleeplessness, drowsiness, illusions, delirium, fits, each of which we will now discuss.

Paralysis may be the symptom for which the patient is admitted, or it may come on gradually or suddenly while he is in the hospital. When a case is admitted for paralysis, the nurse must endeavour to note how much he is paralysed, with special reference to particular movements, such as buttoning his clothes or picking up pins; thus she will more readily recognise any extension of it. Hysterical persons get various forms of paralysis which frequently change; first it may be affecting one leg and then one arm, or sensation may be implicated in the same manner. A common form of paralysis is that of the nerve supplying the face muscles of expression. The symptoms of facial paralysis when well marked are very characteristic; still, the degree of paralysis varies considerably. In well-marked cases there is a total loss of expression and movement on the paralysed side; the mouth becomes drawn to the sound side when the patient speaks; on eating, food gets between the gums and the cheek; and he is unable to shut the eye on that side. Squint is due to paralysis of some of the muscles which move the eyeball; this consequently becomes drawn out of its normal direction by the unopposed sound ones.

Closely allied to paralysis are involuntary movements. Starting at night directly a patient gets to sleep may be very distressing if it is constantly waking him up. Most

people are acquainted with the involuntary movements which occur in chorea, or St. Vitus' dance, when the patient attempts to do anything. Twitching of muscles, especially of face, trembling of limbs, shaking or nodding of the head, all occur as involuntary movements in different diseases. Perhaps the most striking involuntary movements are those which occur in tetanus. This is a painful spasmodic disease affecting at first small groups of muscles, as those of the hand, fore-arm, or jaw (lockjaw), the muscles either remaining continually contracted or else the contractions become interrupted with periods of relaxation. Later on, if not relieved, nearly all the muscles of the body get affected ; the spasms, if not continuous, become easily excited by very slight causes, such as moving the bedclothes or shutting the door. The contractions may become so general and strong that the patient during the spasm rests on his heels and the back of his head only. The necessity for avoiding all movement and noise is in this case obvious.

In some nervous diseases a condition known as rigidity comes on. An arm or a leg becomes as though made of wood, refusing to move or bend at the joints.

In a form of paralysis called Bulbar paralysis, the patient gradually loses the power of speech and of swallowing ; at first very slight, the paralysis may become so great that speech is unintelligible and swallowing almost impossible. These cases have to be fed with great care with liquids in small quantities only. Solids must not be given on account of their great liability to get into the larynx, and, by cutting off the air, suffocate, and so cause the death of the patient.

Various characteristic pains occur in nervous diseases; thus lightning pains in legs and sensations of cords round the waist appear in locomotor ataxy; pain in the throat and on the top of the head in hysteria. Headache has so many causes of origin that it is impossible to attempt to discuss it. Vomiting is always an important symptom of nervous disease, occurring in meningitis, locomotor ataxy, and many others.

Sleeplessness, nurses will always meet with as long as they are associated with sick people; it forms a most troublesome symptom, yet one which can often be remedied by simple treatment, and it is important that nurses should be acquainted with the methods employed. In sleep there is less blood in the brain than when awake; consequently you will find that a patient who is wakeful and restless will sometimes quickly go off to sleep on simply giving him an extra pillow, the raising of the head allowing less blood to go to it. On the other hand, the blood being poor in quality, as in anæmia, or in quantity, as after hæmorrhage, there may be too little in the brain, and this form of sleeplessness must be relieved by removing any extra pillow, or raising the end of the bed, so as to bring the head on a level with or below the rest of the body, in order that more blood may go into it. Another form of sleeplessness is relieved by warm drinks, either of milk, arrowroot, or beef tea. Cold feet are a not unusual cause, the obvious and efficient remedy being the simple application of a hot water bottle. A frequently overlooked cause is the amount of the bedclothes, some patients requiring more and some less than others. Often when going round late at night the author has been successful in procuring

patients sleep by adding or removing an extra blanket. A remedy well worth trying and always comforting is washing the face and hands with warm water. All these may be tried one after another until one succeeds; when their efforts have been successful a few times the nurses will realise what a valuable power they have acquired.

Drowsiness generally arises from commencing head affections, an overdose of some drug, as morphia, or is a symptom of commencing uræmia. In children it points to the commencement of one of the specific fevers or indigestion.

Delirium is met with in many diseases, taking various forms, from slight wandering at night, up to acute mania. The wandering may occur only during sleep, entirely disappearing on waking, or on waking it may pass into a failure to recognise where he is. When this happens the patient tries to get out of bed with the idea of going home; being resisted, he thinks all around him are enemies, and renews his endeavours to get away from them; consequently, it is better, if possible, to coax or persuade him back to bed rather than to use force, which only produces more resistance. There are different forms of delirium which are sufficiently explained by the terms, angry, boisterous, merry, depressed, muttering, trembling, maniacal.

Delirium tremens, produced by the abuse of alcohol, is specially characterised by trembling, muttering, and illusions. Patients fancy they see snakes, coins, devils, etc., may commit suicide or murder, or die suddenly from great exertion. Dr. Budd used to impress this on his pupils by relating a circumstance

which occurred on board the hospital ship *Dreadnought*. Three sailors were suffering at the same time from delirium tremens. One cut his throat, and, during the commotion thus caused, another jumped through a port-hole and swam down the river. He was captured and brought back to the ship, but in the process of getting him on board he struggled so violently that he died of sudden syncope. Certain drugs, as salicylate of soda, belladonna, and cannabis indica, in large doses, produce delirium.

Delirious patients are sometimes very cunning, seizing often the slightest relaxation of the nurse's vigilance to get out of bed and do harm to themselves or others. On no account, therefore, should patients with delirium be ever left for a second, nor should they be argued with or contradicted. The less talking and noise near them the quieter they will be; nurses should remain, therefore, sitting beside them, not talking or constantly moving, but ever ready for any emergency which may arise. A patient must never be tied down without the authority of the medical officer. When tied down, and his movements restricted, he may go off to sleep, if a piece of lint soaked in water or evaporating lotion is placed on his forehead and he is gently fanned. This method will also be found useful in the sleeplessness of non-delirious patients. Light should as much as possible be excluded; candles and lamps at night must be shaded on the side facing the patient.

For practical purposes, fits may be regarded as either hysterical, epileptic, or apoplectic. The hysterical occur in young women chiefly, but also in elderly women and men, mostly being accompanied with much noise and

throwing about of limbs. Sympathising and fussing over them only makes them worse, the best treatment being to leave them alone; when thus ignored the fit does not usually last long.

Epilepsy occurs chiefly in young people of both sexes. In a typical fit the patient suddenly gives a scream and falls insensible. This is followed by violent twitchings of the arms and legs, dusky countenance, snoring breathing, frothing at the mouth, and biting of the tongue. All that can be done is to unfasten the clothes round his neck, insert something between his teeth to protect his tongue, and generally take precautions against the patient hurting himself. Nurses should note carefully all that takes place, and write it down at once, in order that the doctor may be told all that has occurred when he arrives.

Apoplexy occurs more in elderly people, and is marked by insensibility, twitching, snoring breathing, unequal pupils, and gradual paralysis. In the way of treatment very little can be done beyond putting the patient to bed and slightly raising his head.

In children fits occur from very slight causes, such as indigestion; they take the place of the rigors which occur in adults at the commencement of the specific fevers and other diseases.

The general treatment of nervous diseases is limited. Some patients have to be kept for weeks lying on their faces while blisters, leeches, or cauteries are applied to their spines.

Electricity, if used, will, as a rule, fall to the nurse's lot for application. It will in each case be explained to the nurse how it should be applied She should always

see that the handles of the battery are tightly screwed on; that the sponges are well wetted for use, and carefully removed and dried after use; and, in order that she may not give unnecessary pain, she should always try the current on herself before applying it to the patient.

Massage is a much-used method of treatment, the management of which should be acquired if an opportunity should occur. Massage consists of a more or less forcible kneading, pressure, or alternate compression and relaxation by the operator's hands of the soft tissues of any part of the patient's body. It is used to improve local nutrition in a wasted limb, to increase the circulation when languid, and to accelerate the re-absorption of swellings or thickenings—the result of inflammation, chronic congestion, or injury. Massage produces its good effects by its action on the local circulation, as seen by a previously cold, clammy limb being made to glow with natural warmth after a few minutes' rubbing. The whole thickness of the limb, including the skin and bones, partake in its good effects. It is used also for the relief of pain and for chronic constipation. No good would result from a description of the various movements of massage, which can only be learnt practically. The first few applications of massage generally cause great tenderness of the muscles; but this soon wears off. The operation should last from twenty minutes to an hour, and the patient should generally feel rather more rested than tired after the performance.

CHAPTER IX.

SUBJECT—THE BLOOD AND BLOOD DISEASES. RHEUMATIC FEVER. FEVER. REGULATIONS OF HEAT. SYMPTOMS OF FEVER. THE TYPHOID CONDITION. GRAVE'S DISEASE. PASTEUR'S TREATMENT.

THE blood is the medium by which food and oxygen are carried to, and waste matter carried from, the tissues of the body; it consists of a liquid, the plasma or serum having equally distributed through it millions of little solid particles called corpuscles. These are of two kinds, the red and the white, of which the former are more numerous, though the proportion between them varies considerably. The functions of the red corpuscles are essentially respiratory, that is, they carry oxygen to and carbonic acid from the tissues—they are the lungs of the tissues. In shape they are round, flat, and concave on each side. The plasma, which removes the waste from and carries the nutrition to the different parts, oozes out of the minute capillaries into the tissues, which take from it what they want, giving it in return what they do not require. Some of the plasma, but not all, which oozes out of the capillaries is taken up by them again and passed on into the veins. Unless it were all taken up the tissues would rapidly become waterlogged,

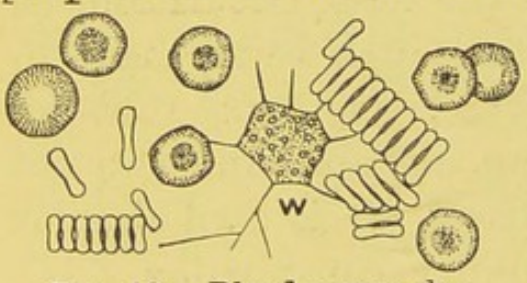


FIG. 18.—Blood corpuscles.

dropsy would result; how is this prevented? Besides the capillary blood-vessels the body is everywhere permeated by a system of minute transparent tubes

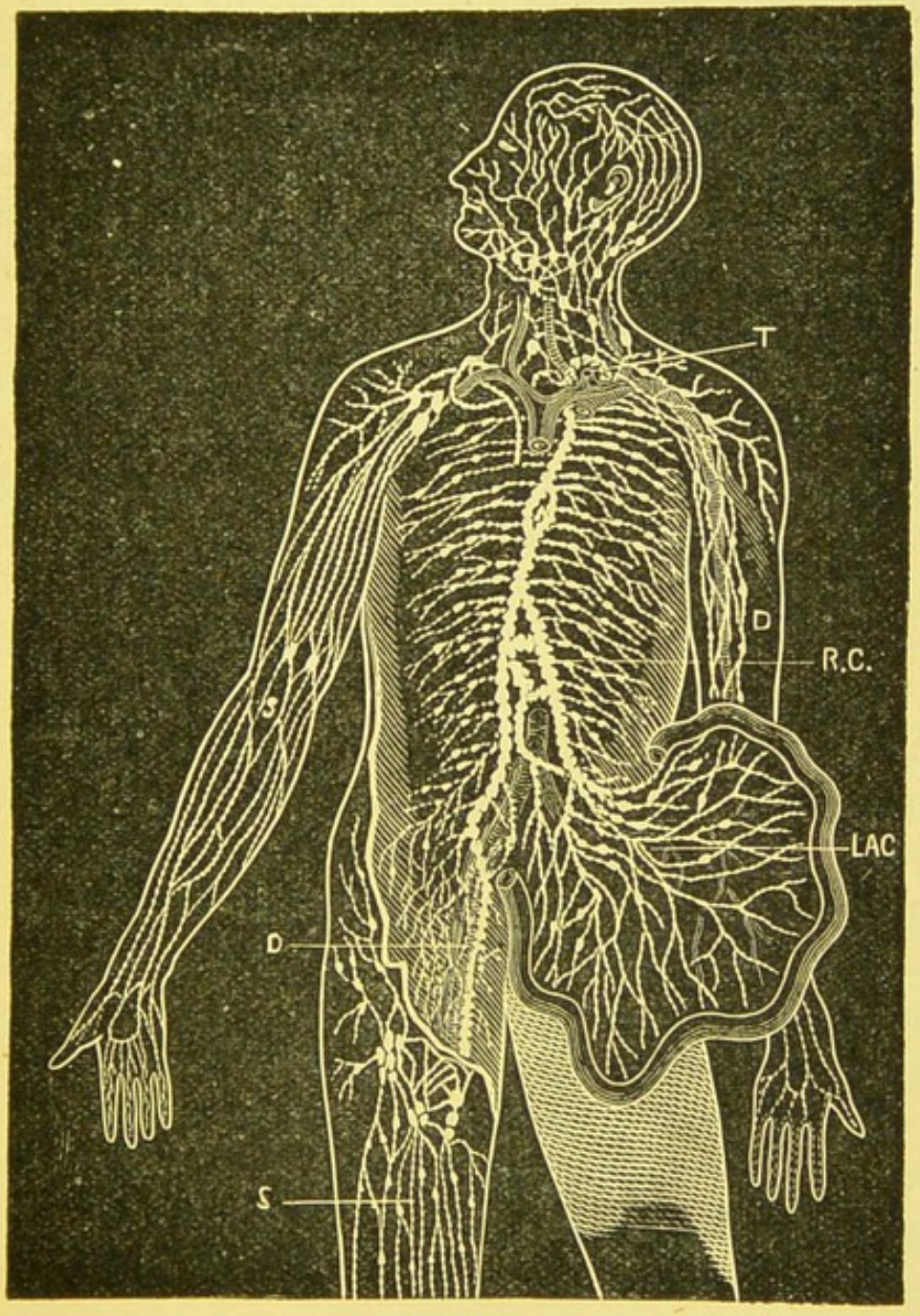


FIG. 19.—The lymphatic system.

called lymphatics, which begin in the spaces between the cells or essential elements of the tissues,

and, gradually uniting into large lymphatic ducts, open finally into the deep veins of the neck. One important part of this lymphatic system is the lacteal. The lacteals begin in the minute villi of the intestine, and absorb fat from the food. All lymphatics are furnished at intervals in their course with lymphatic glands, which act partly as filters. If, for instance, one has a poisoned finger, the glands in the armpit are liable to inflame, because they filter the poison from the lymph (plasma is so called in lymphatic vessels), preventing it going to the rest of the body. The lymph, having no red corpuscles, is colourless, and contains colourless corpuscles similar to those of the blood; in fact, the lymphatic glands are believed to be the source of both. The spleen also forms corpuscles, and is regarded as a large lymphatic gland. Seen under the microscope, the white corpuscles appear as little balls of jelly-like matter; if watched for some time, it is noticed that they can move by protruding one portion, the rest flowing after it. They take into their insides small particles of solid matter placed near them, absorb what suits them, and throw out the rest; they, in fact, eat, digest, excrete. Their functions are most important. Watched in the capillaries, as can be done by putting a frog's web under the microscope, they are seen passing through the walls of the capillaries into the tissues, wandering where they will, and either returning to the capillaries or joining the blood again *viâ* the lymphatics. If the portion of the frog's web under the microscope be injured the blood-vessels in the neighbourhood dilate, bringing more blood to the injured part, and the white corpuscles pour out in thousands to repair the injury

done; the same happens all over the body: wherever a part is injured or inflamed, the white corpuscles are present trying to repair it. Incidentally, has been mentioned one of the properties of blood-vessels—viz., that of dilating and allowing more blood to go to a part where it is wanted; this they do not do of themselves, but because they are connected with controlling nerve-centres by different sets of nerves, one for causing dilation, another for causing contraction, according as more or less blood is required. This regulating mechanism works not only in injury of organs, but in their ordinary use. When the brain is being used more blood goes to it, when food is taken more blood goes to the stomach, when muscles are used more blood goes to the muscles.

There are certain diseases which come under the heading of blood diseases, such as gout, rheumatism, tubercle, and anæmia, which will next receive attention.

Rheumatism and gout depend on the retention in the blood of substances which should be changed or excreted. Both may be either acute or chronic, and may affect almost any part of the body.

Acute rheumatism or rheumatic fever is characterised by fever, furred tongue, profuse sweating, painful swelling of the joints, especially the larger ones (such as knees, hips, or shoulders), and by the complications it is prone to, of pericarditis and endocarditis.

It is essential that rheumatic patients should be scrupulously protected from chill, by having flannel night-shirts, and by being wrapt in blankets, for any chill vastly increases their tendency to heart complications. Even the bed-pan should be covered round with flannel to prevent the chill which would be

given by contact with a large cold surface. For the painful joints, fomentations with or without soda may be ordered, or the limbs may be enveloped in cotton wool and placed on a splint, the slightest movement of the limb, or even of the bed, causing most intense agony in the inflamed joints. This should be remembered in making their beds, so as not to disturb them unnecessarily. On account of the profuse sweating, the night-shirts must be changed at least once a day; the clean one should be well warmed before being put on, and the change effected as quickly as possible. The medicine mostly used is the salicylate of soda, in large doses, but alkalies are often given instead, or occasionally the treatment may consist in the application of ice-bags to the painful joints only. The heart complications may come on insidiously, though pericarditis may be suspected from vomiting, pain in the chest, palpitation, and a gradually increasing inability to lie down. These are the symptoms to be on the look-out for and report. The fever presents nothing special, except that it occasionally becomes very high in conjunction with a complication known as cerebral rheumatism, where the patient becomes delirious with a temperature of 107 deg. or 108 deg. This is treated by cold baths or iced sheets, in a manner to be described in speaking of fevers.

The profuse sweating may bring out a rash called milaria or sudamina, which, however, is of no importance.

Chronic rheumatism may take many forms, affecting joints, muscles, or nerves. The smaller joints suffer most from chronic, the larger from acute rheumatism.

Lumbago is rheumatism of the back muscles; sciatica, rheumatism of the sciatic nerve at the back of the leg.

Gout presents nothing special from a nursing point, except that gouty patients are very irritable. The great toe joint is the one most often affected.

Tubercle, which is another word for consumption, has been discussed before.

There are other blood diseases depending on the corpuscles. If the red are deficient in number or in colouring matter, anæmia is the result. Anæmia is seen from the first cause after profuse hæmorrhage, and from the second cause in young girls, many of which cases nurses will see in hospital.

A great increase in the number of white corpuscles is associated with disease of the lymphatic glands and spleen.

All the various infectious fevers, the symptoms of which will now be discussed, are blood diseases. The normal temperature of the body is 98·4 deg. F. The natural heat of the body is derived from the combination in the blood and in the tissues of the food and oxygen which they have absorbed, and the whole body is maintained at the same temperature by the circulation of the blood. This, though slower, is the same process as burning. When a thing burns, it unites with the oxygen of the air, giving out light and heat. People don't give out light because they are not burning sufficiently quickly.

Heat is lost by the evaporation of the perspiration on the skin, by the contact with the air and clothes, and by radiation, but the normal temperature is maintained independently of the temperature of the surrounding

air; it is the same whether a man is in Greenland or the tropics. The way it is regulated is this. The small arteries of the skin are under the control of a nerve-centre called the heat centre. Should the temperature begin to rise above the normal, the superficial arteries are made to dilate, more blood goes to the skin, heat is lost more rapidly; or, should the temperature be lowered, the arteries of the skin are made to contract, less blood goes to the surface, and heat is not lost so rapidly. If the amount of heat increases more rapidly than this regulating mechanism of the skin can cope with, fever is the result. Life is not compatible with a rise in temperature of more than 9 deg. or 10 deg., so that the highest temperatures met with are 108 deg. and 109 deg. Normally, the temperature does not vary more than a degree during the whole day, but when there is fever it may oscillate between 96 deg. and 109 deg. Mostly there will be found an evening rise and a morning fall. Fever may be continuous, varying only a degree or so for days together; hectic consists of a very high evening and very low morning temperature; irregular fever, high temperature for a few days then low for a time; intermittent, recurring every other day; or remittent, at fixed intervals. These two latter occur in the different kinds of ague. Fever may end in a gradual decline, lysis, the evening rise getting less and less, and the morning fall greater and greater until the normal is reached; or in crisis, when the temperature suddenly falls to normal and remains there. Typhoid fever is a type of the former, pneumonia of the latter.

So much for temperature ; the other symptoms of fever will now be discussed. The skin becomes very hot and dry to the touch, though as a matter of fact more moisture is lost by it than in health. As the temperature falls it becomes covered with profuse perspiration.

The pulse is increased in frequency, and may bear some relation to the temperature. Occasionally the pulse rises to 150 or 160 or more. Respirations are increased, though not so markedly in adults as in children. Thirst is usually great, and accompanied with a dry, foul state of the mouth. The digestive organs are always out of order, and only capable of assimilating easily digested foods ; appetite is nearly absent, often quite so. Bowels almost always constipated, unless, as in typhoid and cholera, diarrhœa happens to be one of the symptoms of the special fever. The urine is scanty, high-coloured, with thick deposits. Other symptoms are headache, weakness and delirium.

Fevers long continued, and those producing great prostration, are liable to bring on a state called the "typhoid condition," but this may be produced by other exhausting diseases. The patient is unconscious or nearly so, and may have a low muttering delirium ; he lies on his back, with a tendency to slip down in the bed ; his skin is perspiring, with a tendency to bed sores ; lips and tongue dry and black with perhaps little ulcers ; he refuses food ; involuntary evacuations of urine and fæces take place, and from this state he passes into coma, and probably death.

There are some interesting diseases due to disease or alterations in the thyroid gland. The thyroid gland is a large gland consisting of two lobes connected together by an isthmus. The lobes are placed on either side of the windpipe in the neck, and the isthmus passes in front of it. In an ordinary way, one is unconscious of its existence. It has no duct, but manages to send its secretion into the blood directly. Sometimes it gets enlarged, and is then known as Goître, or the Derbyshire neck. It is enlarged, though to a much less extent, in a condition known as Grave's disease. This is supposed to depend on excessive secretion on the part of the gland, which leads to rapid pulse, palpitation, and prominence of the eyeballs. An opposite condition to this is known as myxœdema. In this condition the patient, who is generally a woman, becomes much increased in size, from a kind of solid dropsy. The features become swollen and bloated, the tongue large, the speech thick and slow, the brain power is impaired, and the hair falls out. The treatment of this condition forms one of the wonders of the day. Until quite recently, the condition was practically incurable. Now, however, the condition is quite cured in a week or two by the administration of thyroid tablets. These are made from the freshly pounded up glands of sheep. The treatment, in fact, consists in giving the system what it had not got, viz., thyroid secretion ; for the disease is now known to depend on inactivity of the gland itself. In other words, the gland ceases to do its work, and so thyroid extract has to be imported from without.

There is another class of blood diseases which have interesting treatments, viz., hydrophobia, lockjaw, and diphtheria.

Hydrophobia or rabies is the disease which results from being bitten by a mad dog or cat, or by a person suffering from the disease. The time at which the symptoms show themselves after the poison has been inoculated by the bite varies from a month to many months. Death often takes place before the end of the fourth day from the commencement of the symptoms. The latter are cramps of the muscles of the throat and thorax. The contractions of the throat on attempting to swallow are so severe and painful that the patient comes to fear not only attempts to swallow, but even the sight of anything to swallow, such as water. Hence the name of hydrophobia. Spasmodic action, the diaphragm interferes with the breathing. As the disease gets worse, the paroxysms tend to recur more easily, and even without any attempt to swallow being made. A profuse flow of viscid saliva takes place, delirium and exhaustion follow. The treatment is divided into treatment at the time of the bite, and treatment when the symptoms occur. Lately has been added, thanks to the researches of Pasteur in Paris, a new treatment at any time between the bite and the symptoms.

When a person is bitten, no doubt the best thing is to at once excise the skin and deeper parts where the teeth have been. Next to this, the very best thing is to suck the wound, and then have caustic applied freely to all parts of the wound, both superficial and

deep. When the symptoms occur, the treatment is almost confined to drugs, such as chloral, chloroform administration, atropine, and opium. But the treatment which has lowered the mortality from something like sixty per cent. of all cases bitten to one or two per cent. only is Pasteur's. Briefly, his treatment is this. It is found that the poison exists chiefly in the nervous system. If the poison is inoculated into a dog, the dog killed after a certain interval, and an extract of its nervous system made, this extract is found, if injected into a person who has been bitten, to protect the person so injected from dying of the original bite. The treatment is a good deal more complicated than this, but this is the essence of it. For instance, it is found advisable to inject at intervals extracts of nervous systems of dogs which have been killed at different periods of time after they were inoculated.

These injections may be performed at any time after the bite, and before symptoms of the disease have appeared.

Lockjaw or tetanus is partly described in the chapter on nervous diseases. It may occur without any apparent cause, or it may occur as an early or late complication of wounds. There is a new treatment, too, of this disease somewhat similar to that described for hydrophobia, but not so complicated. When case occurs, it is usual to telegraph to London for what is called the antitoxin of tetanus. This is injected under the skin at certain intervals, and tends to render the poison of tetanus already in the blood, inert. Many

doctors, however, are very sceptical about it. The same sort of antitoxin treatment is used in diphtheria. This is prepared from horses which have had the disease, by bleeding them, and preserving the serum of their blood.

CHAPTER X.

Section A.

SUBJECT—THE SPECIFIC FEVERS. SYMPTOMS. COMPLICATIONS AND NURSING POINTS. VARIETIES. SYMPTOMS OF INTERNAL HÆMORRHAGE.

In previous chapters have been incidentally mentioned many causes of fever, such as inflammation of the various organs; here attention is directed to the "specific" fevers, as they are called. These are fevers running a definite course, characterised by certain definite symptoms, and believed to be due to the taking in of certain poisons in the form of germs. Germs are very minute microscopic living particles, which by their multiplication and growth inside the body produce certain diseases; the specific fevers are one class only. Each poison is perfectly distinct, never producing any fever except its own, and one attack in most cases confers immunity against any recurrence of the same fever. The germs get into the body in various ways, as by the breath, with food, water, or by wounds. Some, such as hydrophobia and cow-pox, must be inoculated under the skin before they can produce any effect on the body. All the specific fevers are more or less infectious or contagious, the difference being one of degree. Scarlet fever is "infectious" because it is very easily transferred from one person to another by the air, letters, clothes, etc., even when the individuals are long distances

apart. Diphtheria is said to be "contagious" because a closer contact must be brought about before the disease is acquired by a second person. Most fevers have well-marked definite periods. First, there is the period after the poison enters the body, during which nothing is apparently happening, though the poison is developing: this is called the period of incubation. Then comes the period of invasion, during which the first symptoms of the disease appear, followed by the period of eruption while the rash comes out. The fever lasts a certain time, when the period of decline takes place, followed by that of convalescence. The different infectious specific fevers are typhoid, typhus, scarlet, measles, German measles, smallpox, varioloid, chicken-pox, mumps, whooping cough, erysipelas, cerebro-spinal fever, diphtheria.

Typhoid or enteric fever is, strictly speaking, a drain disease, but it may be convenient to describe it here. The poison to which it is due is chiefly found in the motions, and is by their means almost entirely spread. It is believed not to be contagious or infectious like the other fevers, or not to anything like the same extent. As first discharged the motions do not contain the poison in an active state; on standing and decomposing, however, they become highly infectious, spreading the disease either by the air or by getting mixed with water which is afterwards drunk. The severity of the fever varies from an attack so mild that the patient does not consider it necessary to go to bed for it, to one so bad that the patient, if he does not die. is for a long while in jeopardy. The symptoms are mostly those of fever, with a tendency in bad attacks to

pass into the "typhoid condition," a rash of small rose-coloured spots, which is sometimes absent, and certain abdominal symptoms depending on inflammation of the numerous little glands scattered throughout the mucous membrane of the intestines. In the ileum these glands are gathered together into masses called Peyer's Patches, which ulcerate, often to such an extent as to cause the intestinal walls to become very thin and easily perforated in this situation. Diarrhœa is a symptom, though numbers of cases of typhoid never have any at all. The stools are liquid, offensive, and of a pea-soup colour, which even when solid they still retain.

Scarlet fever, or scarlatina, is exceedingly infectious. A scarlet rash appears first on the throat and chest, spreading from thence over the body, with inflammation of the throat, and high fever. Vomiting is one of the most constant symptoms of the period of invasion. The fever is followed by profuse shedding (desquamation) of the skin, often in large flakes, that of the hand frequently coming off like a glove. There are three forms of scarlet fever—the simple, in which the rash is the most prominent symptom; anginosa, in which the throat symptoms form the chief part of the disease; and the malignant, in which the disease comes on so rapidly that it may kill the patient in a day or so. In the malignant the rash hardly appears at all, the temperature is very high, and delirium the most prominent symptom.

Measles is a fever most infectious, having a peculiar measly rash, coming out first on the face, extending over the whole body, and accompanied by more or less inflammation of the throat and air passages, nose, and

eyes. It is supposed to be more infectious before the rash comes out than afterwards. The disease lasts two or three weeks, and the disappearance of the rash is accompanied by fine branny desquamation. There is also a malignant form of measles, in which the rash comes out slightly; the patient rapidly reaches the typhoid condition, and often dies.

German measles, or rotheln, is not a severe affection. The fever is always mild; the rash comes out on the face and fore-arms chiefly.

Smallpox is an infectious fever, marked by the appearance on the third day of a papular rash, which becomes pustular in eight or nine days. The papules, as they are called, are at first little red pimples, feeling like shot under the skin. Fluid collects in them, which, changing into pus, converts the "papule" into a "pustule," each pustule being, in fact, a little abscess, destroying the skin in which it is formed. The period of invasion is marked by two symptoms—viz., vomiting and pain in the back, the occurrence of which, together with fever and rigors, always makes us suspect smallpox.

Smallpox is now rarely seen, owing to the immunity which is obtained by vaccination. Before the discovery of vaccination thousands died every year in England alone, the mortality having been specially great among infants. It has been said that every third person you met was marked and disfigured by the scars it left; now it is very rare to see a person so marked. Smallpox in those who have not been vaccinated is a dreadful disease. The fever from these little abscesses is very high, the pain intense, the patient smells

horribly, and is fortunate if he escapes with sight and hearing. This fearful complaint, from which a very large proportion of the population formerly suffered, has been almost entirely eradicated by vaccination, and yet there are anti-vaccinators, as indeed there are anti-everything else that is good, who clamour for its abolition on the plea that occasionally it has been done carelessly, and other diseases have been inoculated with the lymph.

Occasionally, but very rarely, people who have been vaccinated—mostly those who have not been re-vaccinated—do get a very mild form of the disease: but it is so unlike the unmodified form—patients, as a rule, hardly feeling ill—that it is called by a different name: varioloid. Variola is the name for smallpox, and the term by which nurses should always speak of it, if they, unfortunately, get a case accidentally in their wards. At the word "smallpox" the other patients would probably leave in a body.

Chicken-pox, which is essentially a children's disease, is a very mild complaint; if it were not for the spots, one would in most cases hardly know they were ill. The rash consists of large vesicles, which dry into scabs and come out in crops a few at a time.

Mumps is a fever marked by inflammation and swelling of the large salivary glands placed at the angles of the jaw. The swelling may become so great that swallowing is difficult, and the fever may be very high. In mumps is now and then exhibited the curious phenomenon called "metastasis". When, for instance, the inflammation has apparently subsided, the genital organs may be attacked with the disease, the change being not

unusually accompanied with symptoms of collapse. Metastasis may take place in either sex, though in women the breasts are more frequently affected than the genital organs.

Whooping cough is a very severe and persistent kind of cough occurring in children, and accompanied with more or less fever, inflammation of the throat and bronchitis. The cough is very characteristic; once heard, it will be always recognised again, and no description will be of much use in enabling nurses to know it without this. The typical "whoop" is very often absent, though the paroxysmal nature of the cough is sufficient to enable one to say what the disease is. The disease is very infectious, and conveyed easily by air and clothes.

Erysipelas occurs in two forms: either surgically, in connection with wounds, or medically, as an infectious fever. Medically, it attacks the head and face, causing inflammation of the skin and subcutaneous tissue, with great pain, redness and swelling. In children particularly it has a tendency to wander all over the body until every part of the surface has been in turn attacked.

Cerebro-spinal fever and typhus are rarely met with.

The nursing of fever cases consists chiefly in the feeding; in the avoidance of all causes likely to give rise to complications; the early detection of these complications as they arise; and the measures ordered for controlling the fever and preventing its spread. It should be remembered that the mildest cases often go wrong, and so require as much attention as serious ones: perhaps there is no class of diseases where so much depends on careful nursing. Patients who are too ill to move require

to have their position changed often, because the most dependent parts are liable to get congested, especially the bases of the lungs if they are kept long on their backs. On account also of their tendency to fatal syncope, they must never be allowed to sit up in bed without the permission of the doctor in charge. There is no harm in washing any part of the surface with a warm, damp sponge night and morning, provided a small surface only is uncovered at a time, and that the drying is done quickly; indeed, this is an attention which is always most gratefully received. The other nursing points will be discussed under the headings of the different fevers and their complications; all of them are, in fact, liable to certain very grave complications, which are usually the cause of death.

The spots of typhoid, which come out in crops, a few at a time, may be very numerous or altogether absent. They are frequently of great use in aiding doctors to make a diagnosis in a doubtful case. The nurse should look carefully for them, and surround each one she finds with a circle of ink or aniline blue pencil; should any occur the next day, she will use a square or a triangle instead of a circle, and so on. The spots are most numerous on the abdomen and back.

Typhoid cases, more strictly than other fever cases, should not be allowed to rise in bed for bed-pan or washing or any other purpose, on account of the great danger of producing what is termed "perforation". It has already been mentioned that ulcers formed in the ileum, very much thinning the walls of the intestine there; they may, indeed, become so thin that the least movement will burst them, and allow

their contents to escape into the peritoneum. This is "perforation," and very generally causes a fatal peritonitis. For the same reason, no solid food is allowed, milk and beef tea only being given. Often milk alone will form hard curds, which, irritating the ulcers, cause perforation; should the nurse, therefore, notice curds in the motions, she will inform the medical man.

But there is another danger in typhoid almost as serious as perforation, viz., hæmorrhage: the ulcers may bleed by causing an opening into some large blood-vessel, and a very large, perhaps fatal, quantity of blood may be lost before any is passed into the motions. How, then, is one to know what is going on? There are certain well-marked symptoms of internal hæmorrhage which the nurse should know and be able to detect at once. The patient becomes pale and giddy, feels sick or vomits, pulse sinks, temperature falls suddenly to normal or below, with cold perspiration, difficulty of breathing, followed, if the bleeding goes on, by syncope and death. These symptoms should always excite alarm, and cause the nurse to send for a doctor without waiting for any blood to be passed. Until he comes, she should keep the patient as quiet as possible, and *on no account give stimulants.*

Section B.

SUBJECT—COMPLICATIONS OF FEVERS, CONTINUED. ANTIPYRETIC MEASURES. COLD BATH. ICED SHEET. TAKING TEMPERATURES.

The complications of measles are capillary bronchitis, pneumonia, diarrhœa, inflammation of the eye, ear or

throat, and gangrene of the mouth and elsewhere. The onset of gangrene will be noted by the occurrence of redness, followed by black sloughing, of the skin of the part affected.

The most important complication of scarlet fever is nephritis, or inflammation of the kidney, which, unless treated—and, in severe cases, in spite of treatment—may end in rapid general dropsy. The urine will be scanty, and may contain blood. Other complications are: abscesses in the neck, rheumatic inflammation of joints, inflammation of the ear, peritonitis, pericarditis, and pleurisy.

Smallpox has many complications, and very dangerous ones, *e.g.*, erysipelas, pyæmia, laryngitis, œdema of the glottis, bronchitis, pneumonia, boils, abscesses, inflammation and destruction of the eye or ear. Smallpox cases are mostly treated in special smallpox hospitals, though occasionally it may occur in patients who come in for other diseases, or the case is inadvertently admitted by mistake for something else.

Whooping cough may be complicated with bronchitis, pneumonia, emphysema, convulsions, bleeding from the nose, persistent vomiting, and hæmorrhage under the conjunctiva of the eye. The nurse is expected to note the number of whooping attacks the patient has in the day or night, or, if prevented by her numerous duties from noting continually, she should be able to state how many such attacks occur in a definite period, say an hour, from which the doctor may be able to form some idea of the progress of the case.

The complications of erysipelas are meningitis, accompanied by rise of temperature and delirium,

and œdema of the glottis. The glottis is the narrowest part of the larynx where the vocal cords are placed; should this swell from œdema the air supply to the lungs is cut off sometimes to a sufficient extent to cause death by suffocation.

Chicken-pox and German measles have no special complications. Diphtheria is discussed in a separate chapter.

Measures which are adopted for controlling excessive fever are called "antipyretics". They may be divided into three classes for nursing purposes: (1) Cold applications, which act by abstracting heat; (2) Measures which produce sweating; (3) Medicines which either act on the heat-controlling mechanism, or aim at killing the poison in the blood. Which measure or measures are adopted, depends on the nature of the case and the doctor in charge. There unfortunately exists among the public a great horror of the use of the cold bath, but there is no doubt but that it forms a most useful and efficient means of saving life in some cases of excessive temperature (hyperpyrexia). The patient is wrapped up in a sheet or blanket and placed in a bath long enough for him to lie in, containing water at a temperature between 95 deg. and 100 deg. F., which (when he is in it) is gradually cooled down to about 70 deg. F. by adding cold water at the side of the bath. This treatment is generally carried out under medical supervision, but stimulants should be always at hand. The bath lasts ten minutes or more according to instructions, and may have to be repeated every hour or so. Nurses will be expected to take the patient's temperature frequently while he is in the bath, and

observe, by means of the bath thermometer, the heat of the water, to see that it does not sink too low.

The iced sheet is frequently used as a cold application. The patient is stripped of all linen except a towel over the genitals, laid on a bed covered with a mackintosh, and then sheets wet with ice-cold water laid over him. These are changed about every three or four minutes as they become warm. By this means the temperature may be very quickly and pleasantly reduced, and this too without exciting the prejudice of the friends.

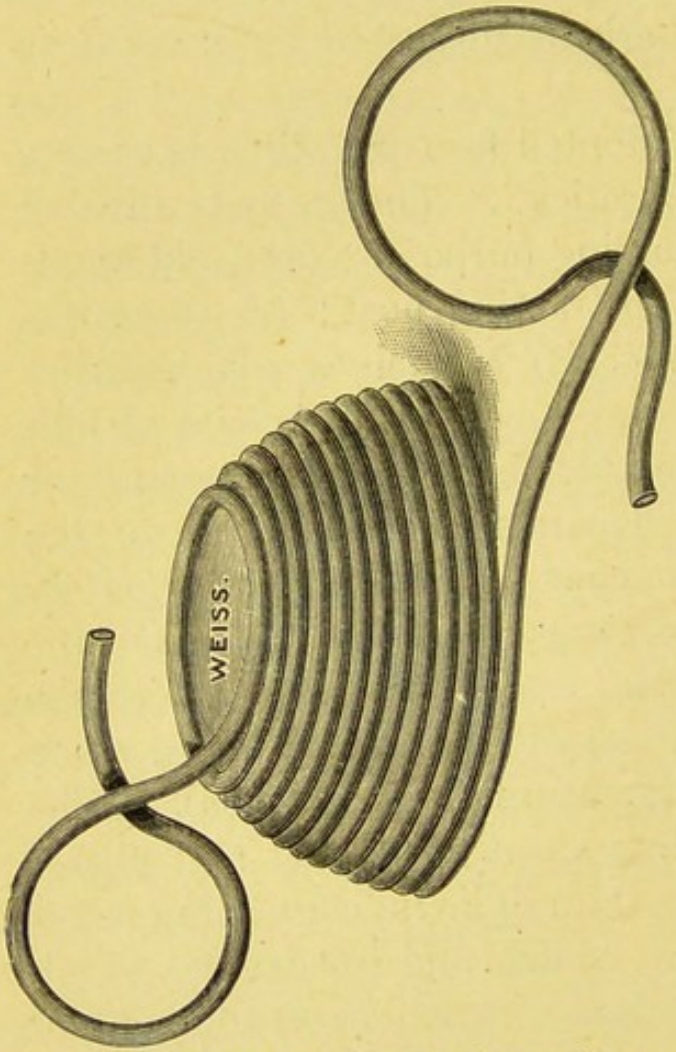


FIG. 20.—Leiter's tubes in form of a cap for the head.

Cold sponging is a modification of the previous method. The whole body or the limbs only are gently and successively sponged with cold, wet sponges, which will in many instances sufficiently reduce the temperature. Generally this method is very pleasant to patients, but there is reason to believe that to children, if too cold,

it is rather the reverse. Should they resent it and seem frightened, the nurse will of course report the fact to the doctor who ordered it.

Ice-bags are used to abstract heat locally as from inflamed joints or the head in meningitis.

Leiter's tubes consist of a coiled or spiral arrangement of tubes through which ice-cold water is kept flowing. They are made either to go round a limb or in the shape of a cap to go round the head.

The measures which reduce temperature, by producing sweating, are the hot and cold packs already described.

Of antipyretic drugs, aconite and antimony were formerly more used than any. In hospital practice they have almost entirely given place to new remedies. In private practice, however, especially with the older practitioners, they still hold their own. Aconite is usually given in half-drop or drop doses in a tea-spoonful of water every ten or fifteen minutes for two hours, and then hourly. Nurses will probably be given instructions as to how often to give it depending on the temperature. Antimony, or rather its salt tartar emetic, is used in very much the same manner; about one-sixtieth of a grain in water every quarter of an hour for an hour or more, and then hourly. Should the patient become faint nurses must use their discretion and stop giving it, unless, as in a hospital, they can get a doctor at a minute's notice.

Quinine is going out of favour, because, to be of any use, it must be given in such large doses that unpleasant symptoms, such as giddiness, noises and buzzing in the ears and faintness, are produced. It is mostly given

dissolved in acidulated water, but as much as half-a-drachm may be ordered, wrapped up in tissue paper, to be swallowed as a bolus.

Salicylic acid and salicin are most efficient in reducing the temperature of acute rheumatism, in which disease they are almost solely used. These drugs in too large doses cause giddiness, faintness, and delirium.

Antipyrin and antifebrin, two new drugs much used in reducing temperature, are given in small doses often repeated according to the effect on the temperature. The nurse may be told, for instance, to give a dose of one or the other whenever the temperature rises over a certain height, say 101 deg. Now and then, when too big doses are used, unpleasant symptoms arise from the temperature coming down too quickly, producing faintness or collapse. From too much antifebrin vomiting may occur, and the skin become a dusky blue colour. Both drugs occasionally produce rashes, varying from a few pimples to a severe attack of nettle-rash.

Carbolic acid and the sulpho-carbolate of soda are given more as internal antiseptics than as direct reducers of temperature. They do, however, indirectly reduce temperature and shorten the disease, but not in such a marked manner as the others. When too much has been given the urine becomes an olive green or even black colour.

When any drug is given or measure adopted to reduce fever, the temperature should be taken both before and after it. In the case of a cold bath or pack, immediately after, and the nurse should continue taking it every half-hour until the temperature rises again, or as directed. With a drug the temperature is

watched in the same way, commencing half-an-hour after its administration. This is very important, in order that the doctor may know what effect the measure has had, and how often it is necessary to repeat it.

In taking temperatures with the clinical thermometer, the nurse must be careful to keep to one place; either take it always in the armpit or always in the mouth, because the temperature of these two places varies a degree or so, and unless this rule is adhered to, a doctor may form an erroneous judgment in comparing the temperatures of two different days. When the temperature is taken in the mouth, the thermometer must be well washed in carbolic after use; when taken in the axilla it should be seen that the axilla is wiped dry first, that the thermometer is really in contact with the skin, not entangled in the clothes, or projecting out at the back, and that the arm is brought well forward over the chest. The index should be shaken down before giving the thermometer to a patient; and a patient should never be allowed to take his own temperature. When taken, it should be entered in the book or on the chart at once, and it should be endeavoured as much as possible to take the temperature at the same time of day. With children or delirious patients the thermometer must be held the whole time to prevent it being broken. Although if not shaken below 97 deg. an ordinary thermometer will register

Fig. 21.—The Clinical Thermometer.

temperatures in three minutes, still it is advisable to allow five minutes as the time for leaving it in contact with the skin. When given a new thermometer it is worth while testing its accuracy by comparing it with one of the old ones (of whose accuracy the nurse is certain), by dipping the two in bowls of water at different temperatures. If they agree on each occasion she may be satisfied, but if they differ she should get the new one exchanged for another.

N.B.—The normal temperature is 98·4 F.

Section C.

SUBJECT—THE PREVENTION OF THE SPREAD OF FEVERS. RULES FOR NURSING THESE CASES IN HOSPITALS AND IN PRIVATE HOUSES. DISINFECTANTS AND HOW TO USE THEM.

It has been said that the infectious fevers are due to living poisons called germs entering the body, which by their presence and growth cause the symptoms of the fever. These living poisons always proceed from similar cases, they never originate of themselves. Every person who has a specific fever has caught it from some one else, probably either by breathing the air near an infectious person, or by drinking water contaminated with his excreta. The poison is multiplied many times in each case, being eliminated by the different excretions, which are consequently impregnated more or less with them, and are capable, if introduced in even very minute quantity into the body of a healthy person, of inducing the same disease. Some are

more easily conveyed than others; measles and scarlet fever germs may be carried great distances by clothes or letters; the recent epidemic of influenza has come all the way from Russia. Another peculiarity of these poisons is that they may remain latent or passive for an indefinite period, and yet under suitable conditions may give rise to the fever from which they originated. If a room in which a scarlet fever patient has been nursed is shut up for years, people again occupying it may catch the fever unless precautions have been adopted to prevent it. Seeing, then, the ease with which these diseases may be propagated, it is the duty of the nurse to be most particular in carrying out all the precautions which are used for preventing the spread of them; every precaution neglected may possibly give rise to many cases of the disease of which death is not an uncommon termination, and these cases may give rise again to others, and so on indefinitely.

There are certain substances which have the power of killing germs, rendering them harmless even when introduced into the bodies of susceptible people; they are called "disinfectants" or "antiseptics".

It has already been pointed out that the poisons or germs were eliminated from the body by the various excretions; these excretions should be treated with the disinfectants. As showing the efficacy of thorough disinfection, it may be noted that at King's College Hospital fever cases are admitted into the general medical wards and never spread, owing to the perfect way in which the disinfecting is there carried out.

The following are the best disinfectants to use:—

Carbolic acid.
Corrosive sublimate.
Sulphurous acid.
Sulphate of iron.
Chloride of lime.
Sanitas.
Burnett's fluid.
Condy's fluid.

There is a difference between disinfectants and deodorants. The latter prevent smell without interfering with the vitality of the germs. By far the best and safest disinfectant for most purposes is the one in twenty solution of carbolic acid; it has, however, the great drawback of being very expensive. A cheap, more or less impure acid is sold for disinfecting purposes, one pint of which to sixteen of water is the right strength to use. For disinfecting the different secretions, the disinfecting solution should be at least in equal volume to the secretions, *i.e.*, a pint of the solution is required for a pint of urine, etc. Corrosive sublimate, one in five hundred, is fairly cheap and very efficient.

