MOORE'S MANUAL

OF

FAMILY MEDICINE

& HYGIENE FOR INDIA

Published under the Authority of the Government of India

EIGHTH EDITION

REWRITTEN BY

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FOREWORD

THE original edition of "Moore's Manual of Family Medicine" obtained the prize offered by the Government of India in 1873 for the best Manual of Family Medicine and Hygiene for India. During the thirty years following the date of its first publication six editions appeared.

Thirteen years have elapsed since the seventh edition was issued. Thirteen years is a long period in these days of active advance in all that pertains to Tropical Medicine; and the need of a new edition has been evident for some years past.

The duty of rewriting the volume was entrusted to Major C. A. Sprawson, Professor of Medicine in the Lucknow Medical College, who is to be congratulated on the care and discrimination that he has devoted to his task. To cover so wide a range within the limits of 657 pages is a task by no means easy of fulfilment. As to how far Major Sprawson has succeeded in this endeavour, I leave the following pages to speak for themselves.

"Moore's Manual of Family Medicine" has fulfilled a most useful function in the past, and in its new guise I can with confidence predict a still wider field of usefulness in the future.

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SIMLA.

PREFACE TO THE EIGHTH EDITION

THIS work was written originally by Sir William Moore, formerly Surgeon-General with the Government of Bombay, in 1872, and was intended to be a manual suitable for the numerous individuals, families, and office establishments necessarily scattered over India in positions more or less remote from medical and surgical aid; it also contained general instructions for preserving health in circumstances of exposure, and of residence in unhealthy localities; and was adapted to a small, economical medicine-case, carrying as few medicines as possible.

In 1903, when the seventh edition was brought out, the work was revised by Major J. H. Tull Walsh, I.M.S. Since then the changes required in a new edition have become so great as to necessitate the entire rewriting of the book; and this has now been done, not by one author alone, but by the joint aid of several who are specialists in their own subjects. The changes occurring since the last edition of this book was published have been of a twofold nature: firstly, the advance in our knowledge of the causes of many tropical diseases; secondly, the needs and position of the public, Indian and European, likely to use this book have changed. The great increase in railway communications, the improvement of roads, and the introduction of motor-cars have brought highly skilled medical aid much nearer many people than was formerly the case; while the gradual establishment of an independent medical profession, the multiplication of branch dispensaries, and the growth of druggists' shops and 'medical halls' selling the remedies employed by Western medicine have brought near, even to many remote parts of India, medical aid and European drugs. These latter considerations do away with the need for a special medicine chest, in conjunction with which this book was formerly sold. There are still parts of India, in the further Himalaya and elsewhere, where medical aid is remote: residents and travellers in these parts will still require an extensive chest; but one can

be selected according to the needs of the traveller from the lists of the larger druggist firms and adapted to its particular use.

There are several new features in the present edition. More attention has been given to children's ailments, and considerably more space has been devoted to the practical details of nursing, and to the means of application of several external remedies that doctors sometimes direct to be given. The arrangement of the subject-matter has also been changed; it is thought that its division into several chapters will make it easier to find any subject that is wanted.

My thanks are due to the following ladies and gentlemen for much help in several parts of the book: to Miss M. O'Brien, M.B., B.S., Superintendent of the Dufferin Hospital, Lucknow, for the whole of Chapters XIII, XIV, and XV, and for much help in correcting proofs; to Mrs. M. O. Allen, Lady Superintendent of Nursing, King George's Hospital, Lucknow, for the whole of Chapters XIX and XXI, and for much of Chapter XX; to Lieut.-Col. W. R. Clark, I.M.S., for the whole of Chapter II and a large part of Chapter III; to Lieut.-Col. W. Selby, D.S.O., I.M.S., Professor of Surgery, Medical College, Lucknow, for the part of Chapter XII dealing with diseases of the Ear, and for the articles on Appendicitis and Obstruction of the Bowels; to Lieut.-Col. S. A. Harriss, I.M.S., Sanitary Commissioner to the United Provinces, India, for the whole of Chapter XXII and part of Chapter XVIII; to Lieut.-Col. J. T. Calvert, I.M.S., Principal, Medical College, Calcutta, for permission to use his pamphlet on the Preservation of Health in writing Chapter XVIII; to Major Cochrane, I.M.S., Superintendent of King Edward's Sanatorium, Bhowali, for the whole of the long and important Chapter VIII; to Major A. E. J. Lister, I.M.S., Professor of Ophthalmology, Medical College, Lucknow, for the whole of Chapter XI on Affections of the Eye and Eyelids; to Sir Ronald Ross, K.C.B., for permission to use his pamphlet on the Prevention of Malaria; to Lieut. F. E. Sprawson, R.A.M.C., for the articles on Toothache and Tooth Extraction; to Major Harvey, I.M.S., Director of the Central Research Institute at Kasauli, and to Major Liston, I.M.S., Director of the Bombay Bacteriological Laboratory, for permission to use leaflets on Anti-venene, Anti-typhoid inoculation, Rabies, and Plague prevention.

C. A. S.

LUCKNOW.

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It should be clearly understood that the treatment of illness recommended in this book, whether by medicine or otherwise, is not intended to take the place of skilled medical assistance and advice. There may be special reasons in any particular case why other measures should be adopted than those here recommended.

What is given here is as a substitute when skilled aid is not obtainable.

CHAPTER I

MEDICINES IN INDIA

Now that druggist's shops and medical halls are so common throughout India even in comparatively small towns, it is better to rely upon one of these and obtain one's drugs fresh than to keep by one a supply of rarely needed medicines that the climate will cause to deteriorate. Even so a few necessaries, such as materials for a simple surgical dressing, some carbolic acid, tincture of iodine, potassium permanganate, and quinine sulphate, should be kept in every house, since such are most frequently required.

For those, however, who spend long periods in camp, far removed from medical aid or from druggist's shop, or for those who travel in altogether uncivilised places, something more is necessary. The traveller in the wilds cannot do better than possess one of Messrs. Burroughs and Wellcome's numerous Tabloid Medicine Chests. This firm makes these equipments in many sizes and forms, and the traveller should select one of size and contents according to his probable needs. Whatever else it contains the chest should include some compressed bandages, lints and wools for surgical dressings; carbolic acid to make an antiseptic lotion; magnesium sulphate, and tincture of opium; tincture of iodine, iodoform, potassium permanganate, quinine sulphate, and phenacetin. The last three may be in tablet form. For further detail regarding simple surgical equipment the first pages of Chapter VIII should be consulted. For an aperient pill, the compound colocynth pill given in prescription No. 61 should be taken. If the traveller be sufficiently skilled to be able to give a hypodermic injection with antiseptic precautions, and this is a simple matter, he should also take with him a hypodermic needle and case, and tablets or ampoules of a salt of morphia and of emetine hydrochloride. Measures for liquids and solids are also necessary.

As some of the drugs given in our Prescriptions at the end of

the book can be obtained in Indian and other bazaars, we give here a list of some of them with their classical and Hindustani names.

Classical name	English name	Hindustani
Abrus precatorius	Jequirity	Gumchi
Acacia catechu	Catechu	Kathā
Aconitum ferox	Indian aconite	Bish
Aconitum heterophyllum	Indian atees	Atees
Aconitum napellus	Aconite	Mitha zahar
Aegle maomelos	Bael fruit	Bel
Aloe barbadensis	Barbados aloes	Ghikanvār
Alumen	Alum	Phitkari
Andrographis paniculata	Creat	Kiryāt
Andropagon citratis	Lemon grass	Harichāha
Areca catechu	Areca nut	Supāri
Balsamodendron myrrha	Myrrh	Bol
Camphora officinarum	Camphor	Kapūr
Cannabis sativa	Indian hemp	Ganja
Capsicum annum	Cayenne pepper	Lal mirch
Cassia lanceolata	Indian senna	Sana
Cera alba v. flava	Wax	Mom
Cinchona cortex	Cinchona bark	Cinchona
Cinnamomum zeylanicum	Cinnamon	Dālchin
Citrullus colocynthus	Colocynth	Indrāyan
Coffea arabica	Coffee	Kāfi
Coriandrum sativum	Coriander	Dhania
Croton tiglium	Croton-oil seed	Jamālgoet
Cubeba officinalis	Cubebs	Kabābchini
Cuprum	Copper	Tāmbā
Curcuma angustifolia	Indian arrowroot	Tikkur
Datura alba	Datura	Dhatoora
Dipterocarpus turbinatus	Gurjun oil	Garjan
Elletaria cardamomum	Cardamom	El chi
Eucalyptus globulus	Blue gum	——
Eugenia jambolana	Jambul	Jaman
Ferri sulphatis	Sulphate of iron	Hira kasis
Ferula asafœtida	Asafœtida	Hing
Glycerrhiza glabra	Liquorice	Mulhatti
Gynocardia odorata	Chaulmugra	Chaulmugra
Hemidesmus Indicus	Indian sarsaparilla	Magrabu
Hydrargyrum	Mercury	Pārā
Hyoscyamus niger	Henbane	Khorasani ajowan
Juniperus communis	Juniper	Aarar
Linum usitatissimum	Linseed	Alsi
Mel	Honey	Madh
Melia azadirachta	Neem	Nim

Classical name	English name	Hindustani
Opium	Opium	Afim
Piper nigrum	Black pepper	Kali mirch
Plantago ispagula	Isapghul	Isapghūl
Potassii nitras	Saltpetre	Shōrā
Psoralea corylifolia	Babchi	Babchi
Ptychotis ajowan	Ajowan	Ajowan
Ricinus communis	Castor oil	Arand
Santalum album	Sandal-wood	Sandal
Scilla Indica	Indian squill	Jangli pyās
Sodii biboras	Borax	Tinkāl
Sodii chloridum	Common salt	Nimak
Strychnos nux vomica	Nux vomica or strychnine	Kuchlā
Sulphur	Sulphur	Gundhak
Swertia chirata	Chiretta	Chirāyata
Tamarindus Indica	Tamarind	Imli
Zingiber officinalis	Ginger	Adrakh

All ordinary medicines should be obtained at a reputable druggist's; such simple remedies, however, as alum, asafœtida, bael, castor oil, saltpetre, senna leaves, stramonium leaves, honey, and sulphur may be obtained when necessary from the Indian chemist in the village bazaar. There are, however, many other drugs in his stock, powerful in their effects, and most of them well known to European medicine; but the source and strength of these is so variable that it is scarcely advisable to make use of them except in cases of extreme emergency, and the writer has seen cases of accident and even of death produced from their indiscriminate use by hakims and other self-constituted physicians. Indian writers frequently carp at the neglect which Government shows for the resources of the country in importing such drugs as aconite, belladonna, nux vomica, and the like, supplies of which are available in India sufficient for the world's needs, but the adulteration and sophistication of the specimens found in the Indian market, and the variability of the strength of the drugs themselves owing to their being procured not from one but from many allied species, renders it quite impossible to use them with safety or economy until standardised specimens are procurable in sufficient quantities to render dealing in them profitable; and enterprise of this sort

would seem more fitting for the individual than for a Government to undertake.

COMPOUNDING OF MEDICINES

Weights and Measures used in Compounding Medicines

WEIGHT FOR SOLIDS

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

MEASURE FOR FLUIDS

60 minims make	. . . . .	1 drachm
8 drachms ,,	. . . . .	1 ounce
20 ounces ,,	. . . . .	1 pint
8 pints ,,	. . . . .	1 gallon

Glass measures as sketched below should be placed in all medicine chests large enough to admit them :

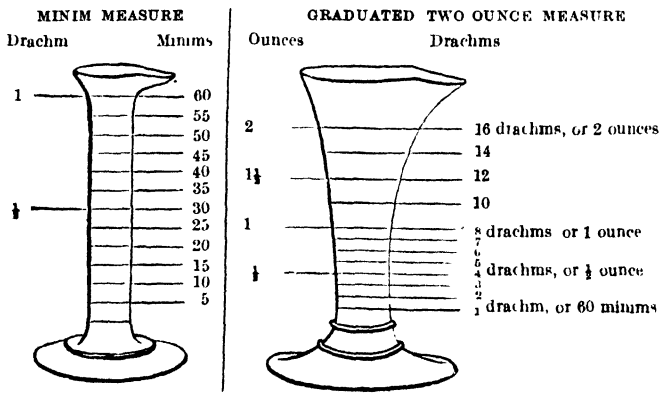


FIG. 1

When the quantity of fluid medicine is so small that it cannot be measured by minims, *drops* are ordered, which should be poured from the bottle accurately. The bottle should be held obliquely, with the lower part of the lip resting against the stopper. The bottle should then be carefully tilted, when the contents will drop from the lower edge of the stopper. A little practice will enable any person to drop with exactness.

It should be remembered that drops do not necessarily equal *minims*, as fluids vary in density; for instance, oil and water. The size of the mouth of the bottle, and the manner in which the fluid is manipulated, may also vary the size of the drop. The best plan is, therefore, to obtain a *glass medicine dropper*, by which greater accuracy is insured. Measurement of fluids by the minim glass should, however, always be adopted, unless the medicine is required in very small quantities.



FIG. 2

The following is a rough measurement of fluids approximating to the apothecaries' measure for fluids (*see* p. 4). This rough measurement is sufficiently accurate for doses of ordinary mixtures, the active ingredients in which are diluted by water; but it should *not* be used to compound medicines, or to measure them in the *undiluted condition*, as the size of spoons, even of the same class, is liable to vary.

1 teaspoonful . . .	= one drachm
1 dessert-spoonful . .	= two drachms
1 tablespoonful . . .	= four drachms, or half an ounce
1 small wineglassful . .	= about two ounces

In COMPOUNDING MEDICINES distilled water should be used. If this cannot be procured, water which has been purified by filtering and boiling should be used, and the measures, knives, &c., should be kept perfectly clean.

DOSES OF MEDICINES

Unless expressly stated to the contrary, the doses mentioned in the account of diseases, and in the collection of prescriptions (*see* Chapter XXIII), are those adapted for an ordinary strong adult,

For younger and less robust patients, and for children, a smaller dose is necessary. Delicate women usually require a less powerful agent than stronger women, or than those of the other sex.