Condy's fluid, to be of use, is required in large quantities, which makes it expensive; it has the advantage of changing from a deep crimson to a dark brown, as its power becomes exhausted, so that it is necessary to keep on adding more fluid until the natural colour is retained.

Whatever disinfectant is used, it must be in sufficient quantity and strength to kill the poison; short of this it does no good at all, and is only so much money wasted.

For clothes, heat is the best disinfectant, and most hospitals have a heating chamber where this can be done. The clothes to be disinfected must be spread out, not tied in a bundle, as heat penetrates cloth and woollen material with great difficulty. This is the reason ice is wrapped in flannel when we wish to prevent it melting.

The following are the various secretions which require disinfecting.

They are :—

(1) The breath.
(2) The expectoration.
(3) Discharges from the nose and mouth.
(4) Vomit.
(5) Motions.
(6) Urine.
(7) Menstrual discharge.
(8) Perspiration and peeling skin.
(9) Discharges from ulcers or abscesses.

Remembering this list will explain and help the nurse to bear in mind the following rules :—

I.—On admission the patient's clothes are to be disinfected without delay, not left about in cupboards until convenient.

II.—A basin of one in twenty carbolic is to be kept beside the bed, and every time the nurse (or anyone else) touches the patient or his bed, or anything belonging to him, she must dip her hands in the solution.

III.—All vessels used for him to be marked and kept entirely for his use. If taken out of the ward, to be well washed first in the carbolic or sublimate solution.

IV.—Disinfecting solution must be kept in the spittoon.

V.—Before giving the bed-pan or urine bottle, a little disinfectant should be placed in it; both after use should be washed in some disinfectant solution, a little of which should be allowed to remain in. Bed-pans are always to be carried covered, and no discharges kept unless ordered.

VI.—All linen, as sheets, night-shirts, etc., on removal, to be at once immersed in a bath of one in twenty carbolic, or its equivalent strength of other antiseptic. All soiled linen is to be changed directly it is discovered to be so. The bath of antiseptic is to be brought to the bed to receive it, *not* the linen carried across the room or ward to the bath, in order to avoid diffusion of the poison as much as possible.

VII.—Constantly sprinkle the carbolic solution round the bed. All dusting in the room should be done with a duster damped with the same solution, to avoid the stirring up of any germs which may have settled.

VIII.—The thermometer to be kept in a shallow basin of the carbolic solution.

IX.—Disinfect the motions by mixing with the carbolic solution, or with a solution of sulphate of iron, in the proportion of 1 lb. to the gallon. Whichever is used should be allowed half-an-hour to act before the mixture is emptied into the drain.

X.—All poultices should be burnt in a good fire, not left smouldering on a slow one, or the poison escaping up the chimney will pass into the atmosphere in an active state.

XI.—Free ventilation is most essential.

XII.—All pieces of rag or wool used for wiping up discharges to be burnt immediately after use.

XIII.—In cases where desquamation of the skin takes place, it must be anointed with oil or something which will prevent the scales being shaken about. Glycerine with a drop or two of oil of lavender is a very neat preparation for the purpose.

XIV.—The mattress should be protected by a mackintosh. The nurse should wear a mackintosh apron when nursing babies.

Most of the above rules are taken from Miss Luckë's *Lectures on Nursing.*

Nurses need not be frightened of catching fevers from patients, for the chances are greatly against their being susceptible to it. If ten people were exposed to the risk of infection, probably only one or two would have the fever. Residents in hospitals seem to have a special exemption from catching diseases; it is not meant that they never do catch them, but only that they do not do so as often as would be expected; still they do sometimes take them, so nurses must adopt all the precautions they can. If the above directions are faithfully carried out they will run very little risk, but they should also avoid inhaling the patient's breath or other emanations from his discharges or person. Ventilation will, however, form the chief protection if efficiently done. The emanations from a patient seem to hang about like clouds of smoke, only of course invisible; consequently as much ventilation is required in the sick-room or ward as if the chimney had been smoking. In private houses ventilation to this extent may be impossible without

producing draughts dangerous to the patient; the nurse must do the best she can.

These precautions are to be maintained until the patient is quite well and allowed to rejoin his friends, or the doctor gives permission to relax them. The time varies for different fevers: for chicken-pox and mumps it is ten days, for measles about three weeks; for scarlet fever, whooping cough, smallpox, about forty days. The slight cases require as much disinfecting and precautions as the severe ones, though sometimes the attack may be so slight as to pass undiagnosed until the advent of some complication makes the nature of the case clear. Scarlet fever, for instance, may be so mild as to pass unrecognised until peeling or dropsy occurs later on. Any complications leading to discharges, such as inflammation of the ear or abscesses, will increase the time during which the patient remains infectious, for it has been found that such discharges continue to eliminate the poison long after the excretions have ceased to do so.

Additional rules to be observed when nursing fever cases in a private house.

I.—The carpets, curtains, valances, and all superfluous furniture are to be removed and put on one side, to be included in the general disinfection of the room, which takes place when the patient has recovered.

II.—A hand spray of carbolic should be used frequently.

III.—The bed is not to be placed in a corner, but so arranged that the nurse can get at the patient from both sides.

IV.—A sheet saturated with carbolic solution to be hung across the door. This should be redipped often enough to keep it constantly moist.

V.—The mouth to be cleansed at least twice daily with an antiseptic mouthwash, such as Condy's fluid and water.

VI.—For giving a bath, a hip bath is to be placed before the fire, with a screen behind to keep off draughts.

VII.—Before leaving the patient's room the nurse should disinfect and wash her hands and leave her apron and oversleeves in the room.

VIII.—The patient is to be separated entirely from the rest of the inmates of the house. A room at the top of the house is best.

IX.—At the conclusion of the case, good waterproof sheeting can be disinfected, but thin or badly stained material should be burnt.

X.—In the event of death, the body should be washed in disinfectant, and disinfecting carbolic powder freely sprinkled on the bottom of the coffin.

XI.—As soon as the doctor gives leave, a general fumigation of the room should take place, together with the clothes and bedding. The chimney is to be blocked up, and the windows, doors, and other openings tightly closed by pasting over the cracks with brown paper. For fumigation, a quarter of a pound of brimstone (or more, according to the size of the room) should be broken in small pieces and put in an iron or porcelain dish (or lid of a saucepan turned upside down), supported by a pair of tongs over a bucket of water. The brimstone is set on fire either by putting on a shovelful of live coals, or a table-spoonful of turpentine ignited

with a match. The doors are then to be quickly shut, and the room kept closed for four or six hours.

After this, a thorough cleansing should be effected; everything washable should be washed, and all other things cleansed by proper means. The floors, walls, and ceiling should be scraped and cleansed. The old paper should be thoroughly removed, and the walls scrubbed down with a solution of carbolic before the new paper is put on. The chimney should be swept and a good bright fire allowed to burn for twenty-four hours and the windows left open for a day or two.

(The above rules are taken from those of the Paddington and Marylebone District Association, and from Mrs. Dacre Craven's *Guide to District Nurses.*)

Mattresses should be ripped up, the contents burned, the ticks steeped in carbolic solution and exposed to fresh air to dry.

When a patient leaves "quarantine," the following precautions should be adopted: He should for three days previously have a warm bath, each evening, containing some antiseptic, such as carbolic or Condy's fluid. The nail- or bath-brush should be freely used, and he should be washed all over, especially the head, with carbolic soap. On the day of leaving he should go into another room, where new linen and clothes that he has not worn during his illness are put out. Here he should have a similar antiseptic bath, and, getting into the new clothes, he should go away without touching his old ones, or anything else which he wore during his period of incarceration. In this manner he may be perfectly sure of not carrying any infection away with him.

CHAPTER XI.

SUBJECT—ANATOMY OF THE LARYNX. DIPHTHERIA AND TRACHEOTOMY. SIGNS OF OBSTRUCTION. EMERGENCY OPERATION. HOW TO ASSIST. SUCKING THE TUBE.

THE larynx, or organ of voice, situated in the neck, is composed of several pieces of gristly substance called cartilage. The names of the cartilages are the thyroid, the cricoid, and the arytenoid. The thyroid is composed of two quadrilateral halves, united in front but separated behind to allow room for the broad part of the cricoid; where united in front they project, forming the lump more prominent in men than in women, and commonly known as Adam's apple. Above, it is attached by membrane to a horseshoe-shaped bone, the hyoid, to which the tongue muscles are fixed. Below, it joins the cricoid cartilage, which is shaped like a signet ring, the narrowest part being placed forwards. To the upper margin behind of the cricoid the little triangular arytenoid cartilages are fastened. The larynx contains the vocal cords, two in number; they are attached in front to the angle of junction of the two halves of the thyroid, and behind one is attached to each arytenoid. They are close together in front, but separated behind, forming a V-shaped space called the glottis. The larynx is continued below into the trachea, and above it opens into the pharynx, or throat, in front of the opening into the œsophagus. In order that food may

not enter the larynx, its upper opening is provided with a lid which always remains open except when food is being swallowed; it is so placed that anything to be swallowed must press down the lid before it can pass on; this is called the epiglottis. Sounds are produced by the air blown through the larynx from the lungs, causing the cords to vibrate, and alterations in voice by little muscles tightening and relaxing the cords when so made to vibrate. The glottis is the narrowest part of the larynx, consequently it is very liable to become blocked by inflammatory swelling, diphtheritic membrane, or foreign bodies. The whole interior of the larynx is lined by a delicate mucous membrane, continuous with those lining the mouth and trachea.

The nature of diphtheria is still a matter of dispute, some maintaining it to be a local disease, commencing in the throat and larynx, spreading thence to the system; others that it is a blood disease, with local symptoms in the throat analogous to the rash of the infective fevers. Whatever may happen first, the chief characteristic of the disease is the growth of a membrane in the throat, which has a tendency to and often does obstruct the glottis. In such a case, death from suffocation results, unless an opening be made into the trachea below and a tube inserted. The operation for doing this is tracheotomy. Starting in the throat, the membrane may grow up into the nose, appearing even at the nostrils and giving rise to an offensive discharge from them, or it may grow down from the larynx into the trachea, reaching even the smaller bronchi. All discharges from the nose and mouth are very infectious. The author once saw a ward maid contract

the disease, from which she afterwards died, by finishing some jelly with the spoon with which a diphtheria patient had attempted to eat the same. The temperature varies: it is sometimes high, though in other cases it is normal or subnormal.

The general nursing is the same as for other fevers, but the nurse must specially be on the look-out for signs of obstruction of the larynx, such as increasing difficulty of breathing, blue or dusky look of the skin, blowing noise with the breathing, sinking in above the clavicles and lower ribs; any change should be noted, and, if urgent, the doctor sent for.

When it is expected that tracheotomy may be required, it is usual to have everything ready for doing it at a moment's notice. In these cases the instruments, although at hand, should be kept covered or out of sight, so as not to frighten the little patient, or any friends who may visit him. The surgeon may frequently have to perform the operation with only one nurse to assist him. Here the nurse will be required to make herself of the greatest possible use. The most important things which she will be required to see to are: first, that the chin shall be kept well up; secondly, that the head shall be kept perfectly straight, that he may be able to keep his knife in the middle line over the trachea; and, thirdly, that the wound shall be kept well open with retractors without being pulled too much to one

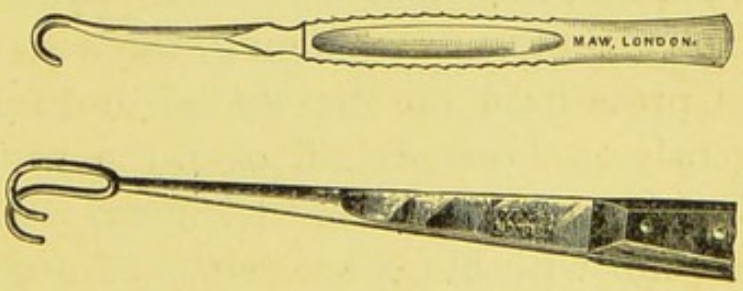


FIG. 22.—Blunt hook retractors.

side or the other. All these requirements can be fulfilled by one nurse if the patient is placed on a table and the nurse understands how to do it. The first point is managed by placing a sand-bag covered with a mackintosh under the child's neck without any pillow under the head; the second is effected by the nurse standing at the head of the table and holding the child's head between her elbows in the position required, thus leaving her hands free for the third requirement, that is, holding the retractors to keep the wound open. If chloroform is required, the surgeon will be able to administer it before he commences operation, and he must manage the sponging himself. Of course, if he has a second assistant, he or she will do the sponging and hand the instruments. In sponging, the assistant is not required to press hard on the wound or long; simply to press gently and evenly all over the wound, removing the sponge quickly and not leisurely, as it allows the wound to refill with blood before the surgeon can cut again.

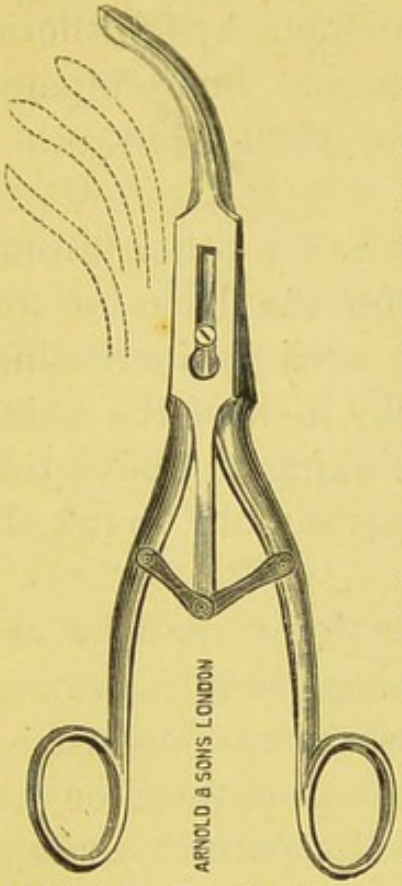


FIG. 23.—Tracheotomy dilator.

FIG. 24.—Chloroform drop-bottle.

An ordinary wine bottle covered with a towel makes a good substitute for the sand-bag if the latter is not

at hand. An emergency operation can be done with a penknife and a pair of scissors if instruments are not ready.

The nurse's duty after the operation is contained in the three words, "*watch, anticipate, count*"; under which headings it will be discussed. Watching includes the patient and the surroundings, and this leads to the subject of tents. Some doctors prefer to shut tracheotomy cases up in a small tent about the size of the bed, open only at the middle third of the side next the fire. This has the advantage of being easily kept up to the required temperature, but has the disadvantage that ventilation cannot be carried on sufficiently to keep the air pure. Some doctors, recognising this, employ a tent without a top, *i.e.*, they have the screen all round the bed to keep off draughts, but do not have a roof to it. Others, again, make the room the tent, which is perhaps the best method of all, though it is more difficult to raise it to and maintain it at the required temperature. Whichever is ordered, the ward thermometer should be placed *at the head of the child's bed*, as nearly as possible on a level with its head, and the index should be watched in order to see that it keeps between 65 degs. and 70 degs. The temperature of the room or tent is kept up chiefly by the fire and by preventing the entrance of cold air; consequently it is important to prevent people coming in and going out as much as possible. Where no tent is used, a screen should be placed between the door and the patient. The air of the tent or room will also have to be kept moist, which helps to loosen the membrane. According to the size of the room or tent, one or two steam kettles are required. If two are used, they should

be so filled that they do not both require replenishing at the same time, and to save time boiling water should then be put in them. Thus, as far as the surroundings are concerned, the thermometer must be watched to see

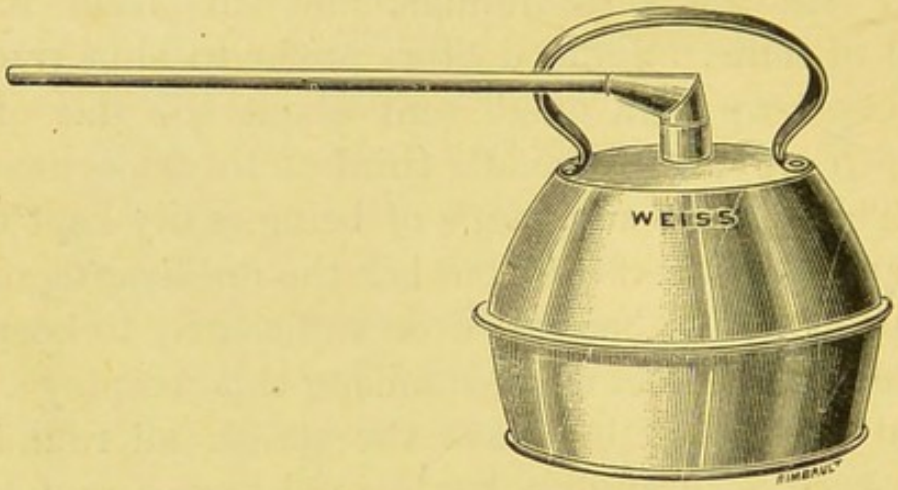


FIG. 25.—Bronchitis kettle.

that the temperature is maintained; the fire, that it does not get too low; the door, that people do not come in unnecessarily, or keep it open longer or wider than they are obliged; and the kettle, that the lamp does not go out or the tube project over the patient's head and allow hot drops to fall on him. In spite of all this, her vigilance on the patient must never be relaxed for a moment. Children are very apt to pull the tube out, however accurately it may be tied in. The neck must be kept clean and dry, or it may become sore, itch, and induce the child to scratch it.

The best dressing for the wound is boracic ointment spread on a circle of boracic lint and cut in two halves, so that it may be changed without removing the tube.

In changing the tape the new one should be put in before the old one is removed, so rendering it impossible for the tube to be coughed out in the middle of the process. To prevent its becoming blocked the inner tube will require changing every two hours, which duty will probably fall to the lot of the nurse. It is not easy to do without hurting the child, and if once it is hurt her difficulties will be increased each time she dresses it. The best plan is to practise on a tube fixed in a hole in a piece of newspaper. The inner tube generally has some rings or projections at the sides by which it is withdrawn with the finger and thumb of the right hand, after first fixing the outer tube by taking hold of its upper and lower border with the finger and thumb of the left hand. In removing it the nurse should be careful not to press on the outer tube, or pain will be caused. She should remember also that the direction of removal will not be straight forwards, but sloping towards the feet. Having removed the tube, she should cleanse it as quickly as possible, anoint it with a very little oil, and replace it in the same manner that it was withdrawn. If the tube requires cleansing oftener than two hours, it is usual to clear it out with a feather without removing it. To do this, it is no good poking a feather in and withdrawing it again, for if this is done to a tracheotomy tube held in the hand it will be found that the feather almost invariably passes out through the opening at the bend, instead of at the end of the tube. To avoid this,

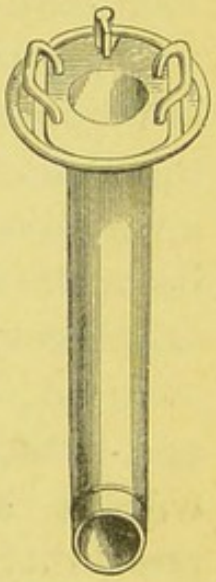


FIG. 26.—Tracheotomy tube.

care must be taken that the feather presses against the upper edge of the opening during the whole time of introducing; once introduced, it must be given quickly a whole or half twist, and withdrawn again. Feathers are either used dry or moistened with different solutions designed to dissolve or loosen the membrane. It is as well not to use the feather unless the tube is obviously getting blocked, as indicated by increased rapidity of breathing, with a hissing or bubbling noise in the tube.

A word or two about sucking the tube, which is a wrong proceeding in several ways. First, a child who has diphtheria so badly that the tube gets blocked to this extent almost never recovers, so the nurse has only a very questionable right to risk her own valuable life for such an off chance as success would give the child; and, secondly, sucking the tube does no good. If there were an opening in the chest so that air could come in and be sucked through, it *might* carry the membrane with it, but in default of this, it is a physical impossibility.

Instead of steam, or in addition to it, the doctor may order hot flannels or sponges to be kept over the mouth of the tube; these will require renewing every three or four minutes—that is, before they get cold. When these are not used, a single layer of gauze should be loosely laid over the tube, to prevent sputum or bits of membrane being coughed about the room. Another thing a nurse has to do is to help the patient to cough, or rather save him coughing, by catching each piece of expectoration or membrane with a swab, piece of wool, or whatever she is using for the purpose. directly it appears at the orifice of the tube, so pre-

venting its being withdrawn again into the tube with the next inspiration to give rise to more coughing.

Of course the patient cannot speak, so the nurse should be always on the alert for whatever he may want, and *anticipate* all his desires for food, toys, or bed-pan, as much as possible.

Lastly, she should be continually counting and noting the frequency of the respirations, that the doctor may have early notice of any bronchitis or pneumonia supervening, and she may have some sort of a guide as to whether the tube is getting blocked. Food can generally be given by the mouth, but never of course by the tube, which leads into the lungs. One more precaution: these cases should *never be allowed to raise themselves suddenly*, even when apparently doing well, because under these circumstances they are very likely to have a fatal syncope.

Diphtheria may be complicated with, or followed by, paralysis of different kinds, as shown by squint, weakness of the limbs, a nasal tone of voice and difficulty of swallowing.

The operation of tracheotomy may be complicated by erysipelas, diphtheria of the wound, and emphysema of the cellular tissue from air getting into it. This will be known by large, painless swelling of the neck and front of the chest.

Tracheotomy may be done for other conditions than diphtheria. It may happen that a patient may get food into his larynx from a sudden inspiration with the mouth full. Then the patient will be choked, and unless tracheotomy is done on the spot, will die.

Children, either from being given too hot drinks, or

from sucking at the spout of a kettle, may get such acute swelling in the larynx and parts around as to necessitate tracheotomy being performed. Tracheotomy may also be performed in acute laryngitis, either from cold or from the swallowing of strong acids, either accidentally or with suicidal intent. Lastly, it may be done for laryngeal phthisis, tumours or paralysis of the vocal cords.

CHAPTER XII.

Section A.

SUBJECT—LISTERISM OR ASEPTIC SURGERY. ITS THEORY AND PRACTICE. THE UNIVERSAL INVISIBLE DUST. THE USE OF ANTISEPTICS NOT NECESSARILY DRESSING ASEPTICALLY.

What is called Listerism or Aseptic Surgery is by far the most important of all the things a nurse will be called upon to learn in surgical nursing; it is also one of the hardest, because, although the principle is easy, the details vary so much, not only among the rank and file of the profession who practise it, but also because those who are engaged in the perfection of the process are constantly changing their methods as they approach nearer and nearer to perfection. Perhaps, however, the greatest difficulty of all arises from the fact that the details of the process are only understood and carried out by a minority of the profession. Many surgeons profess to practise it who ignore altogether its underlying principle. "Such men, by neglecting and ridiculing its essential details, demoralise all their assistants, male and female, and spread an entirely erroneous idea of what aseptic surgery really is." A nurse who has learnt to dress aseptically has acquired a knowledge of which she may be justly proud.

The principle of aseptic surgery is based on the fact that everywhere indoors and out of doors, in

dwellings, in air and in water, there is present a fine dust which covers everything however clean it may look. This dust consists partly in very minute living particles called germs, which, when introduced into a wound, even in the smallest quantities, are capable of producing putrefaction in it. It is the same dust which makes meat go bad, milk go sour, jam to ferment or become mouldy. It contains numerous kinds of germs, each producing its own kind of effect. Some produce erysipelas in a wound, some pyæmia, others gangrene or septicæmia, the commonest of all being those which produce suppuration only.

Aseptic surgery consists in the exclusion of the minutest quantity of this dust from wounds, and in the killing of any such germs as get in accidentally by different germicide (antiseptic) solutions. A nurse must get clearly in her mind that the mere use of these antiseptic agents does not make the user an aseptic dresser, any more than the use of poisons as medicines makes the doctor a poisoner. *It is the so using them, as to exclude living germs from wounds, which constitutes aseptic surgery.*

Some people think that using the carbolic spray is aseptic surgery; but the spray is not now used, and had very little to do with aseptic surgery; it was in no way essential to it. Wounds into which germs have penetrated (mostly) suppurate, *i.e.*, discharge a milky or creamy fluid, called "matter," "pus," or "suppuration," which, if not quickly removed, will putrefy, smell, and, getting absorbed into the blood, cause septicæmia or pyæmia (blood poisoning). To prevent these results, wounds were at one time simply

freely drained with tubes, not being covered with any dressing which could interfere with the exit of discharge; or wounds were not sewn up at all, but simply poulticed to make them discharge freely. At another time wounds were kept immersed in a bath which washed the discharge away as quickly as it was produced; or water was kept running constantly over them; or again wounds were covered with large masses of absorbent cotton wool, which soaked up the discharge very quickly. In spite, however, of all these precautions, wounds nearly always suppurated, and were so frequently attacked with erysipelas and other forms of blood poisoning that often hospitals had to be closed on this account. This is what a German surgeon has written about a German hospital: "Formerly (*i.e.*, before the aseptic method) injuries of the head, compound fractures, amputations and excisions—in fact, almost all patients in whom bones were injured—were attacked by pyæmia. For example, of seventeen cases of amputation, eleven died from this cause. Even patients with severe whitlow died of it. Hospital gangrene had got the upper hand, and in spite of all methods of treatment, finally eighty per cent. of all wounds and ulcers were attacked. Almost every wound was attacked with erysipelas. Now there is no pyæmia, no hospital gangrene, and no erysipelas."

It may be objected that these complications are not now common, and we never now shut up hospitals on their account. Well, the answer is that cases do still occur where the system is not properly carried out, and that their scarcity is due to antiseptics being used, though they may not be used quite aseptically, for it is

far better to half carry out the method than not to attempt it at all. In proportion as perfection in their use is approached, so will the results be. It will be well to compare an aseptic with a septic wound. In the latter there is more or less local inflammation, which may be accompanied by fever and constitutional disturbance; there is pain, often very severe; profuse discharge of pus, which rapidly putrefies; the wound heals slowly and leaves a conspicuous scar. In the former there is no rise of temperature, no constitutional disturbance, no pain, slight discharge of watery serum, the wound is not inflamed and heals quickly, leaving an almost invisible scar. All these results can be assured with practically absolute certainty by those who take the trouble to thoroughly acquire the antiseptic method; yet real antiseptic dressers are still few, and they often find their efforts rendered fruitless by people who do not understand the method.

Various antiseptics are used for wounds, but chiefly:—

Carbolic acid.
Corrosive sublimate.
Boracic acid.
Iodoform.

Some time and patience are required in order to acquire the manipulation necessary to avoid introduction of septic matter into a wound; if, however, every wound is treated, whether septic or not, as if it were an aseptic one (aseptic means having no living germs in it), the aseptic method will become a second nature, and then dressing aseptically comes more or less automatically ever after.

During an operation it should be remembered that everything which has not been well soaked in some antiseptic solution, *i.e.*, purified, is septic (containing living germs), and that everything which is to go near the wound must have come straight out of the antiseptic solution after a good soaking without touching anything else, not even the operator's hands, unless they too have been purified.

The part to be operated on must first be purified with carbolic acid solution one in twenty. To effect this, a towel soaked in the solution is bandaged on for half-an-hour before the operation. Instruments and sponges must also be soaked for half-an-hour in the same solution; and the hands of the operator and his assistants well scrubbed with a nail-brush and one in twenty. In order that no instruments or other things used for the wound may get contaminated with dust from blankets or table, a towel soaked in one in twenty carbolic is spread on a mackintosh between the operator and the patient, and is called the "antiseptic basis". Here he puts instruments which he has used once and is going to use again, without fear that they will be contaminated; wherever instruments or sponges are likely to be put, towels wet with one in twenty carbolic must be spread. To kill any germs which may get in the wound from the air, the wound is frequently douched during the operation with antiseptic solutions. When the operation is finished, a piece of wet gauze is put next the wound, then dry gauze, and lastly thick layers of antiseptic cotton wool. This gives even pressure when the bandage is applied, and though it allows air to get to

the wound, it filters off any germs it may contain. These are the most important details, though there are many minor ones. Frequently all these precautions may be frustrated, that is, the wound rendered septic, by some one handing the operator an instrument with unpurified hands, or an instrument which, having been purified, has been dropped on the floor or placed on a blanket or dry towel or some other septic thing, by some onlooker meddling with unpurified hands, or by septic dust being, in some other unobserved manner, introduced by a careless or ignorant person. The operator is necessarily unable to watch everybody, and so the success of an operation depends to a very large extent on the care and attention of every one of the assistants. Sponges should be well washed after an operation, and always kept in one in twenty carbolic. Aseptic wounds do not require dressing often; when a wound is dressed depends on the surgeon in charge, but it will always be dressed for pain, rise of temperature, shifting of the dressing, or the discharge coming through, which are consequently the points the nurse must be on the look-out for and report. Once the discharge appears on the outside of the dressing, the filtering action of the wool is done away with, and germs easily travel through the dressing where it is soaked with discharge, so infecting the wound. If when the discharge comes through the surgeon is not at hand, the nurse should well soak the stained part with one in twenty carbolic and bandage on some more dressing. In changing the dressing the same precautions are as necessary as in operating. If the wound is looking well the new dressing is put on as quickly as possible,

and all pushing, syringing, squeezing, probing avoided.

More minute details have been purposely omitted in this section because it is wished to call attention first to the most essential ones. Once these have been mastered, the others will follow easily.

Section B.

SUBJECT—DETAILS OF THE DIFFERENT DRESSINGS. THE ALEMBROTH. GUARDS. THE CYANIDE DRESSING. CARBOLIC GAUZE. THE EIGHT LAYER THEORY. BORACIC DRESSINGS. ACCIDENTAL WOUNDS.

Of all antiseptic dressings the alembroth is that most frequently used. It consists of a gauze and a wool, both stained blue in order to distinguish them from other dressings; the discharge washes out the blue colour, showing distinctly where it has been deprived of its antiseptic properties. The alembroth salt is a non-volatile antiseptic, and consequently does not smell; as it requires to be wetted by discharge before it can exercise its antiseptic properties, it follows that any part of the dressing which has not been so wetted can be used over and over again. With this dressing it is usual to have the bandages also made antiseptic, by soaking them in a corrosive sublimate solution of one in five hundred and drying them. A little aniline blue is added to this sublimate solution to stain the bandages, to avoid any doubts as to which bandages have been so purified. Generally nurses are expected to do this in the wards. In drying and rolling

them it is important to avoid reinfecting them with dust, so the quicker they are dried the better. If they are dried by placing them on a chair-back in front of the fire, a mackintosh which has been washed with one in twenty carbolic should be placed between them and the chair. In rolling them, too, the table should be covered with a mackintosh in the same way, and every precaution taken to keep them as free from dust as possible. When rolled they should be kept in a tin box which has been washed out with carbolic. All antiseptic dressings should be treated as a wound would. They should be handed with purified hands from the tin box to the operator, *never, never being put down on table, blankets, or other septic things.* They should be cut with purified scissors when it is necessary to cut them at all.

The piece of alembroth gauze going next the wound is first soaked in one in two thousand corrosive sublimate solution, and then wrung out as dry as possible: it should be sufficiently large to overlap the wound an inch in all directions. Next to this is put plenty of dry gauze, then the wool and bandage. For this dressing only two lotions are necessary, viz., the one in twenty carbolic for purifying hands and instruments, and one in two thousand corrosive sublimate for the wet gauze for redipping the hands after they have once been purified, and for doing any washing of the wound which may be necessary. In redressing a wound the greatest care must be taken to disturb it as little as possible; no force should ever be used to pull off a dressing which sticks, no pain should ever be given. If it does stick, it is only necessary to soak the soiled part with one in

two thousand solution, squeezed on it drop by drop, from a wet piece of wool which has been well purified by soaking a few minutes in the solution. Some surgeons, instead of wet wool, use pieces of butter cloth, about 6 in. square, folded in four layers, and put in the one in two thousand bowl, for this purpose; such pieces are called "guards". As each layer of the dressing is soaked it is easily removed, and so on until the wound appears. Directly this is reached, it is covered with one of the wet guards to protect it from dust, while the piece of wet gauze for the new dressing is being prepared. It may be repeated that when a case is aseptic *no washing, syringing, or probing is necessary or advisable*, for nature is acting under the most advantageous circumstances of rest and freedom from irritation, with which all these measures would interfere. With septic wounds the case is different; but they will be referred to later on. The new double cyanide dressing is used in much the same way as the alembroth. As, however, it is liable to lose its strength by "dusting" (*i.e.*, the antiseptic shakes out of it to some extent), it is recommended to keep it damp with one in twenty carbolic in stone jars. It is to be wrung as dry as possible before being applied. The piece going next the wound should be well washed in one in forty carbolic or one in four thousand sublimate solution. The cyanide is a much stronger antiseptic than the alembroth, so that discharge is less liable to putrefy in it, even when it has appeared at the edge of the dressing.

Other dressings commonly used are the carbolic gauze, iodoform gauze, and the boracic dressings. The iodoform gauze and wool are used in precisely the same

way as described under the alembroth, and the same lotions are used.

With carbolic dressing, a piece of green protective is used to cover the wound, and overlap about ¼ in., in order to protect it from the irritating effect of the wet gauze placed next to it. Owing to the expense, a layer of pink jaconet (or guttapercha tissue) is placed outside the gauze, so only allowing the discharge to come through at the edge of the dressing, *i.e.*, it is compelled to travel the length of the dressing first. This is important, because the carbolic in the gauze rapidly evaporates, and so the unsoiled part of the dressing cannot be used again as the alembroth can. These dressings should be very neatly made; no free edges of gauze should appear, all being folded in, and, if necessary, they may be tacked together at the borders with a purified needle and thread. For neatness' sake, a single layer of gauze is put outside the jaconet, over the edges of which it is folded; this also serves to keep it in its place. The lotions used with this dressing are the one in twenty and one in forty carbolic. Before putting the jaconet into the dressing, it must be held up to the light to see that there are no pinholes in it through which discharge would come, the surface well sponged with one in twenty carbolic; and of course the shiny side of the jaconet goes nearest the wound. It is quite immaterial how many layers of gauze go between the jaconet and the wound, so long as there are sufficient to soak up the discharge. Some of those who do not understand aspetic surgery affect to think that there must be eight layers, neither more nor less. Eight layers is a good thickness,

but whether there are six, eight, ten, or twelve is really immaterial. The bandages used with this dressing are either made of carbolic gauze or of ordinary unpurified white butter cloth. The carbolic dressing has given way to the alembroth for most operations, but it is still used for cases in which there is a very great amount of discharge, as empyæmata and psoas abscesses.

Boracic dressing is used for cases where strong antiseptics are not wanted, as for most ulcers and superficial wounds. There are three varieties of it, viz., the ordinary, the boracic ointment, and the boracic poultice dressing. The ordinary consists of green protective, over which is a piece of boracic lint, both wet with boracic lotion, then some layers of dry boracic lint, and over this again some antiseptic wool and a bandage.

In the boracic ointment dressing, boracic ointment spread on dry boracic lint is placed next the wound, then more dry lint, wool and bandage as before. In spreading ointments only a very thin layer is required. The best way is to spread a little ointment on lint, then lightly scrape off nearly all one can, and then the right amount of ointment will be left.

The boracic poultice is a most useful dressing when properly applied. It consists of one to four layers of boracic lint soaked in hot boracic lotion, squeezed to get rid of the superfluous moisture, and applied covered with guttapercha tissue (or jaconet) in such a manner that the tissue overlaps the lint an inch in all directions. If any lint is left uncovered the poultice rapidly dries, and is then no longer a poultice. Over the tissue some wool and a bandage are placed.

So far operation wounds only have been dealt with; now accidental ones will be considered. In the out-patient room a wound is sure to be infected with septic matter, and requires purifying if possible. With small wounds this is done by washing them freely with one in twenty carbolic, well scrubbing the skin round to get it as clean as possible, and dressing antiseptically. Supposing, however, that the wound is a deep, torn one, or even a compound fracture, then the proceedings are more complicated, and must be left to the house surgeon or surgeon; all the nurse has to do is to wrap the part up in a towel wet with one in twenty, to prevent its becoming more contaminated. The surgeon will probably proceed thus: first the wound will be plugged with some gauze, wet with one in twenty, then the skin in the neighbourhood will be scrubbed with a nail-brush, soap and one in twenty, next the plug will be removed and the wound treated in the same manner; parts which cannot be reached with a nail-brush will be washed by squirting or irrigating one in twenty through a clean catheter passed into them. The wound will be then sewn up, a drainage tube inserted, and the dressing applied. By these means an accidental wound can in general be converted into an aseptic one; but as one cannot be quite certain that this has been done, the wound will require dressing oftener than otherwise at first.

Now for one or two mistakes which beginners are liable to make. The commonest of all perhaps is not to purify the hands sufficiently; it is not enough to dip the fingers only in the solution, the whole hand should be thoroughly immersed up to the wrist, and *kept wet*

with the lotion. The instruments should be well cleaned with a nail-brush and thoroughly dried before

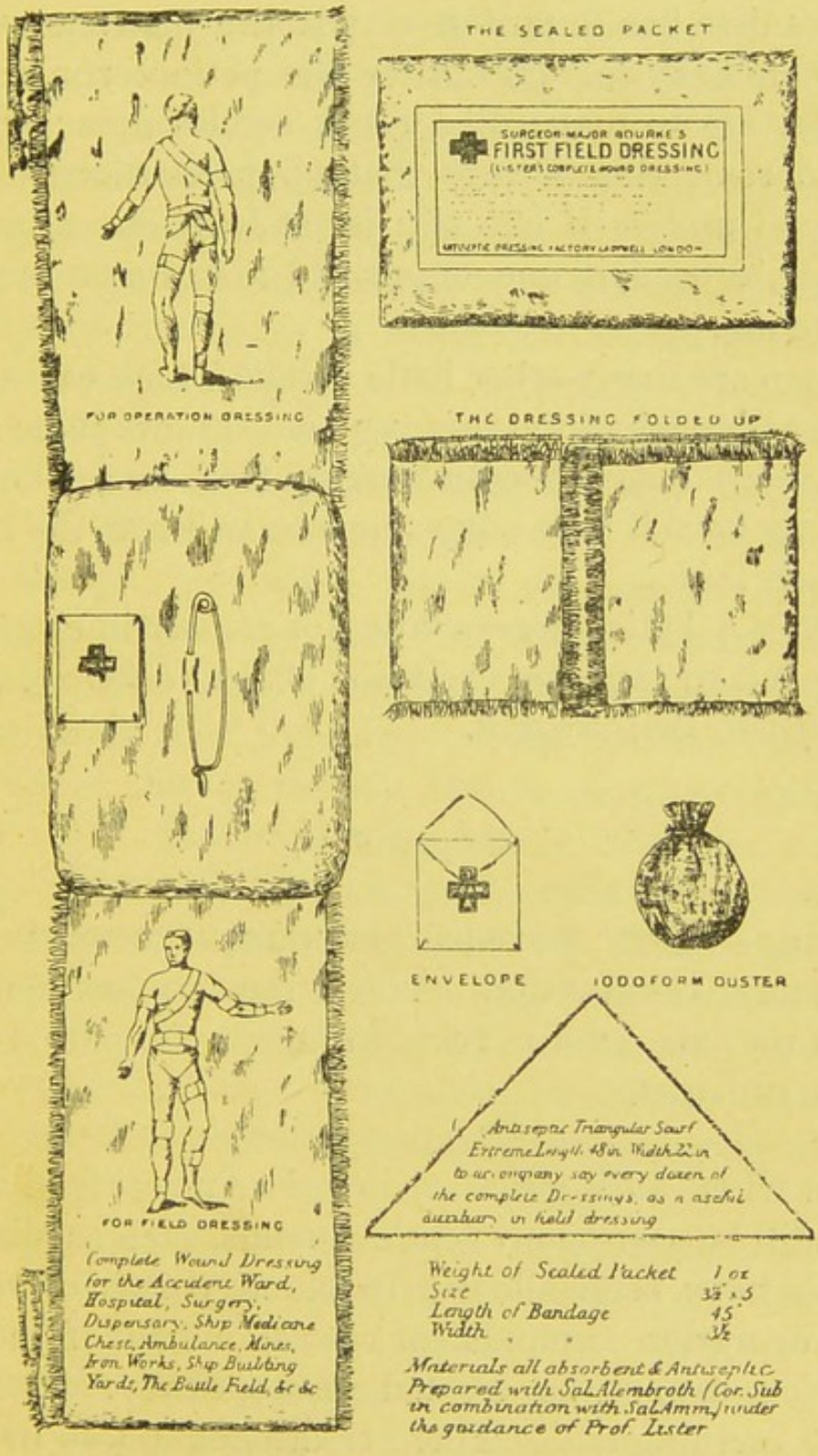


FIG. 27.—A convenient pocket antiseptic dressing.

being put away, and should soak for half-an-hour before being used. An instrument should never be handed to an operator after only a hasty dip in the one in twenty. If the nurse has forgotten to put the instruments out, she should say so, and not let the patient run the risk of infection to make up for her carelessness; and she should remember always that all precautions may be rendered useless if one slip is made, if one unpurified sponge is used, if one unpurified instrument is put in the wound.

There are many other little details which can only be learnt practically from some one who knows them; anyone can *understand* aseptic surgery from books, but they can only *learn* it from some one who will take the trouble to teach them.

N.B.—Aseptic surgery does not consist in cleanliness alone, but in the total exclusion of the *Universal, Living, Impalpable, Invisible dust.*

Section C.

SUBJECT—SEPTIC WOUNDS. PRINCIPLES OF TREATMENT. FREE IRRIGATION. POISONING BY ANTISEPTICS. HOW TO AVOID IT. RULES. BANDAGING AND BANDAGES.

Even where antiseptics are practised most rigidly, there will still be seen many septic wounds, such as abscesses which have been allowed to burst, poisoned wounds, and operation wounds of parts which from their position cannot be treated antiseptically, as mouth, nose, rectum, etc. Their treatment differs in many

respects, the essential difference being due to the fact that an irritant in the form of growing and multiplying germs has got into the wound, causing the formation of pus, which putrefies, and so still further increases the irritation. In order to reduce its effect as much as possible, and so lessen the time of healing, it is the surgeon's object to remove the discharge as quickly as it forms, by the free use of antiseptic lotions and drainage, and at the same time taking care not to increase the irritation by using the lotions too strong. For washing septic wounds, irrigators containing a weak solution of corrosive sublimate, one in three thousand or one in four thousand, are used. Dressings should be done frequently, according to the amount of discharge; not only must the wound itself be thoroughly cleansed, but the skin around must be kept scrupulously white. In aseptic wounds *surgeons do not mind how dirty they look*, because any dried blood about cannot putrefy, but in septic wounds any dirt or dried discharge will putrefy, smell and delay healing. The soiled dressings of septic wounds should never be touched with the fingers, but always removed with dressing forceps. When ointment dressings are used, all the old ointment must be removed before the new is applied, though if attention be paid to what was before remarked about spreading it, no scraping will be necessary.

Drainage tubes are necessary in all deep wounds; they must not project above the level of the skin, or sink below it, but be cut *exactly flush* with it. In cleansing them, it is useless to attempt to do so with a syringe; the best way is to rub them between the finger

and thumb while they are held in the carbolic lotion. This will loosen any adherent pus, which will finally be got rid of by rinsing them in the solution. If green protective is used it must not cover the end of the tube, or it would block and render it useless. When the wound is only large enough to admit the tube, no protective is of course required; the protective is to protect wounds which are wanted to heal, and it is not wished that wounds made for the insertion of drainage tubes should heal until these are left out. Drainage tubes are used in aseptic wounds too, but their use is only temporary.

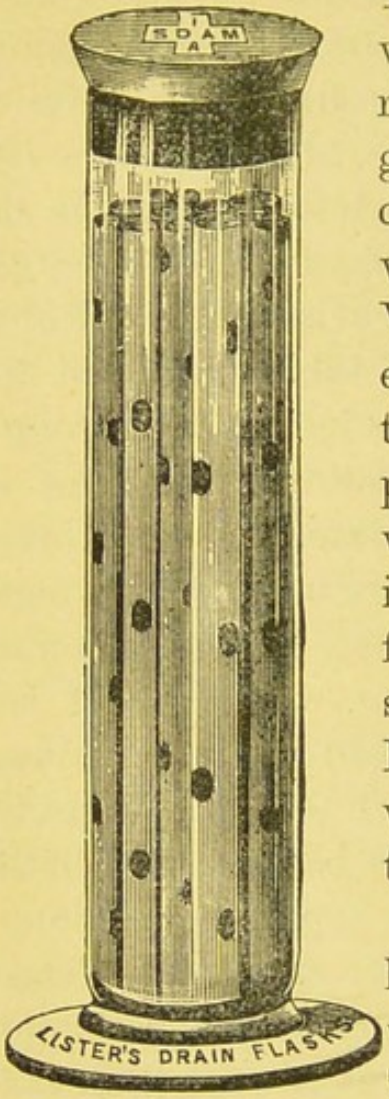


Fig. 28.

All septic wounds heal by granulations, with the appearance of which nurses soon become familiar. These granulations are liable to become excessive or "exuberant," that is, to project above the level of the healthy skin. When this happens, the nurse should draw the house surgeon's attention to it, and he will then take measures, either by caustic or otherwise, to get rid of them. A nurse ought not to apply caustic to a wound without orders. In applying the dressing the bandaging should be firmly and evenly done; the part should, if possible, be elevated on cushions or in a sling. There is always great difficulty in getting nurses to understand

what elevation means. To elevate the leg, the heel should be kept at least a foot off the mattress ; one or even two ordinary pillows hardly elevate it at all. (See page 193.)

There are some important rules to be observed in dressing wounds.

1. Dressings should be quickly, but thoroughly and neatly done, and *without giving pain.*
2. Before commencing to dress a wound, see that everything is ready.
3. Wounds should be washed with wool or guard, wet with some weak antiseptic lotion, and an irrigator should be used in most cases.
4. Always wash the wound first and cover it temporarily with a piece of clean wet guard, while the parts around are washed.
5. Always wash *away* from the wound, and do not touch it with a soiled swab or guard.
6. After washing the parts around, avoid giving the wound a final dab with the soiled swab.
7. If called away before the dressing is completed, the nurse should cover the wound with wet guard or dressing of some sort, *but never leave a wound uncovered.*
8. Treat all septic wounds as infectious, and be careful to thoroughly disinfect hands and instruments after touching them.
9. When erysipelas occurs, the precautions against spreading of it must be most strict, whether isolation be adopted or not.

It is best when dressing a wound to place a screen round the bed, for though nurses are quite used to the sight of wounds, they should remember the other patients

are not; and they should not uncover the patient more than is necessary to keep the bedclothes well away from the wound. In winter it is best to keep the lotions double strength, so that they may be diluted with warm water for dressings. Mackintoshes should protect the bed from getting wet.

In head wounds the hair should be shaved or cut very close—indeed, for an inch and a half all round the wound.

Iodoform is an antiseptic much used in hospital practice for wounds, especially septic ones. It is also used in aseptic wounds when they are near the axilla or perinæum; these parts, being very septic, are well dusted with the powder.

Carbolic oil dressings are now practically out of date.

In using these antiseptics freely, as has to be done in septic cases, great care must be taken not to leave any quantity of them in the wounds, for they are all more or less poisonous, and absorption readily takes place. It is mostly in injecting cavities, such as psoas abscesses, hip cases, and diseases of bone, that this is likely to happen, and then it might nearly always have been prevented. The first effect of absorption of carbolic acid is to impart an olive green colour to the urine, which rapidly becomes black as more is absorbed. Should further absorption occur, vomiting, feeble pulse, and symptoms of collapse rapidly set in.