The following table shows the approximate doses of medicines for different ages. For solids the scales and weights must be used, according to apothecaries' weight (*see* p. 4). For fluids the measures must be used (*see* p. 4), and *minims* must be substituted

Age above	Maximum dose one ounce	Maximum dose one drachm	Maximum dose one scruple
1 month	24 grains	3 grains	1 grain
6 months	2 scruples	5 grains	1¾ grains
1 year	1 drachm	8 grains	2½ grains
2 years	1¼ drachm	9 grains	3 grains
3 „	1½ drachm	12 grains	4 grains
5 „	2 drachms	15 grains	5 grains
7 „	3 drachms	20 grains	7 grains
10 „	½ ounce	½ drachm	½ scruple
12 „	5 drachms	40 grains	14 grains
15 „	6 drachms	45 grains	16 grains
20 „	7 drachms	50 grains	18 grains
21 „	1 ounce	1 drachm	1 scruple

for grains, according to apothecaries' measure (*see* p. 4). Below five minims drops should be given (*see* p. 5).

This shows that, if the dose of any medicine for a man of twenty-one years of age is 1 ounce (maximum dose), then the dose of the same medicine for a child between one month and six months is 24 grains, or 24 minims if a fluid; for a child above five years of age, 2 drachms; and for a child above ten, half an ounce. Or, if 1 scruple, or of fluid 20 minims, is the maximum dose for a full-grown man, then the dose of the same medicine for a child seven

years old will be 7 grains of a solid medicine, and 7 drops of a fluid medicine; and for a child one month old 1 grain, or 1 drop.

The above may be accepted as safe for ordinarily strong children; but when dealing with weakly children it will be advisable to lessen the quantities by one-sixth up to one year of age, and by one-eighth from one year to ten years of age.

Independent of the differences which exist between the doses suited to an adult male and a delicate female, as mentioned above, other circumstances, such as *habit, disease, climate, mind, race, and idiosyncrasy,* must often be considered when regulating the dose. Thus children are peculiarly susceptible to the influence of *opium,* very minute quantities having proved fatal to infants; and unfortunately opium is the powerful agent in various 'soothing syrups' and 'cordials' sold for children. In this book preparations containing opium are rarely, and always most cautiously, prescribed for children. Habit will enable certain people to consume large quantities of opium, arsenic, and of some other substances: in certain maladies large doses of opium produce little effect. In a tropical climate it is sometimes undesirable to use purgatives with the freedom with which they may be given in other latitudes; and especially so if cholera prevails.

Idiosyncrasy to Drugs

Indians as a rule require smaller doses than Europeans, except in the case of purgatives, of which they require larger doses. Besides such differences due to race, climate, or age, there are found at times certain individual peculiarities to certain drugs: this is called an idiosyncrasy. Such idiosyncrasy is illustrated by the smallest particle of mercury sometimes producing salivation, by iodide of potassium occasionally exciting symptoms of *coryza,* and by pollen exciting hay asthma in some people. It is not, however, medicines only which produce extraordinary effects on peculiar constitutions. There are persons who cannot eat celery, shellfish, oatmeal cakes, strawberries, apples, mushrooms, or cucumber without suffering from nettlerash or colic.

These peculiarities, however, are very much the exception: although certain neurotic people are inclined to imagine they possess them when they really do not. This is not infrequently the case when the medicine suggested is unpleasant in taste or in

immediate effect. A doctor is sometimes told by a patient that he cannot take castor oil, or by another patient that she (it is usually a 'she') can never take any quinine. There are many instances when quinine must be given, and it is the physician's duty if he cannot get it in by the mouth to give it by the rectum or hypodermically. Usually, however, the unpleasantness of any drug can be so disguised as to make it tolerable. Patients would help doctors somewhat if they did not tell him as soon as he comes to see them for 'fever' that they cannot possibly take quinine: besides the doctor's purpose is probably not changed thereby, for he knows well enough that though true idiosyncrasy to such drugs does exist, yet such statements are usually the result of childish affectation or of neurosis.

CHAPTER II

THE ANATOMY AND PHYSIOLOGY OF THE HUMAN BODY

In the work now to be undertaken, it is essential that the reader should be acquainted not only with the remedies at his disposal and the diseases he is liable to meet with, but also with the methods by which he may distinguish one disease from another. It is necessary therefore that the lay reader should have some preliminary knowledge of the size, shape, position, and function of the various organs in the human body in order that he may be able to ascertain the particular organ or organs affected, from the symptoms complained of by the patient. Such a knowledge implies a preliminary study of the anatomy (or formation) and the physiology (or function) of the various parts of the human body, and a chapter on these subjects would therefore seem to form an essential portion of this work.

The human body is roughly separable into head, trunk, and limbs. In the head the brain case, or skull, is to be distinguished from the face ; the trunk is naturally divisible into chest or thorax, and belly or abdomen, and two sets of limbs are distinguishable, the upper limbs or arms, and the lower limbs or legs. If the body were split lengthwise with a great knife, which was made to pass down the middle line of both front and back aspects, the two halves would be seen to be almost exactly alike. One-half of the body divided in this way would show in the trunk the cut surfaces of thirty-three bones joined together by a very strong and tough substance into a long vertical column, which lies much nearer the back (or posterior) aspect of the body than to the front or anterior aspect. The bones thus cut through are called the vertebræ. They enclose a long slender canal, called the spinal canal, which lies near the back aspect of the body, from the more spacious chamber of the chest and abdomen which lies in front. There is no direct

communication between these two primary canals of the body. The spinal canal contains a long white cord (the spinal cord), which is a very important part of the nervous system. The anterior chamber is divided transversely by a partition, partly fleshy, partly

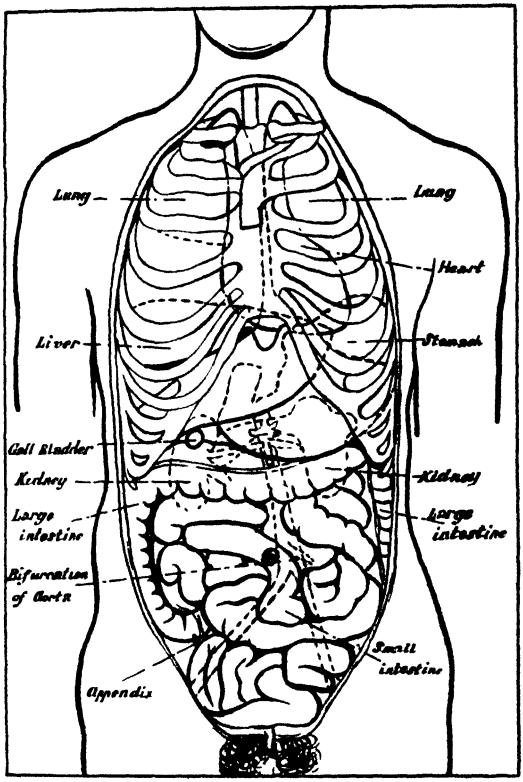


FIG. 3. Diagram showing shape and relation of organs from in front

membranous, called the diaphragm, into two subsidiary partitions, the chest or thorax, and the belly or abdomen. The alimentary canal or tube by which the food is conveyed into the body traverses both these partitions passing through the diaphragm. So does a long double chain of little masses of nerve substance, called the ganglia, which are connected together by nerve cords. These constitute what is known as the sympathetic nervous system. In addition to alimentary canal and sympathetic nerves, the abdomen

contains two kidneys, one placed against each side of the vertebral column, a liver, pancreas or sweetbread, spleen, and bladder, and in the female a womb and two ovaries. The thorax or chest, besides its segment of alimentary canal and sympathetic nerves,

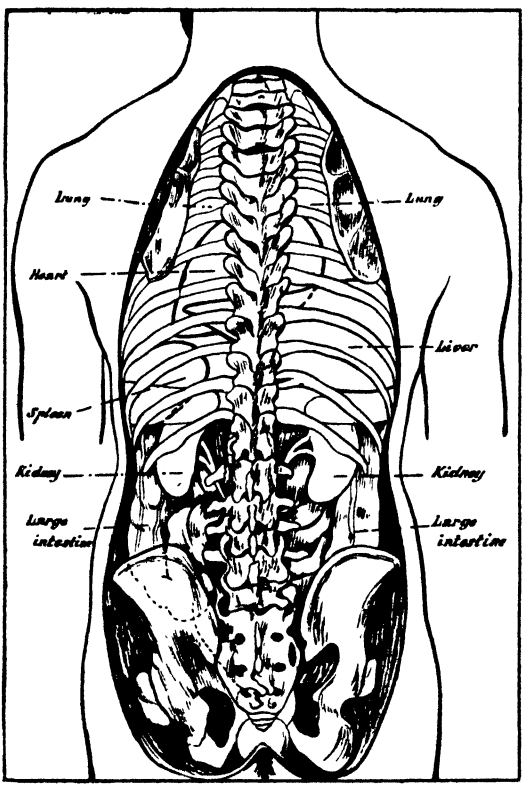


FIG. 4. Diagram showing shape and relation of organs from behind

contains the heart and two lungs. These last are placed one on each side of the heart, which lies nearly in the middle of the chest.

Where the head joins the body the uppermost of the thirty-three vertebræ is succeeded by a continuous mass of bone which extends through the head and still separates a posterior from an anterior chamber. The posterior and upper chamber or cavity of the skull opens into the spinal canal. It contains a large mass of nerve matter called the brain, which is continuous with the spinal cord,

the two together constituting the cerebro-spinal axis. The ventral chamber or face is occupied almost entirely by the mouth and pharynx, which form the upper end of the alimentary canal.

We see thus from a study of the human body that it is essentially composed of two tubes, a dorsal one and a ventral, separated completely from one another by the bony spinal column and the bony skull axis, which form the floor of one tube and the roof of the other. If viewed on transverse section, it is seen that these tubes differ in their comparative size according to the position at which the transverse section is made, the posterior being much the larger at its upper end, where it contains the brain; while in the region of the thorax and abdomen it is the anterior one, which contains lungs and heart, or stomach, liver, kidneys, spleen, &c., that has the preponderance in capacity.

Such chambers as are found in the trunk are nowhere to be met with in the limbs. These are solid or semi-solid throughout except for the tubes (blood-vessels and lymphatic vessels) which permeate them, conveying nourishment to their structures and carrying off the waste products evolved by their action.

On dissection of the human body with no other apparatus than the surgeon's knife we can see that it is covered by a continuous membrane, thicker at some parts, thinner at others, called the skin; and if we trace this membrane to the various apertures of the body we will find that it continues inside the body and forms a lining to the various cavities. Its character, it is true, differs as it passes inside, but the lining membrane of the cavities is continuous with the skin of the exterior. By careful dissection it will be seen that this membrane is everywhere composed of two layers: an outer one, purely membranous, containing no blood-vessels or nerves; and an inner one containing both, but mainly fibrous in its structure, from the deep surface of which in all directions fibres radiate into the organs contained in the body in such a complete network that if the structure of the various organs could be washed away a fibrous cast would be left of the entire body. The outer membranous layer, where it covers the exterior of the body, is called the epidermis. It is there stratified, and it is to the comparative number of its strata that the thickness or thinness of the outer skin at the various parts is due. Where it lines the cavities of the body it becomes unstratified, hence thinner and redder, and takes on the function of secreting mucus, a glairy

fluid which lubricates the interior of the various cavities of the body. It is then distinguished by the name of mucous membrane or epithelium, but is essentially a continuous membrane lining the interior of the cavities, as the skin does the exterior of all, and it is continuous at its margins with that membrane. The derma or true skin and the deep layer of the mucous membrane which corresponds to it, are, as already stated, chiefly made up of fibrous filaments which spread from these throughout the body in all directions. These fibres collectively are known as the connective tissues of the body, because it is by means of them that the whole body is knit together. Connective tissue varies very much in character; in some places it is soft and filamentous, as where it forms the framework of soft organs like the spleen or liver, at others it is collected together into firm cords and bands, as in the tendons and ligaments, and attains great strength and density; but it exists everywhere throughout the body, and forms a sheath to each organ as well as a fine meshwork in the inside of the organs, upon which as in a framework the various organs are built up.

The presence and action of some of these organs which are built up in this meshwork of connective tissue may be determined during life. Thus if the front of the upper arm of a man whose arm is extended be grasped by another person, a soft mass will be felt, which thickens and becomes hard if the forearm is bent on the arm. When the forearm is extended, the upper arm again becomes soft, and the thickening and hardness vanish. If the skin were removed from the front of the upper arm, it would be found that this thickening and hardness was due to the presence of a mass of red flesh enveloped in connective tissue. If this envelope of connective tissue were examined, it would be found to be collected into a cord or tendon at either end attached at the upper extremity to the shoulder blade and at the lower to the bones of the forearm, and that the thickening and hardening of the flesh was due to an inherent property residing in the flesh, whereby it could change its dimensions, becoming shorter and thicker under the influence of will, and returning to its original dimensions when left alone. By the thickening and shortening of the muscle or flesh, the bony points to which the tendons at either end are attached are naturally approximated and the forearm is thus bent on the arm. This temporary thickening and shortening, which is the inherent property of all muscular tissue, is termed its contractility, and it is through

this property that muscular tissue becomes the great motor agent of the body, the muscles being so disposed between the bones which constitute the system of levers that support the body that their contraction necessitates the movement of one lever upon another. These levers form part of the system of hard tissues which constitute the skeleton. The less hard of these are the cartilages, composed of a dense firm substance commonly known as gristle. Harder than this are the bones, masses of tissue akin to cartilage, but naturally petrified by being impregnated with phosphate and carbonate of lime. All the bones of the body are fastened together by ligamentous bands of connective tissue, passing from one to the other, and where the end of one plays on the end of another they are capped with a smooth coating of cartilage in order to prevent jarring and to reduce friction. The opposite surfaces of cartilage, which thus form part of every joint, are called the articular cartilages, and every joint is lined with a delicate membrane which secretes a little joint-oil to lubricate the ends of the bones as they rub one upon the other.

More than two hundred bones are described as constituting the bony skeleton, but the number varies with the time of life, some of these separate bones becoming welded together as age advances. Thus there are in early adult life thirty-three separate bones in the spinal column, and although the upper twenty-four ordinarily remain distinct throughout life, the 25th, 26th, 27th, 28th, and 29th ordinarily become later on united into a separate bony mass called the sacrum, while the 30th, 31st, 32nd, and 33rd also frequently run together into another mass, known as the coccyx. The pelvis, to which the legs are attached, consists, in the adult, of two large bones (the ossa innominata), but in early life each of these consists of three—the ilium, the ischium, and the os pubis. If we place a jointed skeleton or a dead body on its feet on the ground, we will find that in no position is it possible to make it stand upright; the centre of gravity is too high, and the play of the joints one with the other is too free. The upright position, easy as it may seem, is the result of the balance of a number of muscles one with another. The foot forms the surface of support, but it is only by the pull of the muscles on the back of the leg that this is kept upright; the pull of the muscles on the back of the leg would bend the thigh backwards were it not for the strong counterbalancing pull of the muscles on the front of the thigh. These are similarly counter-

balanced by the muscles of the hip, and so on ; it is only by a series of balancing and counterbalancing movements all over the body that the erect posture is maintained at all. What is it then that adjusts the force of all these movements and enables us to assume and to maintain the erect posture which we seem to take up so quickly and easily ? If a person, while standing in the erect posture, receives a violent blow on the head, he will, if the blow be severe enough, lose consciousness and drop helpless all of a heap on the ground. A violent emotion will in some persons produce the same effect. The blow need not be severe enough to cause permanent injury ; in a few minutes the person may recover, and be able to rise and to stand erect again, but for the time being an influence has been exerted on something which governs the muscles, and this has been accompanied by unconsciousness of shorter or longer duration. A cursory examination of this phenomenon might lead us to the conclusion that it is the mind which governs the muscles, but persons who have been so shot or stabbed, or otherwise injured in the back as to sever their spinal cords, without any considerable injury to other parts, have been found also to lose the power of standing up, although their minds have remained clear. Under these circumstances, they are unable not only to stand, but also to feel anything that is going on in the lower parts of their bodies, or to make any movement in them. Although the mind is thus cut off from the lower limbs, a controlling or governing power, however, may still remain, for if the soles of the feet be tickled, the legs are drawn up on the body, and an electric current passed through the limbs will cause them to contract even more vigorously than if the spinal cord were uninjured. If, however, the injury received has been so severe as not only to cut or sever the spinal cord but to crush it or disorganise it, then neither tickling of the soles nor electric currents however powerful will cause the limbs to be drawn up. The conclusion to be drawn from this is that while the brain is the seat of all sensations and of mental action in general, and the primary source of all voluntary muscular motions, yet the spinal cord is by itself capable of receiving an impression from the exterior, and of converting it not only into a simple muscular contraction, but even into a combination of such. Some of the impressions that the body is capable of receiving from without are very diverse in character and appeal only to very limited parts of the body, while others are perceptible by the whole body. Thus an impression

of touch, of heat, or of cold may be received by any part of the skin, but an impression of taste, smell, hearing, or vision can be received by only a small portion of the body which has been specialised to receive such an impression. These portions of the body which have been so specialised are termed the organs of special sense, and of these there are four—the eyes or organs of vision, the ears or organs of hearing, the nose the organ of smell, and the tongue and parts of the pharynx, the organ of taste.

We have thus briefly described the structure of the body, the organs which support it, the organs which move it, and the organs which bring it into relation with the surrounding world, and must now consider how all the parts of this wonderful machine are kept in working order.

All work implies waste. The work of the nervous system and that of the muscles therefore implies consumption, either of their own substance or of something else. The human machine, like others, can do no work without fuel, and it must have a means of throwing out the waste. This is, broadly, what it does. By means of the alimentary organs fuel is brought in, and converted into a condition fit for the use of the body ; by the circulation the alimentary materials are carried to the parts of the body that require them ; while the excretory organs get rid of waste products. The alimentary organs are the mouth, pharynx, gullet, stomach, and intestines, with their appendages. Food-stuffs are received in the mouth and thence pass through the alimentary canal, the whole purpose of whose action is to separate the nutritious portions from the non-nutritious residue, and to reduce the foods into a state of solution or of very fine subdivision in order that they may pass through its walls into the minute branches of the circulatory organs, which form a meshwork of vessels around these.

First of all, the teeth mechanically crush the food and reduce it to small particles, which are capable of being easily mixed with the fluids secreted in the alimentary canal or its appendages. Thus it comes into contact in the mouth with the fluid secreted by the salivary glands. This fluid not only moistens the food and makes it more easily swallowed, but a chemical is found in it, formed by these glands, which has the effect of changing the insoluble starchy substances of the food into an easily soluble sugar. The action to which the food is next submitted in the stomach is also a solvent one, converting some insoluble substances into solutions which

easily pass through an animal membrane. This is accomplished by the glands of the stomach. These glands line the whole of the interior of the stomach, which in a state of rest is pale and merely moist. By a process analogous to blushing and sweating, when the stimulus of the food is brought in the interior of the stomach blushes and its glands secrete a watery fluid, which by the involuntary movements of the stomach mixes thoroughly with the food. The watery fluid contains another ferment, which has the power of converting insoluble albuminous substances, like white of egg, into a soluble substance called peptone, which has no difficulty in passing through the membrane lining the stomach into the meshwork of the circulatory vessels surrounding it. In this way a certain amount of the nourishment taken into the stomach is there transferred to the circulation and carried off to nourish the tissues. The rest of the food now passes into the intestine, and there it meets with the fluid secreted by two of the most important appendages to the alimentary canal, viz. the liver and the pancreas or sweetbread. The fluid secreted by these is thoroughly mixed with the food as it is passed through the upper part of the small intestine by the involuntary movements of that portion of the gut, and further changes occur in the food. The pancreatic juice converts the remainder of the starchy material in the food, which has not already been converted into sugar by the saliva, into a soluble sugar; more of the albumins are converted into peptones; while the bile and the pancreatic juice together act on the fats in the food and emulsify them, *i.e.* break them up into exceedingly minute particles. The fats of the food are thus rendered easily absorbable by the lacteals, a series of little vessels lying in the walls of the intestine along with the blood-vessels, which have the special function of carrying the fats absorbed through a special channel—the lymphatic duct—into the blood-stream. Peptones and sugars are carried into the blood-stream *via* the liver, where they undergo some change. As the food passes along the small intestine, digestion and absorption go on simultaneously. All the way down, the proteins, starches and fats of a meal are undergoing digestion and passing away by the lacteals or the blood-vessels, so that by the time the food has reached the large intestine a great deal of the nutritious matter has been absorbed. Even in the large intestine some nutritious matter is still absorbed, but one marked change undergone in this part of the alimentary canal is

the absorption of water. Up to the large intestine, the amount of fluid secreted into the bowel is about equal to the amount absorbed; in the large intestine, on the contrary, the contents become less and less fluid. At the same time a characteristic odour and colour are developed, and the remains of the food, now consisting either of indigestible matter or of matter which has escaped the action of the digestive juices, gradually assumes the character of fæces.

We have seen that there are a series of vessels which carry away the digested products of the food from the alimentary system. These are very minute tubes with very thin walls, which are called capillaries. Such tubes, with function varying at the different parts of the body, are found throughout. On all sides these capillaries pass into larger tubes called arteries and veins, and these becoming larger and larger at length open into the heart, an organ placed, as we have seen, near the middle of the thorax or chest. The walls of the heart are muscular, and it contracts rhythmically at regular intervals, forcing by these contractions the blood which its cavities contain into the arteries, whence the blood passes to the capillaries and so through the veins back into the heart again. Thus the circulation of the blood is carried on, and the nourishment which it contains is brought into contact with every part of the body. Not only, however, is nourishment conveyed to the tissues through the blood. All energy implies waste, and waste products must be removed. It is the fresh blood-stream sweeping *via* the arteries through the capillaries that gathers up all the waste substances, the products of tissue activity, and carries these into the excretory organs to be separated and removed from the body.

Waste products occur in numerous different forms in the body, but are mostly before removal finally resolved into three principal ones, viz. carbonic acid, water, and urea; and the excretory organs are mainly concerned in varying degrees with the removal of these three. However much the excretory organs may differ in appearance, they are all constructed upon one and the same principle. Each ultimately consists of a fine animal membrane analogous to a sheet of blotting-paper, one side of which is in communication with the exterior, while the other is in contact with a stream of blood that has to be purified. These sheets of blotting-paper may be folded up and crinkled into various shapes, which determine the various shapes of the different organs, but

the principle is always the same although the different sheets of blotting-paper have the power to strain out the different waste products from the system.

Each of the excretory organs is mainly concerned with one of the chief waste products, although it may at the same time offer an auxiliary means for the escape of some one or other of the rest. Thus the lungs are specially constructed to get rid of the carbonic acid, but at the same time they get rid of a good deal of watery vapour. The chief duty of the kidneys is to get rid of urea and saline matter, but at the same time they pass off a good deal of water and some carbonic acid. The skin is chiefly concerned with the getting rid of water, but some carbonic acid and urea also is excreted by it.

The lungs have a double rôle to play in the animal economy, for not only do they eliminate the carbonic acid but they also serve to bring to the tissues oxygen, a substance which is as important as food or drink, since in defect of oxygen the nutritive matters in the food cannot be oxygenated. In other words, the fuel conveyed to the human machine cannot be burnt up and made to yield its supply of energy or heat.

We have thus briefly described the alimentary, the circulatory, and the excretory systems of the human body, and seen how each does its work. This work must, however, be carried on in just harmony. Not only must the quantity of aliment taken in be at least equivalent to the waste, but it must be distributed with due rapidity in relation to the comparative waste in each locality, and the temperature of the body must be maintained at a tolerably even figure in spite of the constant variations in the temperature of the air.

A combining system must, in fact, be added to the organs already described, and this is to be found in the nervous system, which not only possesses the function, already described, of enabling us to move our bodies and become aware of what is going on in the external world but also makes us aware of our need of food, enables us to discriminate nutritious from non-nutritious matter, to exert the muscular actions necessary for seizing food and for guiding it to the mouth, and governs all the movements of the jaws and of the alimentary canal.

By it also the heart is worked and adjusted, and the calibres of the distributing pipes are regulated so that the nervous system governs the excretory and the heating process as well.

These functions constitute the great part of what are known as the vital actions of the human body. So long as they are performed, the body is said to possess life. The cessation of these functions constitutes what is ordinarily termed death. In reality there are several kinds of death which may, in the first place, be distinguished from one another under the two categories of local and general death. Local death is going on every moment and in all parts of the body. Individual cells of the epidermis are constantly dying and being cast off to be replaced by others which are as constantly coming into existence. This is equally true of the blood corpuscles and of most of the other elementary cells of the tissues. This form of death is insensible to ourselves, but is necessary for the due maintenance of life. Occasionally, however, local death occurs on a larger scale as a result of disease or injury. Thus a burn may suddenly kill a larger or smaller portion of skin, or part of the subcutaneous tissue may slough out in the core of a boil, or a whole limb even may die as a result of mortification caused by some disease which interferes with the conveyance of nourishment to that part. The local death of some tissues is followed by their regeneration. Not only may epidermis or skin be thus reproduced, but nerve fibres, connective tissue, even bone also may thus form again after the local death of their predecessors.

With regard to general death, the methods in which this is brought about would appear at first sight to be extremely various. A man may die of old age, of disease of the heart, lungs, liver, spleen, or brain by some variety of injury, or by poison. In reality, however, the immediate cause of death is always the stoppage of function of one or other of three systems, viz. the cerebro-spinal nervous system, the lungs, or the heart. In hanging, death is usually produced by injury to the lower part of the brain, the medulla oblongata; in drowning, by stoppage of the respiratory functions; in heart failure, by the sudden cessation of the heart-beat and the consequent stoppage of the circulation of the blood. Examining these methods of death still more closely, it will be found on ultimate analysis that general death is always produced in one of two ways, either by stoppage of respiration or of circulation. Death of the body as a whole, then, implies cessation of the functions of the brain, of the circulatory and of the respiratory organs, but this does not imply death of the individual tissues. This does not take place till some time afterwards, and for a short

period, after what is ordinarily called death, the tissues, *e.g.* the muscles, may be made to contract by the application of proper stimuli. In the end, however, after general death has occurred, the tissues too die, and the forces of the inorganic world work their will with the dead tissues. Oxygen, the slave of the living body, becomes the master of the corpse, and atom by atom the more complex molecules of the human frame become broken down into simpler and more oxidised substances, and are dissipated into the atmosphere, chiefly in the form of carbonic acid, ammonia, and water. Even dense earthy structures, like the bones and teeth, are ultimately deprived of their animal basis, and becoming pulverised, dissolve among the waters of the globe, and the whole complete human frame is thus reduced into its simplest component elements, whence it may again be gathered up to form new component parts of some other form of life.

CHAPTER III

THE DIAGNOSIS OF DISEASE

BEFORE you can successfully treat a disease you must make yourself acquainted with its nature and the symptoms it produces. For instance, a person may come to you complaining of a pain in the head. This may be due to various causes, and it is necessary for you to distinguish the cause to which it is due before you can hope to successfully cure the evil. It may be due to a decayed tooth, in which case extraction is the only effectual remedy; it may be caused by neuralgia, in which case a purgative and the subsequent administration of quinine may be successful in relieving it; or it may be due to an incurable disease of the brain. But in any case it is necessary for you to ascertain the nature of the disease before you proceed with the treatment. This is what is termed the diagnosis of a disease.

Diagnosis is the science which teaches us to distinguish one disease from another and to trace signs of disease to the causes from which they spring; and before studying the method of distinguishing disease of one organ from disease of another, it is necessary for you to be acquainted with the position, size, and healthy structure of each organ, as well as to be able to become cognisant with the various conditions of disease to which they are liable.