With corrosive sublimate, vomiting, diarrhœa, colic, and tenesmus are the chief symptoms.

To iodoform have been attributed delirium, high temperature, and collapse, but these have been doubted.

Strapping, as a dressing, is not now much used; the

various ways of applying it will best be learnt by being taught practically. When there is no fire at hand, it can be made sticky by lightly rubbing a piece of wool, moistened with turpentine, over it. Before applying, all hair should be cut off; to remove it, pass a director underneath, and then by sliding one blade of a pair of scissors in its groove all risk of cutting the patient's skin is avoided. When taking it off a wound, care should be taken not to remove it in a direction in which it might stretch or re-open it. Used for aseptic wounds, it is made sticky by dipping it in a hot solution of one in twenty carbolic. Strapping is, perhaps, more used for ulcers than anything else, in the treatment of which equal pressure, rest, and elevation are most important. Occasionally surgeons have to scrape, blister, or cut ulcers, in order to promote healing; this is mentioned so that nurses may not be surprised or think them barbarous if they see it done.

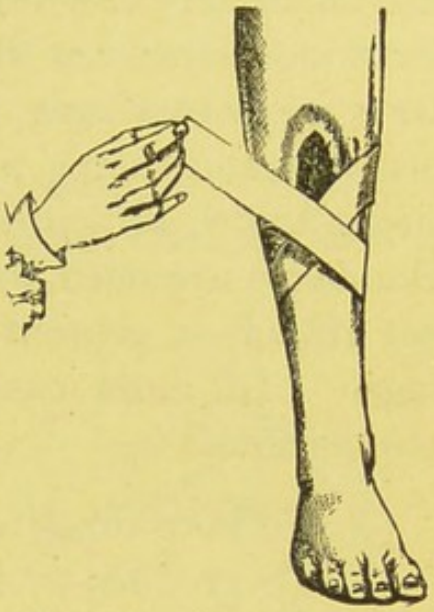


FIG. 29.—Strapping an ulcer.

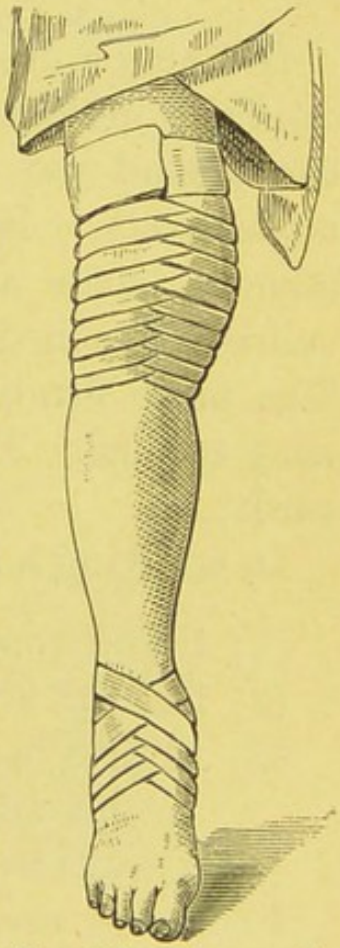


FIG. 30.—Knee and ankle strapped.

Bandaging is essentially an art to be acquired practically, and is fairly easily learnt, if the practice is continuous. It is best to practise on one's

friends or convalescing patients on every spare moment for a month, and at the end of that time a nurse should be a good bandager. It is no good having an hour's practice, and then a week or more interval before practising again; all learnt at first will have been forgotten. Bandages are used to give support to a weak limb, to get rid of or prevent swelling, to fix splints or dressings. In most cases there will be the following requirements :—

(1) To keep dressings or splints in place.
(2) To produce even pressure.
(3) To remain indefinitely as first put on.
(4) Least important, to look neat.

In fixing a dressing or splint, the first turn should be over the middle of the dressing, etc., to be fixed, and the second and third over the upper and lower ends respectively. Bandages are made of different substances, such as gauze, butter cloth, muslin, linen, calico (bleached or unbleached), domet, or flannel. The more firmly they are rolled, the more easily are they applied. The lengths used are six, nine, or twelve yards.

In applying a bandage—

(1) Stand opposite the patient.
(2) Let the first turn fix the bandage.
(3) Always bandage from the inner, across the front, to the outer side.
(4) Always bandage from below upwards.
(5) Never make reverses over a prominence of bone.
(6) Never put on more bandage than is necessary for the purpose for which it is applied.

(7) In removing a bandage, keep all the unwound part together in the hands as it is unwound, not leaving any part hanging out loose.

One of the secrets of good bandaging is to hold the bandage properly. A nurse will never bandage well if

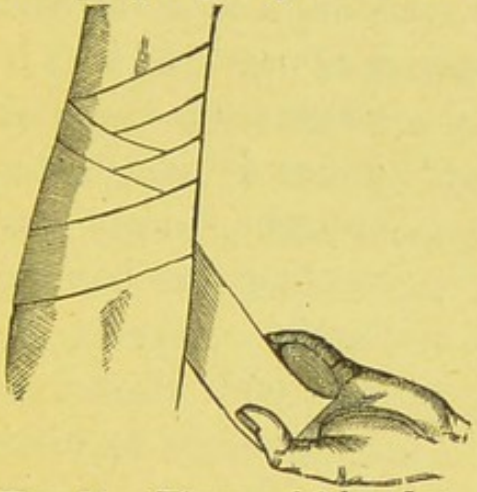


FIG. 31.—Figure of 8 bandaging, and the right way to hold a bandage.

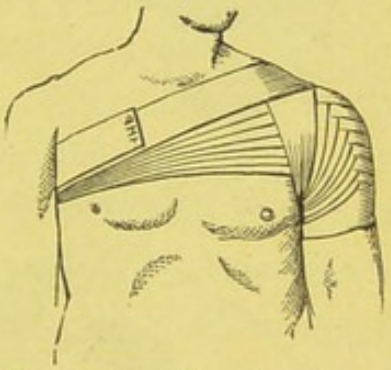


FIG. 33.—Spica bandage.

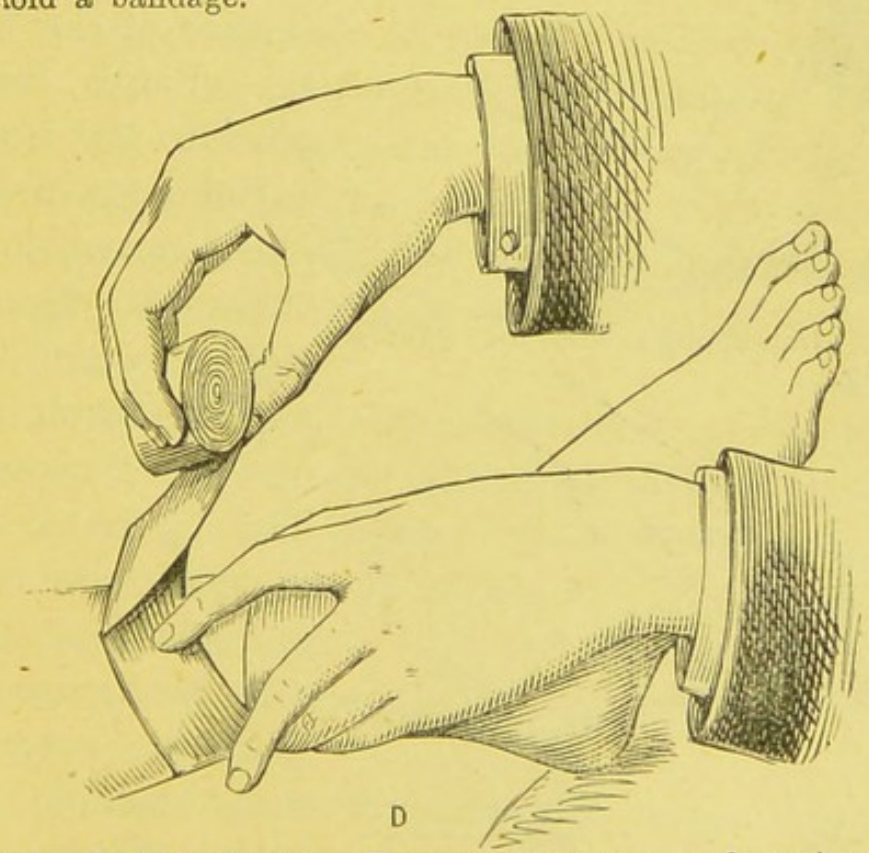


FIG. 32.—Bad bandaging. Reverses are being made on inner side, and the bandage is held in the tips of the fingers.

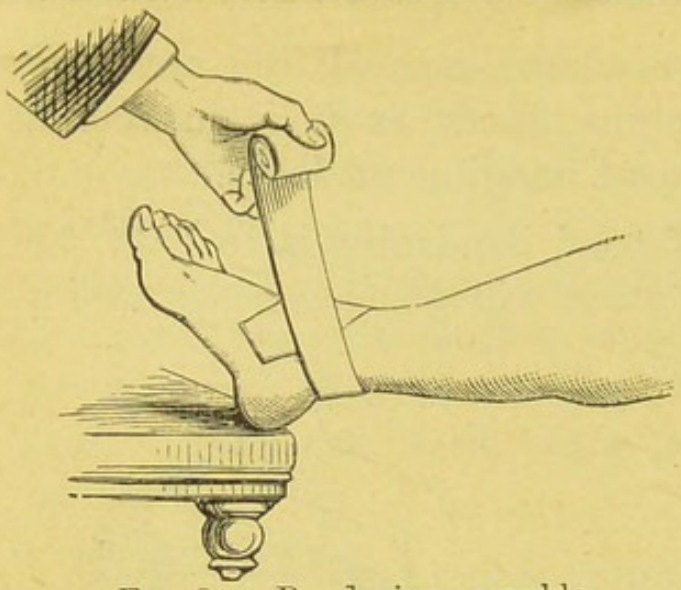


FIG. 34.—Bandaging an ankle.

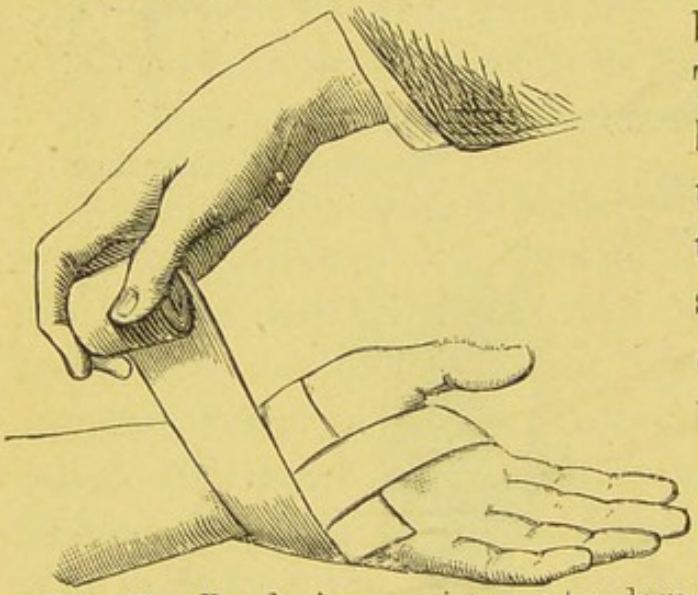


FIG. 35.—Bandaging a wrist, but bandage held wrong.

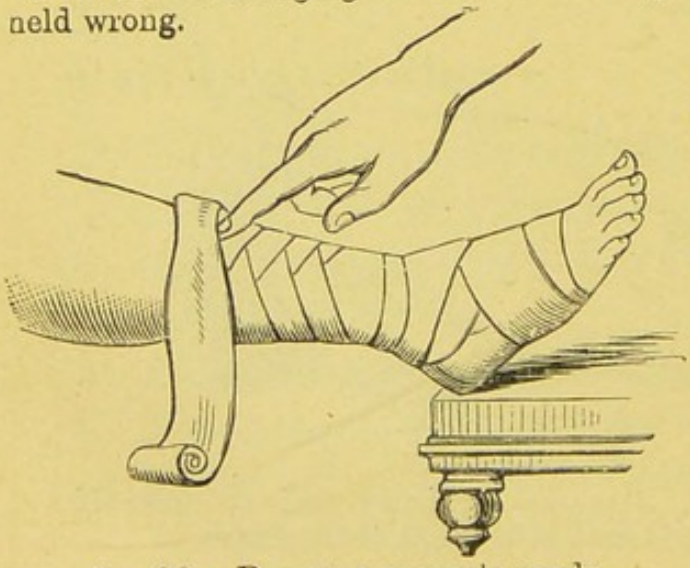


FIG. 36.—Reverses properly made.

she holds the bandage between *the finger* and thumb in the direction of the length of the hand. It should lie *transversely* across all the fingers of the half-closed hand, the thumb simply preventing the bandage being jerked out. The ends should not be touched by either the fingers or the thumb, and the outer surface of the bandage should be applied to the limb.

Bandages are applied in two forms: either as "figure of eight," which term explains their form, or by "reverses". The figure of eight is the more useful, and is becoming more and more used; in fact, the reverse is very seldom seen now. There is no

doubt but that the reverse does not give the steady, even pressure which the figure of eight does, and it is harder to apply successfully, *i.e.*, to fulfil the indications above-mentioned.

A spica bandage is a figure of eight which goes round the groin and upper part of the thigh.

A jaw bandage is made of a piece of calico about two feet long, which is torn in two from each end, to within one inch and a half of the centre. The central untorn piece has a small lozenge-shaped bit cut out for the chin. To this the chin is applied, and the lower two tails taken on either side of the face and tied on the top of the head. The upper two tails are carried along the side of the face and tied at the back of the head. To prevent slipping, the loose tails of the two knots are then tied together.

A T-bandage is made of two bits of bandage at right angles. One bit goes round the waist and is firmly tied in front. The second is tied or sewn to the centre of the first bit behind by one end; it then passes over the perinœum, and the free end is split into two tails, which are tied to the first one on either side of the middle line in front.

Bandages applied to the chest may be prevented from slipping by means of the bandage-brace. This consists of a piece of bandage about fourteen inches long, which is split lengthways in the middle to within a few inches of each end. The head is passed through the slit, and the untorn ends pinned back and front to the chest bandage.

The old capeline bandage is being superseded by the new head and neck bandage. It is useful for any head

or neck dressing. It consists in a few turns round the neck, which are prevented from slipping down by a turn passing above the ears and around the forehead, and also by two vertical turns over the head, one transverse and passing under the chin, and over the vertex in front of one ear and behind the other, and the other longitudinal, ending at the forehead, where it is cut off and pinned. To prevent a neck dressing slipping up, turns are passed under the axilla. The various turns are pinned together where they cross each other.

Section D.

Subject—Description of the Aseptic or "Heat" System of Disinfecting Instruments, etc.

Recently Listerism, as above described, has been described as "Antiseptic Surgery" in contra-distinction to a newer method of *attaining the same end* without the use of carbolic acid or other chemicals. The new method is now called the aseptic system. Thus a confusion of terms has arisen, so that as heat is the agent used for disinfecting instruments, etc., it is as well to term it the "heat system". The form of heat varies very much; thus the instruments are boiled, but the

dressings could not be, so they are baked. One's hands could not be either boiled or baked, so chemicals have still to be used for them. The baking is sometimes performed in air, sometimes in super-heated steam. Where lotions are wanted, boiled water is used. It is quite obvious that the heat system involves more outlay at first in the way of special ovens and boilers. The advantages chiefly claimed for the heat system are cheapness after the initial outlay, no risk of poisoning the patient, no fear of irritating the wound, and rapidity in purifying the instruments. With Listerism *properly carried* out, the risk of poisoning the patient, or irritating the wound, is purely imaginary. Nevertheless, the heat system has certain advantages which Listerian surgeons, in general, have adopted. Thus it is usual now to have a large vessel of boiling water kept going at an operation in which instruments which have been dropped on non-purified parts, or instruments which have not been soaked, can be rapidly purified. Further, surgeons now take more trouble over purifying their hands and the skin of the patient than previously detailed. Instead of simply washing their hands and the skin of the patient, and then using the one in twenty, they now often use turpentine, and then methylated spirit for both, after well washing and scrubbing, and before using the one in twenty. Instead of using one in twenty, the "heat" advocates would use boiled water.

On the "heat" system a great deal more trouble has to be taken with the sponges. These have to be fre-

quently washed in boiled water, and finally in boiling soda solution.

From all that has been said, it seems unlikely the "heat" system will ever replace the Listerian.

CHAPTER XIII

Section A.

SUBJECT—BONES AND LIMBS. BURSÆ. FRACTURES. NECROSIS. PERIOSTEUM. LIGAMENTS. ARM AND LEG. SYNOVITIS. SPINE. SKULL. BRAIN AND ITS MEMBRANES.

An idea of the structure of a limb is best obtained by looking at a cross section of it. Surrounding it on the outside will of course be the skin, under this the subcutaneous fat differing in thickness in different individuals, and underneath this again is the deep fascia of the limb. This fascia is composed of thin but very tough membrane which entirely invests the limb, and sends divisions down between all the muscles so as to form sheaths, keeping them in their places. The muscles, which are of various shapes and sizes, are divided into a body or contractile part, and two ends called the origin and insertion: the origin being the point from which it acts, and the insertion the point it moves. Some muscles are long and pass over two joints before they are inserted, but most pass over only one joint. The ends are often not muscular but tendinous, forming what are popularly called the "leaders". These may be observed on the back of the hand or foot, and the largest in the body, the tendon Achilles, may be felt above the heel. Where muscles pass over surfaces of bone, little sacs called bursæ are placed, full of an

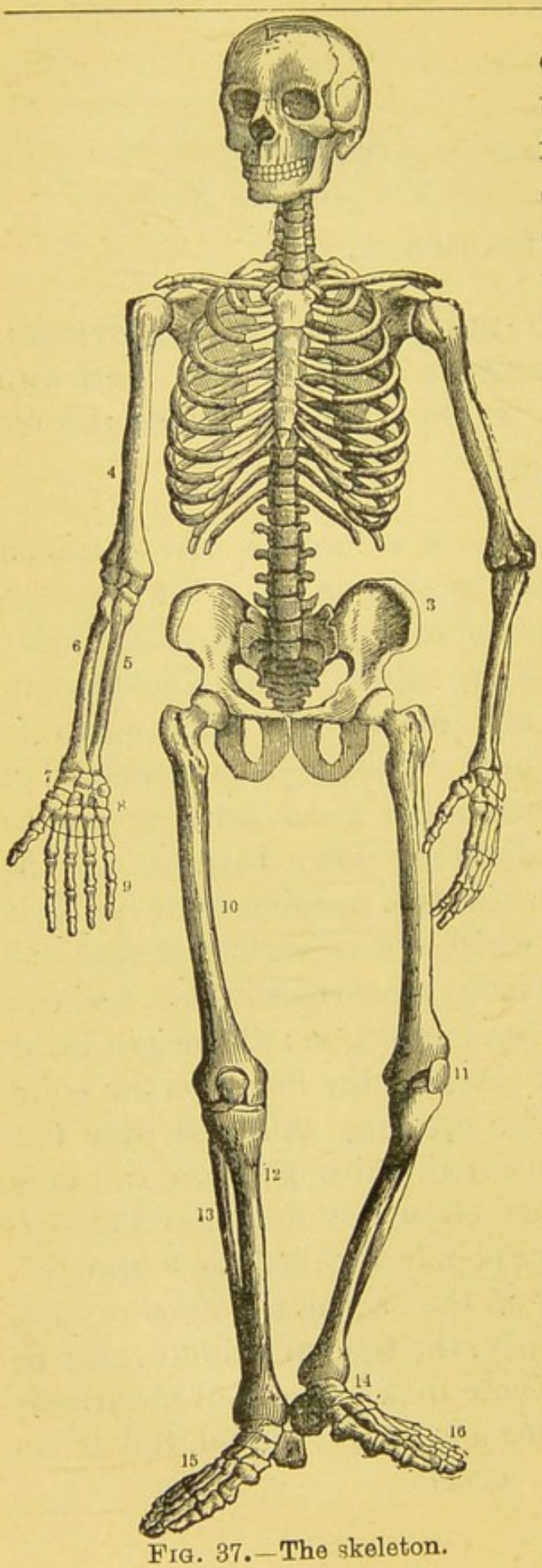


FIG. 37.—The skeleton.

oily matter which is useful in diminishing friction. From injury or other causes these often get enlarged, of which the so-called "house-maid's knee" is a common example.

In the centre of the limb will be found the bone. Bones do not form a lifeless framework to the body. Bones are just as much alive as any other part of the body; they bleed when cut, they are painful when inflamed, they are permeated with blood-vessels, and if their blood-supply is cut off they die.

Any bone left out in the air will soon smell; that is caused by the animal matter in it decomposing. If a bone is soaked in a weak acid solution, all the mineral part will be dissolved out and

only the animal part remain. This will retain the form of the bone, but will be elastic and somewhat like india-rubber. In rickets the animal part is in excess, and the bones consequently bend easily, whereas in old people bones break easily because the mineral part is in excess. When a bone is cut across it will be seen that it is covered on the outside with a tough membrane called the periosteum and that it has a fatty substance, the marrow in the centre. It is from the periosteum that the bone obtains its blood-supply, and if the periosteum gets inflamed, periostitis, the blood-supply is cut off and the bone will very likely die, either in large pieces, necrosis, or in microscopic ones, caries; osteomyelitis is inflammation of the marrow.

Among the muscles, but close to the bone, will be seen the arteries, veins, and nerves of the limb, from which position it will readily be understood how likely they are to get torn when a bone is broken; indeed, it is from this cause that gangrene may set in after a fracture. On cutting a bone down longitudinally, it will be found that the bone tissue is densest in the shaft, but spongy at the ends. The bones of the skull are flat and have no central canal like the limb bones, neither have the short bones of the hand and foot, the vertebræ, scapula, or pelvic bones. In all these the compact dense bone is arranged in plates on their surfaces; to be dense all through would make them too heavy. It will be noticed that none of the long bones are straight, all are more or less curved, the object of which is partly to form increased surface for the attachment of muscles, and partly to diminish shocks received in falling or from blows, thus making them less liable to get broken. The ends of

bones are covered with cartilage, wherever bones come together to form a joint, or where there is any movement between them. Cartilage is what the butcher calls gristle; this varies in consistency, being soft and very elastic in some parts, but hard and less elastic in others. Bones are mostly formed originally from cartilage, though some, as the bones of the skull, are developed from membrane. For a limb bone there are three principal points, called "centres of ossification," from which the conversion begins, situated one in the centre, and one at each end. The ends, even when entirely converted into osseous tissue, remain separated

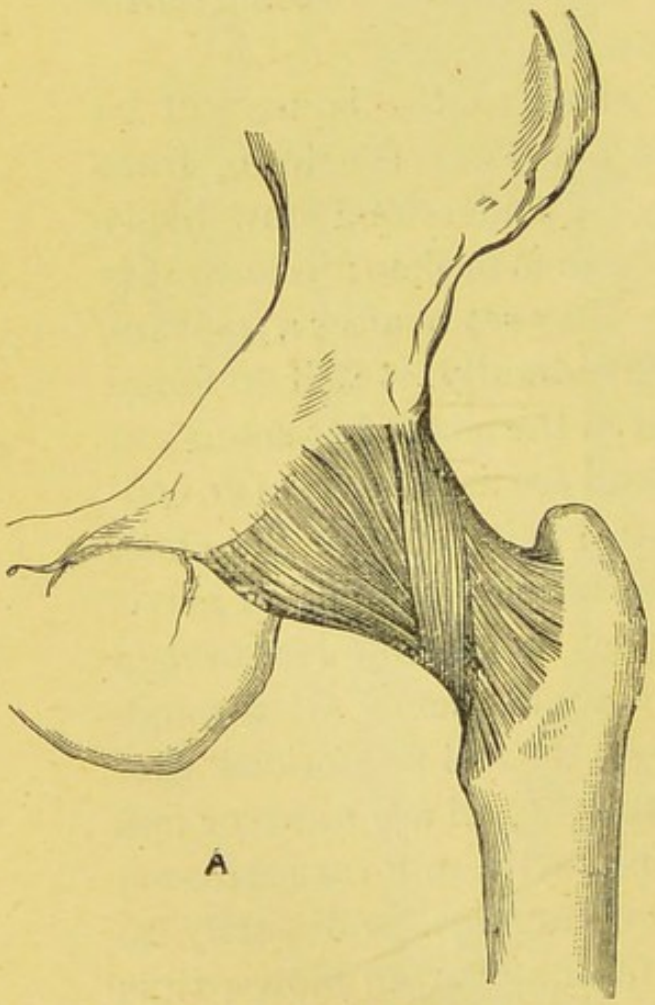


FIG. 38.—The capsule of the hip joint.

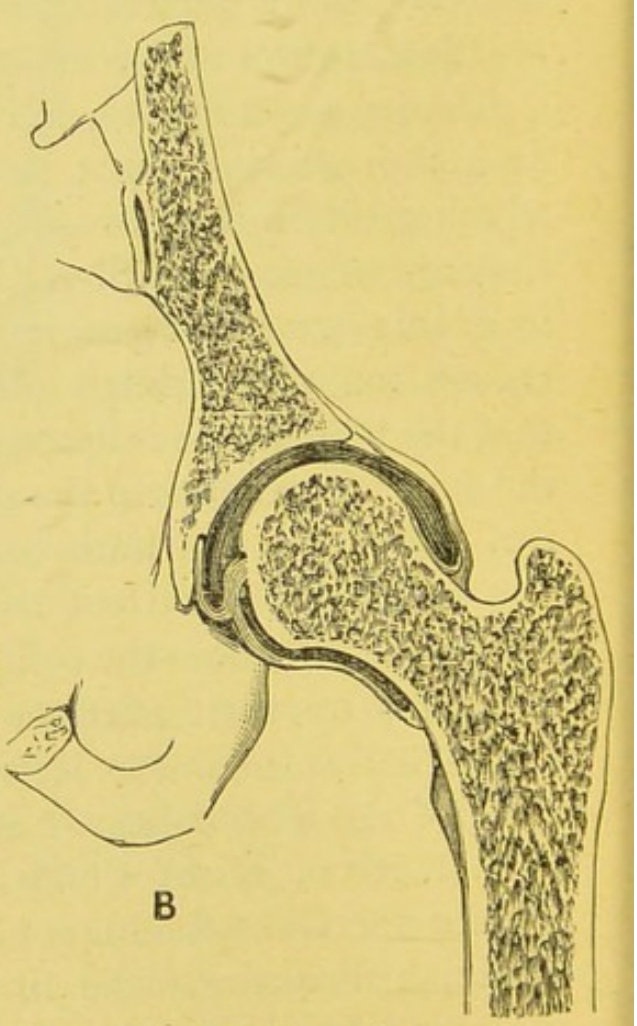


FIG. 39.—Interior of the hip joint.

from the shaft, often for years, by a plate of cartilage, and are called epiphyses. These may be broken off, "fracture through the epiphysis," as such an accident is called.

In the limbs, as has been said, the bones are connected by joints, those entering into the formation of them becoming expanded and covered with cartilage. They are bound together by tough fibrous structures called ligaments, which, while forming a kind of capsule to the joint, are thickened in various parts, giving firm-

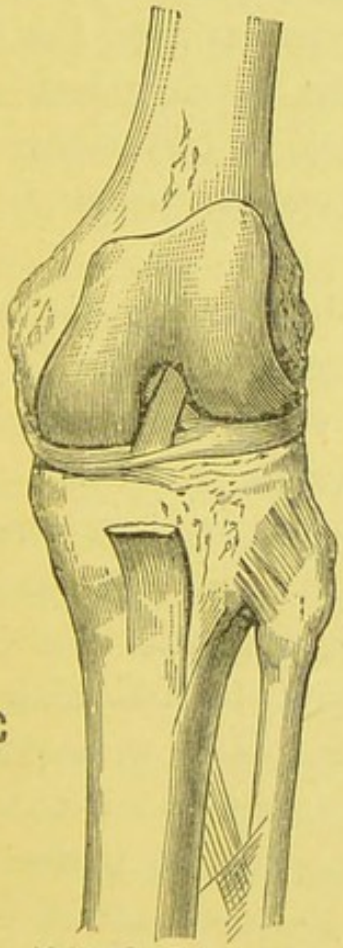


FIG. 40.—The knee joint.

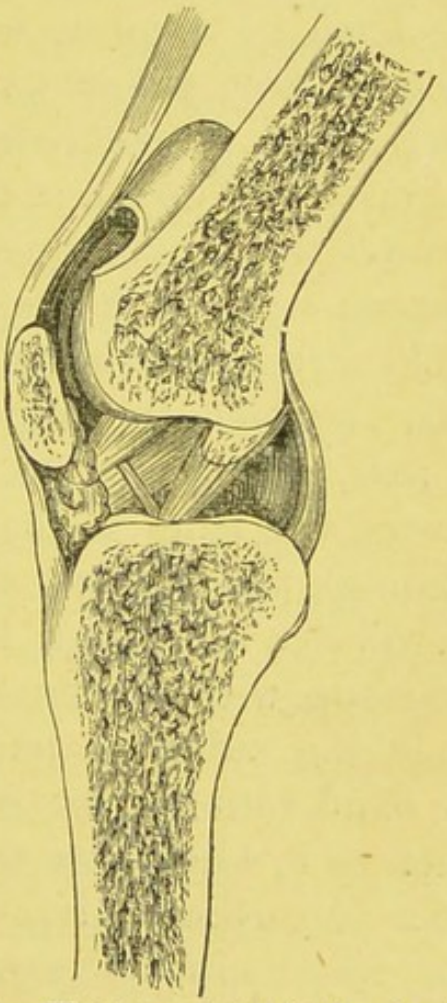


FIG. 41.—The knee joint (side view).

ness and restraining excessive mobility. Lining the interior of the capsule is a delicate membrane, the

synovial membrane, secreting constantly an oily fluid, the synovia, just in sufficient amount to lubricate the opposing cartilages, and so diminishing friction. The movements of joints are of different kinds: some consist in the gliding of plane surfaces on one another as those at the ends of the clavicles; some form ball and socket joints, allowing motion in all directions, as the hip and shoulder; some are simple hinge joints, as the ankle, elbow, and knee; while one consists of a pivot working in a ring, viz., that between the two top pieces of the spine. The arm bone or humerus articulates, *i.e.*, is connected by a joint, with the scapula or shoulder-blade, a large triangular flat bone fixed to the trunk partly by an articulation with the clavicle but mostly by muscles. The use of the clavicle or collar-bone is to prevent the shoulder falling forwards, which is what happens when it is broken.

The fore-arm consists of two bones, the radius and ulna, of which the former moves round the latter as an axis, giving rise to the movements of pronation, causing the palm to look backwards (when the arm is hanging), and supination, causing it to look forwards. It will be seen that the ulna is largest above, to articulate with the humerus, forming the elbow-joint, while the radius is largest below, to articulate with the hand, forming the wrist-joint. The ulna does not reach so low down as the radius, but has a triangular piece of cartilage attached to its end to make up for this, which also acts as a buffer to lessen shock.

The hand is formed of three parts: the carpus, meta-carpus and phalanges, or fingers. The carpus is composed of eight little bones arranged in two rows, all

jointed together and united by strong ligaments. One row enters into the wrist-joint, the other articulates with the five metacarpal bones. The four inner metacarpal bones attached together form about two-thirds of the back of the hand, and have the fingers attached to them; the metacarpal bone of the thumb is separated and movable from the rest.

The thigh is attached to the trunk by muscles and by the hip-joint, which is the articulation between the femur or thigh-bone, and the pelvis. To make it additionally secure, there is a small but strong ligament inside the joint, connecting the two together. The thigh is joined to the leg by the knee-joint, which is in many respects peculiar. It is the largest joint in the body; the bone surfaces, which look very flat in the dried skeleton, are deepened in life by two half rings of fibrous cartilage—the semi-lunar cartilages; it is protected in front by the development of a bone—the knee-cap or patella—in the tendon of the large muscle of the front of the thigh.

The leg is composed of two bones: the tibia and fibula. The latter, which does not enter into the knee-joint, though it does into the ankle-joint, does not bear any of the weight of the body, but has its chief use in the attachment of muscles. There is no rotation of one round the other as in the fore-arm.

The foot, like the hand, is divided into three parts: the tarsus, the metatarsus, and the phalanges. The tarsus has seven bones arranged in the form of an arch, greatest on the inner side, and completed by the metatarsal bones; it is supported partly by ligaments, partly also by tendons of muscles yielding a little to pressure

applied from above, and so allowing of more or less elasticity.

The pelvis is composed of three bones: two innominate bones and the sacrum. Each innominate bone is composed of three parts: the upper expanded part forming the hip is called the ilium; the lower part, on which people sit, the ischium; and the front part, the pubes. The two bones are united in front by a fixed joint—the symphysis, but are separated behind by the wedge-shaped sacrum.

The chest having been previously described, there now only remains that part of the skeleton which protects the nervous system, viz., the skull and spinal column. The latter is composed of four-and-twenty short bones—vertebræ, the shape of which will be seen by looking at a skeleton, having processes which unite behind to form a canal for the spinal cord. The bones are separated by elastic cushions of cartilage, protecting the brain from injury, and allowing of great flexibility and movement of the spine. The bones and cartilages are firmly united together by strong ligaments. Shock to the brain is also lessened by the presence of three curves to the spine, the upper and lower parts being curved forward and the middle part backward. The lowest of the vertebræ is the largest of all, the others gradually becoming smaller and smaller until the top, which is the smallest of all, is reached.

The bones of the skull are closely fitted together by uneven surfaces called sutures. It has already been pointed out that the bones of the skull are flat and chiefly developed from membrane. At birth, all the membrane has not been converted into bone; and so

spaces are left between some of the bones—named fontanelles—through which the brain may be felt. These fontanelles are six in number, two in the middle line, the posterior of which is nearly filled in at birth, and two on each side, which are comparatively small; all signs of these spaces have disappeared by four years of age. Joined together the skull bones form a closed box to contain and protect the brain and its membranes The membranes are three in number: an outer tough fibrous one, the dura mater, an inner soft vascular one, the pia mater, and between the two, a delicate sac, the arachnoid, secreting a watery fluid, the arachnoid fluid. This fluid forms, as it were, a watery cushion on which the brain rests—another way in which this essential organ is protected. These membranes are continued down into the spinal column, investing the cord in the same manner. Inflammation of the membranes is spoken of as meningitis.

Section B.

SUBJECT—SYMPTOMS OF FRACTURES. SIMPLE AND COMPOUND. CALLUS. PADDING OF SPLINTS. NURSING OF FRACTURES. COMPLICATIONS OF FRACTURES. RULES FOR LIFTING. UNDRESSING ACCIDENT CASES.

This chapter is devoted to a consideration of fractures or breaks of bones. In hospitals the diagnosis of injuries does not come within the nurse's province, but in places away from medical aid she may be appealed to, so that it is well to know something about fractures. The

following are the symptoms of fractures as they should be given in an examination :—

(1) Pain.
(2) Swelling.
(3) Bruising.
(4) Crack heard by the patient when the accident occurred.
(5) Unnatural freedom of movement in the part.
(6) Displacement producing deformity of the limb.
(7) Loss of use of the limb.
(8) Crepitus, or the noise heard and felt when the broken bones are moved on each other.

Each of these symptoms may be absent, but generally several are present. Fractures are of different kinds, as transverse, oblique, comminuted, starred, which sufficiently explain themselves. Impacted fracture is when the broken surfaces become fixed by being driven into one another. A greenstick fracture, which is very common with children, is when the bone bends like a stick without breaking quite through. Should the fracture communicate by a wound in the soft parts with the external air, it is a *compound* fracture; if there is no wound, or only a wound which does not reach to the fracture, it is a *simple* one.

Displacements are produced either by the original violence, by the weight of the nonsupported limb, or by the muscles drawing up the unfixed part making the broken ends overlap, or all these causes may act together. Simple fractures, when properly treated, usually unite without deformity, though in some, such as the collar-bone and the lower ends of bones

involving joints, deformity more or less severe may be expected. By about the third week after being broken, the bones become jointed by a ferulle of soft new bone, which, gradually hardening, forms what is called "callus". Complete firm union requires from one to two months, though occasionally fractures do not unite under the usual treatment, constituting "ununited fractures," which may require the operation of wiring the ends together. "Setting" a fracture means reducing the displacement, *i.e.*, restoring the natural position of the bones and the maintaining of them in that position until they are joined. Reduction is mostly effected by extension, that is, pulling down the part which has been carried up by the muscles. The position is retained by splints or apparatus. A nurse should be well acquainted with the names of the common splints and instruments. The best way to do this is to get an illustrated instrument catalogue and look up any instrument or splint that is used, or to get the matron, or a nurse who knows, to mark all of both in common use, and to master their names in leisure time. Fixed apparatus, as plaster of Paris, poroplastic, gum and chalk, etc., are best learnt by seeing them done, and indeed different hospitals have different ways of doing them ; a description of how to apply them is, however, given elsewhere. The padding of splints is part of your business. This should be even, of uniform thickness, without being too thick. A most perfect padding is the Gamgee tissue, and though, owing to the expense, it is not much used, still, it should be taken as a guide and imitated as nearly as possible. Tow, cotton wool, or old linen can be used, and in hospital a sufficient number

of splints should be kept ready padded to meet all likely emergencies. The best way to avoid running out of padded splints is to replace in the store the same day any which may have been wanted for a case. When a fracture has been put up, the nurse should note accurately and exactly how it was done, the position in which it was left, and if possible try to understand the principle of it. Having then got an accurate mental photograph of it as put up, she will at once detect any alteration or shifting of the splints or bandages. A very sharp look-out should be kept on the fingers and toes below the splints for coldness, swelling, or other signs of obstructed circulation. Pain is especially to be reported, as it generally means something wrong with the position, or perhaps from sores forming, owing to too much pressure. When patients have to be kept on their backs, as for fractures of the leg or thigh, their feet must be protected from pressure of the bedclothes by a cradle, and measures taken to prevent a bed sore forming under the heel.

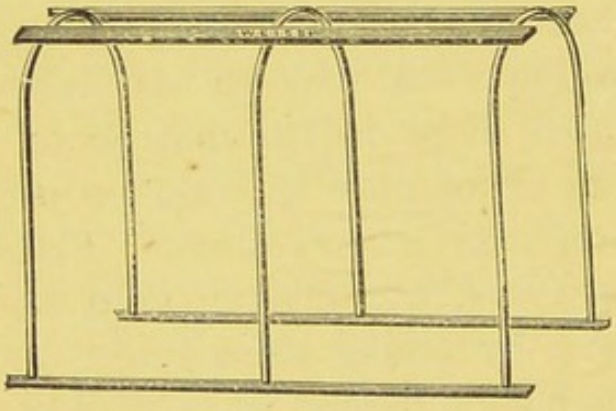


Fig. 42.—Cradle for keeping bedclothes off a part.

N.B.—A bandage should never be put between the splints and the limb, for any swelling would then give rise to gangrene.

In undressing an accident case the injured part must be disturbed as little as possible, for fear of making a simple fracture compound, or causing the fragments to

injure vessels or nerves. The principle of undressing is to *take the clothes away from the patient,* not *the patient away from the clothes.* With this object, if an arm is injured, the sound one should be got out first; if a leg, slit up the trousers on the outer side, keeping to the seam, and the same with the socks. Unless there are reasons against it, the patient is to be washed at once, always washing the injured part first, and placing it between sand-bags to protect it. When the washing is done, a nurse should get ready splints, bandages, strapping, pins, and everything she can think of that will be required for setting it.

There are a few complications of fractures which a nurse should be aware of. The cause which produced the injury may produce serious shock to the system, as evidenced by faintness, coldness and feeble pulse. Great care, therefore, should be taken not to add to the shock by needless exposure for washing, but warm blankets and hot bottles should be freely supplied. Cases of fracture, especially in old people, often suffer from retention of urine for a day or so; this is a symptom which a nurse must be on the look-out for, and report of course. A patient who is in the habit of drinking freely, and who gets a broken bone, is likely to have an attack of delirium tremens (sometimes spoken of as traumatic delirium), for which the nurse must be prepared. The premonitory symptoms are that he will sit up in bed, keep looking for something under it or among the clothes, complain of seeing objects on the wall, or talk nonsense of some sort. It is very important to know the meaning of these symptoms and take measures accordingly, or the patient may get out

of bed and injure himself or others. Tetanus may come on after any injury, and those who have suffered from, or have any tendency to, mania are likely to have an attack after a fracture.

A few remarks on special fractures. In those of the thigh, extension by the weight and pulley is often used. For this the end of the bed must be well raised with blocks, so that the body may not be pulled down by the weight. The application of the extension may fall to the nurse, and she must learn to do it neatly, firm enough not to slip, though not tight enough to cause swelling of the foot; the strapping must be perfectly even and free from rucks, or sore places will be formed in the skin. (See p. 189.)

In fractured ribs complications are common and numerous. The lung may get wounded, and so air is at each respiration blown into the subcutaneous tissue, giving rise to rapid swelling, surgical emphysema, or air may get into the pleura, pneumothorax; if there is much bleeding, it will give rise to hæmoptysis, or accumulation of blood in the pleura, going on to empyæma.

To lift a fracture *without* splints on, the limb must be held with one hand a short distance on each side of the break, extension being first made with the lowest one; then, the lifting must be done moving both hands at the same time, and maintaining their relative position. If the nurse has to raise a limb to which splints have been applied, she must proceed in the same way, only that *ends* of the splint are held without reference to the seat of fracture, and extension is not necessary, except as in thigh cases, where extension is kept up with weight and pulley. Here one must take off the

weight, and make extension with the hand while moving.

When a nurse has to raise a limb she will of course get as near to it as she can, not raising a right leg from the left side of the bed, which is very back-aching work, but always going to the *same side of the bed as the limb she has to lift.* No one should ever take hold of a limb with the fingers from above, but slide them underneath the limb until it rests in the palms of the hands ; thus it will be impossible to drop it.

All fractures attending the out-patient department must be seen by the house surgeon or one of the surgeons *each* time it comes ; a nurse must never on any account take upon herself the responsibility of saying it is all right, and letting them go unseen by a doctor.

Section C.

SUBJECT—FRACTURES OF SKULL AND SPINE. TREATMENT OF HEAD CASES IN GENERAL. TREPHINING. POTT'S CURVATURE. SPINA BIFIDA. DISEASES OF JOINTS. SYNOVITIS. EXTENSION.

Fractures of the skull are very important and dangerous accidents, on account of the almost invariable injury to the brain which accompanies them. There may be no displacement between the fragments on the outside, but the inner wall may be depressed and press on the brain, or, by wounding arteries, cause intra-cranial hæmorrhage and death. Sometimes, as in compound fractures with depression, the injury is obvious ; whereas at others the diagnosis is most difficult, only being made

out or suspected from the complications to which it gives rise. When the base of the skull is broken, a variety of symptoms depending on the soft parts injured occur, which one should be acquainted with, and on the look-out for, in all cases of suspected head injury. Bleeding from the ear, nose and mouth, escape of a fluid, the arachnoid fluid, like white of egg, from the ear, causing a stiff stain on the pillow, escape of blood under the conjunctiva of the eye, paralysis of one side of the face, squint, bruising behind the ear and back of the neck, are some of the chief. Often the patient is insensible or a little off his head, or there may be incontinence or retention of urine and motions.

The treatment of all head cases consists mostly in absolute rest; everything must be done for him, and he must not be allowed to raise or feed himself; the nurse must anticipate all his wants, so that he will not even have the exertion of calling out or asking for anything. Generally a purge will be given, and ice ordered to the head. Absolute quiet must be maintained in the ward and neighbourhood, and light, but not air, as much as possible, must be shut out.

The operation of trephining may be required for these cases either to tie a bleeding artery, to remove a piece of bone pressing on the brain, or to let out pus should this unfortunately form. Encephalitis or inflammation of the brain may come on after the operation, the symptoms of which may as well be mentioned, viz., severe pain in the head, over-sensitiveness to light and sound, noises in the ears, unequal pupils, partial spasms and paralysis, convulsions, high temperature, vomiting, delirium, etc.

Concussion is when the brain simply receives a shock,

causing temporary insensibility without actual injury, the return to consciousness being mostly accompanied by vomiting; compression is the insensibility produced by effusion of blood inside the skull.

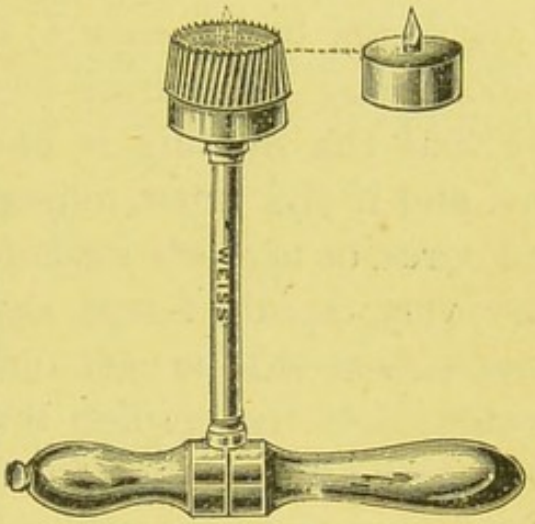


FIG. 43.—Trephine.

Fractures of the spine are common hospital cases; the symptoms, such as paralysis of the parts below, depend on injury of the spinal cord which it contains. At first there will be a good deal of shock with local pain, followed later on by varying degrees of paralysis. Only one or many of the following may occur: paralysis of the legs or arms, of sphincters of the bladder or rectum, impaired breathing from paralysis of some of the muscles of respiration, paralysis of all parts below the neck except the diaphragm. Later on the urine may become offensive, giving rise to inflammation of the bladder, and a great tendency to bed sores sets in. These two complications, or lung complications, generally cause death. The treatment is rest, either on their backs or faces, which means that they are never to be raised or allowed to attempt sitting up. When sheets, etc., are to be changed, it must be done by rolling them to one side or the other; never let them roll themselves: it will cause them pain and is dangerous. The

nursing of these cases is very tedious, and yet it is almost all the treatment. The bowels must be kept open daily, if necessary by an enema, the sheets must be dry and smooth, and everything done to avoid bed sores. It is not that the nursing is hard, but it is the same every day, and if the nurse misses a day looking for signs of bed sores, or neglects his complaints of discomfort, a bed sore very rapidly forms, and at least the suspicion of carelessness will be cast on her by the doctors. Many doctors hold the opinion that bed sores are always preventable, always the fault of the nurse, though they admit that they are very easily provoked in some cases, such as those now being discussed.

When there is incontinence of fæces the cases are tiring indeed; still, that is no excuse for leaving them wet and dirty. In this case, as in all others of a disagreeable nature, one should put oneself mentally in the patient's place, and treat him as one would wish to be treated oneself.