Diseases are distinguished from one another either by such alterations in the organs themselves, or their secretions, as can be ascertained by the senses of the observer (signs), or by changes in the functions of the parts affected, which are perceptible only to the patient (symptoms). The signs of a disease are least liable to mislead us, as in regard to them we are independent of the feelings of the patient, which he may be inclined to exaggerate. Of late years much greater care has been exercised with regard to the diagnosis of disease, and many instruments, *e.g.* the stetho-

scope, the laryngoscope, and the ophthalmoscope, have been invented which enable us to obtain a more accurate knowledge of the various conditions to be found in diseased organs; but as these instruments all require a certain amount of professional training to enable them to be used successfully, a description of their use is out of place in a volume like the present, and only methods of diagnosis which require the use of the senses and a certain amount of ordinary intelligence will be discussed.

In every case of disease that you are called upon to treat you should first endeavour to form your diagnosis from a careful examination of the patient's symptoms, and in order that you may miss nothing which may be of importance, it is well to follow a regular plan in so doing and to make a note of your observations. Such notes will often be of the utmost value to the physician who may subsequently have to be called in to attend the case; and in any case, if you do this systematically, you may be sure that no important fact has been omitted. Commence with the age of your patient. This is important, because many diseases, such as cancer, are more apt to occur at certain periods of life. The nature of his occupation, too, often gives a clue to the complaint; as, for instance, painters and other workers in lead are specially liable to colic, paralysis, gout, and disease of the kidney.

Note the position of the patient. In pleurisy he usually rests on the affected side; in many diseases of the heart and lung, he prefers the sitting posture; while he usually lies flat and helpless in fevers and other diseases attended with great weakness. The general condition of the body must also be noted. He may be emaciated, as in consumption (phthisis), or œdematous and puffy, as in diseases of the heart or of the kidney.

The state of the skin also is of importance. It may be yellow, as in jaundice, dry and harsh, as in some diseases of the kidney, or soft, perspiring, and emitting an acid odour, as in rheumatic fever, or covered with some characteristic rash, as in the various specific fevers. The features and expression of the patient are of the utmost importance; indeed, each feature may furnish its own particular indications of disease. Thus the dilated nostril points to difficulty of breathing, the angle of the mouth drops in palsy, or is fixed in a rigid smile in tetanus or lock-jaw.

Next inquire into the manner in which the complaint commenced, whether suddenly or gradually; if it followed some other disease,

such as fever, or if it could be reasonably attributed to any particular cause, as exposure to cold, accidents, or the like. Ask also if any of the patient's family have been subject to any particular malady, and if he himself generally enjoyed good health before his present illness.

In every case it is important for you to note the state of the pulse, respiration, tongue, and appetite, together with the condition of the bowels and the urinary secretion.

With regard to the pulse, this is caused by the alternate dilatation and relaxation of the arteries into which the blood is forced at each beat of the heart. For convenience it is usually felt at the wrist, but may be counted also in the neck, temple, thigh, or wherever there is an artery near the surface, especially if that artery has a background of bone beneath it.

The state of the pulse affords the best indication of the manner in which the heart is doing its duty. Never feel the pulse when you begin to speak to the patient, but wait until any nervousness excited by your visit has been overcome.

In feeling the pulse the first thing to take notice of is its frequency, *i.e.* you must attempt to count the number of its beats per minute. The application of a single finger to the artery is sufficient to enable you to count the rapidity of the pulse, but it is better to apply two or three fingers when you wish to estimate its other conditions. The number of beats per minute in the healthy state varies according to age and sex, but may be generally accepted as follows:

At birth and till end of the first year	140 beats a minute.
Infancy and till end of the third year	120 to 100 beats a minute.
Childhood or till end of the sixth year	100 „ 90 „
7 to 14	90 „ 75 „
14 to 21	85 „ 75 „
21 to 65	75 „ 65 „
Old age	85 „ 70 „

With decrepitude in very old people the pulse becomes more rapid than it was in vigorous middle life. Debility from any cause, when decidedly marked, is mostly attended with lessened force, but a quickened rate of pulse. Irrespective of the actual frequency of the pulse beats, the educated fingers of the physician also receive through the sense of touch much information regarding the quality of the pulse. He must, therefore, in addition to the

frequency, take note of its regularity, fulness, strength, and of its resistance to pressure. With regard to its regularity, the pulse is said to intermit when a beat ceases to be felt after every few pulsations. This condition may attend heart disease, but it is also frequently to be found in old age, in excessive smoking, or tea drinking, and in some forms of indigestion.

The pulse is also irregular when the beats do not occur at regular intervals. This is not an uncommon condition in children, in whom it may occur without serious import. Fulness or largeness of pulse is to be distinguished from strength. A pulse may be large and soft, or, on the other hand, small, firm and wiry as it is called. The wiry, high-tensioned pulse tells of thickened arteries and high blood-pressure and should be regarded as premonitory of evil in a patient who is becoming advanced in years. The strength and fulness of the pulse are of great importance as they indicate the force with which the circulation is carried on. It is strong in young persons, and in hypertrophy of the heart; feeble in dilatation of that organ, and in those weakened by disease. In considering the strength of the pulse you must beware of mistaking a strong pulse for a weak one in which the coats of the arteries are thickened. To enable you to do so in old persons, in whom the pulse appears very strong, always compress the vessel with one finger and move another finger along it below the compression in order to enable you to detect whether any hardening of the coats exists.

Respiration, or the act of breathing, and the method in which the act is performed, is the next matter which should be inquired into. Breathing is consequent on the expansion and contraction of the chest as the air passes into and out of the lungs. There should be no difference in the movements of the two sides of the chest. Breathing, like the pulse, is quickened by bodily exertion and is also affected by mental excitement. The number of breaths taken by a healthy adult in a state of repose both of body and mind is about one to every four beats of the pulse, but varies in different people from fifteen to eighteen per minute. As with the pulse, so there are persons met with in whom the breathing may be either slower or quicker than the standard; but, as a rule, deviation from the numbers given during a state of rest indicates disease. The number of the respirations may be counted either by watching the rise and fall of the chest, or by placing your flat hand on the lower part of it and counting the movements communicated to this.

The breathing of children differs in some characteristics from that of adults. The abdominal muscles move more than in adults, and the breathing is much quicker, corresponding with the more rapid rate of the pulse. Thus a child up to two years of age breathes thirty-five times in a minute; from two to nine years old, eighteen times during sleep, and about twenty-three when awake; from nine years to fifteen, eighteen times during sleep, and twenty when awake.

Indications of disease of the respiratory organs are pains in the chest or side, cough, expectoration, spitting of blood, and difficulty of breathing.

Although fœtid breath is found in some forms of bronchitis and other lung diseases, yet, in the majority of cases, a bad breath, as it is popularly called, is no indication of the onset of respiratory trouble. It is more usually due to bad teeth, and although efforts may be made to keep these apparently clean, yet the presence of decomposing débris in small and inaccessible cavities may keep up the nuisance. Diseases of the gums are also a fertile source of bad breath, so also may be imperfect mastication or carelessness in the hygiene of the mouth. Mouth-breathers have frequently a bad breath, especially when the tonsils are enlarged, ragged, and contain concretions of foul, cheesy-like matter in their crypts. Discharging ears and diseases of the nose are also frequent sources of a putrefactive odour in the breath, and the breath is often very foul indeed in gastric derangements, especially if these are accompanied with constipation. Apart altogether from these local derangements, indications of disease of other parts may be derived from the breath. Thus in diabetes the breath has a faint apple-like odour, the ammoniacal or urinous smell of the breath in a case of kidney or bladder disease is characteristic, while the breath of the habitual alcoholic retains its sour and vinous odour even for days after any excess has been indulged in.

TEMPERATURE

Another important aid to the diagnosis of disease is furnished by the temperature of the patient.

The normal temperature of the human being is somewhat variable and depends a good deal on the patient, the time of day, and the portion of the body selected for the operation of taking

the temperature. The instrument with which the temperature is taken is known as a clinical thermometer, and one such should be in the possession of every one.

Before taking the temperature the mercury should be gently shaken down to about 96°. This may be done by holding the thermometer in the right hand, and then tapping that hand against the other. Some thermometers are provided with special arrangements for simplifying the return of the mercury toward the bulb: such is the Repello. The manner in which the clinical thermometer is graduated, and the method of reading it off, are simple (*vide* Fig. 5). The scale is shown in the figure. Each of the longer lines indicates a degree, although as a matter of convenience only every fifth degree is numbered. The spaces between the degrees

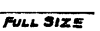


FIG. 5. Clinical thermometer

are divided into fifths by smaller lines. It is easier to read the figures on a thermometer with a flat back.

The temperature is measured by placing the thermometer in the mouth, the armpit, or the rectum. Of these the mouth is much to be preferred as a rule, and the thermometer should be retained in the closed mouth under the tongue for a minute longer than the time it is advertised to be regulated for. When the patient is delirious or unable for other reasons to retain the thermometer in the mouth, then the armpit may be used. For this purpose the armpit should be wiped dry, and the bulb of the instrument placed in the middle of the armpit next the skin. The arm should be held close to the side with the hand lying on the chest, so that the instrument may be entirely surrounded by the patient's skin.

In the case of small children it is better to place the bulb of the thermometer in the groin and bend up the thigh over it. The space afforded for the thermometer is greater here than in the armpit, it is more easily accessible in children, and the leg is more easily controlled, so that there is less danger of the bulb being moved or accidentally broken by the struggles of the child.

When the armpit temperature is efficiently taken it should be about the same as the mouth temperature, but practically it will be found a few points lower. The rectal temperature will be as

a rule about 0·6° F., or 0·8° F. higher than the mouth temperature at the same time.

The temperature of men shows a distinct variation during the day. Usually the lowest temperature is in the morning, between 6 and 7 A.M., when before the subject has risen from bed the mouth temperature will be generally 97·6° F. The temperature rises slowly during the day to reach its maximum, 98·4°, in the evening, 5 to 7 P.M.; it falls again during the night. Muscular activity and food are the factors mainly responsible for the rise in temperature during the day, sometimes also mental activity or emotion. For this reason the temperature should be taken when the patient is fasting and at rest.

The usual hours for observing a patient's temperature are 8 A.M. and 6 P.M. when it is taken twice daily. Sometimes it is necessary to take the temperature more frequently, in which case four-hourly intervals are usually enjoined, and the hours of 2, 6, and 10 A.M. and P.M. are conveniently adopted.

In any case the temperature should be taken regularly and at the same hours on successive days, and always noted down, being marked on a chart if one is available, so that the course pursued by the fever is evident. Any deviation from the normal temperatures given above, if persistent, indicates ill-health. Various classifications of temperature have been proposed, but the following is enough for practical purposes:

Collapse temperature	Below 96° F.
Sub-normal temperature	96° to 97° F.
Slight febrile temperature	99·2° to 100·4° F.
Moderate febrile temperature	100·5° to 103° F.
High fever	103° to 105·4° F.
Hyperpyrexia	over 105·4° F.

Each disease, which runs a definite course, such as the fevers described in Chapter IV, has a more or less characteristic range of temperature. For further information about these diseases and about fever in general the reader should refer to Chapter IV, more especially to the first section in that chapter.

The temperature of children is usually a very little higher than that of adults, and a word of caution is necessary. In children the temperature sometimes increases rapidly, often only from stomach derangement, when there is nothing serious the matter. Care therefore should be taken not to form a hasty conclusion of

some serious disease simply because the thermometer indicates much heat of surface, which often falls with equal rapidity. If, however, the deviation from the healthy standard continues for more than twelve hours there is almost certainty that an illness is commencing.

Relation of the Pulse, Respiration, and Temperature

An increase of temperature of 1° above the natural standard corresponds with an increase of the pulse of about 8 beats per minute, and of 2 or 3 respirations per minute. Thus if the natural pulse and temperature were respectively 75 beats per minute and 98·4°, while the number of respirations was 18, an elevation of the temperature to 100° would probably bring up the pulse to 87 or 90 and the respirations to about 23.

A considerable and persistent deviation from the pulse, respiration, and temperature ratio, *e.g.* respirations at 40 per minute, while the pulse was only 90, and the temperature 100°, would be a sign of greater danger than a higher range of pulse, respiration, and temperature where the ratio kept at its usual rate. Such an increase in the respiration rate comparatively to the pulse is a feature of pneumonia.

THE TONGUE

The appearance of the tongue affords help in diagnosis. The chief points to notice are its size and colour, whether it is moist or dry, and the amount of coating or fur upon it. This fur consists of accumulated dead epithelium from the tongue's surface. Normally the superficial epithelium on the tongue, as it dies, gets rubbed off in the act of mastication. So that if the tongue is subjected to no friction, as is the case with a milk diet, the epithelium tends not to be removed and so forms a fur. Moreover, there will be more epithelium cast off in unhealthy conditions of the tongue, mouth, or stomach, and in febrile states, so that under these conditions we commonly find a marked fur on the tongue.

The following are the principal states of the tongue that are of value in diagnosis:

(1) A thin, white, even furring of the tongue occurs normally in some people. It may indicate mouth-breathing, smoking, bad

teeth, inflammation in mouth or throat, inflammation of the stomach, or some febrile disease.

(2) A flabby, large tongue indented by the teeth and covered with fur, often yellow in colour, is found in chronic gastritis (inflammation of the stomach) and in forms of dyspepsia that are accompanied by gastritis.

(3) A pale, broad tongue indented by the teeth indicates a debilitated condition, often anæmia.

(4) A narrow tongue, with thick fur, especially on the back part, leaving the tip and edges often free, is seen in the height of some fevers, especially enteric.

(5) If the fur described in (4) becomes dry and brown, the 'typhoid state' is usually present; and the patient's condition very serious.

(6) A tongue with red edges, fur in the middle and on the back, is seen in some forms of dyspepsia.

(7) The tongue may appear purple in some lung and heart diseases from obstruction to the circulation.

(8) The tongue may be tremulous in extreme debility or from intemperance.

(9) Loss of power of motion of the tongue, or its being drawn to one side when protruded, occurs in some forms of paralysis.

The Gums should also be always examined. They may be soft and tender, and on pressure with the finger pus may ooze out from between the gums and teeth. In such event refer to the section on Pyorrhœa on p. 351.

PAIN

Pain is the commonest of all symptoms. It is the one thing that every one wishes to avoid. In spite of that fact, pain is a good thing, because it is Nature's warning that something is wrong, and demands our immediate attention to put this something right before matters have gone too far. If it were not for this warning many of us would neglect our diseases until they got beyond treatment. For this reason an eminent English surgeon has recently said that if he could be sure of having one prayer granted to him, it would be that the earliest stages of cancer should be painful. Then attention would be called to the disease early enough for it to be entirely removed, which now is often not the case. The later stages of cancer are usually painful enough, but then it is too late.

In fact, Nature then gives us too much of a good thing, and pain becomes the bad thing that calls for our attention even when we cannot remove its cause.

It behoves us therefore to be able to interpret this valuable sign as well as possible, and in doing so we shall find certain aids in noting the character of the pain, the time it comes on, and its exact seat. It would be out of place in a book of this nature to discuss all these diagnostic points: it is sufficient to exemplify the first two features by saying that bone pain is usually an intense aching that is worse at night, and that a pain from the pleura is usually worse on taking a deep breath. We may remark here too that there are great differences in susceptibility to pain, both racial and individual, the less civilised races tending to be less sensitive and the more highly strung individuals to be most susceptible. Pain is entirely subjective; we have only the sufferer's word for it as to its presence or intensity, and we must remember that many people habitually exaggerate their sufferings, and some also understate them. Exaggeration in this matter is not as a rule intended to deceive, but arises from egotism and a wish to impress the hearer with the sufferer's necessity. This feature is frequently evident in Indian patients of the poorer classes, who may unblushingly tell you that they have been passing ten diarrhœic motions a day for three months, when it is obvious from their present state such could not have been the case. Many women also are in the habit of speaking of most things in the superlative, and when it comes to their physical sufferings there is added to this habit a natural feminine desire for sympathy, with the result that every headache is a 'splitting' headache, and the untrained observer, usually a male relative, is scorned if he is unable to see that the splitting headache of to-day is infinitely worse than the headache of last Tuesday, which was described by the same epithet. He will do well if he estimates the relative severity of such pains by noting to what extent the patient is up and about; but he will do better still if he does not remark on his observation, for he will only be told that such activity is due to the fact that women bear these things so much better than men. And, indeed, it often happens that when real and severe pain does come, the sufferer, who has exhausted intense superlatives on milder attacks, now bears it with exemplary fortitude.

From a study of the exact seat of pain there is much to be

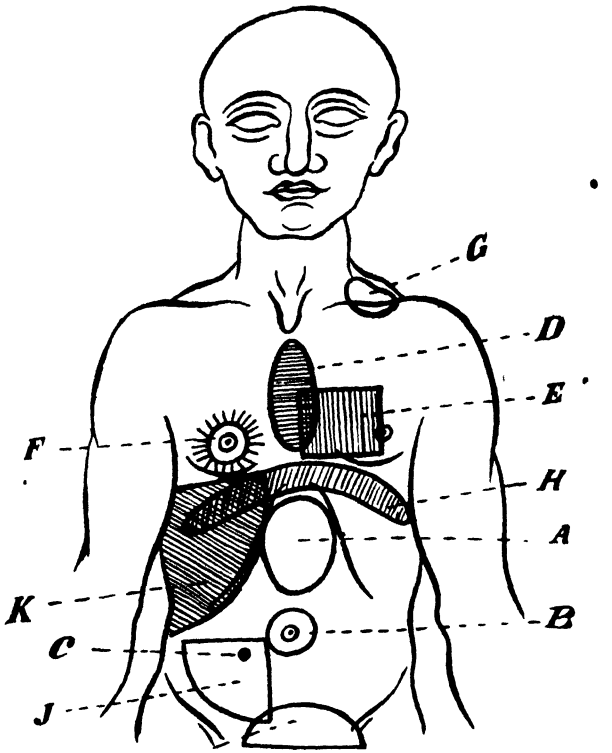


FIG. 6. Diagram to show the commoner causes of pain in certain areas on the front of the trunk

A. Epigastrium
Ulcer of stomach or duodenum
Inflammation of stomach
Some forms of dyspepsia
Pneumonia
Gall-stones

B. Round navel
Colic
Dysentery
Enlarged abdominal glands
Pneumonia
Disease of vertebræ

C. Appendicitis

D. Under breast-bone
Diseases of stomach
Diseases of bone

D.—continued
Enlarged bronchial glands
Bronchitis

E. In front of heart
Some forms of dyspepsia
Anæmia
Angina pectoris
False angina
Diseases of heart

F. Breast
Early pregnancy
Diseases of breast
Diseases of ovary or womb
Hysteria

G. Above shoulder
Disease of diaphragm, as pleurisy there
Disease of large intestine

H. Diaphragm
Much coughing or vomiting
Pleurisy

I. Pubic region
Bladder diseases
Some kidney diseases
Uterus

J. Over right groin
Constipation
Dysentery
Irritation of ovary
Appendicitis
Enteric fever

K. Right hypochondrium
Gall stones
Diseases of liver
Pleurisy and pneumonia

learnt. Very often the area of skin where pain is felt is immediately over the situation of some deep structure or organ in the body,

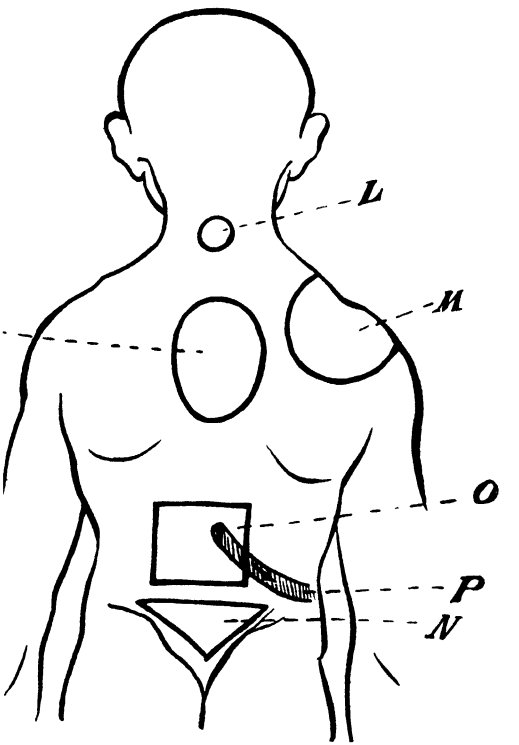


FIG. 7. Pain areas on back of trunk

L. Nape of neck
- Rheumatism
- Neurasthenia
- Meningitis

M. Shoulder
- Gall-stones } Right side only
- Disease of liver }
- Rheumatism }
- Neuritis } Either side
- Pleurisy }

N. Bottom of back
- Disease of womb or ovaries
- Disease of rectum, as piles or ulceration
- Neuralgia

O. Small of back
- Lumbago
- Fatigue or neurasthenia
- Constipation
- Dysmenorrhœa
- Disease of kidney
- Fevers

P. Shooting forward from loin
- Renal colic
- Neuralgia

Q. Between shoulder-blades
- Diseases of stomach, especially with flatulence
- Rheumatism
- Disease of spinal vertebræ

disease of which is the cause of the pain. A study of Figs. 3 and 4 on pp. 10 and 11, showing the position of the organs, may help to

find the origin of the pain in this way. The public are already acquainted with this fact, and like to locate their troubles when they put their hand on the painful area and say, 'It must be my liver.' But only too often are they wrong: pain over the heart is usually not due to the heart, while the advertisers of patent medicines who most graphically represent the agonies of sufferers with their hands on their loins are unnecessarily frightening most of their readers, for the great majority of pains felt there do not come from the kidneys. Many pains are 'referred' elsewhere to a part of the body quite distant from the seat of trouble, and this is due to connections which the nerves of the affected organ form near or at the nerve centres with the sensory nerves that come from these distant areas of the skin. For instance, disease of the spinal vertebræ in a child is often first evident as pain at the navel, and may mislead the unwary into thinking the stomach is at fault.

A study of the four diagrams (Figs. 6, 7, 8 and 9), to show the commoner possible causes of pain in various parts of the body, will assist in arriving at a correct conclusion as to the real seat of disease.

In addition to the information to be obtained from the pulse, breathing, temperature, tongue, gums, and pain, various other symptoms occur, which may be of help in diagnosis. Amongst these the nature of the stools, the vomit and the urine will be dealt with in Chapter XIX on Nursing. Such symptoms also as cough, delirium, giddiness, headache, palpitation, the urinary condition, and vomiting will be found described under those headings in Chapter VI on Other Medical Diseases; an account of fever is given at the beginning of Chapter IV, and of sore throat in Chapter XII.

Although the foregoing symptoms are usually prominent as indications of the diseases to which they point, it should be understood that disease differs in different people, just as the action of medicines has been shown to vary (*see* p. 7). Sex, habit, age, climate, temperament, race, and idiosyncrasy exert influences which tend to render similar diseases in different people varied in their characteristics; sometimes one class of symptoms being more prominent, sometimes another. From the above it will be evident that the aim of the physician must be the treatment of each individual case in accordance with the peculiar symptoms presenting; and it should be equally evident that the popular idea of 'this medicine for that disease must be erroneous, and hence that

patent medicines vaunted to cure all, or even many maladies in all persons, must be unequal to so desirable a result.

Signs of Death. As there are instances of persons supposed to be dead recovering, it is desirable to note the *signs of death.*

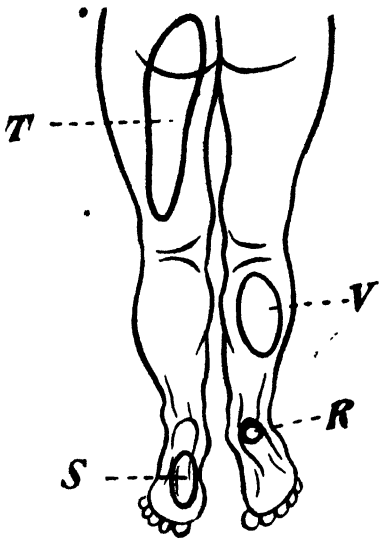


FIG. 8. Pain areas on back of lower limbs

R. Heel
Neurasthenia
Neuralgia
S. Sole
Flat-foot
Fatigue
Neuralgia
T. Back of thigh
Sciatica
Constipation
Disease of rectum
V. Calf
Fatigue
Cramps
Varicose veins
Neuritis

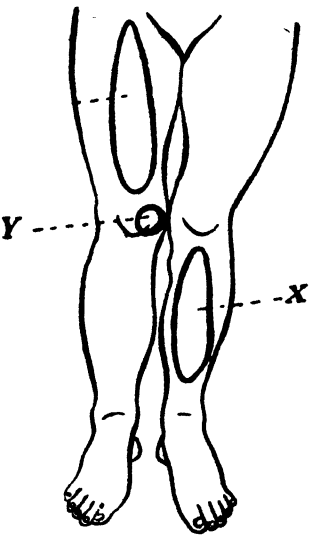


FIG. 9. Pain areas on front of lower limbs

X. Front of leg
Rheumatism
Flat-foot
Disease of bone or its membranes
Severe anæmia
Y. Inner side of knee
Disease of hip joint
Injury to cartilage of knee
Z. Front of thigh
Renal colic
Inflammation of femoral vein
Disease of thigh bone
Disease of womb or ovary
Neuralgia

These are: (1) *Cessation of the circulation:* the pulse cannot be felt, and the beating of the heart cannot be felt or heard. (2) *Cessation of respiration:* the chest does not move, a feather held to the mouth is not stirred, and a looking-glass is not made dim by the breath. But none of these signs are infallible, as instances are

known of persons being able to suspend circulation and respiration, or at least to carry on these processes so slightly that they could not be recognised. (3) *Coldness of the body, commencing at the extremities:* not infallible, as after death from cholera and some forms of fever, the temperature sometimes rises. (4) *Rigidity of the limbs coming on gradually:* not infallible, as after death from some maladies it is long in appearing, and in the cataleptic condition rigidity may be counterfeited. (5) *Death-like stillness:* not infallible, as after death from cholera startings of the limbs sometimes occur. (6) *Eyes dull, flaccid and shrunken:* not infallible, as after death from some poisons the eyes remain bright for a long time. (7) *Absence of a red colour in semi-transparent parts,* as, for instance, the sides of the fingers when viewed with a powerful light behind. (8) *Absence of muscular contraction* on an electric or galvanic current being applied. (9) *Absence of a blister* on touching the skin with very hot iron, but not sufficiently hot to destroy the skin. Sufficient heat being applied to the skin during life, or within a few minutes after death, produces a blister containing water with a line of redness round. Heat applied after death produces a blister containing air except in dropsical bodies. (10) *On opening a vein water oozes out instead of blood.* None of these latter tests are to be regarded as infallible, as mistakes may occur in their application and in the appreciation of results. (11) *Commencement of putrefactive changes,* usually first seen over the bowels: certain. It will thus be seen that none of the signs of death, excepting the last, are in themselves certain evidence of life having ceased. But taken altogether, the evidence is conclusive.

CHAPTER IV

FEVERS

Fever : Incubation periods : Ague : Anthrax : Beri-beri : Blackwater fever : Cerebro-spinal fever : Chicken-pox : Dengue : Diphtheria : Enteric fever : German measles : Glanders : Influenza : Kala-azar : Malaria : Malta fever : Measles : Mumps : Plague : Pneumonia : Relapsing fever : Rheumatic fever : Scarlet fever : Seven-day fever : Smallpox : Three-day fever : Typhus fever : Whooping-cough : Yellow fever

FEVER

THE word 'fever' is used loosely in two senses. One is that of a body temperature raised above the normal, which the physician more accurately designates 'pyrexia.' The other is in the sense of one of the infectious fevers, such as enteric : we use it in this sense when we say a patient has 'a fever.' A further limitation of this second meaning is sometimes heard in India, when people, speaking of a man having 'fever,' mean that he has the particular febrile disease prevalent in that locality, commonly malaria.