There are some diseases of the spine which may be mentioned here. Angular curvature, or Pott's curvature, is a bending of the spine, caused by disease of the bones. Abscesses may form, and most often travelling down in the sheath of the psoas muscle (a large muscle attached to the front of the spine and going from thence to the thigh) point in the groin or thigh, forming psoas abscess, but the matter may open in the back or elsewhere. Until the introduction of antiseptics these cases were allowed to burst; then followed profuse discharge, accompanied by hectic fever, and after a few months' misery, by death. Now, under antiseptic treatment, the majority of these cases re-

cover, although they are still long cases. If the surgeon sees them before an abscess has formed, he treats them with plaster of Paris spinal jackets. Lateral curvatures are mostly due to weakness of the muscles, and are treated

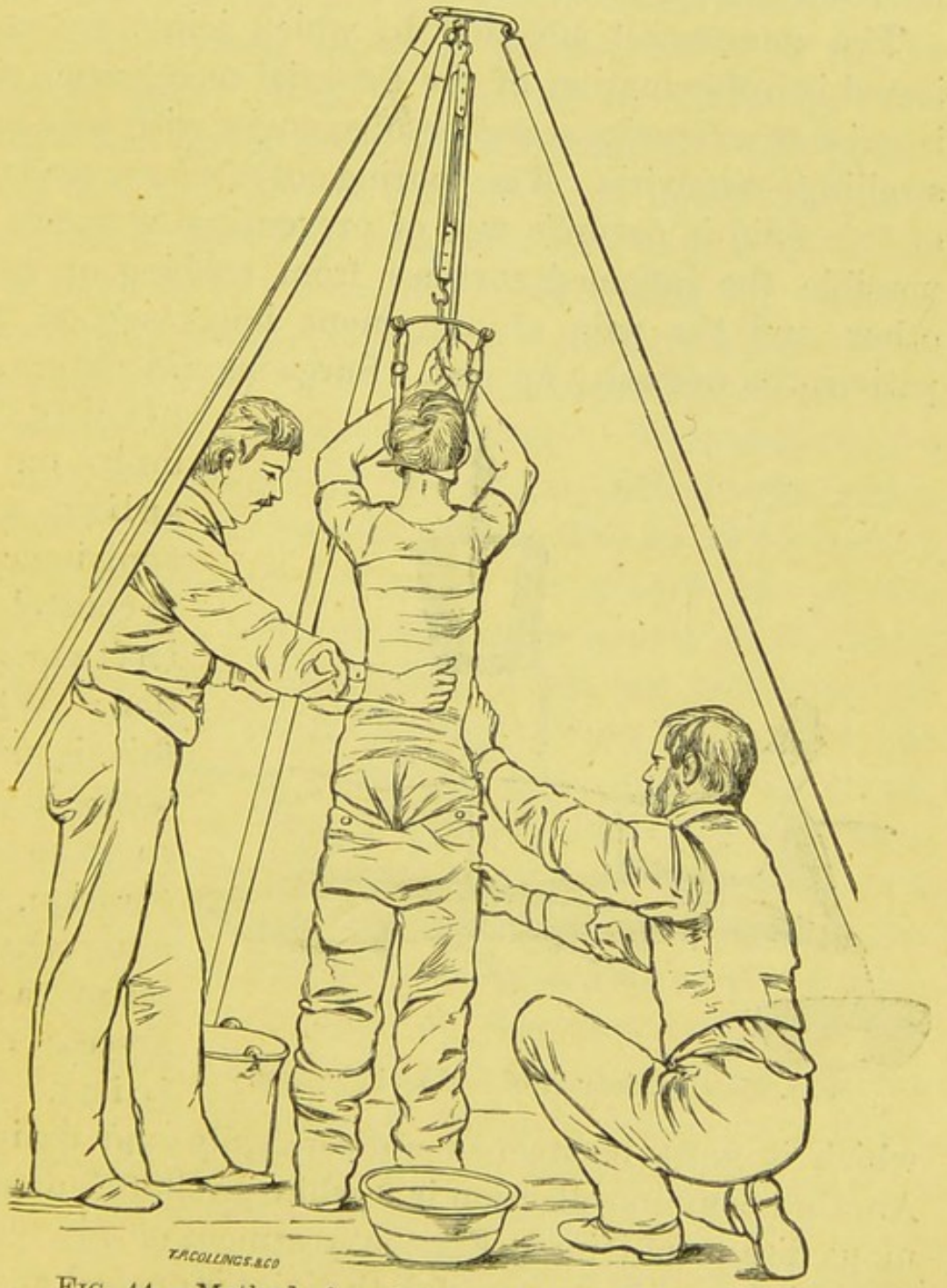


FIG. 44.—Method of applying a plaster of Paris jacket.

by gymnastic exercises. A Spina Bifida is a congenital defect in the bones of the spine, allowing the membranes of the cord and arachnoid fluid to protrude. This gives rise to a swelling over the spine, of which nurses in hospital will doubtless see many cases.

The commonest affection to which joints are subjected is inflammation of the synovial membrane, giving rise to extensive secretion of synovia, with pain and swelling—synovitis. The pouring out of a large amount of this fluid is nature's way of preventing as much as possible the inflamed surfaces from rubbing on each other, and the pain of movement impresses on the patient the necessity for rest. Surgeons aid nature by placing the limb on a splint, and applying cold to control the inflammation. When this is more severe it may go on to suppuration, forming what is called acute abscess of a joint, for which it must be opened antiseptically and drained. Another common affection is "white swelling," or strumous disease of joints. For the treatment of this, rest is first tried, but if unsuccessful, the joint is opened, and all

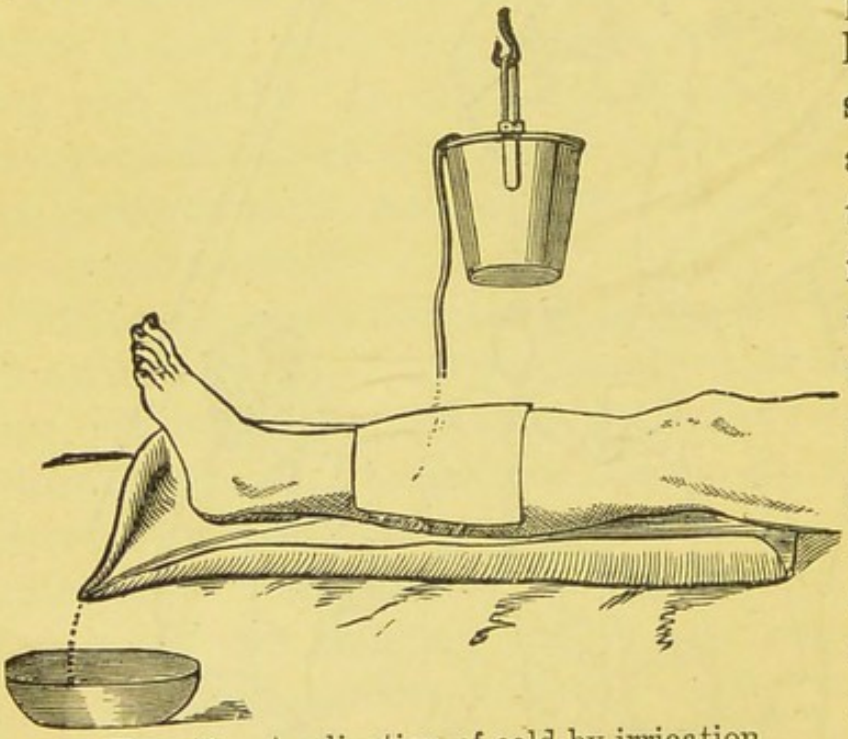


FIG. 45.—Application of cold by irrigation.

the strumous disease cut or scraped away, or the joint may be "excised," *i.e.*, the ends of the bone are sawn off and made to join together into one continuous bone, or to unite by fibrous tissue forming a false joint. The knee and the hip are the joints most affected with strumous disease, hip-joint disease being a regular hospital case. Rest is secured by extension with weight and pulley in the following manner: The pillows must be low, under the head, but not under the shoulders, and a sheet kept firm with sand-bags must be put over the body to prevent the child sitting up. Extension is required also in cases of contracted knees and in hip-joint disease. The weight is connected to the limb by means of the ordinary "stirrup". This consists of a piece of strapping, from two to four inches wide, which is doubled upon itself at its middle, so as to form a long loop, the sides of which are placed one on the inner and the other on the outer aspect of the limb, from the foot to the middle of the leg or higher. A loop about four inches in length being left beyond the sole, the strapping is kept in place by circular strips, over which a bandage is applied. It is best to place a soft bandage between the strapping and the skin, as it prevents all risk of injury from rucks or slipping of the plaster. A thin piece of wood of the shape of a visiting card is placed transversely in the lower end of the stirrup to prevent the sides from pressing on, or rubbing the ankle bones. Through the centre of this piece of wood, and through the strapping at a corresponding point, a strong piece of cord is passed and carried down to the foot of the bed, where it passes over the pulley and supports the weight. The mattress, which must be a firm one,

should be protected by a mackintosh and draw sheet. Two points must be well looked after, viz., the tendency of the leg to rotate outwards, and a tendency for the toes to become pointed. The first point is overcome by constant vigilance and by the rectifying at once any change of position from a right angle by sand-bags, and the second by keeping off the weight of the bedclothes with a cradle. A circular pad must be placed under the heel, or a bed sore will very likely form. Pain referred to the knee or distant parts, and starting of the limb at night, causing pain severe enough to wake the child, are the symptoms to look out for.

In case the nurse has no directions, and it is a point surgeons often forget to give instructions on, as to the weight to be used, the rule is, a pound for each year of age up to six, but never more than six up to twelve years of age, then begin again adding a pound for each year of age. Thus a child of fourteen will have an eight-pound weight. For adults, bricks neatly covered, and tied round with a piece of cord, are simple and efficient; one only is used as a rule.

An inflamed or diseased joint must be raised in exactly the same manner as a fracture.

Section D.

SUBJECT — EMERGENCY TREATMENT OF FRACTURES. FRACTURE APPARATUS. PLASTER OF PARIS AND OTHER IMMOVABLE BANDAGES. PREVENTION OF ITCHING AFTER APPLICATION OF SPLINTS.

When a person with a fractured leg arrives at the hospital he must be carried on a stretcher up to the

ward; and it is very important, to avoid all up and down movements, that the porters who carry the stretcher should not walk in step. The first one should give the order to start, leading off with the right foot, while the last one starts with the left. If a surgeon is at hand it is best for him to see the patient as soon as the clothes have been removed, especially if it be a fractured thigh, so that he may rectify any tendency of the broken bone to protrude through the skin or press unduly on an artery, and that such splints, etc., as he may want shall be got ready while the patient is being washed. If, however, the patient has to be moved a long way to a doctor, the leg must be made as immovable as possible. For the lower leg, two short sticks, each a little longer than from the knee to the heel, should be fastened with handkerchiefs, one on either side of the fracture. Umbrellas or walking-sticks will do very well for this purpose, and a hurdle covered with rugs or coats will make a good stretcher. For the thigh, a broad piece of wood fastened on behind for its whole length with handkerchiefs, or a rug, or shawl, or folded newspapers wrapt round, with a long splint reaching from the arm-pit to the heel or beyond. A long broom will do very well to prevent injury during moving, or until a proper apparatus can be got.

As regards other fractures, it will be as well that a nurse should know how to deal with them when she meets with them at a distance from medical aid. For a fractured fore-arm, a folded newspaper, or a piece of wood of appropriate length and breadth, and padded with wool or flock or even hay, applied on the palmar side, and kept

in position by handkerchiefs or a few turns of a bandage, will be quite sufficient to allow her to wait several hours for a surgeon without anxiety. The thumb should point upwards.

When the upper arm is broken, the trunk can be used as a splint; a pad of cotton or a folded handkerchief should be placed in the axilla, the corresponding side of the chest should be padded, then on the outside of the arm a wooden splint should be applied. By means of a few turns of a bandage including the arm and the chest, and by putting the fore-arm in a sling, complete immobilisation will be obtained. If a wooden splint cannot be obtained a folded newspaper will do very well. A dry, firmly-folded newspaper will retain its firmness very often long enough to be useful throughout the whole of the treatment.

In cases of fracture of the ribs, the best means of preventing pain is to limit the movements, either by stays tightly applied or by putting on a second waistcoat over the ordinary, and tightly buckling the straps at the back. In hospital, strapping and bandages will be used, and for this each piece of strapping should be at least two inches wide, and pass at least four inches

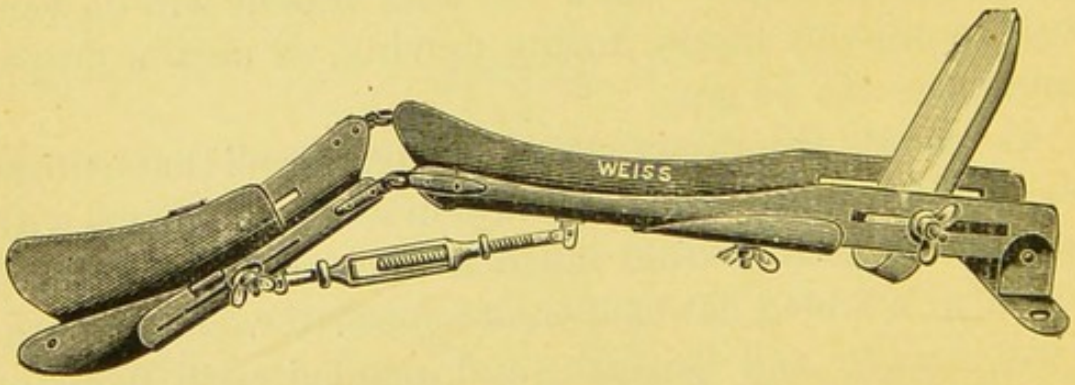


FIG. 46.—MacIntyre's splint.

beyond the middle line, both back and front. The bandage should be of flannel, four or six inches wide.

Of splints there are a great variety in use, and of all

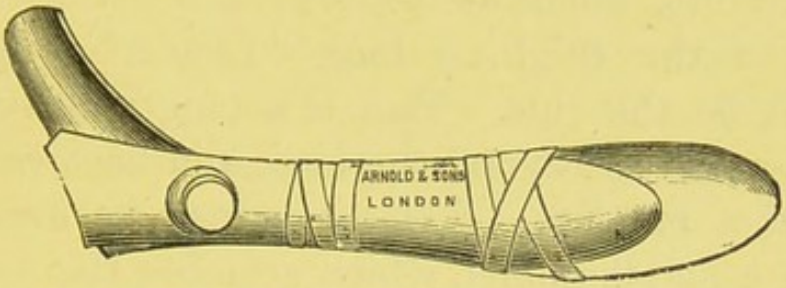


FIG. 47.—Cline's splints for the leg.

FIG. 48.—Long Liston splint.

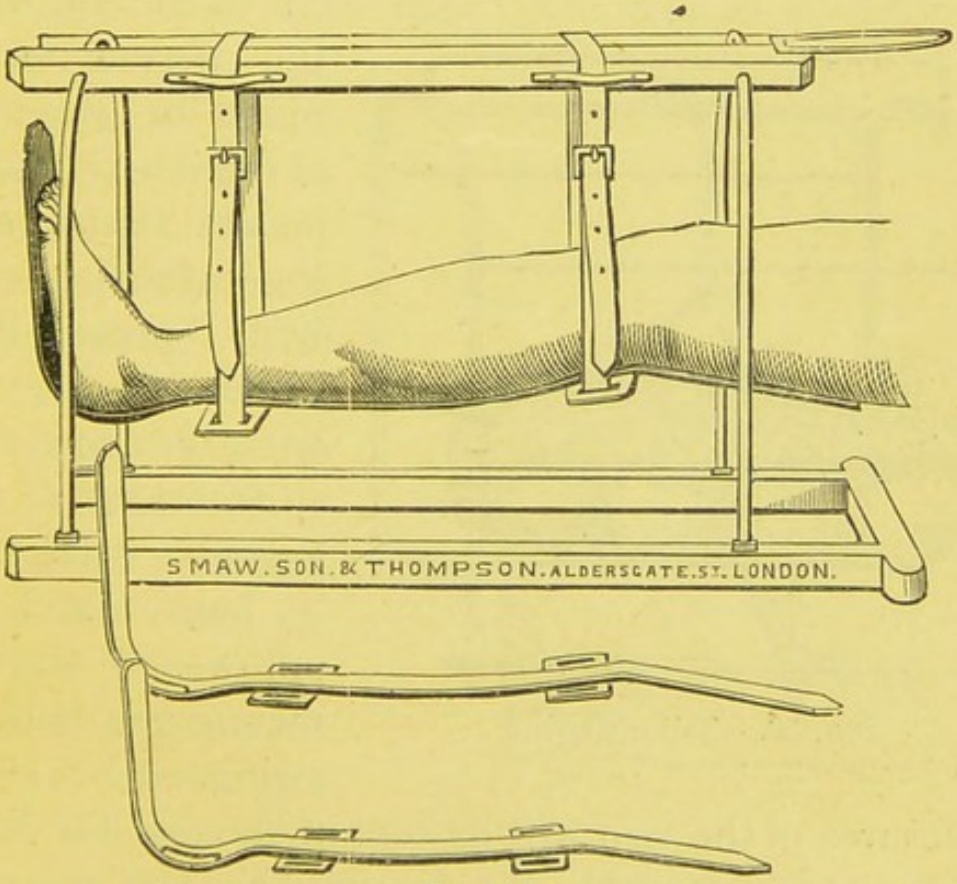


FIG. 49.

sorts of different materials. In hospital practice one will frequently see metal ones, such as MacIntyre's or Dupuytren's, used in fractures of the leg. For fracture of the lower end of the fibula, called Pott's fracture, special splints, such as Cline's, will be used. For fracture of the thigh, a long "Liston" will almost invariably be the rule. This is a long splint reaching from the axilla to beyond the heel, and kept vertical by means of a bracket. Extension may be kept up by means of a handkerchief, which attaches the foot above the ankle to the end of the splint, while counter-extension is effected by the perineal band. This latter is attached to the upper end of the splint, passing through the two holes in it, and passes between the legs. Where it is in contact with the perinœum, it must be carefully covered with gutta-percha tissue, and this again loosely with boracic lint, which can be frequently renewed.

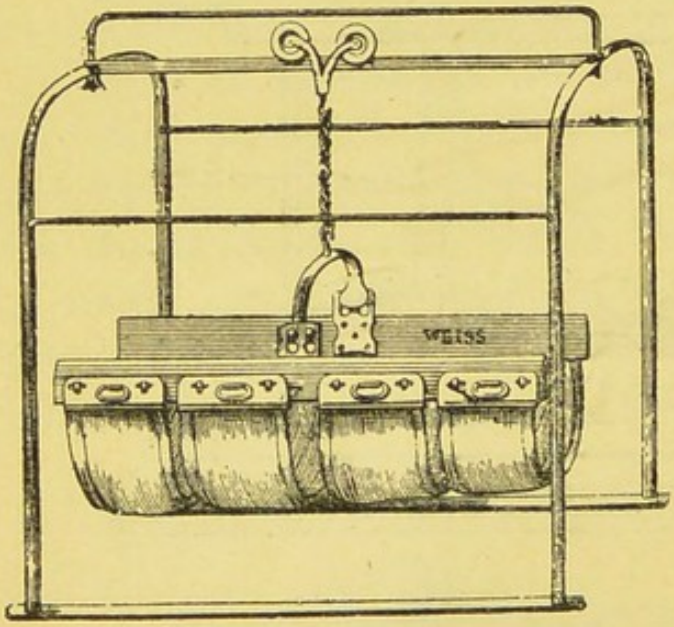
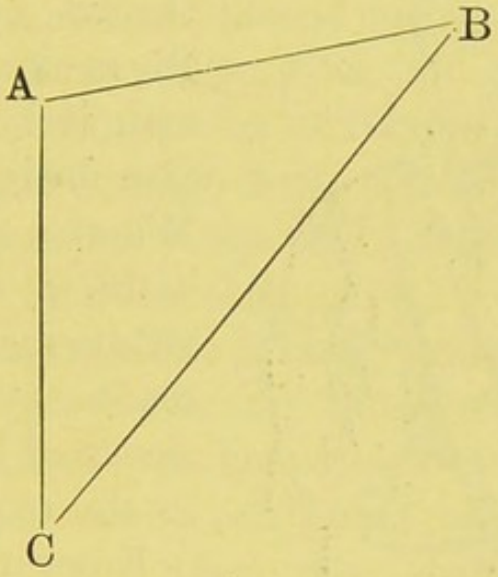


FIG. 50.—Salter's swing.

Fractures of the lower leg will either be kept raised by pillows, or will be swung in a Salter's swing.

Fractures of the arm will be kept in slings. Of slings there are two sorts, according to whether the elbow is to be supported or not. In the first case, the sling is

folded or cut into a large triangle and laid across the patient's body, so that the apex of the triangle A projects



behind the arm to be slung, and B lies on the opposite shoulder. C is then raised and tied to B behind the patient's neck. A, which now hangs loosely behind, is brought forwards and pinned in front of the sling. The elbow and fore-arm will be found to be firmly and evenly supported, and the sling as now arranged forms the "broad arm sling".

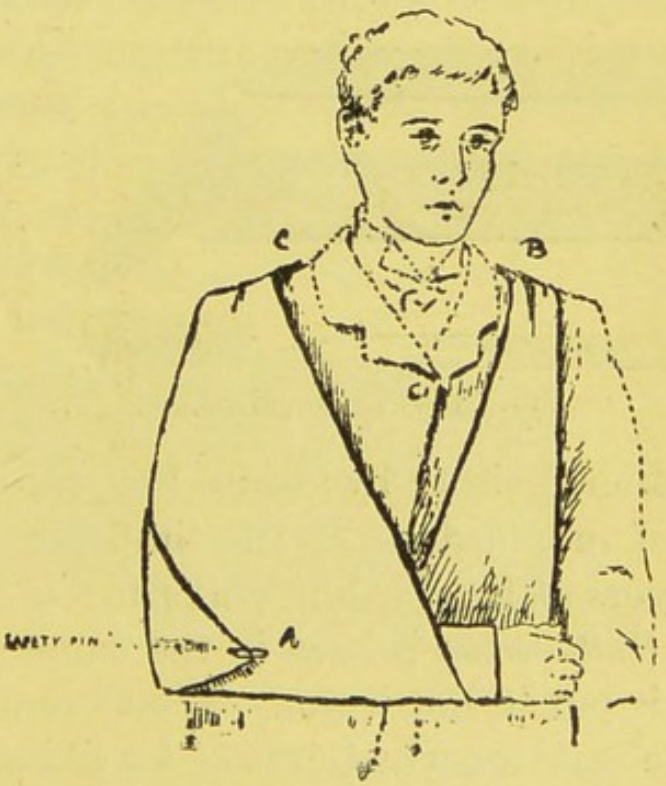


FIG. 51.—Broad arm sling applied.

The narrow arm sling can be made out of the same piece of stuff, and is folded until it is about four inches

FIG. 52.—Narrow arm sling applied.

wide; the fore-arm is laid in the middle of it, and the two ends tied behind the neck, so that the fore-arm is horizontal, or at the height required. When a sling is not at hand, a very good substitute may be sometimes made by pinning the sleeve of the injured arm to the opposite shoulder.

Fractures of the lower end of the radius, "Colles' fracture," require special forms of splints, as Carr's, Gordon's, or pistol-shaped.

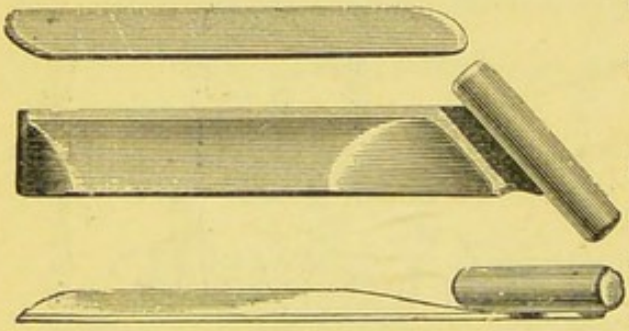


FIG. 53.—Carr's splints.

Poroplastic felt makes a very firm and light splinting; it consists of felt saturated with resin. Cut to the size of the limb, it can be easily softened either by steam, hot water, or before the fire, and moulded to fit the limb accurately. One or two layers of boracic lint will form a quite sufficient padding.

Guttapercha is used in the same way. For moulding, it is put in hot water. When moulding it on the limb, the bandage which is used for fixing it in position should be *wet*, or it will stick to the softened guttapercha.

Millboard is only used in combination with starched

bandages. Strips about four or five inches wide should be thoroughly softened in boiling water, steeped in hot starch solution, and then placed lengthwise along the limb outside a layer of cotton wool, and fixed in position by a starched bandage. In making the strips, they should be cut half through with a knife, and the other half *torn* through, thus there will be no hard edges to come in contact with the skin.

Immovable bandages are of the greatest use in surgery for a variety of purposes, but more especially in the treatment of fractures, so that this is a fitting place to describe them in. They can all be applied in such a soft, pliant state that they can be most accurately adapted to the shape of the limb, and when they have set, they form a firm and even support to every portion of it. Their great disadvantage is, that a certain time must elapse between applying and setting, during which the limb may get out of position; and as they are not transparent, this malposition may easily be left unrecognised until too late for correction. Once they are split up for inspection, they never again fit so well. This difficulty is got over by enclosing strips of Gooche's splinting, telegraph wire, strips of perforated tin or millboard in the bandage. If applied before the swelling has all disappeared, they are apt, though fitting well at first, to become loose, and so deformity results. This is got over by re-applying or

FIG. 54.—Gooche's splinting.

by slitting down the middle, putting in fresh padding, and an ordinary bandage outside. After the swelling has gone, a plaster bandage may in most cases be applied and the patient sent home.

For plaster of Paris bandages the finest freshly prepared plaster is required. It must be free from damp, or it will not set well. The best bandages are crinoline, which take up a maximum of plaster.

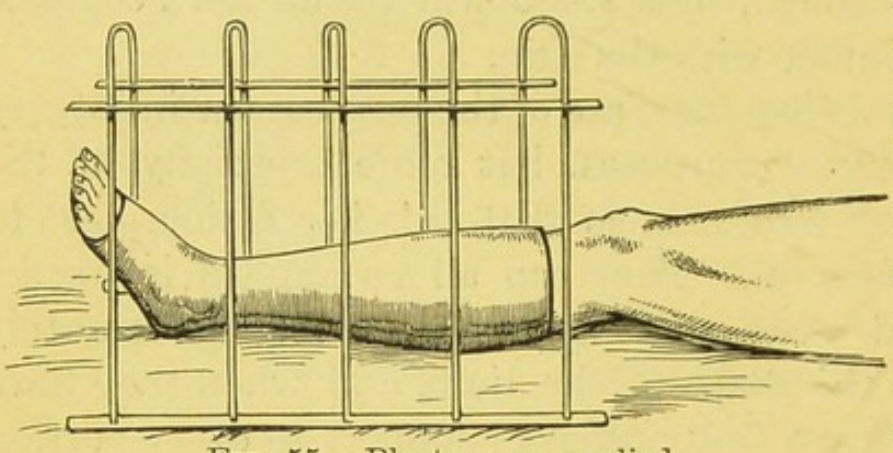


Fig. 55.—Plaster case applied.

The plaster must be well and evenly rubbed into the bandage as it is rolled up. If they are to be kept ready rolled, a tin box and a dry place are essential. They must be fairly loosely rolled to allow the water to percolate into them easily, or the outer layers would set before the inner were even wet. The limb must be first covered with a boracic or flannel bandage, though in a recent case, where swelling is present or expected, a layer of cotton wool should be first placed round the limb. The plaster bandage is then placed *on end* in a basin of warm water (warm water makes it set quicker than cold), and allowed to remain there until all *bubbles have ceased to rise from it*, even on gentle squeezing; then gently squeeze out the superfluous water, and apply quickly in oblique and spiral turns until all the limb is covered. While one bandage is being applied, another is put in to soak.

Three or four bandages will generally be required for a limb; reverses should never be made. When the bandages have been applied, the whole should be smoothed over with plaster "pudding," either thickly or thinly, according to the strength required. A polish may be put on by rubbing the nearly set plaster with very wet hands. A window is, when required, cut in the plaster; the exact position of the wound or fracture being best found by accurate measuring from a finger, toe, heel, etc. The piece of card with a pin projecting from it does not, as a rule, work so satisfactorily as accurate measuring from a fixed point.

To make Bavarian splints, take two pieces of flannel sufficiently long to reach from the ham to the ball of the toes, and a few inches wider than the circumference of the leg. Stitch them together along the middle line for the length of the leg, and beyond this cut them through in the same line. Put the flannel behind the limb, with the seam exactly in the middle; bring the inner layer round, and pin it along the front of the leg, and the front and sole of the foot, so as to form a tightly-fitting stocking; smear this layer all over with plaster of Paris cream, and before it sets, press the outer layer, already cut to the proper size, evenly over it. When the plaster has set, remove the pins from the inner layer of flannel, and bring the borders of the latter round the edge of the splint in front, and along the sole, and stitch it to the outer layer. The apparatus forms an accurately-fitting splint, which can easily be removed without in any way disarranging the limb, as the seam along the back of it acts as a perfect hinge.

Croft's splints for the immediate treatment of frac-

tures of the leg consist of two well-moulded lateral splints, made of coarse house flannel thoroughly soaked in plaster of Paris cream; the flannel should be well shrunk, and from it four pieces having the shape of the patient's stocking, and long enough to reach from the knee or a little above it to the middle of the foot, should be cut, particular care being taken that the foot piece is at right angles to the leg piece, and also that the anterior border of the latter is a straight line. Arrange the four pieces of flannel in pairs—two for each side of the leg—and saturate the outer piece of each with plaster a little thicker than cream, and re-apply it to its fellow. The splints ready, the leg should be held in position with the foot at right angles to the leg, the splints applied and fixed with a simple plaster of Paris bandage. When hard, the bandage may be cut down the front, the edges trimmed and bordered with adhesive plaster. A still further finish may be given by putting in eye-holes for laces.

Starch bandages are used for the same purposes as plaster, but are of course much lighter, and they take a much longer time to set. They are made thus: a basin of hot clear starch mucilage is prepared, well shrunk calico bandages are passed through it, and then re-rolled. The limb is evenly enveloped in a layer of cotton wool, the starch bandage is applied evenly without reverses, and, as they are applied, more starch is continually rubbed in by the hand. The limb is firmly fixed between sand-bags until the starch is stiff.

Silica bandages should be kept in the liquid glass solution ready for use. They are used in just the same way as starch, but are usually covered on the outside

with an ordinary gauze bandage, for neatness and to prevent them sticking to the sheets before they are set

Gum and chalk bandages are applied in the same manner as starched ones, and have the advantage of setting more quickly and firmly. Equal parts of gum-arabic and precipitated chalk should be mixed with boiling water, and the bandages passed through the mixture and re-rolled. Any sort of bandages will do.

Often one of the most troublesome accompaniments of fractures is intense itching of the skin under the splints and bandages. This is caused by the putrefaction of the perspiration, giving rise to substances which irritate the skin. The perspiration is also kept in by the outer layers of the skin, which are not rubbed off in the usual way. This itching may be prevented easily, if the limb, before being put up, is well washed—first with warm soap and water, then with some 1-1000 corrosive sublimate solution, and a boracic lint bandage used next the skin. The perspiration then remains aseptic, does not decompose, does not irritate. It can be easily done, and is well worth the trouble. The same treatment should be adopted wherever any apparatus remains for any length of time in contact with the skin, as in "extension" for hip disease, for example. A boracic lint bandage may then be put between the strapping and the skin.

Thomas's hip splints are now very much used for treating cases of hip-joint disease, and are indeed most useful, as they do away very often with the necessity for keeping the patient in bed. The splint is composed of wrought iron, which is sufficiently malleable to admit of being moulded into shape with suitable

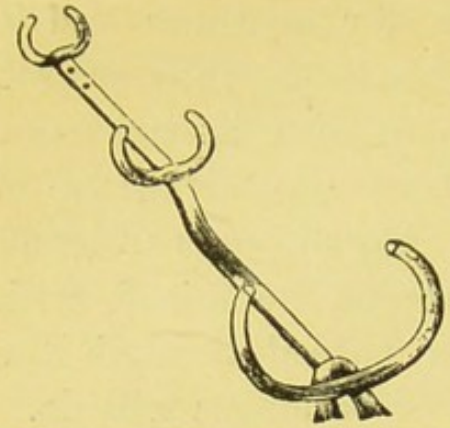


FIG. 56.—Thomas's splint.*

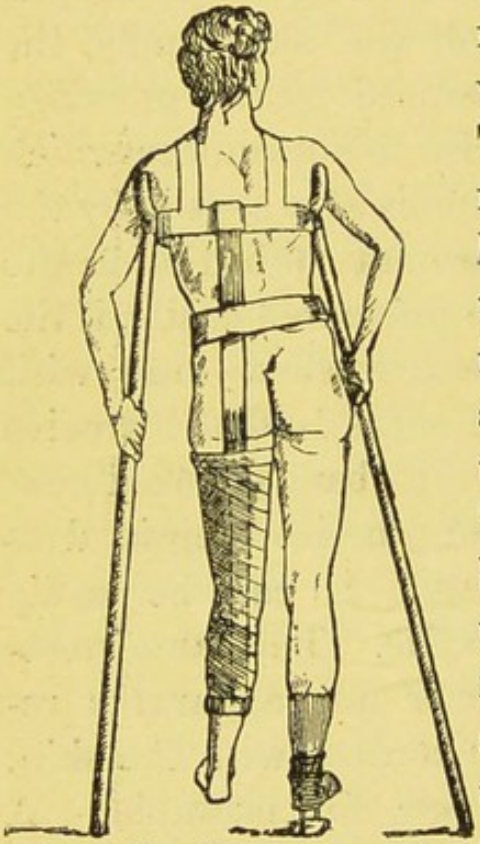


FIG. 57.—Thomas's splint applied.

wrenches, and yet unyielding enough to prevent any modification in shape by movements on the part of the patient. The splint is useless if its own weight can *bend* it when held straight out, and this unfortunately is the case with those made by most instrument makers. The splint has three wings and an upright stem. The top wings extend two-thirds round the chest, at about the level of the nipples, the second two-thirds round the thigh, an inch or two below the groin, and the third two-thirds round the lower third of the leg. They are all much more easily bent than the upright, and the upper ones terminate in loops for the reception of the bandages, which extend from the top of the stem over the shoulders. The wings should fit close to the body on the inner side, but should be open on the outer; this prevents the tendency of the splints to escape to the outer side. The splint should be bandaged to the leg, the fixed point of the bandage being made by making a hole in the end of the bandage and fastening it to the outer lower wing. For the first part of the

* By the kind permission of Dr. Robert Jones of Liverpool.

treatment, the patient is kept in bed, but after a while he may get up, with crutches, the bad side being kept off the ground by fixing an iron patten to the boot of the opposite leg. The measurements required when ordering a splint can be obtained from Messrs. Critchley of Liverpool.

CHAPTER XIV.

SUBJECT—SURGICAL EMERGENCIES. HÆMORRHAGE AND ITS TREATMENT BY NURSES. HERNIA AND THE MANAGEMENT OF TRUSSES. BURNS AND THEIR COMPLICATIONS.

ALL wounds are accompanied by a more or less abundant escape of blood, that is to say, hæmorrhage. In a usual way this arrests itself either under the dressing or spontaneously; at other times it persists and may place the patient in very great danger.

There are three sorts of hæmorrhage generally recognised, according as to whether the blood escapes by oozing—capillary hæmorrhage; in a red jet, intermittent if the vessel be large—arterial hæmorrhage; or in a black and continuous stream—venous hæmorrhage. These varieties are often combined.

It is easy to recognise with which of these varieties you have to deal. In arterial hæmorrhage, when the jet is intermittent, it is synchronous with the beats of the pulse, and it is easily arrested by compressing the limb above the wound in the course of the principal artery.

When a vein is opened there is a free escape of black blood, which either oozes out or comes in a continuous jet according to the calibre of the wounded vessel. By pressing the limb above (that is, nearer the heart) one increases the escape, whereas by pressing below the wound the hæmorrhage is arrested.

All hæmorrhages, not being of the same character, cannot be arrested by the same means. The general means which one can employ in all cases, and what ought to be done under certain circumstances, will now be considered.

First of all the nurse ought to have well in view the prevention of septic infection of the wound, for her services to the wounded patient are greatly marred if in stopping his hæmorrhage she infects his wound. It should be remembered also that hæmorrhage easily recurs in septic wounds. The wound must be purified then at the same time that the hæmorrhage is stopped.

Irrigation with a cold solution of sublimate (which should always be at hand in the wards and out-patient rooms of hospitals), stuffing the wound methodically with iodoform gauze, placing the limb in an elevated position, with the application of moderate pressure, will often arrest the escape of blood until the arrival of the doctor. The lay practice of stuffing wounds with cob-webs and other septic nastiness would, of course, only be thought of with a shudder by trained nurses.

Perchloride of iron is not only an imperfect hæmostatic at best, but it prevents rapid healing of the wound, and is frequently the cause of sloughing and inflammation.

Should a patient arrive with a dressing put on by some one outside, with an attempt at asepsis more than doubtful, and should blood be soaking through, if a surgeon is not at hand, the nurse should not scruple to remove the dressing and start afresh.

After raising the limb, and the higher the better, the nurse should see that there are no bands or tight

clothes which can compress the veins leading from the limb. By these means one will almost always be able to stop venous and capillary hæmorrhage of moderate gravity.

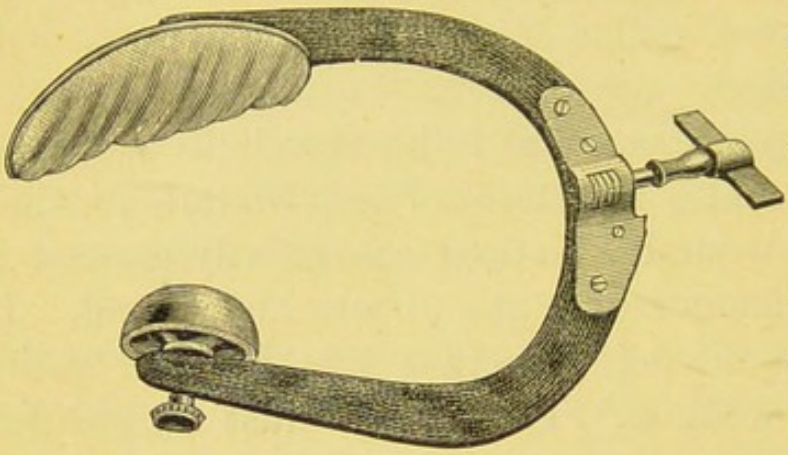


FIG. 58.—Signorini's tourniquet.

Supposing, however, that these means fail, the dressing must be removed, and one may then often succeed by pressure made by means of a small pad of antiseptic gauze, held by the finger directly in the wound. The limb must at the same time be elevated. The nurse can also, with the other hand, make digital pressure on the principal artery.

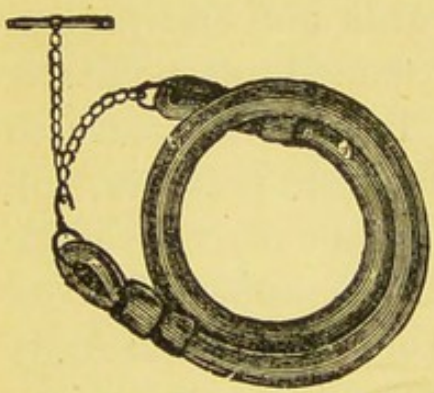


FIG. 59.—Esmarch's tube.

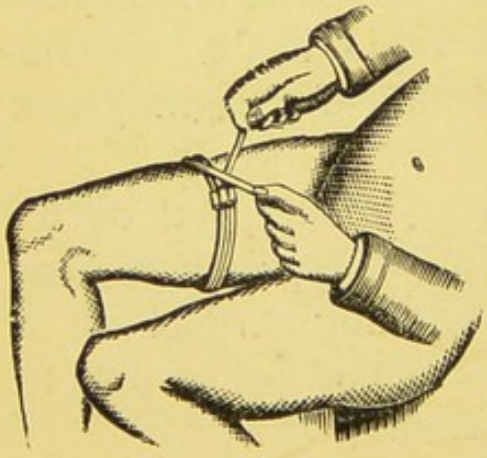


FIG. 60.—Application of tourniquet.

In the case of a wound of one of the larger arteries of a limb, the nurse should apply digital compression in the course of the vessel at the outset, or, better still, a tourniquet or Esmarch's tube. A skilled nurse can completely arrest arterial hæmorrhage by digital compression. There

are points in both limbs where one can bring pressure to bear most efficiently. In the leg, the artery ought to be compressed in the centre of the fold of the groin. To find the exact point one should feel for the pulsating of the artery in this position, then place the tips of the four fingers closely together on the vessel, parallel to its direction, and press firmly. Additional power will be gained by pressing the thumb against the outside of the thigh. If this stops the hæmorrhage, one can place the index and middle fingers of either hand in the same position; two fingers sufficing for the compression, it is then possible to rest one hand while the other takes its place.

In the arm the nurse must feel for the arterial pulsations on the inside of the prominence of the biceps muscle; the vessel can here be firmly compressed against the humerus. She should grasp the arm with the thumb on the outside and with the index and middle fingers on the artery.

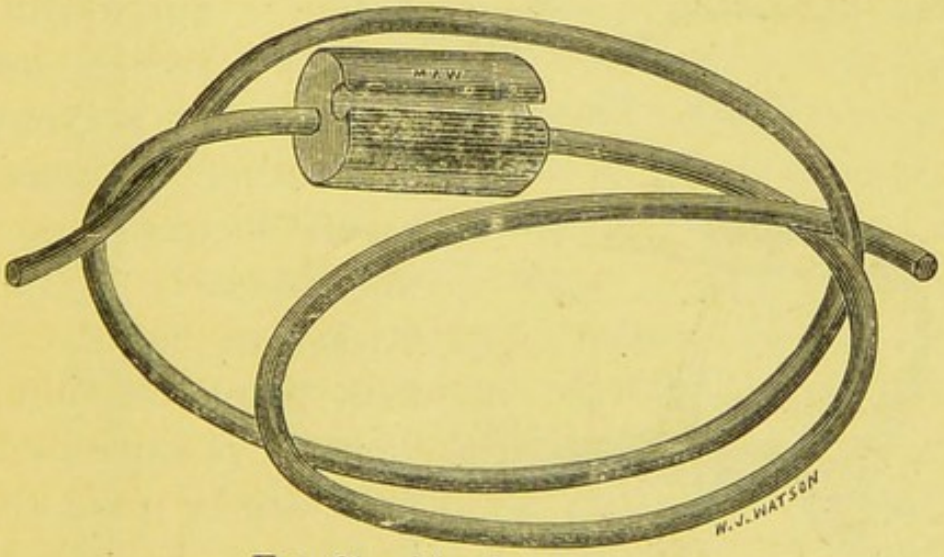


Fig. 61.—Maw's tourniquet.

Tourniquets are not easy to apply unless people have special skill in the matter, but anyone can apply

Esmarch's tube. Formerly, an elastic bandage was first firmly wound round the limb, in order to press all the blood contained in it into the body. Now, however, elevation is mostly used instead. Esmarch's tube consists of a round elastic band, which, being kept stretched, is firmly applied round the limb, and kept tight by being fixed either with a clamp or by tying the ends together. It absolutely prevents the passage of blood in the arteries. No non-elastic band, such as a bandage, however tightly tied, is of any use for this purpose.

Esmarch's tube can be applied to any part of a limb; it is not necessary to apply it to the places above indicated for digital pressure. The use of this tube is a powerful and radical means of preventing, or rather suspending, severe hæmorrhage, but unfortunately it is not always at hand. From this point of view the "garrot" is superior to it, for it can be made almost instantly. Like the tourniquet, it is composed of a pad to be applied to the artery, of a band which goes

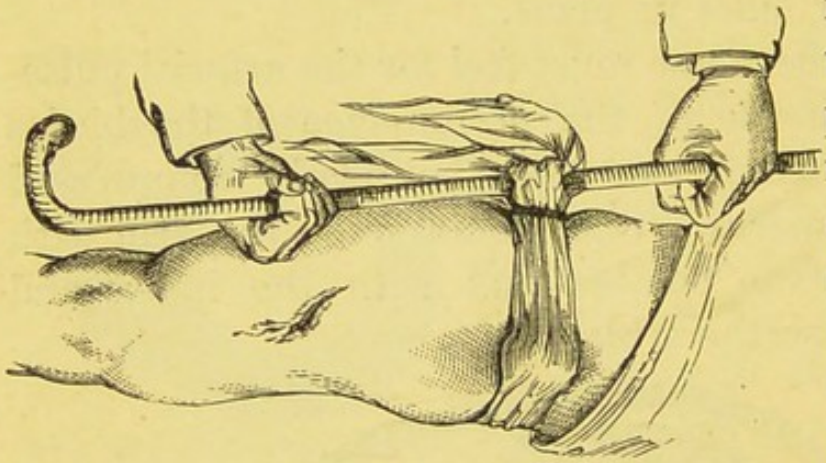


Fig. 62.—The garrot.

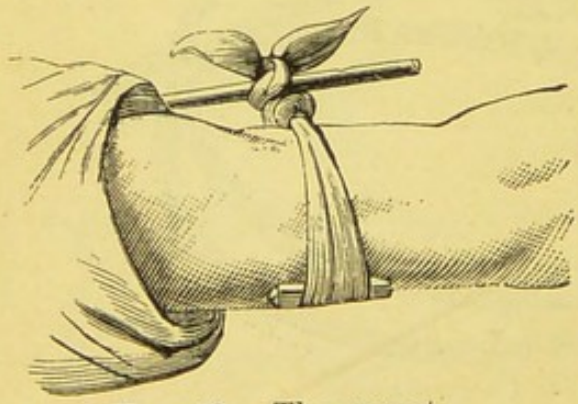


Fig. 63.—The garrot.

round the limb and is tied on the opposite side, and of a stick by means of which one can tighten the constricting band or loosen it at will. With a handkerchief, a walking-stick, and a piece of wood the bleeding can be arrested until help arrives. The tightening is done by pushing an inch or two of the stick under the handkerchief after it is tied round the limb, and causing farther the end of the stick to describe a circle.

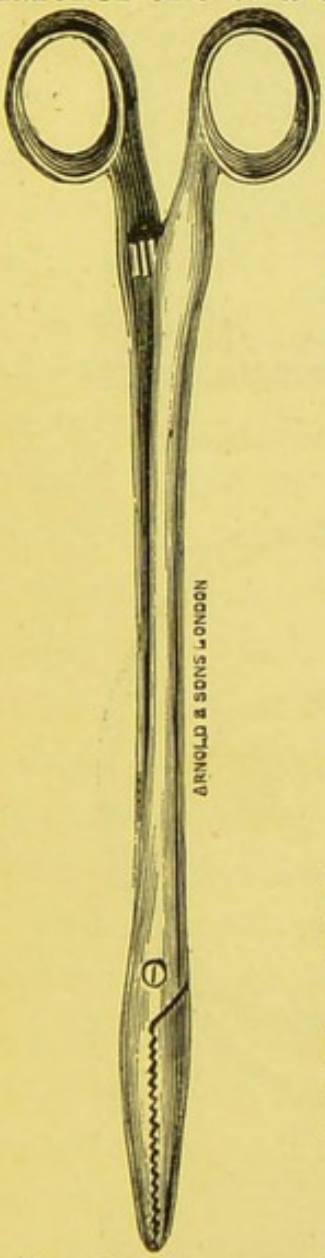


FIG. 64.—Spencer Wells's forceps.

The elastic band or the "garrot," which can totally stop the circulation of a limb, ought to be used in all cases of great urgency with as little delay as possible. All the same, they must not be kept on too long, or gangrene will be produced.