A high temperature may be normal after active exercise, even to 101° F. For the meaning of 'normal' we must refer the reader to our remarks on the clinical thermometer. But in health a rise of temperature from exercise quickly returns to normal. In this the healthy man contrasts with the febrile patient, whose regulation of temperature is imperfect.

It should be understood that the maintenance of the temperature of an adult man, as of other warm-blooded animals, is conducted by an exceedingly delicate nervous mechanism. His internal temperature remains the same whether he be in the Arctic circle or on the Equator, and this is achieved only by the brain's control over the debit and credit sides of the balance-sheet of temperature. Heat is produced by the body in various ways, but especially by the muscular tissue. Heat is lost mostly by the skin : 85 per cent.

of all heat loss is by the skin ; and some by the heat of the air that is expired. The amount of heat-production and of heat-loss is controlled by the nervous centres, and in the healthy adult the control is perfect. In children it is not nearly so perfect. That is why children get 'fever' so much more readily than grown-ups ; even from teething or digestive upsets that would not disturb an adult.

We know now that in most fevers there is at first both a diminution of heat-loss and an increase of heat-production, so that in two ways the body temperature becomes raised. An old saying is, 'Feed a cold, but starve a fever.' Like many proverbs, this is fallacious. Colds are best treated with a light diet, and though in fevers the diet should certainly be light also, the patient should not be starved beyond the first twenty-four hours, since the body heat that has to be produced is then only made at the expense of his own tissues, and the patient rapidly wastes. Treating a case of fever without feeding the patient suitably has been compared to raising the temperature of a home by burning it down, and by feeding him with suitable food to raising the temperature by burning coals in the grate. Three stages have been described in fever :

(1) The initial stage, when the patient feels cold, or shivers. A violent shivering is called a rigor. At this stage, although the patient feels cold, the temperature is rapidly going up.

(2) The hot stage. He now feels hot.

(3) The stage of defervescence. This means the coming down of the temperature, which may be gradual, by lysis ; or rapid, by crisis. The temperature may even fall 7° in as many hours.

The following names are used to describe certain types of fever :

(1) Continuous. The temperature is high and the difference between morning and evening is but slight.

(2) Remittent. The temperature does not reach normal at its lowest, but there are 2° difference at least between morning and evening readings.

(3) Intermittent. The lowest temperature reaches normal daily : the maximum is high.

(4) Hectic. The morning temperature is normal or nearly so, the evening is at least 3° higher.

A temperature of 105°.5 and over is called 'hyperpyrexia.'

Certain *symptoms* are present in most fevers. A chill may initiate a sudden rise of temperature : then there may be ill-feeling or malaise, thirst, headache, restlessness, mental disturbance—which

may reach delirium if the fever be high—sleeplessness, loss of appetite, furred tongue, face flushed, constipation, urine scanty and high-coloured, respiration and pulse quickened. In certain fevers some of these symptoms are accentuated. Thus in pneumonia the respiration especially is quicker, more so relatively than the pulse. Roughly, the pulse rises about 8 beats per minute for every 1° to 1·5° F. rise in temperature, but there is no rule about this.

Fever is usually caused by micro-organisms that make poisons which cause the disturbance; and the height of the fever will depend on two factors: (1) The dose of the poison the patient receives; (2) the natural power of the patient of resistance to this particular infection.

It will be understood from the above that there is really no such disease as 'fever.' Fever is a symptom of some specific disease, or a result due to a particular cause. The treatment here recommended for fever generally is suitable for all diseases which are accompanied by raised temperature, and can be usefully and safely used until the specific disease has been diagnosed.

Treatment applicable to all cases of fever without regard to the diagnosis of a particular case.

Bed. The patient must be put to bed at once to conserve his energy. Even in short fevers he should not be allowed up till the temperature has been normal at least twenty-four hours.

Diet. If the patient express repugnance to any form of nourishment it will not hurt him to starve for the first twelve or sixteen hours.

Water to relieve thirst, either by itself or flavoured with lemon or lime juice, may be given *ad libitum;* water is preferable to soda-water.

The best food is milk; it is easily digestible and easy to swallow. If it appears to cause indigestion and 'wind,' it may be peptonised. And if curds are passed in the stool, or much wind is evident in the abdomen, whey should be given in place of milk.

On the other hand, if it is only the taste of milk that is objected to, this may be concealed by adding a little coffee. Three pints of milk should be given in the twenty-four hours, in even quantities every two or three hours. If the fever is likely to last several days, some carbohydrate, as maltine or lactose, should be added to the milk. Two ounces of lactose (sugar of milk) to each pint of milk is a suitable quantity. Some common salt should also be given

daily: a little may be added to the milk, or, if preferred, in a little broth daily. But soups, broths, and beef-teas, either home-made or ready bought, are to be discouraged. They give but little energy, and when used in quantity distend the stomach. However, if the patient likes broth, four ounces once daily may be allowed.

Except in malaria, where quinine is a specific, or for the relief of special symptoms, drugs are usually unnecessary during the fevers. Some relief, however, may be obtained by the use of the Diaphoretic Mixture, Prescription No. 40, every six hours: by encouraging sweating this mixture often makes the patient feel easier.

Alcohol in fever as a routine measure is quite unnecessary: sometimes a little is advisable when the temperature is falling rapidly, or during convalescence. Do not give it during the height of a fever unless it is indicated by signs of heart failure or delirium. Good brandy is the best form in which to give alcohol: and it should be administered half an ounce at a time, diluted with water or milk. Champagne, one or two ounces at a time, is useful when there is stomach irritability as well. A champagne tap should be fixed in the cork to prevent the wine becoming flat.

Regarding the treatment of special conditions arising during the course of a fever, we can only mention a few.

(*a*) **Hyperpyrexia.** Either cold-pack the patient (*see* 'cold-pack'), or put him in a bath. The bath should be at about 80° F., and should be cooled after the patient is in it to 70°. Keep the patient in it till his rectal temperature is 100° F. Then remove him, dry him, put him back to bed; and give him half or one ounce of brandy in water if his pulse show signs of collapse. Do not mind his shivering or looking blue.

If no bath is available, a continual douche may be arranged for the patient by putting him in a mackintosh sheet, grooved so as to drain into a bucket, and pouring cold water over him. Children may be treated by cold sponging till the temperature is down to 102°.

Do not give the patient antipyretic drugs, such as phenacetin or antifebrin, in this condition.

(*b*) **Insomnia,** if present, is probably due to the fever itself, and should be treated by sponging the patient all over with cold water just before he is wanted to sleep. Having once got him to

sleep do not wake him for food, nor even for medicine, except under the doctor's orders.

(*c*) **Constipation** will usually be present. An enema on alternate days is an excellent plan for keeping the lower bowel clear. In enteric fever it may be unsafe to give a purgative; but in other fevers 1 grain of calomel, repeated hourly till 3 or 4 grains have been taken, or the bowels opened, is a convenient purgative.

INCUBATION PERIODS

After a harmful micro-organism has entered the system it may or may not be destroyed at once and entirely by the protective powers of the body. In the former case no illness is evident. But if the harmful germ succeeds in holding its own against the body then it multiplies, and after a certain period, during which growth is taking place, the poisons that the germ has made begin to exert their deleterious effect on the body cells and the symptoms of disease begin. This period, during which the germs are growing, varies much for different diseases, but is a fairly constant interval for the same disease. It is the interval between infection and the onset of symptoms and is known as the incubation period. The Table on p. 42 gives the incubation period of the more important infectious fevers.

AGUE

Ague. *See* **Malaria.**

ANTHRAX

Anthrax is an infective disease of sheep and cattle due to a special bacillus. It may attack men, usually shepherds, workers in hides, or wool workers, who may meet with infected animals. In man the disease may show itself in the lungs, or as an intense poison in the bowels; but usually in the skin of the face or hands as a carbuncle-like inflammation called a 'malignant pustule.'

BERI-BERI

Beri-beri is a common disease in China and in Japan, where it is known as kakké; it also occurs in India. The nature of the disease is an inflammation of certain nerves, and the symptoms

beri-beri gives rise to depend upon which nerves are so affected. Thus in one type of the disease the nerves of the limbs are chiefly

INFECTIOUS DISEASES

——	Incubation period	Date of the definite illness on which the eruption appears
Cholera	A few hours to ten days usually three to six days.	——
Chicken-pox	Ten to sixteen days.	First day and three following days.
Diphtheria	Two to ten days.	——
German measles	Nine to eighteen days, or even longer.	Second to fourth day.
Influenza	One to four days, usually three to four.	——
Measles	Ten to fourteen days.	Fourth day. The patient is highly infectious for two days before the rash appears.
Mediterranean or Malta fever	Fourteen days.	——
Mumps	Ten to twenty-two days.	——
Plague	Two to eight days; in rare cases, up to fifteen days.	——
Scarlet fever	One to eight days, usually three to five.	Second day.
Small-pox	Twelve to fourteen days.	Third or fourth day.
Typhoid fever	Seven to twenty-one days, usually ten to fourteen.	Eighth or ninth day.
Typhus fever	Five to fourteen days—very variable.	Fifth day.
Whooping-cough	Seven to fourteen days.	The characteristic whooping may not appear for three weeks, although the patient is infectious before then.
Yellow fever	Three to six days, and in rare cases thirteen.	——

involved, and the patient becomes wasted and thin, with loss of power in the lower limbs especially, absence of knee-jerks, and

sometimes complete paralysis of the legs. Or there may be diarrhœa and vomiting. In another common type the nerves of the heart are involved, and in this variety the clinical picture is quite different. Here, owing to enfeeblement of the heart's action, the lower limbs become swollen and œdematous, and the patient altogether may appear fat, puffy, and bloated.

In both varieties the calves of the legs are tender on pressure; and there is no rise of temperature accompanying the disease.

The *treatment* of this disease should depend upon removal of the cause, but on what the cause is physicians are not yet agreed. There is some evidence to show that it consists in the absence of some essential constituent, vitamines as they are called, from the food. Treatment therefore should consist in giving fresh food, fruits, vegetables, and meat, as well as in keeping the patient at rest in bed and in removing him from the locality where the disease is prevalent. For the thin or dry variety, Prescription No. 51 may be given thrice daily; for the swollen or wet variety Prescription No. 48 may be given four times a day.

There is another disease called **Epidemic Dropsy** with many points of resemblance to beri-beri, but epidemic dropsy is accompanied by fever in its early stages.

BLACKWATER FEVER

Blackwater fever derives its name from the fact that the urine passed in this disease is very dark in colour: it may be quite black, like stout, or dull red. This colour is derived from hœmoglobin, the pigment of the red blood-corpuscles, and its presence denotes that there has been much blood destruction.

Blackwater fever occurs mostly in Tropical Africa, and also in some parts of India, especially in Assam and the Duars, in South Italy, and in parts of Tropical America. It will be noted that all the above are areas where severe malaria is common, and it is found that nearly all, if not all, the sufferers from blackwater fever actually harbour the malarial parasite. The cause of this fever is not yet determined; but it is generally thought to be severe malaria together with another factor, and this second factor is held by many to be the large doses of quinine-sulphate that have been given to treat the malaria.

Attacks usually come on suddenly with high fever, which may

remit after a few hours, to rise again later. It is a very serious disease, and competent medical advice should at once be obtained. Meanwhile the patient should be put to bed, and treated on the lines laid down for fever generally. Quinine should be administered freely, but not the sulphate of quinine. The bihydrochloride should be obtained and, if feasible, given by intramuscular injections, 3 grains at a time, often repeated. Quinine tannate is a good preparation, also to be given by the mouth. Plenty should be given the patient to drink, water or soda-water, and tea; while the diet also should be fluid, such as whey, milk, albumen water, or Benger's Food. Do not give strong soups.

CEREBRO-SPINAL FEVER

Cerebro-spinal meningitis is an infectious disease, occurring either sporadically or in small localised epidemics. It is not rare in India.

The symptoms are such as would be associated with meningitis of the brain and spinal cord, intense headache, irregular temperature, vomiting, delirium, and sometimes a dark-spotted rash.

Diagnosis should be confirmed by puncturing the spinal membranes in the lumbar region, where the causative organism may be found.

The disease is very dangerous, though the mortality varies in different epidemics. The means of its spread is unknown.

Ice should be applied to the head for headache and delirium; and the general measures given under the treatment of fevers adopted. A specific serum may be injected by the doctor.

CHICKEN-POX

Chicken-pox or varicella is an infectious fever with a characteristic eruption: it is usually of a mild nature and occurs mostly in children. The incubation period is about a fortnight: then the patient is seized with slight fever.

The next day an eruption of pink spots appears, first on the trunk, and later appearing on the face. In a few hours the spots become vesicles, *i.e.* filled with clear fluid, and in two days more they are seen to contain purulent matter.

By the third or fourth day they dry into crusts, which gradually fall off.

The disease is almost always mild, and no treatment in particular beyond isolation of the patient and protecting him from chills is required. The importance of chicken-pox is in its resemblance to mild smallpox, and it is necessary to make the diagnosis with care for fear of neglecting to recognise a case of the graver disease and so allowing it to spread. The chief points in the differentiation of the two diseases are given under the head of Small-pox, and this account should be referred to.

DENGUE

Dengue is a fever known by many other names, of which ' break-bone fever,' in reference to its rheumatic pains, is the best known. It occurs mostly in the tropics in watery and low-lying lands, just in such places as the very common mosquito *Culex fatigans* is found, by the agency of which it is spread. It prevails in many parts of India between July and October.