Summing up then :—

(1) In cases of general oozing from a wound, gentle compression of the wound with elevation must be tried.

(2) In venous hæmorrhage, it is still to these means, *and above all to elevation*, that nurses would have recourse.

(3) In arterial hæmorrhage they must make digital compression on the principal artery.

(4) Direct pressure on the bleeding point by the purified finger or with a small antiseptic pad intervening, is to be used if the above means fail.

(5) As a last resource, Esmarch's tube or the "garrot" may be applied.

Such then are the means which

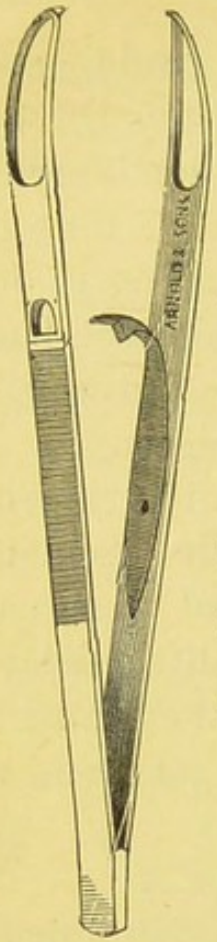


FIG. 65.—Common artery forceps.

FIG. 66.—Bulldog forceps.

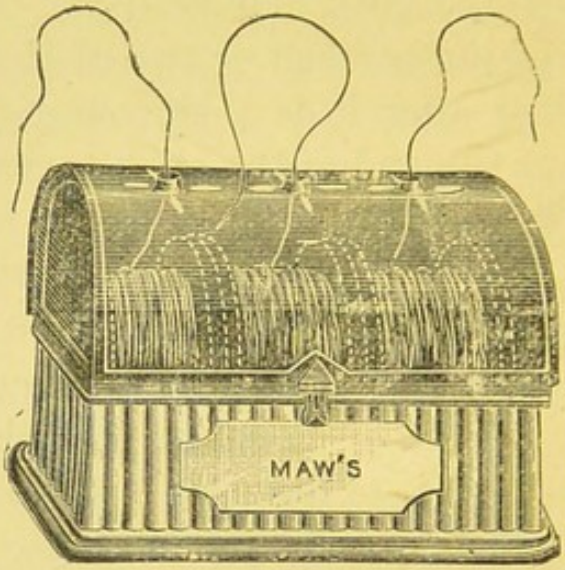


FIG. 67.—Ligature trough.

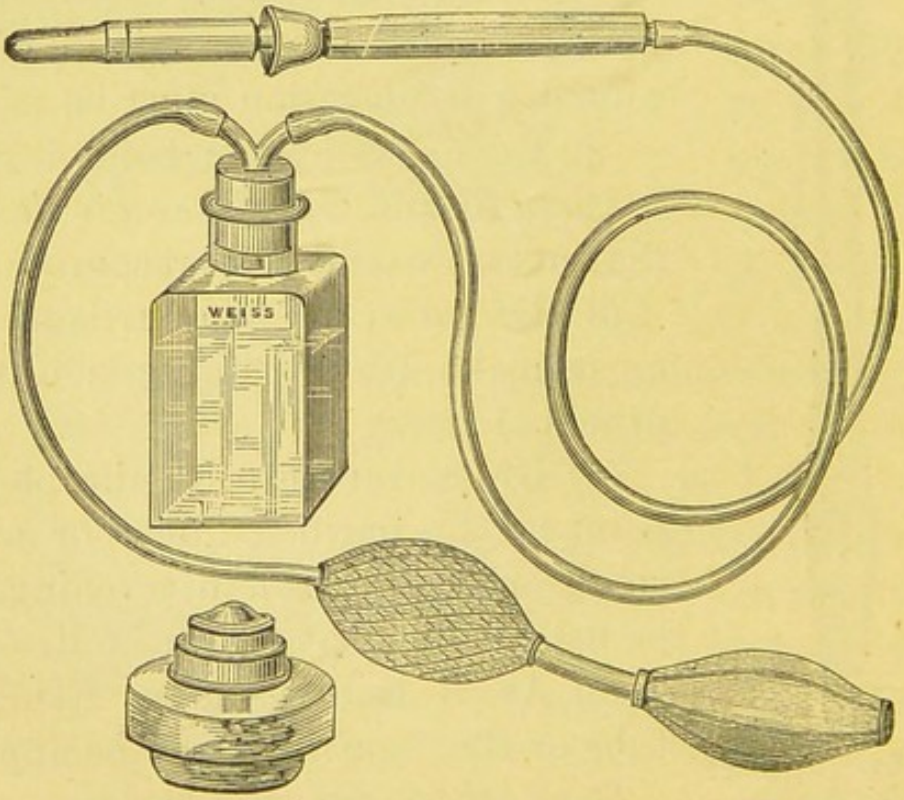


FIG. 68.—Pacquelin's cautery.

nurses may adopt until a surgeon arrives. In cases of venous and capillary hæmorrhage, if it has been successful, the treatment will in most cases be continued; but in arterial hæmorrhage, the surgeon will usually proceed to find and place a ligature around the severed vessel. For this purpose, catgut or fine silk is used, as in aseptic wounds these become ultimately absorbed in the process of healing, remaining, however, sufficiently long to prevent any recurrence of the bleeding. When once it is tied, a firm clot forms in the artery above the ligature, and so the vessel becomes permanently sealed. It is not, however, always easy, even with an Esmarch's bandage, to find the cut artery, and it is often necessary to much enlarge the wound before this can be accomplished; especially is this the case with punctured wounds or stabs. If the artery cannot be found, the wound must be packed with antiseptic gauze, but as this much retards healing, it is not a treatment to be desired. A red-hot iron, as Pacquelin's cautery, has often to be used, when the bleeding comes from vessels in the substance of a cut or broken bone. Special forceps are used for getting hold of cut vessels, as Spencer Wells's, Tait's, Assalini's, Liston's, Luer's or ordinary, Bulldog, Bryant's.

The general symptoms of excessive bleeding are given under the head of internal hæmorrhage, and of course they do not differ whether the loss of blood is internal or external. Occasionally the operation of transfusion is resorted to. This consists in injecting the blood of an animal or of another person into the veins of the patient. The operation is most successful when it can be performed, but the complicated apparatus necessary

to accomplish it is not often at hand, nor have many people sufficient skill for its proper use. Other substances, such as milk or warm salt solution, are said

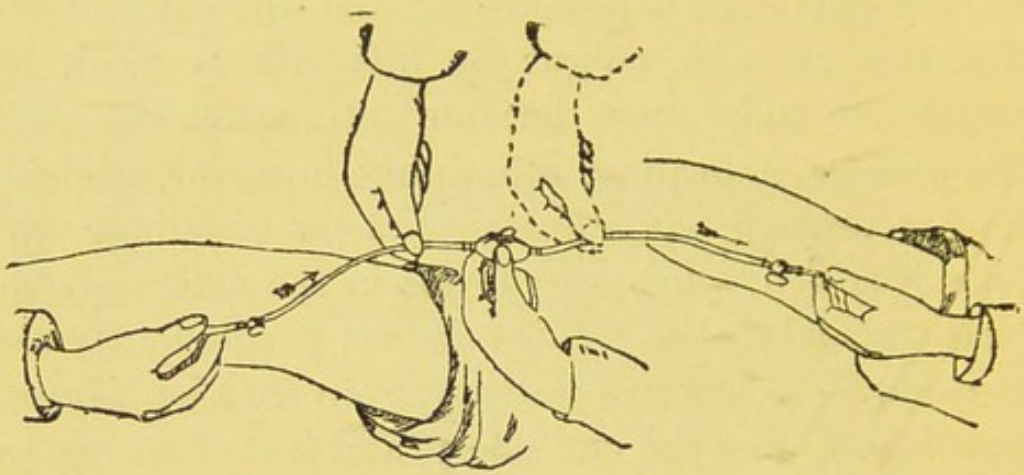


FIG. 69.—Transfusion.

to have been useful in saving life when injected into the veins.

Hernia.—As was noted when discussing the medical diseases of the abdomen, various impediments or blocks may occur in the intestinal canal giving rise to obstruction. The symptoms of obstruction are persistent vomiting, rapidly becoming fæcal, constipation, pain, and gradual distension of abdomen. It often happens that surgeons have to open the abdomen (abdominal section) to find out and relieve the cause. The nursing of these cases does not differ materially from that described under ovariotomy. When, however, it is known that the obstruction is caused by a cancer low down, as in the rectum, laparotomy is performed, that is, the large intestine is opened at the side and a permanent opening into it is made, through which the motions will pass for the remainder of the patient's existence (*artificial*

anus). But the commonest cause of intestinal obstruction is what is called a strangulated hernia. A hernia is the passage of some portion of the bowel from the abdomen by a new opening in the walls of the abdomen or pelvis, from ruptured muscles, etc., or more commonly by one of the natural openings by which vessels or ducts leave it. Should these openings be large enough, the bowel comes down and returns with ease, but should they be small, or an extra large piece of bowel come down, it is unable to return, it is in fact "strangulated," and the symptoms of obstruction supervene. There are two common forms of hernia occurring —one above the inner end of the groin, "inguinal hernia," and one just below it, "femoral hernia". Umbilical occurs at the umbilicus. For their relief when strangulated, an attempt is made first to return them into the abdomen, by manipulation with or without chloroform, "taxis," or the operation of herniotomy, *i.e.*, enlargement of the opening, is performed.

FIG. 70.—Hernia knife.

The special instruments required are a hernia knife and hernia director.

On admission, the patients must be kept from any exertion which would make the strangulation worse, and it is good routine practice to apply ice until the doctor sees it. In cases of large hernia, or where they are frequently getting strangulated, a "radical cure"

is performed by stitching up the enlarged opening with silk or other material.

The ordinary palliative treatment consists in returning the protruded intestine into the abdomen and keeping it there by blocking the opening with a pad, which is kept in position by means of a spring or elastic steel band (covered with wash-leather or other material) passing round the body. Such an apparatus is called a truss. There are many varieties of trusses, and more varieties in price. Cheap trusses with hard pads are no good. A hard pad simply presses in the

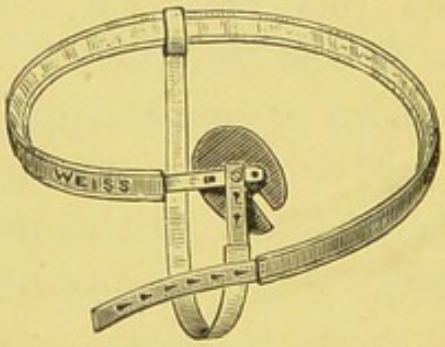


FIG. 71.—Truss.

opening and dilates it. An air, water, ring, or horse-shoe pad is best. They require a great deal of skill to make properly, and are, consequently, very expensive. Most instrument makers will supply hospital patients at the cost price of production, making no charge for the skill required. Messrs. Matthews Bros. issue the following very important instructions for the management of trusses, which it is as well a nurse should be acquainted with :—

"The truss should be constantly worn.

"The truss should always be adjusted with the patient in the recumbent position, never with them standing upright, in the following manner:—

"The spring should be opened sufficiently to go round the right leg; it should then be placed round the left leg, and afterwards drawn up into its place, and the pads adjusted in their proper position after the rupture has been perfectly reduced (*i.e.*, put back). The object of this is to prevent the breaking, or gradual weakening, of the spring.

"A duplicate truss is recommended in all cases, not only for renewal of cover, or in case of injury to the original truss, but for the great additional comfort of a 'change'.

"A bathing truss is always recommended, it being almost impossible to retain the rupture with the hand during swimming, bathing, or ablution.

"A band truss is recommended. This truss has no steel spring; a silken or padded belt encircles the body, and holds the pads *in situ*. A band truss, as described, is sometimes used for ordinary wear in slight cases. It is also used as a sleeping truss.

"As the truss forms part of the attire, it must be so considered; the inconvenience of wearing one pair of boots or shoes from the time they are new to the time they become worn out is obvious; a new truss is equally irksome to wear, and should be brought gradually into regular use.

"The principle that a rupture should, under all circumstances, be kept up, should always be borne in mind."

Burns.—Though the treatment of burns is very responsible work, and does not often devolve on nurses, still it will be useful to consider them, in order that their gravity may be understood and that they may be able to deal with them in an emergency until a doctor arrives. For practical purposes, burns may be divided into three classes (for purposes of perplexing students they are divided into seven): when the skin is only red, painful, and congested (first degree); when the epidermis is raised into little blisters (second degree); or when the skin and the subjacent tissues are destroyed to a variable extent and depth (third degree).

In the first stage, to relieve the pain and congestion of the skin, lint soaked in cold boracic lotion may be applied, and changed frequently; or the part may be put in a local cold bath. A little carbolic oil on lint will also be of use in getting rid of the painful symptoms.

In the second stage, the nurse must be careful not to tear or pull on the vesicles. The clothes must be removed by undoing or cutting the seams, not by pulling them off roughly. The burnt part being uncovered, it can be irrigated with boracic lotion, then the vesicles can be opened with scissors or a needle. The best dressing will be the boracic ointment, with a thick covering of antiseptic wool and with guttapercha tissue, and a bandage outside all. This will be renewed according as to whether the discharges are more or less profuse. When burns occupy a large extent of surface they produce a great amount of shock, which may prove fatal, so stimulants and hot bottles will probably be required.

In burns of the third stage, whatever may be the

extent or gravity of the accident, the necessary treatment is always the same. The nurse must "embalm" the affected parts. Disinfection must be accomplished with 1-3000 cor. sub. solution, then iodoform must be freely used, either as an ointment with vaseline, or as iodoform gauze. The wound is then further dressed with antiseptic wool and guttapercha tissue.

During the period of healing, a careful attention should be given to prevent contraction from taking place too much. One often sees in hospitals cases whose fingers are drawn down to the palm of the hand, or with the arm adherent to the chest, or the head more or less fixed to one side. These may all be avoided by care during the healing.

CHAPTER XV.

Section A.

SUBJECT—PELVIC ORGANS. RECTUM. FISTULA. BLADDER. STONE. STRICTURE. CATHETER FEVER. HOW TO CLEAN CATHETERS.

The organs contained in the pelvis are the bladder, urethra and rectum, with the addition in the female of the uterus, vagina, Fallopian tubes and ovaries.

The rectum, the continuation of the sigmoid flexure of the colon, follows the posterior wall of the pelvis, that is, the sacrum, terminating in a muscular sphincter, the opening in which is the anus. If one looks at the skeleton, it will be seen from this arrangement that the rectum forms a curve with the convexity backwards, a fact of importance in giving enemata, for if the tube were pushed straight in, it would cause pain by pressure on the bladder. Piles are dilated knots of veins, which are liable to get inflamed from injury, or from being caught in the sphincter. Foreign bodies swallowed, such as pins, fish-bones, etc., are very liable to stick in the walls of the rectum and cause abscess. These abscesses, which may open into the rectum or outside the anus, are called fistulæ or sinuses. For the cure of this, a director is passed into it and the whole laid open in order that it may heal from the lowest part. To prevent the upper part uniting

first and so re-forming the fistula, the wound is stuffed with lint, and kept so until well. After every action of the bowels the wound must be washed in some weak antiseptic, and the lint replaced: it is needless to remark that the patients cannot do this themselves.

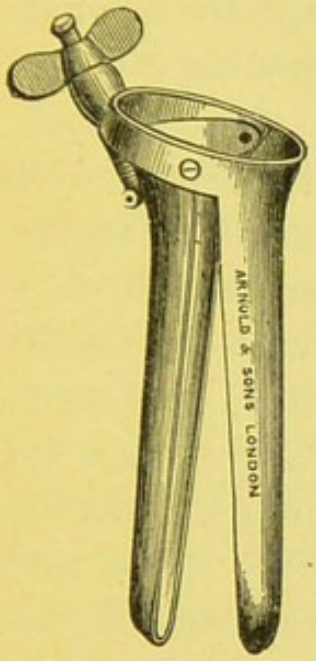


FIG. 72.—Rectal speculum.

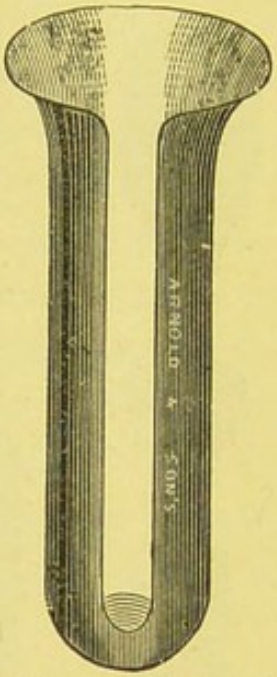


FIG. 73.—Rectal speculum.

The bladder is placed in the fore part of the pelvis behind the pubes. It forms a receptacle for the urine with a usual capacity of about a pint, though it may in certain cases get so stretched as to hold a great deal more. Cases are met with where the bladder reaches above the umbilicus from inability to void its contents. From the bladder the urine is conducted away by the urethra. Just after leaving the bladder it is surrounded by the prostate, a gland which continually enlarges as age goes on, and by its enlargement gives rise to retention of urine. The urethra is liable to be affected with narrowing of its calibre, stricture—also one of the causes of retention of urine. Inflammation of the bladder is called cystitis. Hæmorrhage may occur in it from tumours, or a stone form from the deposit of solids from the urine. For the relief of stone, two operations are done, viz., lithotrity and lithotomy. The former is the introduction of a crusher or lithotrite *viâ* the urethra, whereby the stone is broken up into minute

pieces, and removed with an evacuator; the latter operation consists in cutting into the bladder, and removing the stone through the opening made. This opening is either made above the pubes—suprapubic lithotomy, or from the perinæum. In the latter case, urine will flow from the wound for some time after the operation, requiring arrangements for soaking it up and keeping the patient dry. Of course the nurse will watch for bleeding after, just the same as she would for any other operation case.

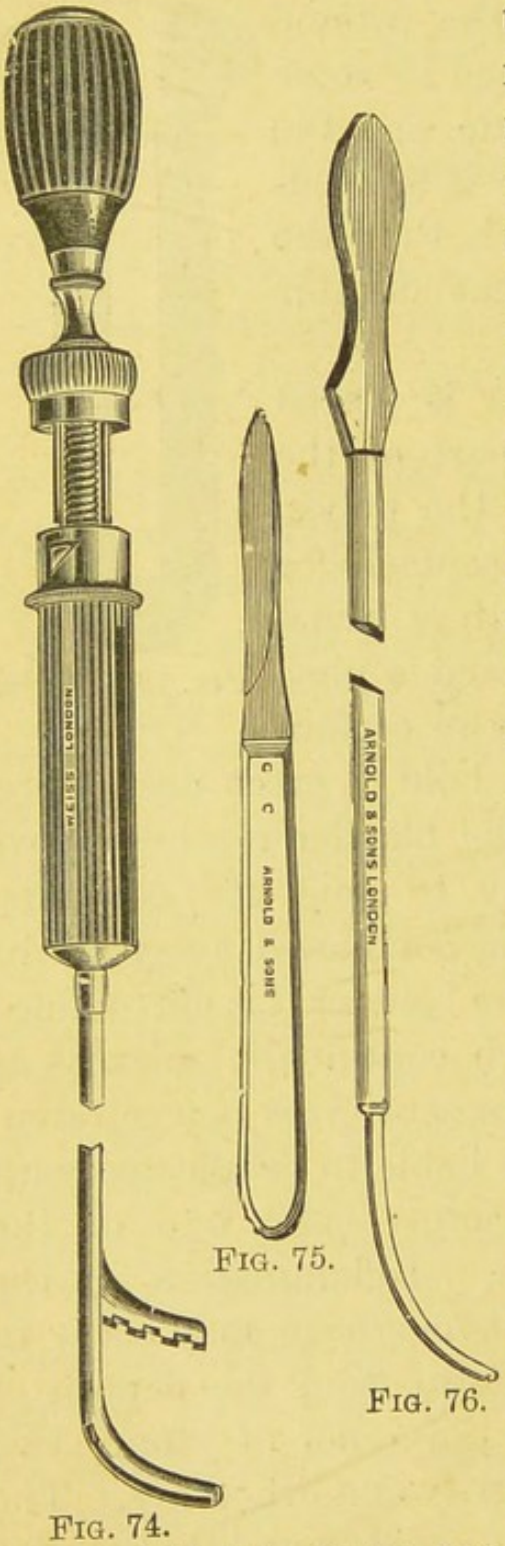


Fig. 75.

Fig. 76.

Fig. 74.

Fig. 74.–Lithotrite; fig. 75.–Lithotomy knife; fig. 76.–Do. staff.

One of the symptoms of stricture is retention of urine, which may be absolute, the patient coming for relief because of the inability to pass water, or there may be retention with overflow. In retention with overflow, the patient will pass water in small quantities often, so that people who are not aware of this fact may think the bladder empty, whereas it may contain several pints. The retention of old people is nearly always of this character.

For the treatment of stricture, catheters or sounds are passed, commencing with a small one, and passing up each day or week to a larger one, until at last the normal is reached. When they are used the surgeon will require hot water, a bowl and carbolic oil. In some cases, where there has been great difficulty in its introduction, the catheter is tied in for a few days, as it is found this is a very quick way of dilating a stricture. Here the nurse must take care that the instrument does not slip out, that it is protected by a cradle, and she must watch for rise of temperature or rigors, either of which must be at once notified to the house surgeon Rigors are grave complications, and usually call for the speedy removal of the catheter.

Catheters are mostly made of gum elastic or silver. The gum elastic after being used for some time become brittle and cracked, and when used in this condition are apt to break. When therefore the nurse finds any becoming so, she should inform the house surgeon, that he may have them replaced. Catheters very easily become foul from retaining decomposing urine, pus or blood, although they may look perfectly clean and bright on the outside. Should one of these foul instruments be used, what is called "catheter fever" may result, or cystitis may be induced. Catheter fever is the rise of temperature with rigors which occasionally follows the introduction of a foul catheter. These symptoms may go on to suppression of urine, which, if prolonged, as it may be, causes death. To clean a catheter the handle end must not be put under the tap, allowing the water to flow out of the eye, because the eye is not at the extremity of the instrument, and by sending the stream this

way one would wash any clots or matter into the part between the eye and the tip. Here it remains, decomposes and causes catheter fever in a patient later on. The right way to wash out a catheter is to put the eye end under the tap, allowing the water to flow out at the open or handle end. The nurse should further make sure of the part above the eye being clean by passing a feather in at the eye up to the tip and twisting it round. For cleansing the outside, the nurse must soap the fingers and thumb well, and cleanse from the tip to the handle end, not *vice versâ*, or she will open up the curve (for they bend very easily), and so spoil the instrument. Drying should be conducted in the same manner, but before doing this the catheters should soak in one in twenty carbolic for about a quarter of an hour.

Section B.

SUBJECT—THE FEMALE PELVIC ORGANS. ANATOMY AND PHYSIOLOGY. THE NURSING OF DISEASES OF WOMEN. OVARIOTOMY. PASSING THE CATHETER.

As has been said, the special organs found in the pelvis of the female are the Ovaries, Fallopian Tubes, Uterus, and Vagina, and of these the following is a short account:—

The Ovaries are two oval bodies, from one to two inches long, and about three-quarters of an inch in breadth, placed one on either side of the pelvis. From each ovary there is a duct, called the Fallopian Tube, leading to the Uterus, whose duty it is to conduct the ova from the former to the latter.

The Uterus, or womb, is a pear-shaped organ, divided into two parts—the body, or fundus, and the narrow end, or cervix, which projects into the vagina. This is slung, so to speak, in the centre of the pelvis by ligaments, and is covered partially, as the ovaries and tubes are entirely, by the peritoneum which lines the abdominal cavity. It is composed almost entirely of muscular tissue, but contains within its centre a small cavity lined with mucous membrane.

The Vagina is the canal which forms the communication between the uterus and the exterior.

As regards physiology, each ovary contains a very large number (several thousands) of immature ova, one of which ripens and is discharged with each menstrual period. During the whole of the child-bearing epoch the periodical maturation and discharge of ova is going on.

It is in the cavity of the uterus that the ovum is arrested if impregnation occurs, and it is there that it develops.

Another function of uterus is that of menstruation. It generally commences during the fourteenth and sixteenth years, and ceases to appear between the ages of forty and fifty.

The period of its final cessation is spoken of as the "climacteric". It seldom ceases suddenly; but it may be absent for one or more periods, and then occur irregularly. The period of the climacteric is not attended with that amount of danger which is popularly attached to it, most women passing through it with little more than digestive troubles.

From causes often very slight, menstruation may be

suspended for a time, a condition spoken of as Amenorrhœa. This is often the cause of great anxiety to those who are subject to it; it often, however, really only points to the patient being out of health, and treatment which restores health will cause the function to start afresh. There are a large number of nostrums and quack remedies sold daily for the relief of amenorrhœa, as patients unfortunately allow themselves to get really ill while taking these nostrums instead of consulting a doctor. In most cases a suitable tonic is all that is required.

When Menstruation is accompanied with much pain, the patient is said to have Dysmenorrhœa.

Menorrhagia is when the intervals are too short and the discharge too profuse, and Metorrhagia is when the discharge of blood is more or less continuous.

In some cases of uncontrollable bleeding from the uterus, it becomes necessary to plug the vagina. This is done by packing the vagina through a speculum with a number of firm pledgets (tampons) of cotton wool, either each pledget having a separate string attached, or all being fastened to the same.

We will just mention shortly some of the commoner diseases which will be frequently met with in the wards set apart for women's ailments.

The uterus may get out of its normal position from various causes; any marked deviation from its proper position is spoken of as a "displacement". If it comes down too low, so as to present at the orifice of the vagina, it is spoken of as a prolapse. Displacements backwards or forwards are called retro-

versions or anteversions. If the fundus of the uterus is bent backwards or forwards without the cervix being affected, it is either spoken of as a retroflection or anteflection. These displacements are treated by instruments called pessaries, the object of which is to cause the uterus to return to its natural shape or position. Those commonly used are Hodge's, Hewitt's, the cradle, the stem and the ring.

For a doctor to examine a uterine case it is necessary for the patient to be placed in what is called the "obstetric position," as this is the only position in which he can thoroughly explore all parts of the pelvis. Nurses should be well acquainted with this position and should place them so that the doctor has not to make any alteration for any part of his examination. The body should lie on the left side, obliquely across the couch or bed, *the head being well over to the further side*, the hips close to the edge of the couch, the shoulders on the same level as the buttocks, and the knees drawn up towards the abdomen. The left arm should be brought out behind, and the patient rolled somewhat over, so that the front of the left shoulder rests slightly on the couch. Exposure should always be avoided as much as possible, by covering the patient with a blanket of which the doctor can remove as much as is necessary.

The stays should be removed and all clothing round the waist loosened, so that the doctor can, if he wishes, place one hand on the abdomen, while the other is examining *per vaginam* (the bi-manual method). For a complete examination the use of the uterine sound is often necessary, for by it we estimate the length and

direction of the cavity of the uterus. The speculum, too, is also used in uterine examinations, and so nurses should know the names of the commoner ones, as Fergusson's, the bi-valve, and Sims'.

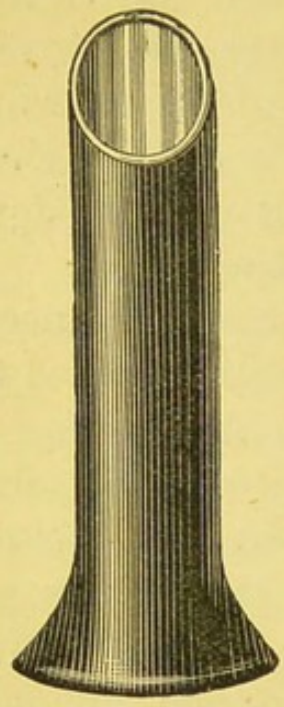


FIG. 77.—Fergusson's speculum.

Inflammation of the inside of the uterus, or endometritis, is a very common hospital complaint. It is mostly accompanied by a profuse discharge from the womb, leucorrhœa. This is treated by vaginal douches, and by the application of caustics to the inside of the uterus. A vaginal douche requires to be done thoroughly, and to be of use, plenty of water must be used at the temperature ordered, generally 100°. A vessel of any sort capable of holding a gallon or two of water should be placed above the patient, and have an india-rubber tube fitted with a vaginal end and stopcock attached to its lower part. The patient is then made to lie crosswise on the bed, with the hips at the edge, and elevated by a pillow, while the feet

FIG. 78.—Uterine sound.

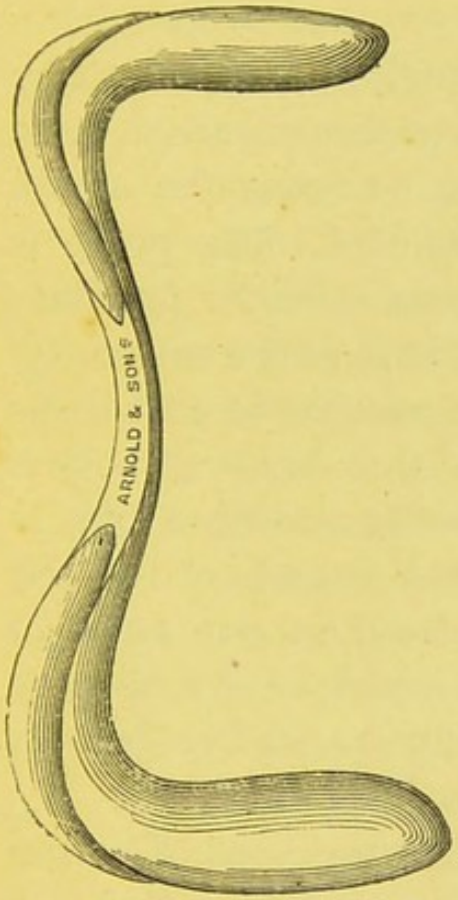


FIG 79.—Sims' speculum.

rest on two chairs, between which is a receptacle to receive the water. To prevent the bed getting wet a mackintosh is placed over the pillow, the other end reaching to the bath, forming a sort of waterway. The nurse, seeing that the patient is as much covered as possible under the circumstances, inserts the vaginal tube, and turns the stopcock.

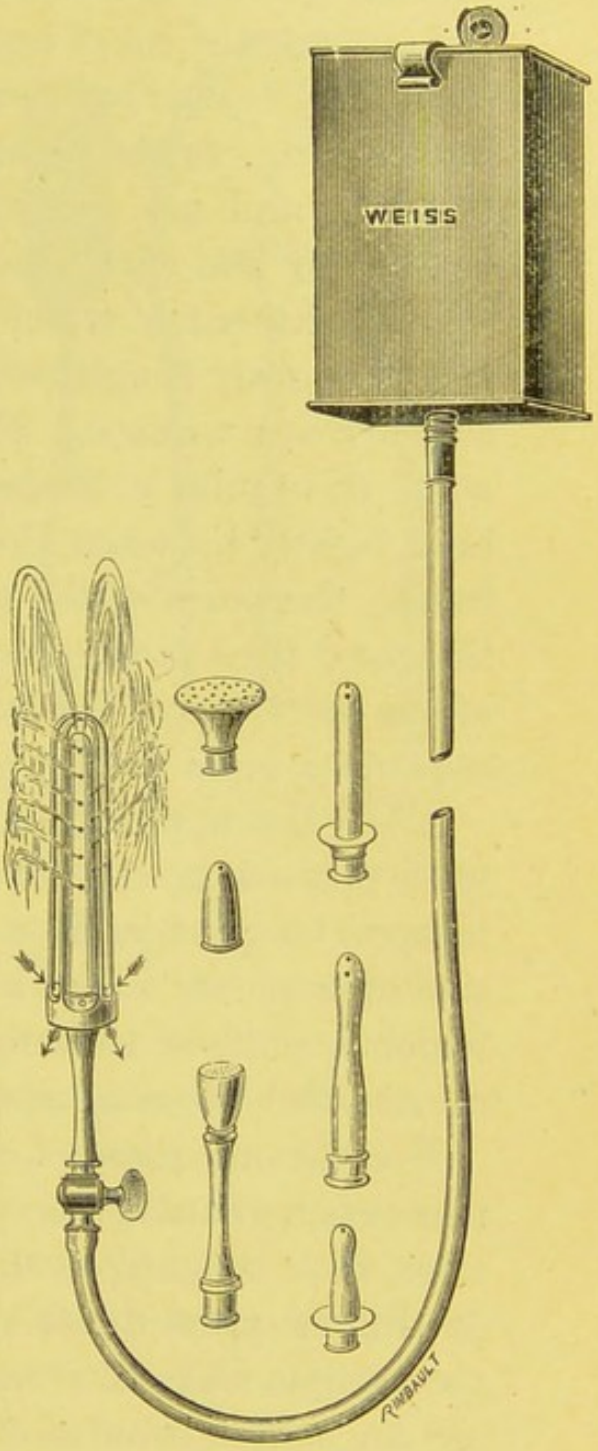


FIG. 80.—Irrigator or douche.

In this way a large amount of water is with ease thrown gently into the vagina.

Caustics are most applied through the speculum by means of Playfair's probes. These probes are about three inches long, made of aluminium, to resist the action of acids, and are mounted on handles. The probe is coated for use with *absorbent* cotton wool, to facilitate the attachment of which, it has a bulb at the extremity, and is slightly roughened. The nurse has to coat these as they are wanted. For this a thin layer of cotton wool, triangular in shape and about three inches long, is held lightly between the finger and thumb of the left hand; the point of the probe is placed at one angle of this, and then twisted round and round, so as to dispose of the cotton wool firmly and evenly over the probe. It requires a good deal of practice to effect this.

After the application of caustics, tampons of cotton wool soaked or not in glycerine will be applied. A tampon or pledget is a plug of cotton wool about the size of a plover's egg, with a piece of string attached, which is allowed to hang out of the vagina to facilitate its removal when necessary.

For various reasons, such as the presence of polypi, tumours, granulations, persistent hæmorrhage, etc., we often have to explore the interior of the uterus, and to do this we must dilate the cervix of the uterus. There are various ways of doing this. (1) Those commonly in use are tents either of "laminaria" or sponge. Tents are long, more or less conical bodies, which when inserted into the uterus absorb moisture, and consequently increasing in size, necessarily cause the uterus to dilate. To introduce them, the obstetric position, a speculum

and tent introducer are required. Tents are mostly left in from six to twelve hours. The use of them has been followed by serious symptoms, such as pyæmia and peritonitis, but these results are now rare, owing to the use of antiseptic precautions. (2) Hydrostatic dilating bags are introduced empty, and then distended with air or fluid. (3) Solid dilators, such as Hagar's or Lawson Tait's.

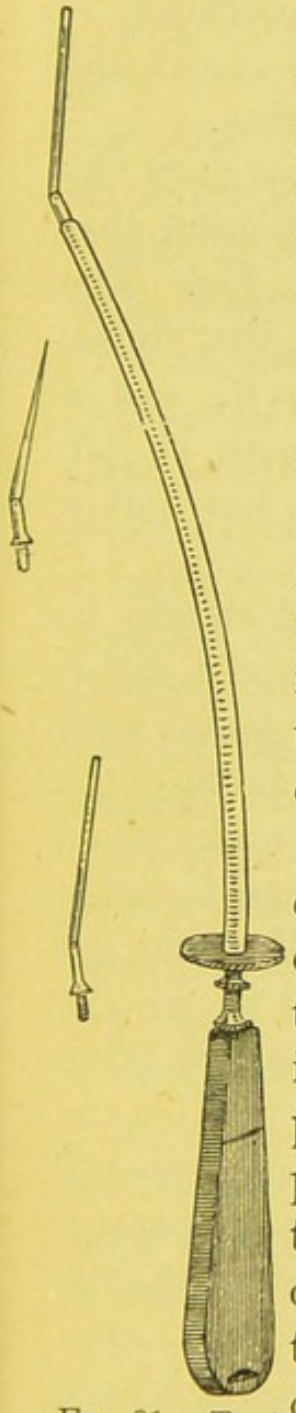


FIG. 81.—Tent introducer.

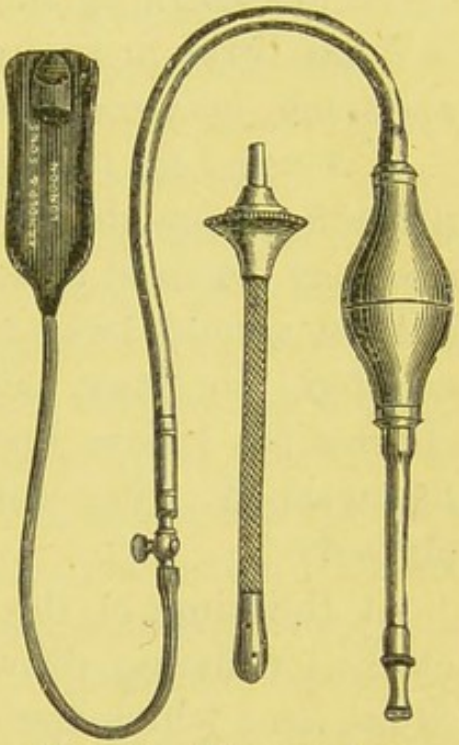


FIG. 82.—Barnes's bag.

There are a large number of women's diseases which come solely from *septic* causes, either following confinement or from infection from other sources. Such infection is very liable to follow the use of insufficiently purified instruments; pelvic peritonitis, pelvic cellulitis, suppuration in the Fallopian tubes (pyo-salpinx), may all occur from this cause. It is curious that in many hospitals the surgical instruments are taken extreme care of, but the obstetric ones are often kept in the ward in a basket or tray, often without a lid, no care being taken to keep them from dust or other sources of suppuration.

The nursing of ovariotomy cases, however, calls for

separate mention. By ovariotomy is meant cutting out the ovary, a treatment which has to be adopted in certain cases of cysts or tumours of these organs. It is done through an incision in the middle line of the abdomen, between the umbilicus and the pubes.

It is usual for the patient to be in the charge of the nurse for a few days before the operation, in order that she may get used to and have confidence in her. The patient should have the catheter passed a few times, so that she may become accustomed to it, and a short time before the operation the abdomen should be washed with soap and water and the pubes shaved.

At the time of the operation the patient should be clothed in flannel drawers, thick stockings, and a night-dress, over which there should be a flannel jacket with long sleeves so that both can be pulled up well out of the way. A many-tailed flannel abdominal bandage lined with antiseptic gauze or lint, and large enough to reach from the lower end of the breastbone well on to the hips, with plenty of pins, will be required to fix the dressing. Long strips of adhesive plaster are often used as well.

Immediately before the operation the bladder should be carefully emptied with the catheter, and the operator asked whether the patient shall be anæsthetised before or after coming into the operation room.

The ovarian bed is arranged with two upper sheets and blankets, so placed that they open in centre when the counterpane which covers both is turned down. Pillows are placed under the knees and also under the head and shoulders. To prevent the pillow under the

knees slipping down, it should be fastened by cord or bandages at each end to the top of the bed.

Plenty of hot water will be required for the operation; the temperature of the operation room must be kept about 65 deg.; and a foot bath for receiving the often large amount of fluid will be wanted.

The sponges, which should be new for the operation, must be used warm. To ensure this they are kept in a hot one in two thousand solution, wrung out a few at a time, and held in a bag formed by holding together the corners of a piece of purified mackintosh about a foot square. If they get cold before the operator is ready for them, they must be returned to the hot solution and wrung out again; at least four hot wrung-out sponges should always be ready. About six large flat sponges will also be required. All sponges are to be carefully counted before the operation, and again before the wound is sewn up, or they might otherwise be left in the abdomen. Should the nurse miss any she will acquaint the operator with the fact before the stitches are tied. At the operation the abdomen is to be covered with a mackintosh, which should extend from the chin to the feet, in which an oval hole six by eight inches is cut, and spread round the margins with lead plaster to make it stick to the skin. The plaster is put on the mackintosh in the dispensary. The patient's legs and hands are to be strapped down just before the operation commences. Instruments are during the operation left entirely to the operator and his assistants, but when the large pistol-shaped trocar is about to be used, the nurse must see that the foot bath is ready and under the tube attached to the trocar.

After the operation, the room is to be kept darkened, and at night the candle should be shaded on the side next to the patient. The patient must be kept altogether on her back with hot water bottles in the bed, especially at first. Very little if any food will be allowed for the first few days, and the patient may be fed on small nutrient enemata. These must be given very carefully or the rectum will become irritable and intolerant of them long before the time for discontinuing them is reached. The catheter is to be passed every six or eight hours for the first few days. No one, except the nurses in charge and the doctor, is to be admitted into the room without leave; nor should the patient ever be left alone. All sponges, bandages, etc., used for the case, must be washed by the nurse in charge, not sent elsewhere or they might get infected. The urine should be measured, and the temperature taken every three hours when found above normal, otherwise every six hours.

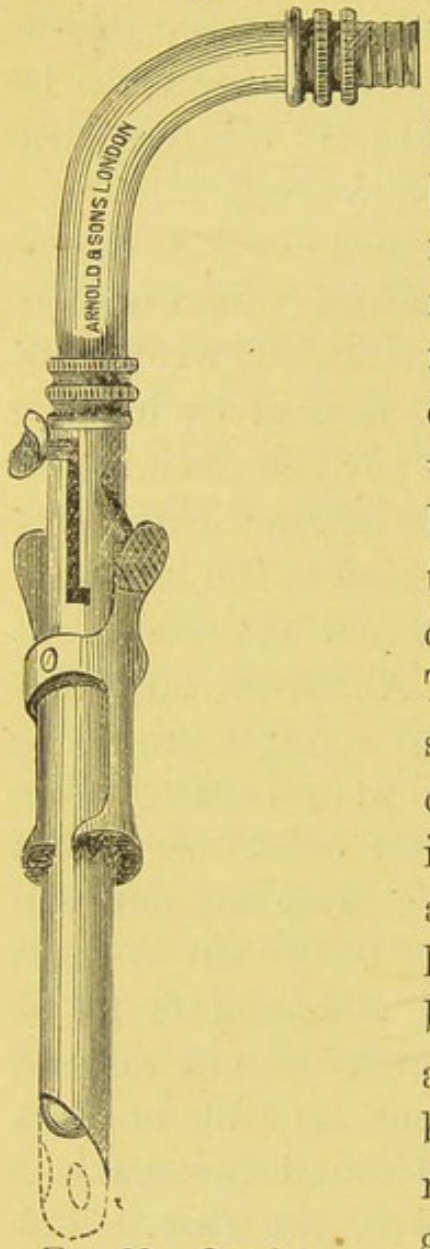


FIG. 83.—Ovariotomy trocar.

If coughing or vomiting occurs, the nurse should support the wound until it is over, by making gentle pressure with the hand on the dressing over it, or the wound might burst open. Lastly, she should keep

the patient as quiet as possible, and prevent her making any exertion by quickly anticipating her wants.

The above treatment applies to hernia cases and all those cases of tumours, etc., for which abdominal operations are required.

In women the urethra is very short, and as the passing of the female catheter is part of the nurse's work, it will now be described.

To pass a catheter on the female it is better to use a male gum-elastic catheter about a No. 8 size than to use the ordinary short female one. The same care must of course be taken to disinfect it as before described. The patient may be either on her back or side. If on her back, she should be near the right hand side of the bed with the knees drawn up; the nurse standing on the right side holds the well-oiled catheter in the left hand. Having anointed the right index finger with carbolised vaseline, she passes the right hand under the patient's right thigh, and introduces the finger into the vaginal orifice. On now slightly raising the finger in the middle line she will feel the urethra like a cord just under the apex of the pubes. If the finger be slightly withdrawn until the outer extremity of the cord be reached, a depression will be felt which is the urethral orifice. The catheter held in the left hand is now passed over the thigh down between the legs, and the point guided into the urethra by the finger. A little gentle pressure upwards and backwards will then send the catheter into the bladder. The ivory end should have been previously blocked with a small peg to prevent the urine escaping until a vessel

is ready for its reception. Sometimes an india-rubber tube is attached to the end of the catheter leading into a chamber placed on the floor.

A patient cannot always be placed on her side, as, for instance, after ovariotomy, but when she can it will be found much easier to pass the catheter in the obstetric position. In this way the left index finger is put in the vagina with the palmar surface facing forwards, while the catheter is passed by the right hand. In cases where there is much difficulty, it is better to raise the clothes and look for the opening of the urethra than to make prolonged ineffectual attempts to pass it.

To now close this chapter, a few important rules for nursing obstetric cases are appended :—

1. All discharges from new patients must be kept for a doctor to see.

2. Also any unusual discharge from old patients.

3. All solid matter passed *per vaginam* must be kept, and if possible prevented from drying until the surgeon has seen it.

4. All instruments used for uterine cases should have great care taken of them and kept as aseptic, as those for an ordinary surgical case.

5. The female organs should be considered for practical purposes as open wounds, and only touched with purified hands or instruments.

6. When any operation is to be performed on the female organs, the vagina should first be purified with a douche of weak antiseptic lotion, say 1-3000 corrosive sublimate, and it is better, in addition, to sponge it well out with purified sponges. The external organs should be well washed, first with soap and water, and then with the sublimate lotion.

CHAPTER XVI.

Section A.

SUBJECT—CONVALESCENCE. ITS NATURE AND SYMPTOMS. EFFECT OF HIGH TEMPERATURES. GENERAL CONSIDERATIONS.

Convalescence is the period of a disease which is marked by the cessation of the more prominent characteristic symptoms, and is the period intermediate between them and full restoration to health.

Convalescence has its degrees and its course the same as disease, and convalescents require to be nursed and looked after and doctored quite as carefully and scientifically as when they were suffering from the disease itself. "Many cases would be irretrievably lost but for careful nursing — some would become permanent invalids; others burdens to themselves and their friends for the rest of their days. There may be return to *life;* but return to health and usefulness depends upon the *after* nursing and treatment in almost all cases." *

Convalescence is only spoken of in connection with tolerably severe disease; for instance, one could hardly be said to convalesce from a slight cold, but we know that convalescence from a severe one may be often very long.

Convalescence may, of course, vary in length in dif-

* Miss Nightingale.

ferent diseases and different individuals; it may be continuous and uninterrupted, or it may be broken from various causes. The change from convalescence to health is much slower in chronic than in acute disease. In some diseases, such as pneumonia and typhus, we can often state the exact hour in which convalescence began, whereas in others, such as typhoid, diphtheria, and rheumatism, the transition from disease to convalescence is less marked.

The circumstances which interfere with convalescence may be either the supervention of some other disease, such as tubercle after pneumonia, rheumatism after scarlet fever, ear troubles after measles, or a recurrence of the original disease; because, owing to a predisposition having been given by the disease, it is easily re-excited by causes which, before the first attack, would have been insufficient to produce it.

The symptoms of convalescence, independent of any special to the previous disease, are mostly those of lowered vitality, or more commonly expressed as "want of tone". The patient is incapable of sustained use of any organ, and especially of the one most affected by the disease. Patients find that continued mental effort easily induces fatigue; they are liable to be cross and easily irritated; they show great sensibility to alterations of temperature; they suffer from dyspnœa on slight exertion even after a cough has entirely ceased; their digestive organs are either out of gear or easily made so by slight errors in diet; slight muscular exertion soon tires them; palpitation is brought on by trivial causes, showing that the circulation is not capable of accommodating itself to circumstances in

the normal way; the urine easily becomes loaded with lithates or phosphates; they are especially liable to a large number of the slight ailments; and the colour and expression of health are absent. "The factors on which the constancy of the bodily temperature depends do not, after a severe febrile disturbance, at once discharge their task with their previous promptness and certainty; and, in fact, the most remarkable peculiarity of the stage of convalescence is, that the bodily heat is more mobile, unstable, than in health, showing greater daily variations and undergoing a really considerable rise on slight provocation, such as trifling muscular movements, or the first meal of solid food, and the like."*

The causes of this "want of tone" may be for the most part included under some or all of the following, in which order they may be discussed:—

(1) Continued high temperature.
(2) Changes in the blood, giving rise to altered nutrition.
(3) Changes in the circulation.
(4) Shock and loss of nervous control.
(5) Large losses of blood or of some of its constituents.
(6) Want of nourishment, mostly from disorders of the digestive organs.

Continued high temperature had been present in about one fourth of the 1700 patients admitted to the St. Andrew's Convalescent Hospital, Folkestone, during

* Cohnheim's *Pathology*.

1890. It is acknowledged by all to be an important factor in causing loss of tone. It acts thus. In all fever it is known that the excretion of nitrogenous matter by the urine is increased, in spite of the strictest fever diet and the smallest amount of food. "No doubt can be entertained as to the significance of this increased excretion of urea; it proves that an increase of the disintegration of albuminous substances takes place in the organism, and since these substances are not introduced as food, that the disintegrating albumen is that of the body itself."* Another fact also tending to prove this is, that the excretion of carbonic acid is increased during fever, as is also the absorption of oxygen. In fever, the cutaneous circulation behaves differently than in health. The temperature of the skin presents much greater variations in fever than in health, and the cutaneous temperature does not always bear a direct relation to that of the internal parts. The arteries over more or less large areas are always in a state of marked contraction. In a rigor there is widespread tetanic contraction of the cutaneous vessels.

Even when fever only lasts a few days the most intense nervous symptoms, and especially those of depression, are observed. Muscular feebleness and tremors on such movements as trying to convey a glass to the mouth are often noticed, and muscular pain and tenderness are frequent accompaniments of fever. This muscular weakness is, in all probability, caused by alteration in the muscles themselves. The digestion is also much disturbed, and at a time, too, when, owing to the increased tissue loss, it would be thought

* Cohnheim.

that the system had special need of extra exertion on its part. The digestive ferments, however, all act best at the normal temperature, so that, even if the patient felt inclined to take plenty of food, it would be impossible for him to digest it, if only for this reason. It is probable, however, that definite structural changes do take place in them as the result, direct or indirect, of the disease, for at post-mortems of patients dying after prolonged fever, fatty degeneration of liver is found, kidneys, and other digestive organs, so that they doubtless occur, though to a less extent, after other fevers also.

As regards the kidneys, after what has already been said, it need only be mentioned that the urinary pigment is largely increased (showing that considerably larger numbers of blood corpuscles are made to disintegrate), and that albumen is very often present.

One result of fever, as a cause of loss of tone, need only be mentioned—emaciation.

The most important cause of all, which has been left to the last, is the effect of fever on the heart. The elevation of temperature is attended by an increased demand on the heart's work. Owing to the greater frequency of the pulse, more work is done by the heart and less time is given for it to rest; "at the same time an additional burden is thrown on it by the increased activity of the respiratory muscles in fever. On the other hand, not only must the defective supply of nourishment tell most severely on those organs which have to work uninterruptedly—the respiratory muscles, and, above all, the heart—but to this must be added the fact that a long persistent fever regularly reduces the

motive power of the heart. . . . The functions of all possible organs will suffer more or less, and the central nervous system, whose periods of recuperation have already been shortened by sleeplessness, must have its activity impaired by the inadequate supply of arterial blood."* The heart itself becomes supplied with an insufficient stream of blood, and must become therefore steadily enfeebled. To this cause is due the coldness of ears, noses, hands, and feet of convalescents; to this cause also is due their tendency to faints (which are often fatal) from slight causes.

Not only, as has been said, is the heart and all the other organs supplied with an insufficient stream of blood, but the blood itself is deteriorated in quality as a result of the fever.

Changes in the blood itself are also a cause of loss of tone in the course of other diseases not accompanied with fever, as anæmia, chronic renal disease, liver disease, and all cases of malnutrition, as starvation, struma, where, even if the circulation were good, the quality of the blood would be insufficient to enable all the organs to discharge their functions normally.

Large losses of blood, such as occur in hæmatemesis, hæmoptysis, menorrhagia, or after some of the major operations in surgery, or losses of some of its constituents, as in severe diarrhœa or prolonged suppuration—all tend in the same way to loss of tone, that is, lowered vitality from deficient nutrition.

Loss of tone may be due to depressed activity of the nerve-centres, of which pain is a much commoner cause than is generally supposed. Patients may die of severe

* Cohnheim.

pain, or short of this a condition not widely different from shock is produced. The intense weakness which follows the passage of a renal or biliary calculus can be explained in no other way. For instance, how easily the agonised expression of a patient in the first stage of pleurisy is changed by a hypodermic injection of morphia. "The effect of nervous disease or disorder in producing loss of muscular tone is illustrated by such disorders as hysteria and epilepsy, by some forms of mental disease, and by the large but indefinite class of cases known as 'nervous debility,' of which mental strain, anxiety, excesses, and alcoholism are frequently the exciting causes."* To these may be added want of oxygen and impurity of atmosphere, from the overcrowding so common in our large towns, and in persons whose work necessitates them being for many hours each day in close, ill-ventilated rooms.

Lastly, may be mentioned those diseases which have necessitated long rest, as fractures of the leg, ulcers, spinal and uterine diseases. Often, many of these causes have been combined together to produce the loss of tone, and have acted and reacted on each other to keep up the vicious circle.

"In convalescence," says Dr. Fothergill, "it is a great matter to see that it be not interrupted. If it be interrupted, the second progress is never so satisfactory as the first; it is always and invariably slower at the least. This is a matter which cannot be too strongly insisted upon. There are two sources of disturbance to which the convalescent is susceptible, and which are the usual causes of such interruptions: these are febrile

* Bruce.

conditions from lowered power of resisting changes of temperature and digestive disturbances."

From what has been stated as to the causes of loss of tone, it is obvious that the treatment of convalescence consists in a great deal more than the mere ordering of tonics; it requires as much, or more care and thought, than the treatment of the disease itself. The dangers are greater, for the patient is up and can move about, and requires, therefore, more watching; he has an appetite, often a ravenous one, and so may over-eat himself, or take something which disagrees with him; he feels well, and may, therefore, indiscreetly expose himself to chill, or may make some unusually sudden exertion, which may bring on a dangerous faint. All ordinary health rules must be strictly laid down and adhered to; all slight ailments must be treated promptly and energetically, and not the slightest excess of any kind allowed. The whole treatment from disease to health must be most gradual, only one restriction being removed at a time, each one being kept on too long rather than removed too soon.

If these rules are attended to, in most cases the patient becomes rapidly restored to health, especially if the disease has been acute. Under some circumstances, possibly depending on neglect during convalescence, or from some weakness in the constitution of the patient, the disease may not become quite cured, but pass into a chronic state, as rheumatism, bronchitis, and kidney disease. Once the disease has become chronic the convalescence is very prolonged; but still careful attention to the rules laid down in this chapter will, if strictly adhered to for a lengthened period, in

most cases effect a cure. One of the commonest instances of an acute disease becoming chronic is bronchitis, and this being neglected, returns with great regularity every year, lasting longer each time, until the patient is hardly ever free from it. This shows well the tendency of neglected chronic disease to become permanent. The same tendency to pass into almost permanent disease is met with in dyspepsia, gout, and numerous other diseases. It must not be forgotten that chronic disease may become acute, and, too, often from apparently trivial causes; this is especially the case with tubercle and rheumatism, and in such diseases as gastritis and chronic diarrhœa or dysentery. The author has seen acute tuberculosis follow scraping tuberculous sinuses, and also after simple aspiration of a chronic tubercular pleurisy; it is no uncommon thing for patients with chronic rheumatism to get an acute attack from some indiscretion on their part. In most of these cases, at anyrate in rheumatism and diarrhœa, if the patients have only the sense to adhere strictly to the advice given them both as regards clothing and food, acute attacks would be entirely prevented. Paralytic cases die generally from cystitis or pneumonia, but if these can be warded off, as they can be, death will not take place until considerably later—not, in fact, until the respiratory muscles themselves become paralysed. The essence of the treatment of convalescents consists in keeping them continuously as near perfect health as possible, avoiding even the slightest causes of ill-health; remembering always that convalescents are ever so much more easily diverted from perfect health by slight causes than are healthy people, and that every such

diversion renders complete recovery less and less probable.

Convalescing surgical cases differ somewhat from medical ones. They have all suffered more or less from shock, either by accident or by operation. In nearly every case, too, there are the effects of prolonged rest to make up. In many cases there are the changes incident to prolonged suppuration, viz., degeneration (waxy) of various organs, with its accompanying malnutrition, to be counteracted. Patients are counted convalescing when still suffering from discharging wounds, as sinuses, healing or chronically discharging abscesses, and the like. There is no doubt that change of air is the very best treatment for these cases, but even the very powerful healing powers of sea air may be counteracted unless attention is paid to the general surgical rules of antisepsis and efficient drainage. The way in which cases heal at St. Andrew's Home strikes one coming fresh from London as nothing short of marvellous.

Section B.

SUBJECT—THE GENERAL MANAGEMENT OF CONVALESCENCE.

In this section it is proposed to consider some of the broad details of the management of convalescents by which they can be kept as near to the normal as possible.

How soon may a patient get up? is a question which

often perplexes nurses. There is no short rule in this matter; but as doctors become more experienced, they are able to decide better, and with greater confidence. Each case has to be determined by the constitution of the individual, the duration and severity of the illness, and, consequently, how much emaciation and tissue degeneration has taken place. It is best always to be on the safe side, and to keep patients in bed a few days longer than is really necessary, than to let them up too soon. Speaking generally, they should never be allowed to get up so long as their temperature remains raised at any period of the twenty-four hours. It is usual to allow six or seven days of normal temperature to elapse after an acute febrile attack, and then should rise of temperature follow the first getting up, several days longer in bed are rigidly enforced. In all cases the process of getting the patient on his legs again should be most gradual; thus, the first day the patient may be well wrapt up in a dressing gown and blanket, and just lifted on to a sofa, where he may remain for an hour, or less if he feels tired from the exertion. The next day the time may be increased a little, and so on according to the way in which the patient regains his strength. The evening is in most cases the best time of day for getting up, as it allows the bed to get cool and be made comfortable for the night. After the first getting up the convalescent will generally be very glad to get back to bed, and will mostly confess that he had over-estimated his powers. After the first time or so the strength will very quickly return, so that, at the end of a week or ten days, it will be permissible, if the illness has not been a long

one, for the patient to be up from ten or eleven in the morning until seven or eight at night. Still the temperature must be watched, and any untoward symptoms should be noted.

Patients should be weighed regularly every week whenever this is possible, as the weight forms a good index as to the progress they are making. It is not advisable to inform patients what their weight is, because, though it is certainly cheering to hear that they are gaining, they are apt to be despondent and attach undue importance to it when the contrary is the case. It is not at all uncommon to find that people, after convalescing from an acute disease, weigh more than they did before the attack. This may, in a large number of cases, be explained by the fact that they were failing in health and losing weight before the disease attacked them; that it was, in fact, this failing health, often expressed as "being for some time below par," which predisposed them to the disease in question. In other cases where extra weight has been gained and this explanation cannot be applied, it will be found that they return to their previous weight after a few months.

Surroundings.—As soon as the patient has been up a few days it is as well for him to move during the day to another room, which should be bright and cheerful, preferably facing south. Medicine bottles and all the appurtenances of illness, which are not required for constant use, should be kept well out of his sight, so that he may feel that he is really progressing.

Now is the time to be specially firm in protecting him from the meddling interference of chattering friends. If a good nurse is in charge, she will take care

that the doctor's instructions are carried out, and that the patient will be safe. Not only will the noise of people talking, and the exertion of having to talk in return, soon tire the invalid and possibly throw him back, but the people themselves are by their presence actually depriving him of another important thing which he greatly needs—viz., oxygen.

It should be seen that the room is well aired each day, and, if warm enough, the window may be gradually opened a little more and more each day, the patient of course being well protected from cold and draught. In winter the door may be opened instead, should there be any sign of the room becoming stuffy.

In all cases care must be taken that the patient is not allowed to go from a warm room to a cold one, or chill will certainly result. This is most likely to occur in going back from the sitting-room to the bedroom at night. The temperature of both rooms should be maintained as much as possible the same, and evenly so. One should be careful to see that the bed is well warmed with a hot water bottle, for the chill given by cold sheets, often bad enough when one is well, becomes a great source of danger to the convalescent.

If the invalid is allowed to sit up after dark, it is very necessary that the air of the room should be as little as possible used up by the sources of illumination. It should be remembered that, as a rule, so much air does not enter the room as in the day-time, because, owing to the lowered temperature, the windows are mostly shut; and that each gas jet uses up as much air as three men. As a rule, it is best to depend on

lamp light, and the smaller the lamp the better. Even after a patient is allowed to go out, he should avoid for a long time churches and places of public entertainment where the ventilation is deficient, and where large numbers of people are congregated together.

Clothing. — Whatever arrangements are made for maintaining the warmth of a patient while the disease is acute, it is very important, when convalescence has commenced, not to cover him in bed with heavy bed-clothes, which keep him in a constant state of perspiration. It is on this side that the mistake is most likely to occur, especially if one has taken great pains to impress the friends with the necessity of avoiding chill. An all-wool or flannel night shirt, or set of pyjamas, should be worn until the following summer. For underclothing, during the day-time there is no question but that wool everywhere from the neck to ankles and wrists should be the rule. Mostly it will be found that flannel vests and chemises are cut too low in the neck, so that the apices of the lungs, *the very parts most prone to disease*, are left almost entirely unprotected. When people can bear it, the flannel should be next to the skin. Many people cannot stand the itching which it sometimes produces; for such, the flannel may be lined with calico without much disadvantage. The special liability of convalescents to suffer from chill has been already mentioned. They also, as a rule, perspire more easily than people who are well, and are consequently still more liable to chill from the evaporation which follows. Wool is a bad conductor of heat, and also a very powerful absorber of water; thus it not only tends to keep off the

effects of chill from cold air, but also to remove a frequent cause of chill arising from the body itself. Great care should be taken to keep the feet warm with thick woollen socks. Cold feet give headaches, cold in the head, etc. One still occasionally comes across the old prejudice against changing the linen of the convalescent, on the ground of giving chill. Linen should certainly be changed often, and chill may be avoided by having it well warmed before it is put on. For the rest, clothes should be warm, and should not oppress the invalid by being of undue weight.

Exercise should be commenced very gradually, and should never be carried sufficiently far to induce fatigue. It is best to begin on a fine day with a walk of a few minutes' duration in the morning, and another in the afternoon. Next day the walks may be slightly lengthened, and so on. At convalescent hospitals, patients should be more or less prevented from overtiring themselves; they should be allowed out just before a meal to begin with, as their appetite will never fail to bring them back within the prescribed time. In commencing exercise, the tendency to syncope noted previously should be borne in mind; the convalescent must not attempt hills, running, or any form of violent exercise. The first effect of exertion on the heart is to increase the number of beats; the heart, in fact, responds to the call made upon it by the muscles for increased supply of blood. In the healthy heart, this increased work does it no harm, but hearts damaged by prolonged high temperature are unequal to the strain, and either stop altogether, causing death, or short of this syncope, or very

distressing palpitation. After exercise the number of beats falls considerably, and may intermit even in a healthy person, so that another period of danger has to be passed by.

On the lungs the effect of exercise is to increase the number of respirations, the amount of carbonic acid given off, and the amount of oxygen absorbed; it increases, in fact, the work of the lungs, and this is the point to remember in convalescents from chest diseases.

On the skin it increases its vascularity and the amount of perspiration, which is the reason that *after* exercise the patient is liable to take cold from too rapid evaporation. It is here that the advantage of wearing flannel is apparent, but the *patient should put on extra covering temporarily whenever sweating is induced.*

On the muscles exercise increases their size and strength, which had been considerably reduced by the disease.

On the nervous system it acts as a tonic directly by increasing the quality and quantity of blood in it, and indirectly by change of scene. The appetite becomes increased, digestion is better performed, the bowels are made more regular.

Rest should be taken in the form most agreeable to the patient. Some are more rested on a sofa or in an easy-chair, others are only rested by lying on a bed with a rug or something over them. Whichever way rest is taken in the day-time, definite times should be fixed. For private patients it is as well to insist on rests of an hour and a half both morning and afternoon.

This has the advantage of so splitting up their day, that it is almost impossible for them to take sufficient exercise to cause over-fatigue. The nature of the rest taken is of course modified by the disease from which the patient is convalescing. The principle of securing physiological rest for the injured organ, and freeing it as much as possible from functional activity, must be borne in mind, if any acute or subacute symptoms still exist.

Baths and Bathing.—It is very difficult to impress patients, and often nurses too, with the proper way of combining cleanliness with absence of risk from chill. Thorough washing can be done every day in every stage of the disease without risk. During the illness and early part of convalescence, while the patient is still weak and in bed, cleansing is best done by tepid sponging, with or without the use of soap. Chill is to be avoided by taking small portions of the surface at a time. The patient being wrapt in blankets inside the sheets, first an arm is released from the night dress and laid on a warmed bath towel, then the nurse proceeds with warm or tepid water to soap, sponge, and thoroughly dry it. Next the other arm, then each leg in turn are similarly treated and returned to the protection of the bedclothes. After this, the chest may be uncovered and rapidly treated in the same manner, then the abdomen. For washing the back the patient is turned on his face or side and each half of the back washed in turn. In this way, unless the process is unreasonably prolonged, ill effects are impossible, and the patient will feel refreshed and more comfortable.

As soon as they are up, people often have a great idea that a cold bath, or a sea water bath, would be most beneficial to them.

We know that the cold bath produces depression, followed, if not too prolonged in healthy people, by reaction. From what has been said in the previous chapter of the effects of disease on the heart and cutaneous circulation, it is obvious that cold baths will be unsuitable for convalescents for a considerable period after apparent return to health. It will readily be conceded that death might occur from shock, or a fatal chill might easily be taken.

A warm bath, on the contrary, *i.e.*, a bath about the temperature of 100° F., produces no shock or depression, so that when a patient can get up this may be permissible. The first warm bath should be taken just before going to bed. The bath should be placed before a fire, and surrounded on all sides by a screen, except that facing the fire. In this way all risk of chill is avoided.

A hot bath, *i.e.*, one about 110° and upwards, dilates the small arteries of the skin, induces perspiration, and depression of the nervous centres and circulation, so much so that a fatal syncope is no uncommon occurrence when taken under the circumstances we are discussing. Especially is this the case if there be any deficiency in the valves of the heart. Until convalescence is far advanced, some one should always be at hand while the patient is taking his bath, to render help in case of need. As regards sea bathing, it should only be taken by the very strong. It is a common occurrence for people coming here (to Folkestone) after

hard work and anxiety, without perhaps having had any special illness, to knock themselves up entirely by sea bathing, though frequently this is due to staying in the water too long. It is best to commence with a sea water bath in one's room for a few days, then for a week a bath in the sea every other day, the bath to consist merely of a plunge in the sea and out again at once. After a week of this, the bath may be taken daily, and slightly prolonged each time according to inclination. To get the greatest possible benefit from a sea bath, it should not be taken for two hours after a meal, and should not be sufficiently lengthened to induce *fatigue*. Sea baths, except for those in the most robust health, should only be taken on medical advice. Paddling is quite as dangerous and as inadmissible as bathing. The author knows of one patient who died from a chill caught while paddling, he being under the delusion that it was a harmless kind of treatment.

Sleep.—Until the convalescent is quite recovered, he should spend at least ten hours out of the twenty-four in bed.

Food.—After an illness, especially when attended with fever, the digestive tract recovers its normal power of digestion very slowly; it remains weak and irritable for a considerable period, and quickly shows signs of resentment if food, improper in quantity and quality, is given to it.

Mistakes in diet are very common, chiefly because the patient is not sufficiently convinced of the important influence which diet has on his recovery. How often are deaths during the convalescence from typhoid heard of, in consequence of patients taking solid food

surreptitiously! When convalescence is very long, as in scarlatinal nephritis, mistakes in diet are very apt to happen. The popular idea, that weakness is to be combated by solid, nourishing food, is at times very hard to overcome.

As a rule the necessity for regulating the diet is much greater after acute than in chronic diseases, the exception being of course where the digestive organs themselves are the subject of chronic disease.

In private patients, especially, it is more common to find convalescents suffering from too much food than from the food being indigestible.

The appetite, after an acute disease, such as typhoid, is often very great, and a relapse is almost certain to follow if any indiscretion is indulged in. After a relapse, convalescence is always slower than before. Dr. Fothergill wrote: "A maxim of Sir Frederick Roberts, in his Afghan experience, was, 'When you have once got an Oriental on the run, keep him on the run'. If his flight were not kept up he might rest somewhere, where it would not be so easy to dislodge him; consequently, it is best to keep him going. So it is with convalescence—it is best unbroken and uninterrupted. Once a check, and the onward progress has again to be initiated. And all initial movement is slow even in a Great Northern Express. Every stop involves a fresh start. Carefully, then, and with caution, liberal supplies of food may be given to the convalescent." The importance of routine and regularity in all things in the treatment of convalescents is nowhere more necessary than in the administration of food.

With the return of health the appetite comes back,

and the patient's thoughts are very much directed to his food. Meals form to him the chief events of the day, and between them he thinks a good deal of what he would like for the next. Consequently, the attention of the doctor, and the patient's nurse or friends, must be very carefully directed to seeing that nothing which can harm him is placed within his reach. In all cases where strict diet is necessary, everything he may have should be put in writing. Diet forms one of the greatest difficulties in private practice, for not only is it necessary to contend against too great eagerness on the part of the patient, but also to struggle against the well-meant but foolish interference on the part of his friends. The nurse's help is here most valuable.

Food should be given often but in small quantities, and the transition from fever diet to that of health should be most gradual.*

In convalescence the relation between the amount of food and exercise is much closer than in health. It is often found, that if a patient who is taking exercise every day is kept indoors by wet weather, the same diet will load his urine with lithates, and greatly diminish the amount of bile in the motions, even when these excretions have been previously normal. To treat a convalescent most satisfactorily, the doctor (or at anyrate an intelligent nurse who can report to him) should inspect both the urine and motions every day, and in those diseases where kidney complications are likely to follow, the urine should in addition be

* See chapter on Food.

frequently tested. Any deviation from health in the appearances of these secretions calls urgently for prompt medical attention.

The subject of convalescence has been gone into thus fully, because of the immense importance of the subject, and the fact that few nurses know anything about it. Nurses are apt to lose interest in their cases when the acute symptoms have passed off. It is hoped that this chapter will invest the convalescent with a new interest for nurses, and that they as nurses will be less willing to lightly undertake the responsibility of the management of convalescing patients, without the supervision and advice of a doctor. The author here takes the opportunity of thanking Sister Gertrude Emily, the Sister Superior of St. Andrew's Convalescent Hospital, for much of his present knowledge of the management of convalescence.

CHAPTER XVII.

Section A.

SUBJECT—THE EYE AND ITS ACCESSORIES. EYE DROPS. DISEASES OF THE EYE. RULES FOR TREATMENT AFTER OPERATION. EYE BANDAGE. EYE PADS. ATROPINE IRRITATION.

The eye consists of what is called the "globe," and certain accessory parts, as the lids, muscles, and lachrymal apparatus. It is lodged in a bony recess in the skull called the orbit, and protected in front by the lids and eyelashes. In the lids there are some little glands —the Meibomian, which secrete an oily matter for lubricating the edges, and so preventing tears from overflowing. The inner side of the eyelids is covered by a delicate membrane, the conjunctiva, which is reflected over and covers the front of the eye. At the inner corner of the eye, called the inner canthus, the conjunctiva makes a semilunar fold, close to which are the openings of the lachrymal ducts to carry the superfluous tears into the nose. The little lachrymal gland which manufactures the tears is placed at the upper and outer corner of the orbit. From its situation it will be obvious that the tears must form a stream across the front of the eye from the upper and outer part to the inner, and that hence when a foreign body, such as a

fly or piece of dust, gets into the eye, one should rub inwards instead of outwards as everybody does.

To put drops into the eye, the patient should either

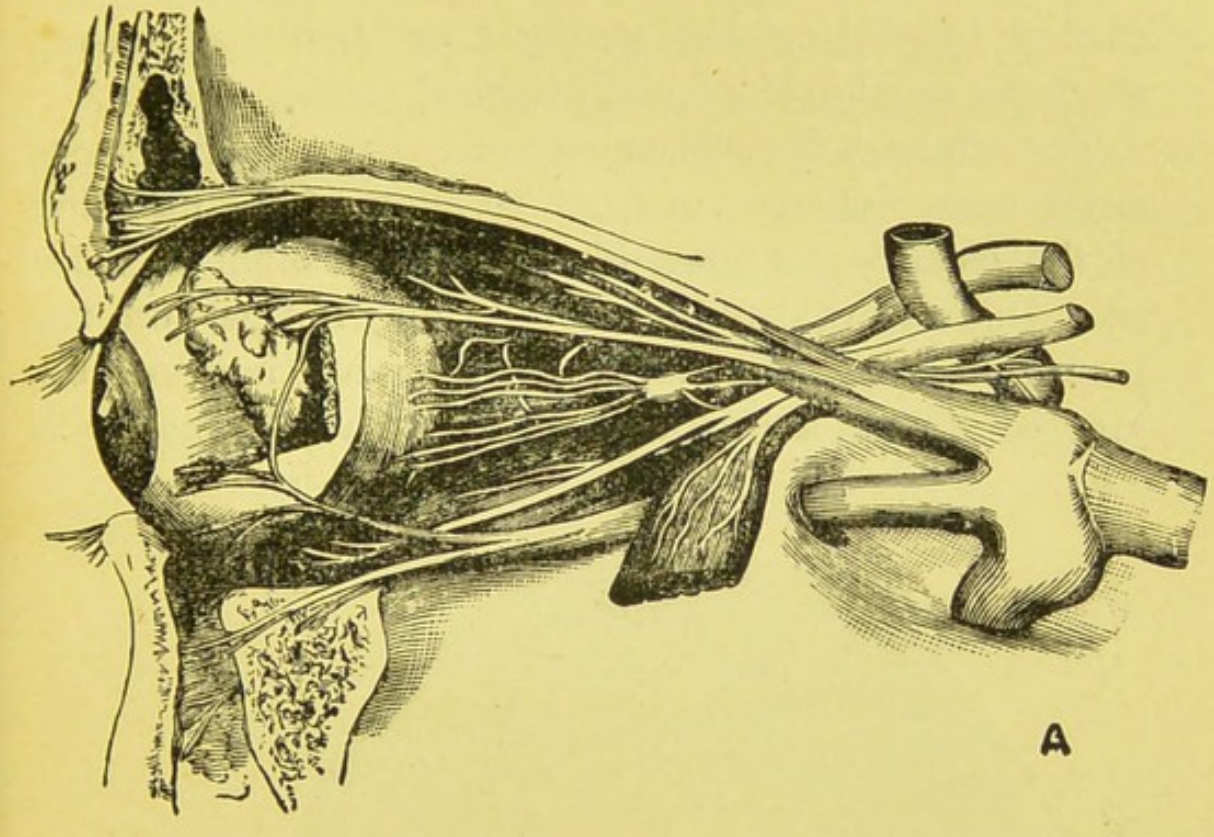


FIG. 84.—Section through the orbit showing muscles and nerves of the eye.

be lying down or the head be held well back, and the lower lid held drawn down at the outer side. The drops are to be *run* in, *not dropped* in, from a glass rod or tube. It is done by starting with the rod horizontal, then gradually raising the end furthest from the eye until the drop slides in from the end nearest the eye, which, though not quite touching, is very close to it. If they are dropped in with a splash the patient at once screws up his eye, and so squeezes out most of what was put in.

The eye is moved by six muscles, viz., four straight, an upper, a lower, an inner, and an outer, and two oblique, an upper, and a lower. Squint depends on some of these being too strong for the others. Surgeons cure it by cutting the strong ones' tendons, causing them to be shortened and attached further back.

The white of the eye, or sclerotic, is the tough fibrous outer coat, deficient in front to allow of the insertion of the clear watch-glass-like cornea for light to enter by. In order that too much light may not get into the back of the eye, the iris, or coloured part, is placed behind it. This is a circular muscle with a hole, the pupil,

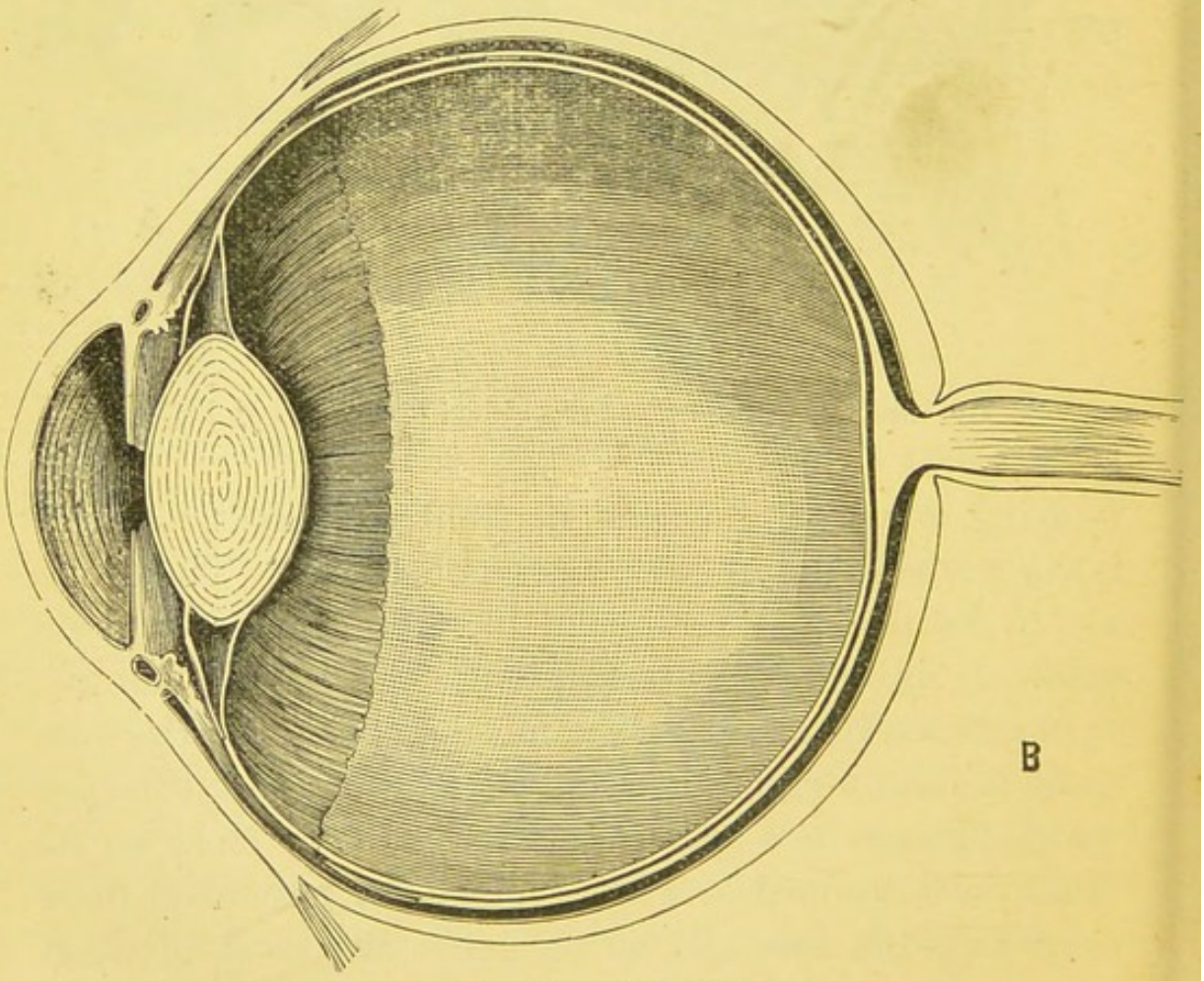


FIG. 85.—The globe of the eye.

in the centre. When a strong light shines in the eye the pupil is made small; on the contrary, when a person is in the shade the pupil becomes large. Between the cornea and the iris is a space called the anterior chamber, filled with the aqueous humour. It is shut off from the posterior chamber containing the vitreous humour by the crystalline lens, by means of which objects are defined. The posterior chamber has two linings inside the sclerotic: one, the choroid, is black and is useful in absorbing the superfluous light; the other, the innermost of all, is the retina, really an expansion of the large optic nerve which pierces the sclerotic and choroid at the back of the eye.

The lens forms clear images of external objects on the retina, which impressions are conducted by the optic nerve to the brain, and thus people see them. If the globe of the eye is too long or too short, images are not clearly defined, and thus long or short sight occurs. If the lens becomes opaque, the patient will be blind, and is said to have cataract. Iritis is inflammation of the iris. When it occurs the iris may stick to the lens, forming adhesions and an irregular pupil. For various reasons surgeons have to excise small pieces of the iris, the operation for doing so being called iridectomy. The cornea may be inflamed, keratitis, or ulcerate, corneal ulcer. Inflammation of the conjunctiva may assume different forms, and is then spoken of as simple, purulent, strumous, or phlyctenular conjunctivitis, or ophthalmia. Purulent ophthalmia cases are highly contagious, and are generally treated in a separate ward, with a special nurse. If the lachrymal

duct gets blocked, the tears will flow over the edge of the lids and down the cheeks.

There are four most important rules to attend to after eye operations, and especially after cataract extractions:—

1. They must be kept perfectly horizontal, not on any account being allowed to raise themselves for anything until the surgeon has given leave.
2. They must not be allowed to cry; if necessary the nurse must sit by them all day and amuse them to prevent this.
3. The dressing must be kept exactly as left by the surgeon.
4. On the first suspicion of sickness, information must be given to the surgeon or house surgeon.

If nurses are given eye cases to dress, they must dress them in exactly the same way as they have seen the surgeon do them. Each surgeon will prefer the nurse to use the same bandage that he does himself. The following is a good one: Suppose one wishes to bandage the right eye; using a soft bandage 2-in. wide, one would start over it, passing first to the left and round the head to the left eye again, then going on to the left ear, dip the bandage down behind it and round the back of the head, to appear again in front of the right ear, and thence upwards over the right eye to the centre of the forehead. Here it is pinned, the pin being at right angles to the direction of the uppermost turn, a reverse made, and the bandage pinned and cut off over the left ear.

Eye pads are made of cotton wool cut with scissors, of such a size that the edges rest on the bony margin of the orbit, and slightly thinned in the centre to allow for the projection of the cornea.

The most important drugs used as eye drops are atropine, esserine, and cocaine. Atropine and cocaine dilate the pupil, esserine contracts it. All are used in solutions of varying strengths, which it is very important to keep to. Some surgeons use discs made with gelatine and containing these drugs. They are inserted into the lower lid with a camel's-hair brush. The effect of atropine lasts for ten to fourteen days, which is often inconvenient ; so a drug called homatropine, whose effects pass off in an hour, is sometimes used instead. It is, however, very expensive. Both atropine and cocaine relieve pain locally. "Some patients will, after the instillation of a few drops of atropine into the eye, rapidly exhibit symptoms of poisoning by this drug," which symptoms it is important for you to know. They are : flushing of the face, rapid pulse, dry throat, and difficulty in swallowing. "In some individuals it produces a curiously irritant action on the conjunctiva known as atropine conjunctivitis ; this is sometimes quite severe, calling forth almost erysipelatous symptoms, at other times bringing out a crop of granulations." When any of these effects are observed, on no account put any more drops in the eye without the orders of the surgeon.

Section B.

SUBJECT—THE EAR. SOUND. POLLITZER'S BAG. SPECULA. DANGERS OF CHRONIC EAR DISCHARGE. MASTOID DISEASE. PYÆMIA.

Sound is produced by throwing the ear into vibrations ; a tuning-fork or a violin string may be seen vibrating

when it is producing a sound. The ear is arranged to receive vibrations, and transmit them to the brain. It consists of three parts: the outer ear which collects the sounds, the middle ear which transmits them on to the third part or internal ear. The outer ear or auricle has a passage, the auditory meatus, leading from it. This is a curved canal which passes first upwards and forwards, then downwards and forwards, so that when using the ear speculum we straighten it by pulling the ear upwards and backwards. It is closed at the inner end by a membrane, the tympanic membrane or drum of the ear, forming one of the sides of the middle ear. The middle ear is a bony cavity hollowed out in the temporal bone of the skull, and lined with mucous membrane continuous with that of the throat, by means of the Eustachian tube, which forms a communication between the two. In it are contained the little ear bones, three in number, making a chain across its cavity and having Latin names, the malleus, incus and stapes, from their shapes being those of a hammer, an anvil and a stirrup. The hammer is attached to the drum by its handle, which can be seen with the ear speculum; the stirrup fits into a window in the internal ear. By means of the Eustachian tube the middle ear is kept filled with air, so that the pressure on the two sides of the membrane is the same. When the Eustachian tube gets blocked, as in cases of sore throat, the pressure on the two sides becomes different, the membrane cannot vibrate properly, and so the patient is deaf. Surgeons unblock the Eustachian tube, either by passing a small tube into it from the nose (the Eustachian catheter), which is

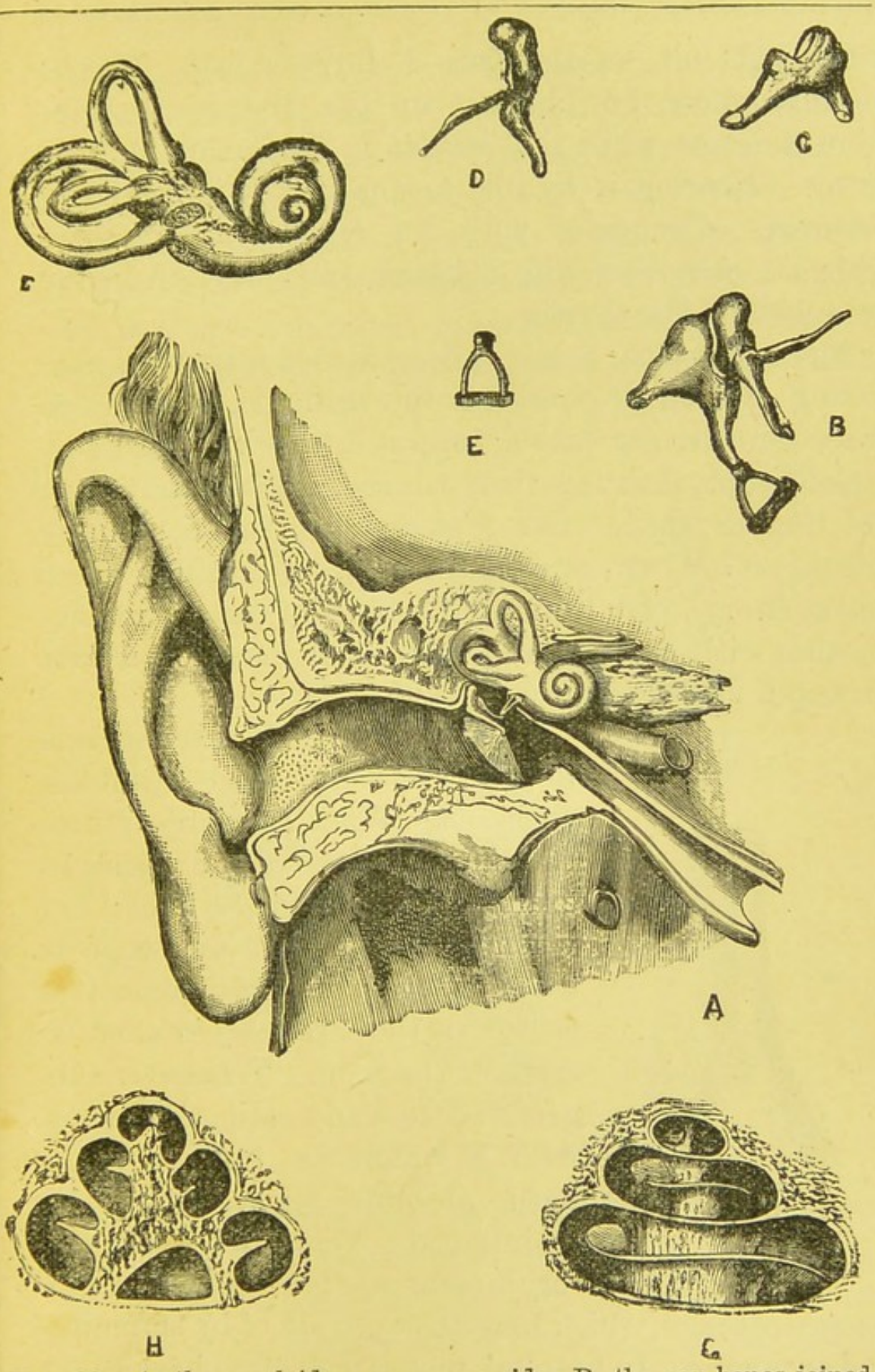


FIG. 86.—A, the ear laid open on one side; B, the ear bones joined together; C, incus; D, malleus; E, stapes; F, the internal ear and semicircular canals; G and H, sections of the cochlea.

rather difficult, or they use Pollitzer's bag. This is an instrument for blowing up the Eustachian tube from the nose while the patient is swallowing a little water. Hearing is by this means mostly immediately restored. Connected with the middle ear are some little air chambers, the mastoid cells, situated in the bone behind the auricle.

The internal ear is a very complicated apparatus, consisting of a small chamber, the vestibule, from which three semicircular canals, supposed to be the organs by which people maintain their balance, proceed, and a part, the cochlea, shaped like a snail's shell, and containing the organ of Corti, or essential organ of hearing. Here the auditory nerve from the brain is spread out in connection with an immense number of microscopic rods arranged like the keys of a piano.

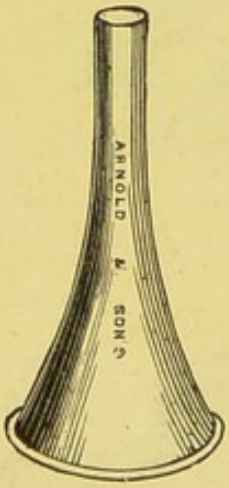


Fig. 87.—Ear speculum.

There are two sorts of ear specula in use: the simple, and Brunton's auriscope. When the surgeon uses the simple one the *ear* he wishes to examine must be to the light; but when the Brunton's auriscope is used, owing to its arrangement of reflectors, the patient's *face* must be towards the light. Whenever surgeons are testing a patient's hearing with a watch or tuning-fork, a most absolute silence must be maintained. Very often the auditory meatus gets blocked with wax or masses of scales, which have to be got rid of by softening and syringing. In hospital, nurses may often have to do

this themselves, though never except under orders, for all deafness does not depend on wax, and great harm may be done by syringing unsuitable cases. The softening is done by dropping in warm oil or glycerine and water. Never put pure glycerine in, because it is very likely to rupture the drum, owing to its attraction for moisture. Syringing is a very dangerous operation unless properly done, so no one should attempt it until they have had definite

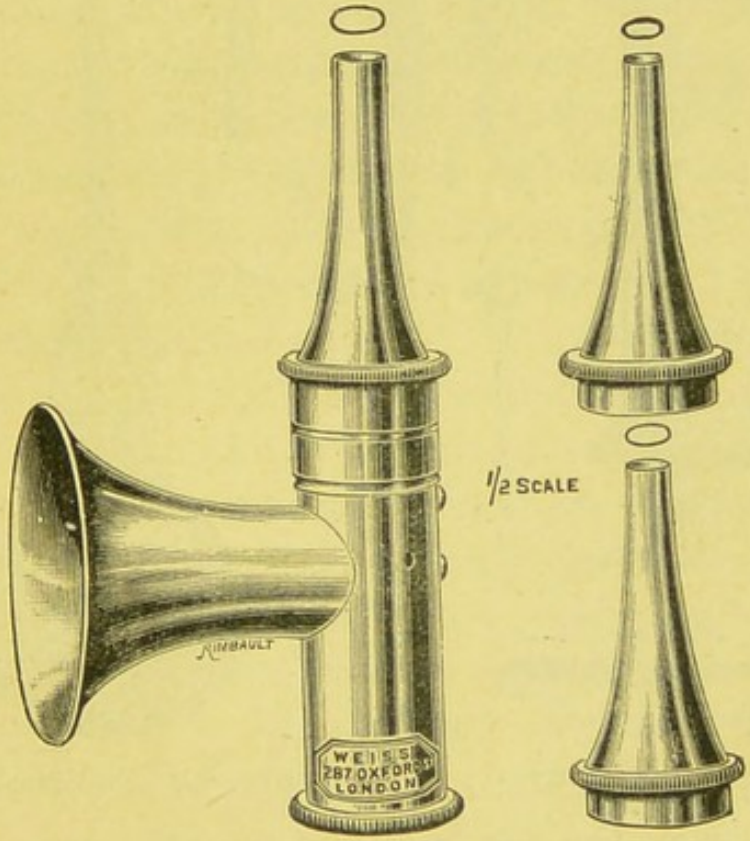


FIG. 88.—Brunton's auriscope.

instructions in the mode of proceeding; it is not easy to learn how to do it safely from lectures or books; one must be shown practically on a patient. A nurse should never try to remove foreign bodies by syringing, thinking that when she has learnt how to syringe properly she can do no

harm, for some, such as peas, beans, seeds, etc., swell up with water, and are thereby rendered more difficult of extraction. Frequent syringing will be required for those dangerous and troublesome cases of chronic

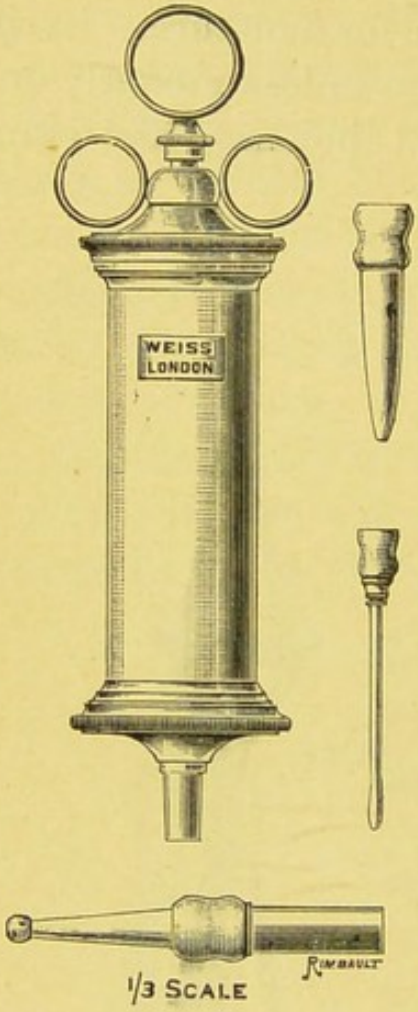


FIG. 89.—Ear syringe.