The incubation period is about three days, and after that the onset is usually sudden with severe pain in some part of the body. The temperature rapidly rises to about 103° F., and the pulse quickens. The face is flushed, and the eyes bloodshot. After two or three days of the fever and discomfort the temperature falls, sometimes to normal, sometimes only to 100° F., and continues low for another two or three days, during which time the patient feels much better. The temperature then rises again, perhaps to as high as 103° F., and a rash somewhat resembling measles appears on the hands and spreads to arms, body, and legs. This access of fever lasts only about a day and then falls, usually on the sixth day of the disease. The rash usually lasts a few days more. A feature of dengue is the pains in the muscles, especially those around the joints, which are commonly severe. Recovery is practically certain, as the mortality is *nil*. There is no specific treatment: the measures given above for fevers generally should be adopted.

Dengue fever has many resemblances to what is known as ' seven-day fever,' to which the reader is referred for the diagnosis of these complaints from others. According to some, dengue fever is the same as seven-day fever,

DIPHTHERIA

Diphtheria is an infectious disease caused by a special bacillus which lodges in one of the mucous membranes of the body, usually that of the throat, nose, or larynx, and there gives rise to a special form of inflammation. This inflammation is characterised by the formation of a thick white exudate from the true mucous membrane, which has the appearance of another membrane and is known as the 'false membrane.' In this situation the bacilli make their poisons, or toxins, which enter the circulation and cause many of the symptoms of the disease. Other symptoms are caused by the actual mechanical obstruction of the false membrane, such as the difficulty in breathing when the diphtheria is in the larynx.

Unfortunately in practice the diagnosis of diphtheria is sometimes not so simple as the above account might suggest, and for two reasons: Firstly, because not every case of diphtheria shows a false membrane; sometimes the appearance may be that of a simple sore throat. Secondly, because not every sore throat showing a membrane is diphtheritic. The true criterion of diphtheria is the presence of the special bacillus, and hence the diagnosis is not confirmed until that bacillus has been either seen or cultured from a swab taken from the throat.

Diphtheria often prevails as an epidemic, and is highly contagious, especially for those in close contact with the sick, as doctors and nurses. Diphtheria is not so common amongst Indians as amongst Europeans, though here we would make an exception in favour of Bengalis. Nearly all the cases of diphtheria we have seen in India have been in Europeans or Bengalis. Diphtheria is often conveyed by those who have only mild sore throats, yet in whom the bacillus is present: and these may be the means of conveying a severe form of the disease to others. Articles may become infected by the sick and convey the disease thus indirectly to others; and milk has been found to be a means of conveyance also.

Bad drains are popularly accused of causing diphtheria, but this is usually a mistake. A bad smell is only an evidence of faulty sanitation and can do no harm itself. Eighty per cent. of the deaths from diphtheria are in children under five years of age; in fact, the commonest age for the disease is from the second to the fifth year, though it occurs also amongst adults.

The symptoms of diphtheria begin to show themselves soon after infection, the incubation period being usually two days, though it may be as long as seven. The illness may begin either with fever, and the usual attendant symptoms of fever malaise, lassitude, vomiting, or the characteristic sore throat may be the first sign. The latter is usually the case. The false membrane is not seen at first, though sometimes it forms very quickly. Sometimes, as we have already explained, there may be no membrane at all. When present it is usually seen as a thick white covering over the tonsils and part of the palate. If present in the larynx there will be loss of voice and difficulty of breathing. If present in the nose there will be nasal obstruction and an irritating discharge that may blister the upper lip. The glands in the neck may become swollen also. The fever is not high: it is usually only about 101° F. when at its height, and commonly falls altogether on the second or third day of the disease. This feature helps to diagnose the disease from a severe tonsillitis, where the fever tends to be higher. In diphtheria there is often danger of heart failure, sometimes very sudden: and if any signs of this, such as a weak pulse, show themselves, the child must be kept quite recumbent.

In laryngeal diphtheria there is the added danger of suffocation from the membrane blocking the air passage, and to obviate this the operation of tracheotomy is sometimes necessary.

Sometimes there is a diphtheritic membrane in the larynx without there being signs of a membrane in the parts of the throat that are visible to the unaided eye. In such cases there may be considerable doubt whether the child has diphtheria or only catarrhal laryngitis. Both conditions have been popularly referred to as 'croup': the former sometimes as membranous croup. But croup is a word best avoided, as it does not actually express the one important point we wish to know, whether the diphtheria bacillus is present or not. If a conclusion cannot be come to on this point, it is best to regard the case as one of diphtheria. In both conditions there will be signs of obstruction in the larynx, usually more severe in the diphtheritic laryngitis; and both conditions may be associated with broncho-pneumonia.

Diphtheria may be followed by paralysis affecting one or many nerves. About one-tenth of all cases suffer in this way, the paralysis usually coming on gradually quite late in the illness when the patient is convalescing. This paralysis is usually recovered from

as gradually as it sets in, but sometimes it continues to progress, and, if it affects the important nerves of respiration, may be fatal.

The two diseases from which diphtheria of the throat has to be *diagnosed* are scarlet fever and tonsillitis. In scarlet fever the temperature tends to be higher and the rash and initial vomiting are stronger features, and the membrane in the throat is not characteristic. From a severe tonsillitis the diagnosis may be more difficult; here also the temperature will be higher and the pus in the throat usually in small pellicles and not as a continuous membrane. But the finding of the diphtheria bacillus is necessary to confirm.

The *treatment* of diphtheria consists in the administration of antitoxin as early as possible and in full doses. The size of the dose is to be regulated not by the age of the patient, but by the severity of the disease. About 6000 units should be injected at once and repeated daily till the membrane begins to separate.

The wonderful effect of antitoxin in saving the lives of countless children from diphtheria is one of the strongest arguments there is in favour of the justice of vivisection when performed under proper control.

Besides antitoxin, the throat must be disinfected so far as possible. After removing as much of the false membrane as will come away, carbolic acid and glycerine should be applied to the red patch left underneath by means of a swab of wool on the end of a probe or small stick. The correct strength is 25 per cent. of carbolic acid with glycerine.

If swallowing is very painful ice may be given to suck just before the milk is given. But often it is necessary to feed a child only by the nose, passing a soft male catheter through the nose down to the gullet and pouring milk in by means of a small funnel attached. The diet should be milk only.

Sometimes benefit may be obtained by the administration of the following prescription:

Perchloride of mercury	1 grain.
Potassium iodide	30 grains.
Glycerine	2 drachms.
Water	to 8 oz.

One tablespoonful of this is a suitable dose for an adult, and it should be repeated four-hourly. The patient should be in a

warm, but ventilated, room, and the atmosphere round the bed moistened by means of a bronchitis-kettle. Sheets should be arranged round the bed-head to form a 'tent.' When the disease is in the larynx, the application of hot fomentations to the outside of the throat may assist, suddenly changing at times to crushed ice if the breathing becomes bad. But the doctor in such cases will be ready to perform tracheotomy, or intubation; and when signs of obstruction are seen the tracheotomy instruments should be kept prepared in case they are wanted urgently.

The convalescence from diphtheria is usually a long one, and the patient should not consort with his fellows until bacteriological examination of the throat has shown that no diphtheria bacilli are present.

Diphtheria antitoxin may be obtained in India from the large Government bacteriological laboratories, such as the Central Research Institute in Kasauli, who issue the following instructions with the antitoxin:

(1) *Early Treatment.* In a case of diphtheria it is most important that serum treatment should be commenced as early as possible. Every hour's delay after the first day is valuable time lost. In a doubtful case it is much better to give serum at once than waste time waiting for a diagnosis. Should the case not turn out to be one of diphtheria no harm is done. The early administration of a large dose of diphtheria antitoxin is the keynote of successful treatment. When time is wasted the antitoxin will not undo the harm which has already been done by the toxin.

Statistics show that success is almost certain in every case when serum treatment is commenced early.

(2) *Method of Injecting the Serum.* The serum may be injected hypodermically in the flank or side of the abdomen, using any sterile syringe provided with a good needle.

The skin at the part selected should be sterilised by rubbing it with a pledget of cotton wool soaked in 1 in 10 carbolic acid, or any other efficient antiseptic. A fold of the skin is pinched up between the finger and thumb, and the needle of the syringe introduced into the subcutaneous tissue, and the serum slowly injected. On withdrawing the needle the part should be again rubbed a few times with the same pledget of wool in order to stimulate the skin to contract so as to close the needle puncture and prevent oozing.

(3) *Dosage.* It is much better to give a large dose at the outset than a series of smaller doses at intervals.

Four thousand units is a suitable dose for a child three to six years of age. In severe cases more could be given with benefit, and a further dose of, say, 2000 to 3000 units, after eight to ten hours where improvement is not marked. The severity of the case would suggest the amount to be given, and also whether a repetition of the dose was necessary.

(4) *Prophylactic Use.* A dose of from 1000 to 2000 units confers a passive immunity for about three weeks, and this amount may be given to the other members of a household where a case of diphtheria occurs.

ENTERIC FEVER

Enteric or typhoid fever is due to infection by the bacillus typhosus. This organism gains entrance to the body by means of the intestinal tract, that is to say it is swallowed; it then, by means of the circulation, invades the entire body and the toxins that it makes poison the tissues and produce the effects that we see clinically.

It is important to understand that every case of typhoid fever arises from sewage contamination, that the disease cannot arise anew, but that one patient sickens from infection by the excrement of a former patient, directly or indirectly, and that this infection always enters by the mouth. The infection may be conveyed in several ways:

(*a*) By contact; nurses, attendants, or relatives of the patient are liable, after touching the patient or his clothes or some article that has been in the patient's use, to convey the bacillus to their own mouths.

(*b*) By water, either directly from drinking unsterilised water, or indirectly from articles, such as milk-cans, salads, etc., that have been washed in infected water. It is the water that is usually to blame in widespread epidemics.

(*c*) By flies; numerous bacilli adhere to the flies' legs and may be conveyed by them from sewage to human food.

(*d*) By typhoid carriers. A typhoid carrier is a person who has had, and apparently recovered from, typhoid fever, but still carries in his body the typhoid bacillus, which he continues to

excrete with urine and fæces. Such an abnormal condition is a constant source of infection, since one so affected may be in the position of a cook or milkman and so liable frequently to infect fresh subjects.

The typhoid bacillus is an organism very resistant to harmful influences; it will survive drying and even freezing.

Certain races are more subject to enteric fever than others. In India the young European is especially liable. Indians may also be infected, especially Gurkhas or other hillmen; but usually in Indians the disease is milder. No age is exempt; in children the disease is often unrecognised. Enteric fever is commonest in the young adult and in those who have not long dwelt in India, but it has been known even in the elderly.

The incubation of enteric fever varies from eight to fourteen days.

The onset of the disease is usually gradual with feelings of malaise, aching all over, loss of appetite, and severe headache, the intensity of which is usually a feature of the first week of the illness. The typical course of enteric fever is divided conveniently for the sake of description into four weeks.

During the first week the temperature gradually rises to 103° or 104°, and the tongue becomes thickly coated. The pulse is rapid, but often not so rapid as it is in other fevers with the same temperature. There may be constipation or diarrhœa. If diarrhœa is present the stools may be thin and yellow, having the appearance of pea-soup. In India, however, constipation throughout the illness is more frequent than diarrhœa. There is usually a slight cough present: careful examination of the chest will always show signs of bronchitis. The spleen becomes slightly enlarged; and at the end of the week there may appear small pink spots on the abdomen, chest, and back. These spots, the 'rose spots' as they are called, fade if pressed upon. They are often not present, and are very difficult to detect upon the dark skin of an Indian.

During the second week the intestinal symptoms may be aggravated, and the abdomen somewhat distended and tender. The headache, however, goes, leaving the patient dull and heavy. The temperature has now reached its height and will show only slight morning remissions, except in a mild case where it may begin to return to normal about the end of the week. Delirium is common at this stage, especially at night.

During the third week the morning remissions of temperature should be more marked, becoming subnormal in the morning, and the evening temperature showing a gradual decline. But the diarrhœa, if present, and abdominal distension, may be worse now. Moreover, this is the time fraught with danger of some complications, as pneumonia, or the more serious ones of hæmorrhage from, or perforation of, the bowel.

By the beginning of the fourth week the patient has become extremely thin, and careful nursing is necessary to prevent the formation of bedsores. In a favourable case, however, convalescence is now beginning, and though very weak the patient is beginning to feel the return of appetite. The tongue by the end of the week should be quite clean. At this stage care is required to prevent a hungry patient securing forbidden articles of diet. In an unfavourable case the patient is still delirious, and lies in what is known as the 'typhoid state.'

Enteric fever has been called a three weeks' fever: it may last any time from ten to sixty days, but from two to four weeks is about the average. Recrudescences and relapses of the fever, after return of the temperature to normal, greatly prolong the course of the disease, which at the best of times has a long and trying convalescence.

The possible complications and sequelæ of enteric fever are many, but cannot obtain further notice here. The diagnosis of enteric fever in its early days may be difficult: later on the temperature chart and general clinical picture usually are sufficient to name the disease. Amongst the general features that help in the early diagnosis of enteric fever are the intense headache, the furred tongue, the comparatively slow pulse, the age of the patient, and the gradual onset of the fever. Amongst special means of diagnosis are the culture of the bacillus typhosus during the first week of the disease, and subsequently the carrying out of the Widal agglutination test. The first test is absolute; if the bacillus is found in the blood the disease is enteric fever. The Widal test is not so decisive, as a negative result from the laboratory does not exclude enteric fever if diagnosed on clinical grounds.

Treatment. The treatment described for fevers in general should be read here and the principles followed in the treatment of a case of enteric fever. There is no specific medicine for this disease; the treatment is expectant, and the successful attendance

in a case consists more in good nursing and in careful attendance to the diet than in anything else. Actual drugs may be entirely unnecessary, and should not be given as a routine measure, but only when called for by some particular event in the case.