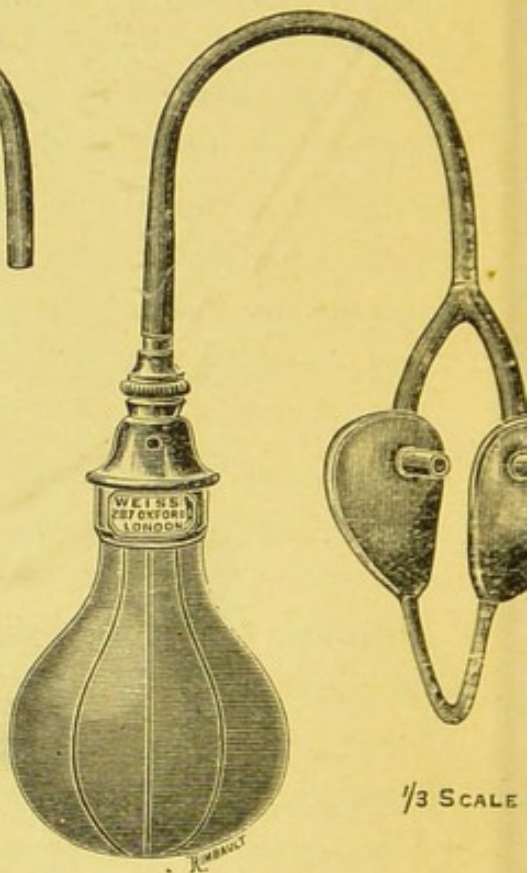


FIG. 90.—Pollitzer's bag.

discharge from the ear, many of which nurses will have the chance of gaining the credit of curing by these means. When the middle ear gets inflamed, as it may do in measles, sore throat and other diseases, it may discharge through the Eustachian tube into the throat, and give rise to very little inconvenience, but if, as mostly happens, this is inflamed too, and blocked, the

discharge collects in the middle ear, forming an abscess. In this latter case, fever, with deep-seated pain and throbbing, will result. This condition is treated, either by the Pollitzer's bag, or incisions are made into the drum to let the matter out. In neglected cases the abscess may burst through the membrane, causing as a rule more or less permanent deafness. Knife wounds of the drum heal readily, and hearing is regained, but holes made by abscesses do not heal. In cases of chronic discharge inflammation may extend to the mastoid cells, which, becoming shut off by the swollen mucous membrane, form a number of small abscesses. When this happens, the matter formed putrefies, and may be absorbed, giving rise to pyæmia, abscess of the brain, or meningitis. The treatment consists in drilling the bone to try and let out the matter ; the operation is not unattended with risk, but if not performed the case may prove fatal. These complications may occur because of the nearness of the abscess to the brain, the ear only being separated from the contents of the skull by a very thin plate of bone, perforated by small veins and lymphatics, allowing easily of spread of inflammation or absorption of septic matter. This is the reason that a chronic ear discharge is always regarded as serious.

CHAPTER XVIII.

SUBJECT—NURSING AT OPERATIONS. PREPARING FOR THE ANÆSTHETIC. DANGER OF FOOD IN THE STOMACH. RESTORATIVES. AFTER TREATMENT. HÆMORRHAGE. A UNIVERSAL RULE. CLEANING INSTRUMENTS.

NURSING in relation to operations is divided into three stages, viz., before, during, and after.

On the evening before the operation, the patient should have a warm bath and some opening medicine of some sort, to be followed, if necessary, by an enema in the morning. It has been found by experience that patients take anæsthetics much better if thus treated; vomiting is not so liable to occur, and the unpleasant effects of evacuation on the operation table are avoided. The nurse should see that the bladder is emptied immediately before the patient is brought to the operation room. To prevent vomiting also during the administration of the anæsthetic, no solid food is to be given for at least two and a half hours previously, though some surgeons order a tea-cupful or more of strong beef tea to be given about an hour before. Besides its unpleasantness, there is the danger that solid pieces of food may be drawn down into the larynx and suffocation ensue. For this reason it behoves nurses to watch that the patient does not procure food surreptitiously, under the impression that he would not otherwise have strength to undergo the operation; and should they find that he has eluded

their vigilance, they must report it to the operator, who will decide whether the operation shall be postponed. It is desirable that the patient should have a good night before the operation. Should he not, therefore, appear to be going to sleep, but be restless, the nurse should inform the house surgeon, when a draught will probably be ordered. As the time of operation approaches, the nurse must try as much as possible to give the patient something to occupy his mind, and prevent him working himself up into a fright over it; she should give him bandages to roll, pictures to cut, anything, so that she prevents him thinking about it.

For the operation, the patient must be warmly, but loosely clad, and so dressed that the part to be operated on can be easily got at. If, for instance, it is a breast case, the patient must be stripped to the waist before the anæsthetic is given; few things are so irritating for an operator as to have to undress a patient when under the anæsthetic. The nurse must see that everything is loose about the neck, that any clothing there is on is well out of the way of being soiled, and that while the part to be operated on can be freely got at, the rest of the body is well covered. With female patients the hair must be done in two plaits and all hair-pins removed; false teeth must be taken out before she comes into the theatre: in fact, the nurse should always ask if the patient has any.

During the operation, if there are sufficient nurses, one should be employed chiefly in looking after the anæsthetist, who may want clean towels, a bowl if vomiting occurs, or the anæsthetic bottle handed to him. A clean towel should be placed under the

patient's head, another should be ready in case it is needed, and a few dry sponges for the anæsthetic cone, which should be well washed and dried after each administration. It will also be the nurse's duty to see

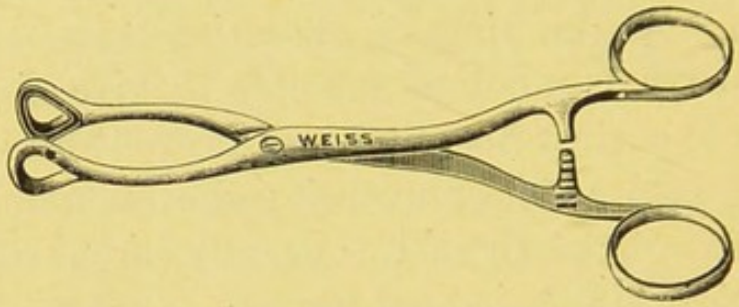


FIG. 91.—Tongue forceps.

that the restoratives are quite ready in case of syncope occurring under the anæsthetic. Those which may be required are: brandy (pure) for rubbing the gums, an enema syringe filled ready for use with brandy and water, an ether syringe also filled with ether, strong ammonia and nitrite of amyl, from both of which you will ascertain that the stoppers can be easily removed. Whenever an anæsthetic is given, these restoratives, together with the tongue forceps, should be ready for use. In addition, the battery should be close by, with the handles screwed on and the sponges moistened. These latter should be well dried before they are put away.

At operations nurses should remember that they are there to help the doctors, not to see the operation. They should be as useful as possible, but not get in the way or appear over-curious as to what is going on; they must anticipate the wants of the operator as much as possible. Each nurse should have a definite duty assigned to her

—one, for instance, should look after the sponges, another the instruments, and so on. As far as possible the dressing should be all cut and ready.

After the operation, the object is to get the patient back to bed as quickly as possible, so the nurse must do everything in her power to promote this. One nurse should accompany him to the ward, while the others clean up and prepare for the next operation, opening the windows if necessary in the interval. The bed should have been turned down ready to receive him, and the nurse should have hot bottles and blankets to revive him in case the shock should have been very great. Once in bed, a nurse must sit by him for half-an-hour or until he has completely recovered from the ether. While recovering they are for all practical purposes drunk, and unless watched may do themselves some injury, such as removing the dressing or getting out of bed. Until quite recovered from the anæsthetic they must be kept horizontal with only a low pillow under the head, any raising or sitting up being liable to be followed by a fatal syncope. Vomiting may occur as the patient comes round, so the nurse must take measures accordingly.

After the operation the points to attend to are to see that the part and dressings are kept exactly as the surgeon left them, to keep a vigilant watch for hæmorrhage or the discharge coming through, to note and report pain at once, and to notify early any rise of temperature. If hæmorrhage occur, the nurse will of course send for the house surgeon, who in hospitals is always quickly to be got. If the operation has been on a part such as the mouth where no dressings are used, she should endeavour to *put her finger on the bleeding point*

until he arrives, but where antiseptic dressings are used it is best to raise the limb as high as possible, and get everything ready for changing them. This rule of putting the finger on the bleeding point until the house surgeon arrives applies also to cases of hæmorrhage coming to the casualty room. If the bleeding point is not seen, she should dip a piece of lint or gauze in one in twenty carbolic and plug the wound with it, putting pressure outside this, and elevating the limb if it is a limb. This will be all that nurses will be required to do in hospitals at anyrate; under no circumstances should they waste time in trying to find out if the source of the bleeding is arterial or venous, for digital pressure on the bleeding point will be equally efficacious in either case. (See page 206.)

Food is not generally given for one or two hours after, and then only as soda and milk until all chance of vomiting has passed off. In abdominal operations, as ovariotomy and hernia, the house surgeon must be informed directly vomiting commences; if allowed to go on it may cause the stitches to cut out, and the abdominal wound to re-open. Patients after operations, like patients after fractures, not unfrequently get retention of urine. If this happens, the nurse will of course report it.

Instruments must be cleaned as soon after the operation as possible, not left to rust till the nurse finds it convenient. She should clean first the knives and cutting instruments, and as each instrument is dried, it should be laid on a cloth before the fire for an hour to make quite sure of its being perfectly freed from moisture. For all instruments with teeth, a nail-brush should be used.

It has been described before how sponges are washed, but if they get much filled with clot, they should be boiled with soda and water.

As a general rule all tumours, or pieces of bone or limbs removed, must be kept until permission to dispose of them has been obtained, and the same rule applies to all evacuations of pus or fluid, which should in addition be accurately measured.

CHAPTER XIX.

SUBJECT—CHILDREN. FACTS ABOUT CHILDREN. SLEEP. GENERAL TREATMENT IN HEALTH. FOOD. WEANING. ARTIFICIAL FEEDING. THE FEEDING-BOTTLE. COMPLICATIONS OF TEETHING. CONVULSIONS. CHARACTERISTIC CRIES. SYMPTOMS OF RICKETS.

THE nursing of children is a good deal harder than the nursing of adults, if only for the reason that the former are unable to express their wants and discomforts in words, which the latter mostly do in abundance. All the requirements of children have to be made out by training the powers of observation to the utmost. Children differ from adults in many ways: they are growing; their vitality is less; their food is different; their diseases run a different course; and they are subject to many diseases from which adults are exempt. Briefly will be mentioned a few facts connected with them. In the newly-born infant respirations are 44 per minute, gradually however slowing down to 28 by the end of the first year, and 25 by the end of the fourth. The pulse in the first year is 130, slowing to 110, and by the end of the fourth to 100. For the first three months very little saliva is secreted, after that dribbling commences. Their temperature varies about 2 deg. during the twenty-four hours, is easily raised by very slight causes, such as indigestion, and heat is very quickly lost, causing them to be very liable to the effects of chill. For the first week of life

an infant can distinguish light from darkness, but cannot distinguish objects; hearing is not good at first, but is better for high sounds than low. At the end of three or four weeks it laughs or smiles when caressed; at the end of eight it distinguishes the voices of its friends. In the third or fourth month it notices its toys; in the seventh to the ninth month it is able to sit up; from the tenth to twelfth it commences to walk, and by the thirteenth a properly-developed child should be able to walk alone. At the end of the first year it begins its first syllables, and by the end of the second should be able to string words together.

Newly-born children sleep all day, only waking for food; at a year old they sleep fifteen or sixteen hours, from two to three years they should sleep twelve or thirteen. After four or five they do not require any sleep in the day, but eleven or twelve at night. After twelve years of age, eight or nine are sufficient. An infant at term weighs $6\frac{1}{2}$ to $7\frac{1}{2}$ lbs.

The first teeth appear in the centre of the lower jaw at sixth to eighth month, and the last of the temporary set at the end of two or two and a half years. These begin to be replaced from six to twelve years by the permanent set.

The general treatment in health consists in plenty of fresh air, sunlight, warmth, cleanliness, regularity, and good food. All young children should have as much fresh air as possible, not only out of doors, but by means of ventilation indoors, and at night. A child's bedroom should be so ventilated that in the morning it smells as fresh as it did when the child entered it; all the rooms, as nursery, etc., in which it

spends any length of time, should be as freely ventilated. Sunlight is as important as it is for growing plants, and should not be shut out unless it is making the room unbearably hot or bright. Children should be bathed at least once a day, for the first three years of life at anyrate. The best time for the bath is two hours after breakfast; it should not exceed three or four minutes in duration, should be about the temperature of the body, and should be followed by a short sleep.

For clothing, flannel of different thicknesses, according to the season of the year, but flannel always should be worn. It should reach from the neck above the collar-bone to the wrists and ankles. Clothing should never be tight, or it prevents the proper expansion of the chest, and in very young children may cause vomiting; nor should ordinary pins ever be used, but "safety" always. Bedclothes should not be heavy enough to produce sweating, or the child will simply throw them off in its sleep, and very likely catch cold.

In feeding, to commence at the beginning, never give sugar and butter to a new-born child, as the mother's milk first secreted has a sufficiently purgative effect.

Dr. Fothergill says: "During the first month appetite ought to be the mother's guide in offering the breast, and if she know how to read the expression of her infant aright, she will want no other". Roughly speaking, it will require the breast every one and a half or two hours, with an interval of four hours at night. These intervals may be gradually increased as the child grows older, to three or four hours in the day, and six or seven at night. A child should be fed

regularly at fixed times, and *never because it cries;* it will very soon fall into regularly waking at feeding time, and will give no trouble in the intervals. It is very important that the mother should get a good rest at night, in order to keep her milk of good quality. If she feeds the infant the last thing at night it should easily go until six the next morning, but should it now and then prove fretful, the nurse will be able to quiet it with a tea-spoonful of sweetened barley water.

Weaning should be commenced between the ninth and tenth months, and should be always accomplished by the end of the twelfth. Breast milk after this does harm, not good, and predisposes to rickets, struma, and other diseases. Weaning should be done very gradually, a little ordinary food being only given once a day at first, then oftener, gradually replacing the breast, until it does so altogether.

Artificial feeding is necessary when the mother is unable to suckle the infant, either from death, ill-health, or from the milk not agreeing. To be done well, and with the best possible results, it should always be carried out under the supervision of a doctor; different children require different diets modified at different times. To be done so as to secure as healthy a child as possible, it must be done scientifically.

The feeding-bottle should be as simple as possible, in order that every part of it can be got at and cleansed. It is best in all cases to have two, in order that when one is being used, the other may be kept soaking in boracic or some other antiseptic solution, otherwise the milk will become sour and frequently cause vomiting. If, when the bottle is given at regular intervals, the

child refuses it, it may be because the inside of the teat is coated with sour curd, and as this mostly occurs after about a week's use, it is as well to have several of them and replace them frequently. The practice of giving a child a bottleful of milk to suck at, and leaving it to get on as best it can, is bad; the child should be given just as much as is ordered, and watched all the time it is taking it. While taking food, the child's position should be as nearly as possible what it would be if it were at the breast; vomiting is very likely to occur if it is kept too horizontal. The position of the bottle is also important; one frequently sees a bottle half full left on its side, so that the end of the glass tube is not in the milk at all, the only result of the infant's sucking being to fill its stomach with air.

The motions of a breast-fed child are dark at first, that is, for the first day or so, then for two or three weeks they are semi-fluid, homogeneous, and vary from a golden yellow to a dark mustard colour; after this, they begin to be gradually formed. Up to three or four months a child passes four or five motions a day. Those of artificially-fed children always contain some curd, and if the food is not agreeing, the curds become much increased in amount, and there is also vomiting, flatulence, and colic.

The period of dentition, from the sixth month to the thirtieth, does not much affect healthy children, but is dangerous to weak or rickety ones. The chief complications are feverishness, sleeplessness, inflammation of mouth, enlarged glands, diarrhœa, bronchitis, different skin affections, and convulsions. When sending for a doctor for the last, get ready a hot bath, for that will

probably be one of the things he will order, and in every case of indisposition in a child, save the motions for him to see, these forming one of his chief guides in treatment.

The cries of children are often distinctive, and a nurse should know how to describe them. In brain diseases they are short, sharp, and sudden; in stomach-ache, prolonged and wailing: when the pain is continuous, as in hunger, thirst, or ear-ache, the cry is continuous; in chest inflammations, hoarse and whispering. Cries do not always mean some of the above-mentioned, but may be due to uncomfortable positions, badly arranged clothes, flies, or being left alone. As a rule it is easy to control a child's crying, and nurses are expected to do so when the surgeon is going round, or there are visitors in the ward: she should use tact, and think. Sometimes simply making movements with the fingers before its face will succeed; or the nurse may give it something, show it a book, or, as a last resource, put her finger in its mouth, and let it suck it until the occasion for restraining it is passed. Sometimes placing another child on its bed will be sufficient to interest it and control its fretting temporarily. When a child cries whenever it is touched, the nurse may be sure there is something wrong, and should inform a doctor accordingly.

As regards the early symptoms of rickets, at first perhaps only dyspepsia will be noticed, which however is soon followed by slight fever, restlessness during sleep, abundant perspiration, especially about the head, and the bones become tender so that he cries on being moved or danced in the nurse's arms. The

abdomen becomes distended, bowels irregular, and the child pale and anæmic. The muscles become weak, so that the child cannot sit up like a healthy one, and makes no, or poor attempts at crawling.

Cleanliness is nowhere more important than in the nursing of children. Many of the different forms of eczema and other skin diseases are due to dirt or unsuitable clothing. Many affections of the skin arise, too, from not removing their soiled linen sufficiently soon. A child who is allowed to remain long wet and dirty soon acquires a so-called "diaper rash". This is an eczema of the buttocks, and parts enclosed in the diaper. After washing them, the greatest care should be taken to dry them thoroughly with a soft dry towel, and to powder them well where the surfaces come together, or on parts on which they lay. It is especially important, too, to see that each child has its own towel, sponge, and brush and comb. It is by a mixing up of these that such diseases as ringworm, ophthalmia, and nites are spread throughout a ward.

Nurses often find children very difficult to manage, but if difficult for them who are with the children all day, how much more so for the doctor who only sees them occasionally! His examinations are often rendered very difficult or impossible by the fear of the patient. A nurse can help him a great deal in this matter when once she has the confidence of the patient. She should give the child an old stethoscope to play with occasionally, so that this instrument may not be a source of fright to the little patient. In some cases a sufficient examination of the chest may be made if the nurse will take the child in her arms, so that its head

looks over her shoulder. Its back will then be turned to the doctor, who can then listen to its chest either with a stethoscope, which the child cannot then see, or by putting his ear directly to the chest.

Whether in bed or up, the nurse must see that the child is sufficiently covered, but not too warm. No child will get strong and well if it is always either chilled or kept in a bath of perspiration. Special care must be taken, too, to see that it does not get in a draught, or get placed under a window where a torrent of cold air will be continually falling on it.

The nervous system of a child requires care when well, but very much more so when ill. Children should not be startled by loud sudden noises, or awakened roughly out of their sleep. Noises which would frighten an adult might terrify children.

Miss Nightingale gives some excellent advice on this head.

"Never distract a child's attention; if it is looking at one thing, don't show it another, and so on."

"Never leave a child in a dark room by itself."

CHAPTER XX.

SUBJECT—VENTILATION. IMPORTANCE OF. HOW AIR BECOMES FOUL. NIGHT VENTILATION. NATURAL VENTILATION. TOBIN'S SHAFTS. VENTILATORS PLANTS IN A ROOM.

In beginning this subject it will be well to quote from Miss Nightingale's notes on nursing. She says: "The very first rule of nursing, the first and last thing upon which a nurse's attention must be fixed, the first essential to the patient, without which all the rest you do for him is as nothing, without which I had almost said you may leave all the rest alone, is this: to keep the air he breathes as pure as the external air, without chilling him". "To have the air within as pure as the air without, it is not necessary, as often appears to be thought, to make it cold."

Air becomes foul by respiration, exhalations from the skin, and from the burning of gas, candles, etc.

It has been seen in a former chapter that expired air contains more carbonic acid, and less oxygen, than inspired air. It also contains a large amount of foul organic matter, which easily putrefies. When large in amount, it imparts an odour to the breath, which is familiar to most people. It is this organic putrescent matter, with the watery vapour given off, which makes a room feel stuffy. When one has been long in a ward it is difficult to tell whether it is getting stuffy or

not, unless you leave it for a minute and then return, when any closeness will be at once apparent.

The means by which ventilation, that is, the removal of foul air and the replacing it by fresh, takes place naturally are: the diffusion of gases, the action of the winds, and the difference in weight of masses of air of unequal temperature. By the diffusion of gases is meant the tendency of air or gases of different compositions to mix freely together until they become uniformly of the same composition. This will take place not only when they are in immediate contact, as when the window is open, but also occurs, to a certain extent, through thick walls.

When air is heated it expands and consequently becomes lighter than the cold air outside, which thus, acting like water would, tends to rush in through any openings which may be made in the wall. The hot air being lighter, rises to the top of the room, as people will have noticed who have attempted to hang pictures by gas-light, when they will have found the heat at the top of the room almost unbearable. If a ventilator were put in close to the ceiling the hot air would rush out by it and cold air would come in through the cracks between the boards of the floor, under the door, and at the edges of badly-fitting windows. As a matter of fact cold air does come in in this manner to make up for the heated air which goes up the chimney from the fire. The fire is thus a good ventilator, but only ventilates the lower part of the room as high as the mantelpiece. The action of the wind blowing over the top of the chimney increases the up-draught in it, acting on the same principle as the little sprays for

scent; it also, of course, increases the amount of air coming in through cracks of floor, window, and door. When a window is opened at the top, cold air comes in like a waterfall, goes straight down to the floor, then along it to the fireplace, and up the chimney. This may also be verified by using the smoking brown paper.

All this leads up to the practical question as to how wards are to be ventilated. Long wards are arranged for cross-ventilation, that is, the windows are placed opposite each other; the nurse must note therefore which way the wind is, and open the windows facing the wind about an inch or two, and those away from the wind six or seven inches; thus there will not be any draught at the top of the ward, and part of the entering air will get slightly warmed by the warm air it meets before being diffused through the room. Some wards are provided with Tobin's shafts, by which a sort of fountain of cold air is admitted; this in the same way gets warmed and spread out before it reaches the patients, and thus draughts are avoided. Patients are apt to look with suspicion at the ventilators near the ceiling, and when they feel a draught are apt to say it comes from the ventilator. Generally they are wrong, as the nurse can easily point out to them with the smoking paper, showing that the hot air is leaving by them, not entering; but if it is a very windy day the ventilator on the side facing the wind may admit cold air instead of letting out hot. It is for this reason that a sloping board with sides to it is attached to them, causing the air, if in-coming, to be directed to the ceiling, and warmed before mixing with the general air of the room. So it must be very windy indeed before it will be

necessary to shut the ventilator on account of inconvenience to patients; at most only the ventilator on the side nearest the wind need be shut, but of course shutting the windows should be first tried.

There is another point besides the pureness of the air, and that is, the temperature of the ward. For surgical and chronic cases between 50 deg. F. and 60 deg. F. is the best, nearer 50 deg. in summer, nearer 60 deg. in winter, but for acute medical cases 60 deg. is the minimum. And by the temperature of the ward is meant the temperature at the level of the patients, as the temperature necessarily varies at different levels.

In ventilating a room, and registering the temperature, it is most important to remember that it cannot be set in the morning and expected to keep pure and at the same temperature all day without constantly altering it. Nurses must get into the way of noting every time they re-enter their ward after going outside whether the air seems pure, and of noting the thermometer every time they pass it, to see if the temperature is right, and making the necessary alterations accordingly. It seems a great nuisance at first, but they soon get to do it automatically, without thinking, and they themselves will greatly benefit, in feeling more cheerful and better able to do their work than when they leave ventilation to look after itself. When a nurse is always easily tired, and looks seedy, it is generally because she has not been attending to the ventilation either of her wards or her bedroom. Of course it is just as important to have good ventilation at night as in the day-time; the custom of shutting all windows and ventilators at night is simply a sign of

ignorance. More ventilation is required when the gas is burning, as each gas jet consumes as much air as three men, and of course much increases the heat of the ward.

All dressings, soiled linen, and excreta should be removed as quickly as possible, and on no account be allowed to stand in the ward.

The question of flowers is often a perplexing one. Flowers in the day-time give out oxygen and absorb carbonic acid; then they purify the air, and are pleasing to the eye. At night they absorb oxygen and give out carbonic oxide just as men do, but in a very slight amount; a whole tableful of flowers probably does not give out as much as one man. Still, for the health of the flowers, it is good to remove them from the ward at night.

Nurses should never forget to close windows when patients are being washed, or sounded, or wounds being dressed. but they should never forget also to open them again when these operations are over.

CHAPTER XXI.

SUBJECT—POSITION IN DISEASE. RAISING LIMBS. EXPERIMENTS. THE POSTURAL METHOD AND ITS NEW APPLICATIONS.

THE influence of position in the treatment of disease is so very important that the author has thought it best to give the subject a separate chapter.

In all acute illnesses, the first thing a doctor orders is rest in bed, and this is done not only that the patient may be protected from chill, but that there may be as little expenditure of muscular energy as possible, for even the maintenance of the sitting position involves a considerable amount of muscular work. The circulation is also carried on with more ease; hence the reason fainting people are at once placed on the floor.

In various chest affections, as bronchitis, pleurisy, etc., and wherever there is great difficulty of breathing, patients often assume of themselves a sitting position, for it gives more play to the muscles of respiration, and enables them to cough with more force. All who have seen much hospital work have come across cases of heart disease which have had to spend days and often weeks in the semi-upright position. Doctors regard the patient's feelings in this matter as a correct index for treatment, and very rarely interfere with them. There are, however, very few cases where it is imperative for patients to remain *days* in one position. The old "Gamps" were content to "let be," and bed sores

were common. Now, the nurses are expected to change the position of helpless patients many times during the day, in order chiefly to prevent bed sores. In typhoid and other diseases frequent change of position is very necessary to avoid a low form of pneumonia (hypostatic), which will otherwise certainly occur. So much do medical men expect nurses to effect these frequent changes of position, that they are accustomed, when patients are to be kept in one position only, to give special instructions that they are not to be moved.

Most surgical cases require more or less treatment by position. All abdominal operation cases must be kept rigidly on their backs, as, indeed, must all acute medical abdominal diseases, as peritonitis, typhlitis, etc. Fractures must be kept raised. The limbs must be elevated for operations, burns, wounds, and inflammations. As nurses often fail to grasp the object of this elevation, and to raise limbs sufficiently, let them perform for themselves a very simple experiment. If anyone raises their arm above the head, and keeps it so for some minutes, it will be found that the hand becomes white, and the pulse smaller or almost absent. Now, what has happened is this: the blood has been returned more quickly by the veins, for it has only to go downhill, but the arterial blood has to go uphill, and so arrives more slowly. The result is that less and less blood goes to the hand, and more and more leaves it, until very little is left. Thus it will be seen how valuable this must be in inflamed hands, or in hæmorrhage from a cut artery. One other experiment: if the hand and arm formerly raised be allowed to hang down for a few minutes, the reverse now takes place;

the veins return the blood with more difficulty uphill, and the arteries bring it with more ease. The hand soon becomes red, turgid, and swollen, so much so, in fact, that few people care to keep it hanging down long owing to the pain caused by the swelling. How much worse, then, must it be for patients, if the hand is inflamed, or if an operation has been performed on it? From these two experiments it will be obvious that the higher the injured limbs are raised the better, and the more they are allowed to hang down the worse for the patient. When limbs are to be raised, the joints should be bent, and not be on the stretch, as this soon gives rise to muscular pain. In order to effect this raising of the limbs, a great pile of pillows is not necessary; books, chairs, tin bowls, anything in fact, may be pressed into the service, and a pillow placed over all. It is best to keep in the ward a number of blocks of different shapes and sizes for this purpose. One more point on the subject of elevation: a leg must not be supported from the heel only, but should rest on the pillow *from the heel to the knee*, and an arm *from the hand to the elbow*.

In an operative case nurses should always try to remember the direction of the drainage tube, so that the patient may be put in the position best calculated to effect the speedy exit of the discharges. This is a point of especial importance in large abscesses, empyæmata, etc. The treatment by position has lately assumed importance from the publication of a book by Dr. R. L. Bowles,* in which a number of diseases have been rendered less formidable by being treated by the so-

* *On Stertor and the Management of the Apoplectic Condition.*

called "postural" method. This is so simple, so effective in those diseases for which it is recommended, and so many opportunities for its application occur to nurses, that it has been thought advisable to embody in this chapter a short account of its uses and applications.

Dr. Bowles has shown that there are in many diseases obstructions to the breathing which doctors have previously allowed to remain untreated, and have thus added the dangers of suffocation to those of the disease. He has also shown that mucus and other fluids in the mouth, throat, and chest may be got rid of by the method which he advocates for the relief of the obstructed breathing. In order to make it all clear, it will be best to first describe roughly the anatomy of the throat and neck as far as it refers to this subject.

The tongue and larynx are loosely kept in their places by being attached by muscles to the lower jaw just behind the chin, and to the upper end of the breast-bone—sternum. Usually when a person is conscious, and has control over the muscles, the tongue is kept pretty well in its place, but when a person is unconscious, and has consequently lost control over the muscles, the tongue swings backwards or forwards, according to the position in which the patient happens to be. The muscles are, in fact (in the uncontracted condition), longer than are required to keep the tongue in its place. If the patient happens to be lying on his face the tongue naturally falls forwards, and no obstruction to the breathing takes place, no matter how unconscious he may be. Should, however, he happen to be

flat on his back when unconscious, the tongue will fall backwards against the back of the throat and cause a more or less complete block to the entrance of air. This is why doctors pull the tongue out when symptoms of suffocation come on during anæsthesia. From what has already been said, nurses will readily understand that it would be easier and more effective to turn them on their faces, or sufficiently so, to allow the tongue to fall forwards by its own weight. But there is another fact to be taken into account, viz., that the chin is not a fixed point, so that if the mouth is wide open, or the chin bent down on the chest, the accident which is being discussed is still more liable to take place. Between a complete block and free passage, there are intermediate conditions when there is a narrowing only of the air passage through the throat, giving rise to gradual instead of complete suffocation. The effect of the air going with force through a small opening causes the sides of that opening, viz., the back of the tongue and soft palate, to vibrate and give rise to sound. Technically, this is called Stertor, and snoring is a familiar example of it. "Stertorous breathing" the reader has perhaps heard of before as a symptom in apoplexy and fracture of the skull. This has now been shown to be not a symptom of the disease, but simply *a result of the position in which the patient happens to be kept.* The result of stertorous breathing is slow suffocation; patients with stertorous breathing from disease are blue, owing to not being able to get enough air in. This stertorous breathing, this slow suffocation, can be at once removed by anyone who has a knowledge of

the above-stated facts; it is, in fact, their *duty* to remove it, just as much as it is their duty to rescue people from any other form of suffocation. Apoplexy cannot be cured by position, but by removing the suffocative symptoms a much better chance of recovering is given the patients than they ever had before, and there is no doubt that many cases could annually be saved if nurses once became acquainted with the proper way of treating them.

It is not necessary always to place patients on their *faces;* it is found, practically, that it is sufficient to put them in the semi-prone position, *i.e.*, half way between being on their sides and their faces, or even on their sides only. By the use of this method stertor in apoplexy and fractured skull can always and unfailingly be got rid of. It is not sufficient to put the patient in the position which removes the stertor; but he must also be *maintained* there. Much can be done with pillows properly arranged, but a constant watch must be kept to see that stertor does not return. If it returns the nurse may be sure that the patient has moved, or that the head has fallen forwards on to the chest.

It has been shown that the postural position will unfailingly remove the suffocative symptoms in apoplexy, chloroform suffocation, and coma following fracture of the skull, but there are other conditions in which the postural treatment is as useful.

In unconsciousness, causing the breathing to be interfered with, as in the case of epilepsy, convulsions in children, concussion, the insensibility which follows large hæmorrhages, drunkenness, and opium poisoning,

the postural treatment should immediately be resorted to and maintained until consciousness, giving control over the muscles, has returned.

In order to make this subject easily understood the other form of stertor has been purposely omitted in the description. When fluids or mucus are present in the throat or larger air passages, they give rise to "mucus stertor," *i.e.*, the noise made by the air bubbling through it, a sufficiently expressive term. Fluids may be present in the throat from various sources: they may come from bronchial secretions, or œdema of the lungs; they may be present as the result of attempts at vomiting; they may be the results of hæmorrhage from the lungs, blood in fact; but, whatever their source, their presence is dangerous, their removal by the postural method is easy, and certain.

If the fluids are in the throat, they will gradually flow out of the angle of the mouth which is lowest; but if, however, they are in the smaller air passages, as in œdema of the lungs, and in cases of drowning, the first effect of placing the patient on the side is to cause the fluid in the lung which is the higher to flow up to where the trachea divides, and then over the division into the lung which is lower; the latter rapidly becomes water-logged, while the former is free to carry on the work of respiration. If the patient were after a time turned on to the opposite side, the fluids in the then upper water-logged lung would commence to pass over into the clear lung now placed below, and the patient would be very quickly suffocated. Hence will be seen the great importance of keeping the patient continually on the *same* side.

That the falling back of the tongue is a real and not imaginary danger, is well illustrated in the case of sheep. In these animals the tongue and its attached muscles are much longer in proportion than they are in man; they are so long, that even when the animal is fully conscious, it is only necessary to keep him on his back to choke him entirely, merely from the tongue falling back against the wall of the throat, and entirely blocking the air passages. This is an accident which frequently happens in shearing.

To sum up, the treatment by position is of extreme importance in many conditions, but in none more so than in those of unconsciousness. It is urgently called for whenever stertor or other symptoms of suffocation are present, and it may be, and should be, at once applied by the nurse. That it has been properly done is at once apparent from the cessation of the stertorous breathing; and by the recovery by the patient of his natural colour when fluids are the cause of stertor, its success is shown from the exit of the fluids from the corner of the mouth.

NOTE.—Where a nurse is on special duty with a case, it is easy for her to maintain the patient in the proper position on his side with the head slightly back. Where, however, a nurse could not be spared, the author has frequently succeeded by an arrangement of bandages in keeping the patient in the necessary position, though they require constant attention.

CHAPTER XXII.

SUBJECT—PRIVATE NURSING. RELATION TO PATIENTS, DOCTOR, AND FRIENDS. WHAT TO DO IN CASES OF EMERGENCY. SUMMARY.

PRIVATE nursing will be found very different to hospital nursing, although the general rules mentioned in the preceding chapters apply. First, the nurse will have generally only one patient at a time, and the patient is mostly the person from whom she will receive her remuneration. Of course patients differ immensely, some giving almost no trouble, whereas others will never give a moment's peace. It is essential that the nurse should gain her patient's confidence, without which half her usefulness is done away with. Most private patients, seeing that they pay very highly for her services, will expect her to be always doing something for them; she cannot draw any hard and fast line as to what she may have to do beyond actual nursing—she will be expected to be useful as well. When patients are restless or fidgety, or cannot sleep, she may have to read to them, or the nurse may be commanded to "talk," when she must make her conversation as interesting as possible, avoiding, of course, all harrowing scenes from hospital life, many incidents of which, however, may be of interest to the non-professional patient. She must avoid, however, always talking about hospitals. Here one of the advantages of reading comes in, for those who read much will of course have more subjects to talk about.

The art of talking does not come naturally to everyone, but a great deal may be done in trying to cultivate it. Nurses must not be chatterboxes or gossips, for nothing can be more unnurse-like, but simply learn the art of being able to interest their patient and prevent him thinking about himself when this is an object to be attained. For children, all nurses should have a good stock of little tales and anecdotes, and be able to draw or cut out in paper rough imitations of men or animals. These things are just mentioned as examples, to point out that the treatment of private patients does not consist in nursing pure and simple only, but that they are expected to amuse and be companion as well.

If there are any alterations the nurse thinks would be advisable in the arrangement of the room, the best way of getting it done is to ask the doctor; she should not on any account begin turning the room inside out directly she arrives there, for often people are prejudiced against nurses, and such conduct only increases it. Two beds are a great boon to the patient, if he can spend the day in one, and the night in the other; in this way each bed gets a good airing. Patient's face, arms, and feet should be washed at least once a-day; with surgical cases, a more extended sponging can generally be managed every day.

In her relations with the doctor the nurse should remember she is there to help him, observe for him when he is away, and to carry out the treatment he prescribes. All his orders should be written down as given, or directly he has gone, and accurate notes of the case kept for his inspection. Should any emergency arise, nurses must act as they would in an hospital,

and, in sending for him, write shortly on paper the nature of the emergency, so that he can bring any drugs or instruments he thinks fit. She must use her own judgment about informing the friends that an emergency has arisen, and also about allowing them in the room or not. It would of course be cruel to exclude them if she thinks the patient obviously dying; in any case, she must get them to leave directly the doctor arrives, that he may not be hampered by their presence. The nurse will of course be perfectly loyal to the doctor in charge of the case, and will not think that, because he does not order the treatment she has seen adopted before, he is ignorant; or by word or look lead the friends to doubt his skill. No good could come of such conduct, and, after all, a qualified doctor generally has very few scruples about calling in a second opinion if the case is not doing well. Now and then, on a point of minor importance, she will possibly know more than the doctor, but such instances are not nearly so frequent or of so much consequence as nurses are apt to imagine, and the more experience she has, the more confidence she will have in doctors. Every house surgeon, for instance, thinks he could treat the cases better than the staff; but when he becomes one of them himself, this illusion is apt to be dispelled.

The friends, as distinct from the members of his household, are apt to give nurses a good deal of trouble, always wanting to be running in and out, chattering or communicating some irritating piece of gossip, and ever ready with unfailing remedies for all and every symptom. The nurse must deal with them once for all by getting orders from the doctor as to who may, and

who may not be admitted, and strictly carry out his orders. Whenever a nurse has any bother, she should appeal to the doctor, who will be her best friend; if she acts without him, she is liable to find her decisions reversed by his orders.

When an operation is to be performed nurses must try to make things as comfortable for everyone as they can. An operating table can be made by covering two dressing tables with blankets and arranging them T wise, and so placed that the part to be operated on is not away from the light, or in such a position that the operator will be between it and the window. Ordinary pudding dishes will make good instrument trays. Plenty of towels and hot and cold water will be needed.

One more point the author wishes to bring before nurses, as he is constantly hearing complaints from his private patients about it, viz., the amount of unnecessary noise which nurses frequently make in the sick room. Any one who has been ill themselves will understand the exquisite pain caused by a squeaky door handle, by basins being put down noisily on a marble washstand, by the shovelling on of coals, by the dropping of cinders, by the crackling of sticks in the fire, due to the nurse having allowed it to go nearly out, and by very many other preventable causes. It is only necessary to use a little thought to avoid these sources of annoyance. Thus a squeaky door should be oiled, and it can be prevented from making a noise when shut by tying a silk handkerchief from one handle, and passing it round the edge of the door to the other handle. Where the door fits too tightly for this, something less bulky than a silk handkerchief can be

used, such as a strip of leather or a piece of braid. The noise caused by the basin can be obviated by having mats or a folded towel on the washstand. The noise of coals can be avoided by having each piece of coal carefully wrapt in paper before it is brought into the sick room, no shovel need then be used, as each bit can be picked up with the fingers; the noise of falling cinders, either by a wire guard under the bars, or by keeping a thick layer of ash on the hearth; and the crackling of sticks, by not using them at all. If the nurse be careless enough to allow the fire to get so low as to require sticks, she may use instead a spoonful or two of brown sugar, or lumps of wax or grease from candle ends. When a patient is settling down to sleep, she should pin a notice, "asleep," to the outside of the door, so that no one may even knock at it; and if she is compelled, for any reason, to leave the patient alone for a time, she should always arrange that the patient can summon her by having a string attached to the bell for the patient to pull, or at least see that a hand bell is within reach.

These are given as examples of how much a nurse may add to the comfort of her patient by using a little thought. It is, of course, quite impossible to mention all the little ways in which a nurse may endear herself to her patient.

When relations of the patient come into the sick room, unless her presence is absolutely necessary, the nurse should always leave, mentioning, however, where she can be found at once if required. This will give the patient and her friends a chance of talking privately if they wish to do so. If she is doing her

duty, the nurse need not fear that she will be criticised adversely.

The nurse should try to be always ready for the doctor's visit. Even if not ready, she should endeavour to admit him to the room as soon as possible after his arrival in the house. He has generally many other patients to see, and time is mostly of the greatest importance to him. He should not be kept waiting either while the nurse takes the temperature; this should have been done and charted long before. As much as possible, all the arrangements of the sick room should be done as in hospital. The room should be as tidy as the ward of a hospital, and as much trouble should be expended on it as if the sister or matron were superintending.

If the nurse receives information about the patient which could have a bearing on the case, she should inform the doctor privately; she need never fear that he will mention the source of his information.

Whatever the nurse's previous social position, she should remember that she enters the patient's house as a nurse. If she is of equal social standing, or better, she must never presume on it, or think that, except in very rare instances, her presence is ever looked upon by the friends as anything but as one of the necessary accessories of the illness.

CHAPTER XXIII.

MIDWIFERY NURSING.

SUBJECT—MIDWIFERY NURSING. GENERAL DUTIES AT THE TIME OF THE CONFINEMENT, AND DURING THE MONTH.

MIDWIFERY nursing, or "monthly" nursing, as it is popularly called, consists in the services rendered by a nurse to a woman in her confinement. The remarks in this and the following chapters apply to midwifery nursing in the patient's house, but they apply with very little variation to lying-in hospital nursing as well.

It is usual for the nurse to be engaged for the "case" some months before she may be wanted, and it is a common practice for the patient to find the nurse. This is a very bad arrangement in many ways. First, because the patient has no means of knowing a good nurse from a bad one; and, secondly, because the nurse may have other engagements for the month before or the month after, and these engagements are apt to overlap, to the great inconvenience of both patients. In all cases where it is possible, arrangements should be made with an institute to supply a nurse on such and such a date. The date varies at the fancy of the patient, many preferring to have the nurse in the house a long time before the expected arrival,

others prefer to wait until the last minute. The confinement may be expected to occur between 273 and 283 days from the last day of the last menstruation.

When the nurse arrives, her first care should be to see that everything that may be required at the time of the confinement is in the house. A monthly nurse should always keep a list of these, that nothing may be forgotten. The nurse, too, should be able to make babies' clothes in the most comfortable and rational way. She should, in fact, be able to instruct the mother in most things appertaining to babies. The mother will not think so much of the nurse if she finds herself superior to the nurse in simple baby matters. When once all is prepared, so that there may be no fuss or flurry when the confinement takes place, the nurse should keep as much in the background as possible. She and the patient will see quite enough of each other during the time succeeding the confinement. It is an extraordinary fact that the patient and the nurse generally part from each other with feelings of mutual relief when the lying-in period is over. Possibly, familiarity breeds contempt. Knowing this, the nurse should, while waiting for the event, be as little in evidence as possible. When the child is born, she should study the feelings of the patient in every way, and endeavour so to act that the patient may regret her going, instead of looking forward to it. The popular saying of the old nurses to the patient, "I shall be very glad to *take care* of you," etc., should be thoroughly carried out.

Doubtless, about the time that the child is expected, the patient will suffer from pains of different kinds,

which she will fancy are commencing labour pains, and she will often summon the nurse in a hurry. The nurse should take care to be sure that they are so before sending for the doctor. Labour pains may be known by their commencing in the back, and recurring at regular intervals of a few minutes. If there is any doubt, it is best to send for the doctor. In any case, when the nurse thinks the confinement approaching, she should send an early intimation to the doctor that his services may be required.

At first the pains are short, and there is a long interval between, but gradually the pains become longer and the intervals shorter. The first effect of the pains is to dilate the cervix or canal leading to the womb, by pushing down the membranous bag of fluid in which the child is contained. This dilation is accompanied by the passage from the cervix of some blood-stained mucus, commonly called the "show". This, which is really of no consequence, has much importance attached to it by the old-fashioned nurses. When the cervix is sufficiently dilated the membranes tear, or are ruptured by the doctor, and more or less of the fluid escapes. "The waters" are said to have "broken". The character of the pains now change, and they become more "bearing down," instead of "grinding." As the child's head descends through the pelvis, it presses on the soft parts, and produces cramps and strainings. Finally the head passes out of the vulva, and is born. The body soon follows, remaining, however, attached to the mother by the "cord". The cord ends in the "after-birth," or "placenta". This is the means by which the child is

nourished while it is in utero. After an interval of fifteen to thirty minutes the placenta and membranes are expelled, and labour is complete. The empty uterus remains firmly contracted, and feels through the abdominal wall like a hard cricket ball. The length of labour varies considerably, as also does the rapidity. It may be only a few hours, or it may be very much longer. At the end of twenty-four or thirty-six hours, the doctor generally terminates it artificially, in order to prevent risk to both mother and child. Such are the phenomena of an ordinary uncomplicated case of labour.

In the preparation of the room where the patient is to be confined, the nurse does not always get her own way. A large airy room, with two narrow beds, wire mattress, floorcloth, south aspect and only the necessary amount of furniture, is best. Where there are thick carpets, it is best to have a large square of floorcloth, in the centre of which the bed stands, or if the bed is a large one, a square may be made to cover the carpet under the bed, but must not be nailed down. When labour is proceeding or douches being given, this may be pulled out a considerable distance from the bed. Thus there will be no risks of spoiling the carpet when the waters break or if hæmorrhage occurs. The bed should be made up in the usual hospital way, with a mackintosh and draw sheet, but over these should be a larger mackintosh and sheet, and over this again the sanitary sheet to be mentioned later. This latter may be removed when the confinement is over, and thus the patient will be left in a clean dry bed.

Poor people mostly prefer to be confined in their

clothes, but in a hospital and private nursing, it is usual for the patient to wear night attire. In the first stage of labour, before the pains become bearing down, the patient prefers to walk about. She is therefore dressed somewhat as follows: First, a clean nightdress is put on, but this is folded and fastened up with pins or otherwise well about the waist, so that it may not be soiled; over this again is put another nightdress. While walking about, the patient has, in addition, drawers, stockings, shoes, and an ordinary dressing-gown. These, however, are discarded when the patient lies down, and when the pains become bearing down.

The nurse's duty during the labour consists in comforting and cheering the patient as much as possible. She must see that the rectum is well emptied by an enema at the commencement, and that the bladder is frequently emptied. During the pains, she must support the patient's back, rub her legs, and generally make her as comfortable as possible. Patients during the confinement are not able, as a rule, to take much nourishment. It is therefore useless to keep trying to feed the patient. On the other hand, she must not be allowed to become faint from want of food. A few ounces of liquid nourishment, such as egg and milk mixture, every hour or so, will be usually sufficient. In the last stages of labour, when the pains are insufficient to bring about the birth of the child, it is usual to aid the bearing down efforts by attaching a stout towel to one of the bedposts. This the patient is directed to pull on, while she presses against the end of the bed with her feet. On the Continent patients are mostly confined while lying on their backs, but in England

the "obstetric position," on the side, is the one adopted.

Patients having a child for the first time are apt to fear the arrival of the doctor. The nurse should therefore do all she can to modify this fear. She should announce the arrival of the doctor in the house to the patient before he reaches the room, and in a matter of fact tone. Nurses frequently upset the patient by making this communication in a way rather suggestive of a burglar being in the house. She should rather imply that now that the doctor has come, all will be well. When he enters the room she should at once conceal his black bag from the patient's view (if he is unwise enough to bring it in), and should report to him as to how often the pains are coming, etc. Thus the patient will get used to his presence. The nurse will have previously informed the patient of what the doctor will have to do. This consists at first in "trying a pain," and is nothing more than an ordinary vaginal examination performed during a pain. This is the time chosen, because it is easier then to feel what progress labour is making. He can feel then best whether everything is going on in a normal manner. The patient should be placed in the obstetric position before the pain comes on, so that he may not be hurried, or the pain pass off before the examination is completed. After an interval the doctor tries a second pain, which enables him to estimate the probable rate of labour. If all is well, but the labour only proceeding slowly, he will probably leave the house, to return again at frequent intervals until labour is nearly completed, when he stays until all is over. The nurse should take

advantage of his temporary absence to get the bladder emptied. As soon as the child is born, the nurse must provide the doctor with a pair of scissors and some thread for tying and cutting the cord. Then she must have a small blanket ready for wrapping the child in. The child in its blanket must at once be put out of the way in some safe place, whence it cannot possibly roll off or get hurt, as the doctor will probably require the nurse's hands for other purposes. When the placenta is expelled, or expressed by the doctor, a chamber must be provided for its reception, and the under part of a soap dish is to be handed to the doctor in order to receive any of the blood or clots, which generally accompany or follow the placenta. As long as he has the soap dish in use, the chamber must be handy, so that when the former is full it may be emptied into the latter.

It is usual to burn the placenta after labour.

For an interval of usually about half-an-hour after the placenta is expelled, the doctor will knead the uterus, so as to secure the efficient contraction by which hæmorrhage and "after-pains" are prevented. He will then leave the patient and prepare to go. Some doctors prefer to put the binder on themselves, most leave it to the nurse.

When the doctor is gone, the nurse has a great deal to do. From all the mother has gone through, she is glad to be left alone while the baby is being washed and dressed. All damp things should, however, be first removed from her, and arrangements be made for catching the discharges. A sharp lookout should, however, be kept for hæmorrhage. When the baby is

washed and dressed, the soiled sheets and cloths, together with the outer nightdress and upper mackintosh, should be removed. The binder is now put on. This consists of a broad strip of calico, or jack towel, which is pinned tightly round the patient's abdomen from the ribs down on to the hips. It is usual, too, to put a pad under the binder over the uterus to ensure its contraction. Many doctors consider this useless. The under nightdress is now to be pulled down, and the patient made comfortable. After a drink of warm milk, she will probably go to sleep, if left quiet and the room darkened.

The nurse will often find herself hindered, and her patience tried, by the presence of interfering but well-meaning friends or relations. Unless the doctor orders otherwise, the only person who has any right to be in the lying-in room is the husband, and he is much better in the next room for every one's sake. There he will be handy if emergencies arise, and he cannot feel happy in witnessing the phenomena of labour. There can be no doubt that a rapid convalescence is often prevented by the presence of friends or relations in the lying-in room, either during or after labour. It is curious, too, that the patient's married friends mostly take the time of their friend's confinement to detail to her all the fearful complications which they believed they themselves or near relations went through.

There is one more point about a confinement, and that is, that the nurse should take care to avoid any unnecessary exposure of the patient, both during it and after it is over. Not only will the patient's feelings be spared, but there will be no unnecessary risk from cold. A mistake may, however, be made on the other

side, leading to quite unnecessary soiling of sheets and blankets, which, of course, introduces the risks to be mentioned later.

For the first week the nurse will be very busy, and have little time for sleep or going out. She must console herself with the fact that the succeeding three weeks will be very much lighter.

If from any cause the doctor happens to be absent at the moment of the birth of the child, it is important that the nurse should know what to do, as well as what not to do. First, she should not express to the patient any anxiety that she may feel, and she should remember that the less she does the better. If she has nursed many cases, she will have noted how to support the perinæum during the birth of the head. This she may then do. As soon as the head is born, she should support it in her hand, and should not in any case attempt downward traction, as this would tend to rupture the perinæum. She should rather encourage the forward movement of the child between the mother's legs, and should therefore raise the upper. When the child is born, she should arrange it comfortably on its side, in such a way that the cord is not pulled on, and that the child runs no risk of being suffocated. Next she should place her hand on the uterus, so that in the event of hæmorrhage occurring she can exercise pressure on it; this would cause contraction of the uterus, and so stop the hæmorrhage. After half an hour, if the doctor is still absent, she may tie the cord and remove the child. Then she must return to the patient, and keep her hand on the uterus, gently kneading it. Sooner or

later the placenta will be expelled, remaining, however, probably attached by the membranes. With the left hand on the uterus, the nurse should seize the placenta with the right, and turn it round and round so that the membranes will become twisted into a rope. After a certain amount of this twisting the membranes will come away with the placenta. For the next half hour the nurse should keep kneading the uterus with her fingers, slackening her exertions when the uterus feels hard like a cricket ball, increasing them if it gets soft or if hæmorrhage occurs. At the end of half an hour, if there is no hæmorrhage and if the uterus feels hard, she may leave the mother and attend to the child. If all these directions have been carried out, and if the nurse has been careful to send again for the doctor when labour seemed imminent, she cannot be blamed if anything does go wrong, nor can she be accused of excessive haste or undue interference.

The doctor will probably visit the patient again within twelve hours of the confinement, and will require to know if the patient has slept well, if she has passed water, if there is any pain, if there is much discharge, and the temperature. On all these points the nurse must be able to inform him.

The diet during the first three days consists chiefly in farinaceous foods, *e.g.*, bread and milk, Benger's Food, arrowroot, gruel, etc. Beef tea, bovril, or broth may also be allowed. On the morning of the third day a dose of castor oil or other aperient is given. If this acts well, and the temperature is normal, a little boiled fish is generally ordered for the chief meal of that day, chicken for the fourth day, chop for the

fifth, and on the sixth day the patient resumes her ordinary diet.

For the first ten days at least, the patient remains recumbent in bed. Many doctors prefer to keep them three or four days longer, as there are very many troubles which may arise from getting up too soon. The first step is to be partially dressed, and lie outside the bed clothes. Then the patient may be moved for an hour or so on to a sofa. Next, to an armchair, and so on. The permission of the doctor must be asked for each stage. In asking permission, it is best to follow the doctor from the room, and ask out of reach of the patient's hearing; thus the patient will not be disappointed if the request is refused. Nurses should never try to pose as the patient's friend at the expense of the doctor, by trying to get him to consent to allowing more getting up or more food than he is disposed to give.

The nurse will, of course, take the temperature twice daily, and record the same on a chart, which she will be careful to show the doctor at each visit. Great attention must be paid to the action of the bowels and passage of urine. If it can be managed (and a good nurse should be able to manage it), the bowels should be made to act while the patient is lying down. With an ordinary bed slipper, there should be no difficulty. It is a good plan, too, to direct that the patient should pass water whilst leaning forwards in bed on her elbows and knees; because this position readily allows of the escape of any retained clots. With an ordinary boat-shaped urinal, which the nurse should hold for the patient, there should be no difficulty either.

TREATMENT OF THE CHILD.

In most cases, as soon as the child is born it gives evidence of life by commencing to cry lustily. At other times it is born apparently lifeless. In these cases, if the doctor is absent, the nurse should make attempts to rouse it. Sprinkling it with cold water, slapping it on the part nature has provided for the purpose, should first be tried. If no cry is given, the mouth should be opened and the mucus wiped away from it from as far back as possible. Then artificial respiration should be performed in the following simple manner:—

"The child should be laid on its side, and the head placed or held well back. The nurse should now grasp the elbow of the uppermost side, and raise it until it touches the side of the head. She should then depress it firmly against the side of the body. After a short interval she again raises it and depresses it again, and should keep on doing so at the rate of twenty times the minute. After twelve such manœuvres, she waits and watches a few seconds to see if breathing takes place naturally. If not, she should keep on performing artificial respiration until the doctor comes. She will know if she is performing the respiration efficiently by noting if air goes in and out of the nose or mouth. Should the mother have hæmorrhage while the nurse is thus engaged, the nurse should leave the child and commence kneading the uterus. The nurse will not separate the child under any circumstances before the half hour previously mentioned is completed."

The washing of the baby should be carefully performed. The child should be placed in a bath of warm

water, and gently soaped all over to remove the cheesy stuff with which it is covered. Any which is very adherent should be left. The child should be well and carefully dried. The cord is to be powdered over with boracic acid powder and wrapped in boric lint. A piece about two inches or more square has a hole cut in it. Through this the cord is drawn, and the lint either folded up with the cord inside, or another similar piece of lint is placed over it. This is renewed day to day for about a week, when the cord will probably have separated. If a raw surface remains, it should either be treated in the same way or dressed with boric ointment.

With regard to clothing, Dr. Playfair's remarks in his *Manual of Midwifery* may be shortly quoted. "The important points to bear in mind are that it should be warm, light, and sufficiently loose to allow free play to the limbs and thorax. All tight bandaging should be avoided, the clothes fastened with strings or sewing, and *no pins should be used.* The child should be bathed once daily, and after the first few weeks both night and morning. After drying the flexures of the thighs and arms should be dusted with violet powder, to prevent chafing. The excrements should be received in napkins wrapped round the hips, and great care is required to change the napkins as often as they are wet or soiled. When washed and dressed, the child may be placed in its cradle and covered with soft blankets or an eiderdown quilt."

There is no hurry about feeding the child. A child could live easily for three days or more without any food at all. Nevertheless, it is advisable to apply the

child early to the breast, because the fluid first secreted in them has an aperient property, and does away with the necessity for the meddlesome interference on the part of those nurses whose great delight it is to dose the baby with oil or treacle. These unnatural aperients administered thus early in life may lay the foundation of future endless troubles from constipation. There are three other ways in which nurses often give everyone who has to do with the baby an infinity of trouble. First, is the practice of giving the baby a "comforter". This is a solid rubber teat, fixed to a bone ring. The child is allowed to suck at this to keep it quiet. Its first effect is undoubtedly to do so. It causes the child, however, to secrete and swallow a very large quantity of saliva. This mixing with the acid gastric juice produces quantities of wind, and causes colic and vomiting. When at last the cause is detected and the child deprived of the "discomforter" it takes some time before it ceases to cry either from the loss of what it has become accustomed to, or before it ceases to suffer from the chronic gastric catarrh which has been set up by its use. Another source of trouble is when the nurse gets into the way of rocking the cradle every time the baby cries. This gradually leads to one person being almost entirely engaged in rocking the cradle to keep the child quiet. But perhaps the greatest nuisance of all is caused by the habit of feeding the child whenever it cries. This leads to the question of feeding in general.

If the mother is healthy and the child thrives on it, there is no question but that the breast milk is the proper and best food for the first nine months of life.

For the first few days, until the secretion of milk is well established, the child should be put to the breast at long intervals only, say three times a day for the first three days. After that, according to the amount of milk in the breast, the child should be fed every two or three hours, leaving four or five hours' interval during the night. After the first two weeks, the intervals should be three hours in the day and six at night. It is of the utmost importance that the child should be fed only at fixed times, which nothing should be allowed to interfere with. The child will soon get used to this, and will not cry for food in the intervals. Irregularity in feeding not only encourages crying in the child, but tends to set up diarrhœa or other digestive troubles.

For many reasons the doctor sometimes decides that the mother shall not nurse the child, and then some form of artificial food becomes necessary. He will decide what the artificial food shall be. During the first month the child will require a half to three-quarters of a pint in the twenty-four hours. It will require, therefore, two ounces to each bottlefull. In the second month it will require about a pint, and this should gradually be increased, until at the end of the sixth month when it should have about two pints. In feeding the child artificially, it should be held as nearly as possible in the position in which it would be if at the breast. One of the old-fashioned boat-shaped bottles should be used without a tube. Only the amount to be given should be put in the bottle, and *the nurse should hold the bottle the whole time the baby is feeding.* It is doubtless much more convenient to have

a bottle with a tube which the child can be left to suck at while the nurse is otherwise employed, but there are several very grave drawbacks to this plan. The tube cannot be kept absolutely clean, and is apt therofore to turn the milk sour. Also the bottle may be left with the child after it has sucked all the milk out. As it goes on sucking, it distends itself with air, which soon causes it to vomit, and thus all the food is lost.

The baby should always be weighed soon after birth and again at the end of a month or before, to see if it gains at the normal rate, *i.e.*, if its food is agreeing with it. The child should be weighed in its clothes, which should be weighed separately, and the weight deducted from the total weight. An average child weighs at birth from six and a half to seven and a half pounds. It should gain at the rate of three or four ounces a week, or a pound a month. For the first week, especially if artificially fed, it mostly loses weight.

CHAPTER XXIV.

THE APPLICATION OF ANTISEPTICS TO MIDWIFERY.

SUBJECT — GENERAL REASONS. SEPTIC DISEASES. CAUSES OF SEPSIS TO A LYING-IN WOMAN. THE ESSENTIAL POINT IN THE AVOIDANCE OF SEPSIS. WHAT ANTISEPTICS TO USE AND HOW TO USE THEM. DOUCHES, ANTISEPTICS, AND THE BREAST. ANTISEPTICS AND THE CHILD.

For a healthy normal woman the giving birth to a child is a simple and natural process. Much of the discomfort and many of the complications which occur are the result of the conditions under which we live. Some of these complications cannot be avoided, but the occurrence of sepsis in any of its varieties is perfectly under control, and ought to be avoided. Sepsis occurs under different forms, the most terrible of these being "puerperal fever," and its varieties. The term "puerperal fever" is used in different senses by different persons. Literally it means the fever of a lying-in woman from whatever cause. Its meaning is now, however, restricted to more or less prolonged fever over 100° or 101°, due to the introduction of septic material into the system of the patient from the genital passages after labour. In the past, when about one mother died in every hundred births from puerperal fever, when the cause of this was unknown or looked

upon as natural, when nothing was known about antiseptics, the doctor and the nurse probably took an equal part in causing the patient's death.

Now, however, that doctors are being trained in antiseptics from their first entry into the hospital, it is probable that the nurse, whose training has not been so thorough, who does not understand so well the great dangers that arise from not rigidly adhering to the antiseptic rules, who works in the absence of the doctor and free from supervision, and who, if puerperal fever does occur, can hardly have the blame definitely fixed on her, is in nearly every case the person who causes the infection. This is a fact which is every day becoming more and more recognised not only in the profession but also by the public.

In lying-in hospitals puerperal fever has been practically abolished, but it still flourishes to a certain extent in private practice. Erysipelas and scarlet fever are specially prone to affect lying-in women, and give rise to a very bad form of puerperal fever. To a nurse who has had no training except in monthly nursing, a training which, it is said, may be obtained sometimes in three months, the acquiring of sufficient skill in manipulation to be sure that she will never herself be a cause to a patient of peurperal fever, is to the author's mind an impossibility. A nurse, however, who has had thorough medical and especially a thorough surgical training will easily acquire the necessary skill. Speaking generally, the genital passages after labour may be regarded from a nursing point of view as a recent wound, and then all the ordinary rules of antiseptic nursing apply with slight modifications.

Not only is there nearly always a wound of some sort from slight rupture of the perinæum, or a little tear in the cervex of the uterus, but there is always a large raw surface in the uterus from which the placenta has become detached. It is quite obvious that a surface such as this may easily become infected by the neglect of the ordinary rules of antiseptic nursing. Especially will it be understood how this can be the case when it is remembered that a dressing cannot be fixed on it. The nurse should exercise as much care in changing the soiled pads as she would if employed in changing the dressings after a case of ovariotomy where it had been impossible to close the abdominal walls. Once let the nurse get this view of the situation, and she will find the application of antiseptics to midwifery perfectly intelligible, easy and safe. The author is in the habit of giving to all nurses who nurse confinements for him a printed card of rules for antiseptics for maternity cases. The reason of them is quite easy to understand if the nurse keeps the above instruction in her mind.

Rule I.—"If you have been at any time during the month previous to attending a maternity case exposed to the infection of puerperal fever, scarlet fever, or erysipelas, or have attended any septic or foul-smelling case, you are to inform the doctor in charge before entering on your duties."

The reason of this rule is that the nurse hereby transfers the responsibility for her attendance on the case from herself to the doctor. If he allows her to attend, he will give her direction for disinfecting, so that she may attend without danger to the patient.

Rule II.—"If you are suffering from sores or festers

on the fingers, or any discharge from the nose or elsewhere, you are also to inform the doctor."

He will then doubtless see that the nurse is cured in time to attend the case.

Rule III.—"You are expected to exercise the same care in an ordinary case of maternity as you would in a case of abdominal section."

This has already been explained above.

Rule IV.—"You are to attend in a freshly washed dress. If time allows it, you should have a warm bath and put on clean under linen before going to your case."

By this means the nurse will have as few septic things about her as possible. Clothes fresh from the wash are known to have very few germs on them.

Rule V.—"You must never perform an internal examination."

This rule, of course, is necessary, as, under the circumstances now being considered, the *nurse* is engaged to nurse the patient, not to conduct the confinement. A nurse who did not carry out antiseptics thoroughly might cause infection. In any case vaginal examinations are more or less necessary evils, to be performed as seldom as is consistent with the patient's safety.

Rule VI.—"You must not bring any instruments with you except a thermometer. You must inform the patient that she is expected to provide a new vaginal douche apparatus, a new nail brush, carbolised vaseline, a supply of antiseptic sanitary towels, a bottle of creolin, and a one-pound packet of perchloride wool."

The number of instruments required is so small that it is safer to have quite new ones for each case.

Bearing in mind the surgical rule that aseptic wounds do not usually require washing, it will readily be understood that douches are not generally ordered when there is no suspicion of septic infection. Many doctors, however, order them as a matter of routine, on the principle that prevention is better than cure. The new nail brush is for the nurse's use, and she should frequently avail herself of it. Her hands can hardly be washed too often, nor the nails scrubbed too much. The carbolised vaseline is for the doctor's fingers when performing the vaginal examinations, for the catheter or any other instruments which may have to be used. The antiseptic sanitary towels form the dressing. As with other dressings, they should be changed as soon as the discharge comes through or before. For the first twenty-four or forty-eight hours, they will have to be changed every one or two hours, but after that probably only three times a day. The nurse should no more think of using the old-fashioned diapers than she would put one of these on an amputation stump. After the ninth or tenth day, the discharge will probably have stopped, and no more dressings be required. The antiseptic lotion most used in private practice is creolin, in the proportion of a drachm to a pint, or stronger at the discretion of the doctor. There is no objection at all to using the same lotions as are used for an ordinary surgical case. Creolin is used for convenience and simplicity, because it involves a minimum of trouble, because its smell gives evidence of its use, and because it is non-poisonous, and being of a sticky

nature, it tends to remain longer on parts with which it has come in contact. The use of the perchloride wool is explained in Rule X.

Rule VII.—"While attending the case, you are expected to abstain from touching dogs, cats, or other domestic animals."

Dogs and cats are frequent sources of sepsis; and that this must be so is apparent when one considers where these animals go, and the infrequency with which they are cleansed.

Rule VIII.—"At the commencement of labour, you should see that the bowels are emptied by an enema. The vulva and adjacent parts should be well washed with creolin solution and soap (℥j ad Oj). This washing should be repeated after each use of the bowels or bladder."

The object here is that a loaded rectum may not be any bar to the progress of labour, and that the descending head may not force out the contents of the rectum just at the moment of its birth, a time which would be inconvenient and might increase the chance of infection. The frequent washings, too, are entirely with the view of maintaining strict asepsis, and removing at once all trace of any substances which might decompose and poison the patient.

Rule IX.—"Before the arrival of the doctor, you are to prepare two basins of creolin solution (℥j ad Oj). One is to be used for the purification of syringes, vaginal tubes, catheter, utensils, etc.; the other is to stand by the bedside, and is to be used for rinsing the hands of both doctor and nurse on every occasion previous to touching the patient in the neighbourhood

of the vulva, whether for washing or for any other purpose whatever. For washing you must prepare a fresh solution each time. The bed slipper, etc., are to be washed in the same solution."

On the principle of regarding the genital passages as a wound, the creolin solution takes the place of the one in twenty carbolic. The use of the creolin solution does not remove the necessity for frequent washing of the hands with soap and water, or for well scrubbing the nails with the brush.

Rule X.—"Under no circumstances are you to use a sponge for cleansing. Blue wool wrung out in the creolin solution must alone be used for this purpose, and on no account should the wool be redipped, when once soiled, into the lotion."

This, of course, is an ordinary surgical rule of avoiding sepsis. The temptation to use sponges is very great, on the score of convenience; but the risk to the patient is too serious. Ordinary sponges used for washing are reeking with germs of all sorts, which are kept in an active state by the continual moisture. If sponges are used, they must be properly purified in the surgical sense of the term each time after use. This would involve so much time and trouble as to render their use impossible.

Rule XI.—"If a catheter is required you must obtain it from the doctor. Before passing it, the vulva must be well washed in the creolin solution. The catheter must also be well washed in the same solution both before and after use, and lubricated with carbolised vaseline. All instruments are to be cleaned both immediately before and after use."

This is another rule which requires no explanation, as it is one on which is based the ordinary practice of surgery.

Rule XII.—"No douches are to be given unless expressly ordered. The external parts are to be cleansed with creolin solution at least three times daily, *i.e.*, at each change of the sanitary towels. Before giving a douche, the external parts are to be cleansed as well as afterwards."

As before mentioned, it is a question which depends on the doctor whether douches are given or not. Many doctors do not order them in private practice because they either think them unnecessary, or because they fear that much more harm may be done than good. They fear, in fact, that the nurse may introduce septic material. If, for instance, she neglected to wash the external parts before giving the douche, she might carry up on the end of the tube septic matter from the outside. There is a fear, too, with the ordinary enema apparatus that unless free exit is provided, the solution would be pumped with great force into the uterus, which might become distended and give rise to hæmorrhage. The latter risk is avoided if the tube be held on one side a little, so that the labia are separated, and by using the douche apparatus (Fig. 80). In hospital practice douching is the rule, not only because the supervision is perfect, but because there would otherwise be risk from the collection of a large number of cases together. The object of douching at all is to hasten the removal from the vagina of the clots and discharges which come from the uterus, and which if they did decompose would give rise to puerperal fever. The

position of the patient for douching is important. In the author's opinion, the position described in Chapter XV., Section B, is the very best and most efficient.

It must, however, be admitted that its disadvantage is that it requires some exposure of the patient, but against this must be placed the fact of its greater efficiency. If for any reason it is not desirable to give the douche in the way advocated, there are two other ways in which it may be done. The patient may remain in bed with an ordinary bed slipper or bed bath under her. The end of the douche apparatus may then be inserted, and the douche given. This method also involves much removal of the bedclothes, and is really the same as the previous method given more clumsily. The third method is to give the douche in the obstetric position. The patient is brought to the edge of the bed in this position, with a mackintosh under her. A large pad is placed over the pubes and between the legs, to prevent the lotion passing in front into the bed. A receptacle of some sort is held against the lower leg to catch the lotion as it flows from the vagina. In spite, however, of extreme caution, this method generally allows the escape of some fluid into the bed, and leaves the nurse plenty of work in the way of removing soiled sheets, night dress, etc., and the patient tired and exhausted. The remaining rules require no explanation, and are:

Rule XIII.—"All necessary dusting should be done by wiping the floor and furniture with cloths wrung out in creolin solution."

Rule XIV.—"All soiled linen, swabs, sanitary towels, etc., should be immediately removed from the bedroom."

Rule XV.—"Twice daily the patient should be well covered up, and the window and door opened for a few minutes to air the room."

Rule XVI.—"Immediately you are engaged to attend a case, you are to inform the doctor where your linen is washed, in order that he may ascertain that no infectious disease exists there."

To complete the arrangements there only now remains the "antiseptic basis". It would obviously be undesirable to place the woman on towels soaked in one in twenty carbolic for her confinement, so an antiseptic basis takes the form of a so-called sanitary sheet. This is essentially a thick sheet of antiseptic Gamgee tissue, which is placed over the drawsheet, and forms a basis fairly free from germs.

Antiseptics have certain uses too in connection with the breast. The common occurrence of sore nipples leads if neglected to abscess of the breast. This, if it occurs, will be treated by the doctor on ordinary principles, but its prevention is the work of the nurse. First, she should endeavour to harden the skin of the nipples by washing with spirit and water, equal parts, and well drying with cotton wool, after each application of the child to the breast. If the nipples are retracted, she should procure a nipple shield, or draw off the milk with a breast pump, and give it to the child in a bottle. If excoriations or cracks on the nipples have occurred, the same treatment should be adopted; but the doctor should be asked to touch them with nitrate of silver, which generally cures them. Of course, if nipple shields are used, they should be treated with the same antiseptic care as the bottles. Immediately after use

the bottle and the teat are to be well scalded, and then placed in a basin of water coloured pink with Condy's Fluid, where it should remain until next required.

The antiseptic treatment of the end of the cord while it adheres to the child has been described. It only remains to mention boracic acid is the antiseptic used for the child if an antiseptic is required. If it gets any inflammation of the eyes the nurse should at once wash them well with boracic lotion. If it gets "thrush" in its mouth, this should be well painted several times daily with glycerine and borax.

CHAPTER XXV.

THE COMPLICATIONS WHICH MAY OCCUR BOTH TO THE MOTHER AND THE CHILD.

SUBJECT—PRESENTATIONS. FLOODING AND ITS TREATMENT. AFTER PAINS. MILK FEVER. PUERPERAL FEVER. WHITE LEG. THE FORCEPS. CHLOROFORM ADMINISTRATION.

MANY of the irregularities and complications which occur in labour concern the doctor only, whereas others entail extra nursing duties. Some of the former will be mentioned as a matter of interest, and the latter as far as the nurse is concerned. In a usual way the child comes through the pelvis of the mother head first, and with the face directed backwards. Hence the top and back of the head are the first to appear outside. When the head is born, the face either turns upwards to the ceiling or downwards to the floor. This allows of the shoulders following with their long diameter in the longest diameter of the pelvis. From different causes this normal course of the head gets altered, and different "presentations," as they are called, occur. Hence the nurse will hear occasionally of face, brow, or occipital posterior presentations. Again, instead of the child coming head first, it may occupy other positions or presentations, such as breech, arm, foot, or knee presentations. Or these may be more or less combined

as hand and head presentations. Twin cases do not add to the nurse's duties at the confinement, but give an extra baby to attend to afterwards. Tedious or prolonged labours only lengthen the time during which the nurse has to remain at her post.

Retention of urine needs the catheter only on the doctor's express order. For directions for passing this see Chapter XV.

During labour the patient is often affected with painful cramps in the legs and thighs. These will disappear when delivery is effected, but some relief may be afforded by friction of the affected limb.

One of the most important complications which may attend labour is hæmorrhage, commonly spoken of as "flooding". This may occur before, during, or after labour. Many women have frequent small hæmorrhages before confinements, it may be weeks before, which are never serious, and which do not prevent the normal course of labour. A large hæmorrhage before confinement is mostly due, however, to "placenta previa". This is a condition in which the placenta is attached too low down, and the hæmorrhage is due to its premature detachment. The hæmorrhage from this cause is often alarming. If the doctor is there, the nurse has nothing to do but keep her head, and be ready to render him any assistance he may require. If he is not there, she must keep the patient quiet and lying down while he is being fetched.

If the bleeding is still going on when he arrives, the treatment he will probably adopt will be either to rupture the membranes, which alone is often sufficient to stop it, or he may "turn" the child

round in the uterus and bring down a foot. This will probably be an efficient plug, and control the bleeding. The labour will then be finished in the same way as an ordinary leg presentation. The flooding after delivery is more easily controlled as a rule. It results from inefficient contraction of the uterus. A fairly free discharge of blood-stained fluid after delivery is the normal condition, and must not be mistaken by the nurse for flooding. In most cases of flooding after labour the fact is sufficiently obvious to both patient and nurse, for the blood rushes out over the bedclothes and mattress until both are soaked, and then runs on to the floor. Generally the kneading which the doctor gives the uterus for half an hour after the expulsion of the placenta is sufficient to remove all risks of hæmorrhage by leaving it in a tightly contracted state. Flooding is an occasion which tries the nerve of the nurse to the utmost. There is no time to send for the doctor, for the patient may die before he comes. The life of the patient may depend on what the nurse does. Her aim should be to effect contraction of the uterus. She should therefore at once remove the binder and seize the uterus, squeezing it tightly in her hand. The first effect may apparently be to increase the bleeding; but this is only apparent, for it is really due to squeezing out of the uterus blood which had accumulated in it. This treatment, if efficiently carried out, is generally successful. Although the hæmorrhage has stopped, the nurse should keep squeezing or kneading the uterus for half an hour, or until the doctor comes. When he arrives, if the hæmorrhage has not ceased, he will probably first try the above treatment, and if un-

successful will possibly apply cold cloths over the uterus, and give an intra-uterine douche of water as hot as he can possibly bear his hand in. The nurse should therefore always take care to have hot water at hand. After delivery, the doctor generally gives a dose of ergot, and on leaving gives the nurse a dose to give in case of bleeding. This, of course, she will have done if bleeding has taken place, but she should always remember that the contraction of the uterus, and consequently the *arrest of the hæmorrhage, is much more quickly promoted by squeezing and kneading the uterus than by the administration of ergot.* In all cases of hæmorrhage the head should be kept low and stimulants avoided.

It is not always, however, that the occurrence of hæmorrhage is so obvious. Large and even fatal hæmorrhage may take place into the cavity of the uterus without any appearing outside. In these cases the symptoms will be those detailed in the account of internal hæmorrhage occurring in typhoid fever. The treatment by the nurse will, of course, be the same whether the blood appears externally or not.

"After-pains" are painful contractions of the uterus after labour. They are due to efforts on its part to expel clots, and are to a large extent avoided by efficient kneading of the uterus after labour. They should not be checked for the first day after labour. After this the nurse may apply warm fomentations, or ask the doctor for an opiate. Incontinence of urine after delivery is irksome, but requires no special treatment beyond the more frequent changing of the sanitary towels. Prolapse of the uterus, or "falling down of the

womb" as it is generally called, is caused by the patient getting up too soon, or doing too much when up. The enlargement of the uterus during pregnancy causes lengthening of the ligaments. After labour it takes some weeks for them to return to their usual length. If they are dragged on too much, they tend to remain long, and allow the womb to fall. The treatment is the avoidance of the causes which give rise to it, and use of prolonged rest.

Paralysis of the legs after delivery will recover without treatment. It is due to the pressure of the head during delivery.

The secretion of milk in quantity by the breasts often is accompanied by rise of temperature, headache, pain in the back and limbs, and furred tongue. The breasts become swollen, hard, and painful. This condition is described as "milk fever," and occurs generally about the third day. An aperient, with gentle massage of the breasts, either in a circular manner or from the circumference to the nipple, will soon relieve the condition. If the breasts remain painful they should be supported by a sling, and should any redness occur a few hours of poulticing will probably relieve it.

Puerperal fever, as has been pointed out, is caused by decomposition of the discharges. The first sign of smell in the discharge should therefore be actively treated by douching. If a foul-smelling discharge is accompanied by rise of temperature, the doctor will give an intra uterine douche. Provided this is done soon enough, the temperature will probably fall at once, and the discharge be free from smell. The nurse's duty therefore is to call the doctor's attention to it as soon

as possible. If, however, the septic poisoning has got the upper hand, rigors will probably follow, and all the symptoms of puerperal fever may be added. Thus there may be severe headache, fever, quick, often feeble pulse, suppression of the milk and the discharges, pain and tenderness in the uterine region, or even over the whole abdomen. There may be great prostration of strength and anxious expression. If the symptoms of peritonitis occur, such as vomiting and distension of the abdomen, the case may be considered hopeless.

Another form of septic infection which occurs later is the so-called "white leg". This is a tense œdematous condition, due to blocking of the femoral veins and lymphatics by clots. It is generally accompanied by pain in the leg and fever. Recovery from it is always slow.

Convulsions and insanity may occur during or after labour. The nurse should know of the possibility of their occurrence.

There are certain operations which occasionally occur in which the nurse's help may be required. It frequently happens that the perinæum gets torn during labour, and has to be brought together by stitches afterwards. In these cases the nurse should see that the patient's knees are kept comfortably tied together, so that the stitches may not be pulled on. A pad between the knees greatly adds to the comfort of the patient under these circumstances.

In cases where there is great difficulty in the passage of the head, it is common for the doctor to apply the forceps. He will require for this a jug of hot water to warm the instruments in, and nurse should be ready to

help in any way in which he may direct. In cases where the doctor fails to extract the head with forceps, it sometimes happens that the operation of craniotomy has to be performed. This consists in breaking up the head of the child with powerful instruments, which so reduces the size of the head that it can readily be brought through the pelvis.

In these operations, it is usual for a second doctor to be called in to give the anæsthetic. In cases, however, where another doctor cannot be obtained, it is usual for the doctor in attendance to put the patient under the influence of chloroform and then to hand the chloroform over to the nurse. On these occasions, although the responsibility rests entirely on the doctor, it is as well for the nurse to err on the side of not giving enough, rather than to aim at keeping the patient perfectly quiet.

There are many other conditions which may arise in the course of labour, but about these the nurse is not generally expected to know much, and for them the doctor will give special directions in each case.

For the child there are a few points to notice. If there is any deformity which has been overlooked by the doctor, the nurse must, of course, point it out. If the child does not pass water in the first twelve hours after birth, this, too, must be pointed out. The nurse must also notice if it is able to suck well, and if it is tongue-tied.

All other conditions must be managed on the general rules for nursing children.

QUESTIONS.

1. What is meant by respiration? State all you know of its uses.
2. What is the pleura? Mention any special nursing points in pleurisy.
3. Nursing points of bronchitis. What is dyspnœa? Describe Cheyne-Strokes breathing.
4. What is aneurism?
5. Nursing points in asthma. What is cyanosis?
6. What is hæmoptysis? State what you would do if it occurred (1) in an hospital, (2) in a private house.
7. What is meant by pneumonia?
8. What are the essentials of a well-made poultice? In default of definite orders, how often should they be changed?
9. Describe how you would apply a blister and all you would do to it.
10. What is the difference between a dry and moist inhalation?
11. Why are emetics used in bronchitis?
12. State what you consider your duties in a case of aspiration of the thorax.
13. What would you prepare for a case of (1) cupping, or (2) of venæsection?
14. What are the chief dangers of chest diseases?
15. How would you support a patient in bed?
16. What would you do for a restless patient?

17. What would you do in a case of syncope?
18. Should a heart case have a bath? If not, why not, and what substitute would you give?
19. What are your duties at the physician's visit?
20. How would you apply leeches; and how would you insure their biting at an exact spot?
21. What is meant by the apex and base (1) of the lung, (2) of the heart?
22. You are told to put leeches over the heart and liver. Where would you place them?
23. What is the epigastrium?
24. What are gastritis, typhlitis, dysentery?
25. What is hæmatemesis?
26. What different kinds of worms are found in the motions? Describe them roughly.
27. How would you look for gall-stones?
28. What is a fomentation?
29. Mention some of the nursing points in feeding.
30. What is the use of beef tea?
31. What may a nurse do to relieve thirst?
32. How may food be given otherwise than by the mouth?
33. State all you know about nutrient enemata. What size should they be?
34. What are the various kinds of enemata?
35. What are the uses of the kidneys?
36. What is renal colic?
37. What do you know about uræmia?
38. What would you prepare when a case of ascites is to be tapped?
39. What relation exists between kidneys and skin?
40. How would you remove scabs from the head?

41. What would you do if a case was admitted with pediculi of the head?
42. Discuss bed sores from a nurse's point of view. Are they preventable?
43. What are the rules to be observed in giving a patient a bath?
44. How would you prepare (1) a salt, (2) a sulphur, (3) an alkaline bath?
45. Should nurses give hypodermic injections? If so, how would you do it?
46. What are apoplexy, hemiplegia, paraplegia?
47. What are the causes and nursing points with regard to sleepless patients?
48. Give the nursing points of delirium tremens and your reasons.
49. What are the different kinds of fits?
50. What is the use of the blood? What are the properties of small blood-vessels?
51. Symptoms of fever? Special nursing points of rheumatic fever?
52. What is meant by the "typhoid condition"?
53. Name the specific fevers; how are they caused and spread?
54. What are the symptoms of internal hæmorrhage?
55. What are the complications of measles and scarlet fever?
56. What is the use of the cold bath in fevers? What can be substituted for it?
57. How would you take a temperature?
58. What are disinfectants?
59. In a case of scarlet fever what would you disinfect?

60. How should clothes be disinfected?
61. What are the rules for preventing fevers spreading in a private house?
62. What is tracheotomy? How would you assist a surgeon if he had no other assistant?
63. What is the after treatment? Why is it wrong to suck a tube?
64. What is meant by antiseptic surgery?
65. What difference do you notice between a septic and an aseptic wound?
66. A leg is to be amputated; what are your duties in such a case?
67. How do you make an antiseptic poultice?
68. How would you treat a small wound?
69. When a surgeon is going to put up a bad compound fracture, what would you get ready for him? What do you consider your duties after it has been put up?
70. How would you dress a case of necrosis of the tibia?
71. What are the symptoms of carbolic absorption?
72. What is an epiphysis?
73. What are the symptoms of a fracture?
74. In a doubtful case of fracture of the skull what do you look out for?
75. What is meant by (1) displacement, (2) reduction, (3) setting?
76. What are the complications of fractures?
77. How would you lift a fractured tibia or thigh?
78. What is synovitis?
79. What diseases is extension used for? How much weight would you put on?

80. How would you clean a catheter? What are the causes of catheter fever?
81. What are the symptoms of retention of urine?
82. Describe all your duties in nursing a case of ovariotomy.
83. How would you prepare an ovarian bed?
84. What precautions with regard to sponges would you take at an operation for ovariotomy?
85. How would you put drops in an eye?
86. What bad results may happen from the use of atropine eye drops?
87. What precautions are necessary in cases of purulent ophthalmia?
88. What rules are to be observed after eye operations?
89. Describe the treatment of a patient about to be operated on.
90. What restoratives are used for syncope at an operation?
91. What is the treatment of hæmorrhage?
92. How do children differ from adults?
93. How should a healthy child be fed for the first year? When should it be weaned?
94. What precautions are necessary with regard to the feeding bottle, and why?
95. What are the complications of teething?
96. What would you do in a case of convulsions?
97. What are the symptoms of rickets?
98. What is natural ventilation?
99. What is the use of Tobin's shafts?
100. Should plants be removed from a ward at night, and why?
101. How is itching of the skin prevented when splints are applied for fractures?

102. Describe the application of plaster of Paris, starch, and gum and chalk bandages respectively.
103. How are Bavarian and Croft's splints made?
104. Describe the different kinds of slings.
105. How would you treat (1) a fractured arm, (2) a fractured fore-arm, (3) a fractured thigh, (4) a fractured leg, if medical aid could not be obtained?
106. What are the uses of bandages? Give the general rules which should guide you in their application.
107. What rules would guide you in dressing a septic wound?
108. How is the cyanide dressing used?
109. How would you make a bed without raising the patient?
110. What rules would guide you in making a bed?
111. Give the general principles of ward management.
112. What are the essentials of a good nurse?
113. What is a hernia? What are the symptoms of strangulated hernia?
114. What rules would guide you in the management of trusses?
115. What are the different degrees of burns? What complications would you look out for? How would you treat them in the absence of medical aid?
116. What are the varieties of hæmorrhage? What treatment can you apply to all cases? What treatment would you adopt when a large artery of a limb is wounded?
117. What do you know about massage?
118. How would you test urine?

119. What are the rules for nursing obstetric cases?
120. How would you pass a catheter on the female?
121. Describe how you would place a patient in the obstetric position.
122. What are the classes of poisons? How would you treat each?
123. What are the symptoms of opium poisoning? and how would you treat a case of it?
124. What are the rules for administering medicines?
125. What drugs are you acquainted with whose action may set up poisonous symptoms?
126. Explain the following: "t. d. s.," "2ndis horis S," "post cibos," "ante cibos". What is a prescription?
127. How much by measure are the following: a dessert-spoonful, a wine-glassful, a tea-cupful, a tumblerful?
128. Give the table of weights and measures used in medicine.
129. What is the "postural treatment"? In what conditions would you apply it?
130. What is stertor?
131. For what reason are limbs "raised"? How would you "raise" an arm and a leg respectively?
132. What general rules would guide you in the management of convalescents?
133. What is convalescence? Give all the details you would pay special attention to.
134. How would you treat a patient suffering from concussion until a doctor arrived?
135. What would you do in a case of internal hæmorrhage?

APPENDIX.

APPENDIX.

SPECIAL RULES FOR THE GUIDANCE OF NURSES.

1.—The wards shall be kept clean and in good order, by such means and at such times as must be deemed most expedient, provided that such times do not interfere with the visits of the resident medical officers or of the medical staff.

2.—Every ward shall be kept thoroughly ventilated. The temperature of each ward shall not exceed 60 deg. F., and shall not be lower than 56 deg. F., by the thermometer. The nurse shall consult the medical officer whenever there is any difficulty in effecting this conveniently, and shall expect to receive orders or suggestions from him frequently as to general condition of the air of her ward, and as to further ventilation.

3.—Each patient shall be attended to *immediately* on admission, and receive such nourishment as he or she may require.

4.—In the case of any patient complaining of great pain or presenting any grave symptom, the nurse attendant on such a case shall communicate at once the state of such patient to the medical officer, and in the case of any patient complaining or appearing worse in the evening, the day nurse shall, before leaving her ward for the night, let the medical officer know the state of such patient.

5.—To inform the medical officer of any irregularity occurring in the wards, such as the admission of visitors at improper hours, or the absence of any patient without leave, or the absence of any patient beyond the specified time of leave, or the introduction into the wards of any article of consumption whatsoever.

6.—To take the discharge papers of each patient to the secretary's office, as the patient leaves the hospital, and to inform the medical officer of the departure of such patient when there is any special reason for doing so. In the event of a patient dying, the nurse shall write at once upon his card the date and hour of his death, and initial it.

7.—The bottles and cards shall be sent to the dispensary as early as possible after the visit of the medical officer.

8.—Nurses are to wait upon the sick, and to administer to them all medicines and medical and surgical applications, according to the direction of the medical officer, and no medicine is to be given without his order or permission.

9.—To see that patients are supplied with the food ordered for them; that they have the requisite changes of linen, are kept perfectly clean, and are prevented from exchanging with or giving to other patients any of the diet ordered for them.

10.—To see that all meals are served as quickly as possible on arrival, and to report to the medical officer any complaint as to quality and quantity of food; and also to report if any patient has not taken the diet ordered, or any part thereof, in order that the medical officer may alter or modify such diet, and so avoid waste.

11.—To inform the medical officer immediately of any marked change in the condition of a patient, and to report to him on his morning visit the names of all the patients who have not slept or have been restless during the night. To enter in a book called the "nurse's ward book," and provided for that purpose, all instructions given to the medical officer for the treatment of any case, and to direct the attention of the night nurse to the same when going off duty. To enter any change she may notice in the condition of any patient.

12.—To give notice to the secretary of the dangerous illness of any patient, in order that the friends may be informed without delay.

13.—To fill up two notices when death occurs, and send one to the medical officer and one to the secretary.

14.—To give a bath to each patient once a week, unless otherwise ordered by the medical officer; to see that the temperature of the water is no higher than 90 deg. or lower than 65 deg.; to turn on the cold water first; and not to bathe more than one patient in the same water.

15.—The nurse is responsible for the condition of her ward. She shall keep the keys of her store closet, medicine chest, and lock up places which may be provided in the wards. All medicines, lotions, liniments and stimulants, with ointments, lint, etc.,

etc., to be kept locked up, and nothing belonging to the wards is to be kept in the nurse's room or kitchen.

16.—No ward is to be left by all the nurses at the same time.

17.—The nurse will have charge of the whole of the body and bed linen belonging to her ward, the inventory of which will be checked from time to time; any loss must be immediately reported to the matron. All linen unfit for use to be brought to the linen room to be changed at such intervals and at such times as the matron may direct. Needles, tapes, cottons, and house flannels will also be given out once a month. Sewing work will be given out daily between 9 and 10 a.m., and finished work is to be brought back at the same time.

18.—The nurses shall not leave their respective wards without permission; and all talking, laughing, running in the corridors and in the rooms, stairs and passages of the hospital is strictly forbidden, as also any unnecessary delay in the entrance hall when going out or coming into the building.

19.—The diet lists should be presented to the medical officer each day for signature. The diets of all patients discharged are to be included in the lists sent down, unless the nurse is quite certain that the patients have quitted the building, in which case she shall not include them.

20.—Diet cards for patients admitted or discharged after the diet sheets are made out must be taken to the steward's office immediately.

21.—The nurses in charge of wards are to report to the matron every morning all broken windows or furniture, and whether any repairs are required in the wards, and the matron will enter the same in a book, to be presented at intervals to the committee.

22.—All clothes sent to the laundry not properly repaired, not marked, or indistinctly marked, and any cuffs or collars not uniform, must be sent from the laundry to the matron's stores, and must be there applied for.

23.—The nurse shall see that the patients are ready for divine service at the appointed times; that none of the prayer-books, etc., belonging to the wards are missing, and when more are required shall report the same to the secretary.

24.—The nurses in charge of wards (sisters) will be held

responsible for the correct and punctual performance of the various duties of those working under them, and they are to take care to enforce the rules of their under-nurses, probationers, and scrubbers, and see that they adhere to their respective time-tables.

25.—Nurses are not allowed to take any meals to their bedrooms, or to their wards, except those on night duty.

26.—Nurses are expected to keep their bedrooms tidy and well ventilated, and not to visit each other's rooms after 10 p.m.; gas to be turned out and all in bed by 11·15 p.m.

27.—No nurse is allowed to go out without a permit, which will be given to her by the sister of the ward, and which must be deposited in the matron's office on her return.

28.—Nurses are not to go into any ward but their own without special leave.

29.—Both day and night nurses are to employ spare moments in doing needlework for the wards.

30.—Patients are not allowed to do any work for the wards unless the medical officer so directs.

31.—No articles to be washed or dried in the wards, and no food of any description to be cooked in the wards.

Rules for Night Nurses.

1.—The night nurse before going on duty must see the day nurse in charge, examine the ward books, and ascertain that articles likely to be wanted are left ready for use.

2.—To enter in the nurse's ward book all information she may receive from the medical officer for the treatment of any serious cases, and to report in writing the names of all patients who have not slept or who have passed a restless night.

She is to keep her book through the night on the ward table for the inspection of the medical officer, matron, or superintending night nurse.

She is to turn off the gas at daybreak, call the day nurses at the stated hours of rising in the morning, and when these enter on their duties at 7 a.m. the duty of the night nurse ceases. The book must then be signed and dated, and any special necessary report given to the nurse entering on day duty.

3.—To take care that the closets, bath-rooms, and sculleries are kept clean, well ventilated, and in good order, and that a light is kept therein after dark.

4.—Great care must be taken not to disturb the wards by unnecessary noise during the night.

5.—The night nurse is to spend her whole time in the wards, using the kitchen only when taking meals.

6.—Night nurses when they go off duty are to report themselves to the superintending night nurse.

7.—Night nurses must be in bed and quiet by 9 a.m. in the summer months, and 12·30 p.m. in winter months.

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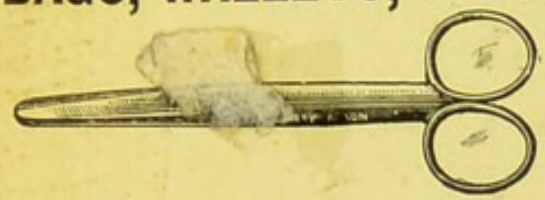

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