As an antiseptic for the intestinal canal the chlorine mixture, Prescription No. 44, is given to many every four hours; but we obtain equally good results without it, or by giving cinnamon oil, 2 minims, in emulsion four-hourly only, when flatulence is troubling. The standard food during this disease should be milk; but on the first appearance of distension of the abdomen, or of curds in the stools, whey should be substituted for the milk, either in whole or in part. Albumen water may also be used if the diarrhœa or distension is great; but there is not sufficient nourishment in this alone to maintain the patient for long. Do not give soups or meat extracts, unless indicated later in the disease when milk becomes nauseating, and then only for short periods and in small quantities. They have the effect of stimulants then for a short time, and are useful to create an appetite and to supply salt, but when given largely tend to dilate the stomach.

Four ounces of milk, every three hours, with lactose added is as much as the patient can be expected to take at first. Later the amount can be increased to six or even seven ounces; and one or two hen's eggs daily may be added.

When the tongue is cleaning and the temperature has been normal a few days the patient's appetite may begin to become ravenous. It is then that particular care must be taken that nothing except the diet ordered is given to the patient. Pastry or potato has been responsible for many a relapse or perforation of the bowel, resulting in death. As a drink during the course of the fever, barley-water flavoured with lemon-juice is excellent; and in any case the juice of one or two lemons or limes daily is advisable. As a routine measure alcohol is unnecessary. It should only be given when specially indicated for a weak pulse or for delirium in the form of brandy. It may be necessary to give as much as four ounces or more in the twenty-four hours, giving it in half-ounce doses as described under the Treatment of Fevers.

The patient should certainly be washed all over every day; while sponging with cold water to reduce the temperature will sometimes help to get him to sleep. For hyperpyrexia the cold-pack is to be used as described in Chapter XX. Some special

points in the nursing of enteric patients are given in Chapter XIX.

If diarrhœa is troublesome, whey only is to be given as food, and the Bismuth Mixture, Prescription No. 41, may be given every four hours.

Should hæmorrhage occur from the bowel a hypodermic injection of morphia, about $\frac{1}{3}$ grain, is necessary to keep the patient absolutely quiet. He should then not be moved, except gently for the necessary processes of cleansing. In the event of perforation no measure, short of surgical operation is of avail.

For severe headache, the application of crushed ice, or of a handkerchief wrung out in eau-de-Cologne, to the head is soothing.

As the patient convalesces the diet may be gradually increased, from eggs to thin toast, grated toast-crumbs, custard puddings, jellies, and so on, to boiled fish and minced meat. At this stage also it is advisable to give hexamine, 5 grains twice a day, for a week, as a routine measure in order to sterilise the urinary tract and prevent bacilluria, not only for the patient's benefit, but as a safeguard to those round him to prevent the urine being a means of carrying infection.

The convalescence from enteric fever is always a long one: it should be remembered that the patient is often to some extent mentally as well as bodily affected. A prolonged rest should be allowed him, and in the early stages thereof he must not be allowed to exercise himself unduly at games or otherwise; neither should he be hurried in his return to work.

PREVENTION OF ENTERIC FEVER

Besides carrying out the general rules of sanitation there is a method of specific protection for the individual against this disease, which should certainly be adopted by all non-immune subjects likely to meet the bacillus. All newcomers to the tropics and those going on active service or into camp life anywhere are advised to undergo the inoculation against typhoid fever, a short account of which is given below.

VACCINATION AGAINST TYPHOID FEVER

I. Principles upon which the Inoculation is Based

Experiments in the laboratory have demonstrated the fact that when animals are inoculated with dead cultures of typhoid bacilli they possess

a markedly resistant power against the effects of inoculation with living typhoid bacilli; or in other words, by means of dead cultures, they are rendered immune against the effects of living cultures.

The immunity thus conferred is accompanied by a specific alteration in the animal's blood serum.

The same specific alteration in the blood can be produced in man by hypodermic inoculations of sterilised cultures of typhoid bacilli. The alterations produced in the blood fluids by this means resemble the alterations which we find in persons who have recovered from an attack of typhoid fever.

As a general rule one attack of typhoid fever confers immunity against a second attack, and taking into consideration the fact that the alterations found in the blood after an attack of the disease resemble those found in the blood of persons inoculated with dead cultures of the causal micro-organism, we are justified in inferring that the latter are also protected against attacks of the disease.

We are also justified in the inference that the alteration produced in the blood of persons inoculated is an index of their immunity.

II. Composition of the Vaccine used in the Inoculation

The vaccine consists of sterilised pure cultures of typhoid bacilli to which an antiseptic has been added to prevent subsequent contamination. In all cases the strength and sterility of the vaccine is tested before being issued for inoculation purposes.

III. Clinical Symptoms which may be expected after Inoculation

The symptoms vary considerably in different individuals

(1) *Constitutional Symptoms.* In every case a little fever and some degree of malaise may be expected between the third and tenth hour.

The temperature rarely goes up as high as 102° F. and only lasts for a few hours. In order to prevent the possibility of a feeling of faintness it is advisable to remain quiet for the first eight or twelve hours after inoculation.

(2) *Local Symptoms.* A certain amount of tenderness and swelling may be expected after the sixth hour, and a red blush makes its appearance about the seat of inoculation. The lymphatic vessels in the vicinity may appear as fine red lines, and the glands in the neighbourhood may feel slightly tender.

These symptoms soon subside without any local treatment.

On the second day the seat of inoculation feels tender and painful when pressed, but on the next day this has disappeared and no more inconvenience is felt. In many of the cases the symptoms are milder than described above and in a few exceptional cases they may be more marked.

IV. Advisability of Second Inoculation

Experience has proved that a higher degree of immunity is conferred by two inoculations than one, when the second is given at a certain interval of time after the first. The interval of time allowed to elapse between the first and second inoculations should be from ten to fourteen days. The antidotal substances present in the blood after the first inoculation are

considerably increased when a second is given. On this account a second inoculation is to be strongly recommended in all cases.

GERMAN MEASLES

German measles, or rubella, is a mild infectious fever characterised by a rash.

The incubation period is about eighteen days; and the majority of those attacked are children between five and fifteen years of age. The disease is common in cold and temperate northern climates, but appears rare elsewhere.

The first sign of illness is usually the rash, which is bright red and in appearance something between that of scarlet fever and measles. It usually fades in a few hours. There is mild fever to about 100° or 101° F. for two or three days, and usually some sore throat. Almost always there is enlargement of certain glands, especially those at the back of the neck and at the angle of the jaw. The disease is always a mild one.

No *treatment* is usually necessary beyond keeping the patient in bed, and, however mild the attack may be, he should stay in bed five days and indoors for another four days, and be isolated from other children for three weeks altogether.

A table of differential diagnosis of German measles from scarlet fever and measles is given under the head of the last-named disease.

GLANDERS

Glanders is an infective disease of horses that is sometimes conveyed to grooms and others coming in contact with a diseased horse, usually by inoculation on to skin already abraded. The disease may be acute or chronic, and may affect principally the nose, or be a general blood-poisoning, *i.e.* a septicæmia, or a pyæmia with numerous abscesses.

The acute form is nearly always fatal; the chronic form may recover after a prolonged illness.

There is no specific treatment yet known, the treatment being in accordance with indications as they arise.

INFLUENZA

The word influenza has been used in two distinct ways; as used by the medical man in its stricter sense it means an infectious

disease, usually affecting the respiratory passages, due to a particular micro-organism. As used popularly it means any severe infectious catarrh of the respiratory passages, whatever organism it may be due to; for there is no doubt that almost exactly similar symptoms may be produced by others than the true influenza bacillus, and at the time of an influenza epidemic all severe colds are liable to be called 'influenza.'

True influenza exists either as a rapidly spreading epidemic or sporadically. It occurs usually in the cold season of the year, but in India may be met with during the rains. The incubation period is one to four days, and the disease usually begins abruptly with fever.

As a rule the respiratory passages are those affected, and then the signs of a severe catarrh are evident, often with sore throat, extending down to the bronchial tubes, giving rise to bronchitis and sometimes to broncho-pneumonia.

More rarely influenza may attack the gastro-intestinal tract, causing gastritis with nausea and vomiting and diarrhœa. Other forms also exist, one of the most severe being a nervous type.

But commonly it is a respiratory disease, resembling a very severe catarrh, accompanied with fever and with signs of weakness and prostration out of proportion to the amount of fever. This excessive debility, which is also evident in the long convalescence from the disease, is a special feature of influenza. The weakness is liable to affect the heart muscle, and therefore care to avoid exertion and other causes of fatigue to the heart must be taken during convalescence.

The disease may last from five days to a week, but sometimes is much prolonged; this is especially the case when complications, as pneumonia, occur.

Treatment. The patient must be put to bed at once, isolated so far as possible, put on milk diet, and the general treatment for fevers adopted.

Half-doses of the Quinine Mixture, Prescription No. 36, may be given four times a day. If the fever is high, then Prescription No. 40 at four-hourly intervals may give relief. Any sign of sudden cardiac weakness should be dealt with by the administrations of brandy in half-ounce doses and of Mixture No. 37. Should bronchitis or pneumonia supervene, the treatment appropriate to those conditions should be adopted. The substance acetylsalicylic acid,

whose trade name is aspirin, has a popularity in this disease, and to relieve pain in the back or joints or reduce temperature may be of use in 10-grain doses, but the dose should not be repeated more than once without medical advice; while such antipyretic drugs as antipyrin, antifebrin, phenacetin, and pyramidon should certainly not be given in influenza without medical advice; owing to the tendency to cardiac weakness in this disease, they may when used unadvisedly cause fatal collapse.

KALA-AZAR

Kala-azar, sometimes called kala-dukh, is a chronic fever caused by a parasite found in the spleen and in other organs of the sufferer.

The disease is common in parts of Assam and Madras, occurs in Burmah and Bengal, and has been found as far west as Lucknow and Lower Garhwal. It is known also in Africa and along the Mediterranean coasts.

The chief characteristics of kala-azar are enlargement of the spleen and liver, periods of continuous high fever lasting several weeks and alternating with periods without fever, great anæmia, with a tendency to bleeding from the gums, nose, and elsewhere, wasting of the limbs, and general weakness. It is a special feature of the fever that if the temperature be taken four-hourly, two maximum rises per diem will be seen.

The disease is an extremely serious one, and there is as yet no satisfactory treatment.

The method by which the parasite gains entrance to the human body is unknown; suspicion has been cast on the bed-bug, which, according to some, conveys affection by biting a non-infected person after an infected one. Certainly the disease is commoner among the poor and uncleanly, and hangs about certain dwellings, as has been observed in the coolie lines of Assam tea gardens.

MALARIA *

(1) **The Parasites and the Fever.** Malaria, or malarial fever, is also known by the names paludism, marsh fever, jungle

* From Professor Ross's book on the 'Prevention of Malaria' (John Murray, London). The following sections on prevention up to the clinical account of malaria are taken with Sir Ronald Ross's and Messrs. Murray's permission. This part may be purchased separately under the title 'A Summary of Facts Regarding Malaria' for twopence.

fever, ague, and periodic fever. It is often called by local names, such as country fever, West African fever, Burmah fever; and varieties of it are called intermittent fever, remittent fever, pernicious fever, and blackwater fever.

Malarial fever occurs more or less in all warm climates, especially in the summer, after rains, and near marshy ground; and causes a quarter or more of the total sickness in the tropics.

It is caused by enormous numbers of the minute parasites of the blood called *Plasmodia*.

These parasites are introduced into the blood through the proboscis of certain species of the mosquitoes called Anophelines.

On being introduced, each parasite enters one of the red corpuscles of the blood, in which it lives and grows.

On reaching maturity each parasite produces a number of spores which escape from the containing corpuscle, and enter fresh corpuscles; and this method of propagation may be continued indefinitely for years.

Thus, though only a few hundreds or thousands of the parasites may have been originally introduced through the mosquito's proboscis, their number rapidly increases until as many as some millions of millions of them may exist in the blood.

At first, while the number of parasites is still small, the infected person may remain apparently well. When, however, the number is large enough, he begins to suffer from fever.

The parasites tend to produce their spores all at the same time; and it is at the moment when these spores escape that the patient's fever begins.

The fever is probably caused by a little poison which escapes from each parasite with the spores.

After from six to forty hours or more this poison is eliminated from the patient's system; and his fever then tends to leave him.

In the meantime, however, another generation of parasites may be approaching maturity, and may cause another attack of fever like the first; and so on, indefinitely, for weeks or months. In this manner the attacks of fever follow each other at regular intervals.

But it often happens that before one attack has entirely ceased another one commences; so that the attacks overlap each other, and the fever is continued.

After a time, even without treatment, the number of parasites

may decrease until not enough of them are left to produce fever, when the patient improves temporarily.

It generally happens, however, sooner or later, that the number of parasites increases again, when the patient again suffers from another series of attacks.

Such relapses are frequently encouraged by fatigue, heat, chill, wetting, dissipation, and attacks of other illness.

They may occur at intervals for a long time after the patient was first infected, and after he has moved to localities where there is no malaria.

It is probable that as long as one parasite remains alive in the patient's blood he may remain subject to such relapses.

Besides fever, the parasites often produce anæmia and enlargement of the spleen, especially in patients who have suffered from many relapses.

Death is sometimes caused by sudden and grave symptoms. Chief among these are the symptoms known as blackwater fever, or hæmoglobinuria, which generally occurs in old and neglected infections.

Death is also often caused during the course of a malarial infection by other diseases, such as pneumonia or dysentery acting upon a constitution already enfeebled by the parasites.

If the patient survives, the parasites tend to die out of themselves, without treatment, after a long period of illness—leaving him more or less 'immune.'

The parasites are at least of three kinds, which can easily be distinguished in blood placed under the microscope. These are (1) The parasite which produces its spores every three days and causes *quartan fever;* (2) the parasite which produces its spores every other day, and causes *tertian fever;* (3) parasites which cause the so-called *malignant fever,* in which dangerous complications most frequently occur.

If a little blood containing any one of these species of parasites is taken from a patient, and is then injected into a vein of a healthy person, the latter will almost certainly soon become infected with the same species of parasite.

Closely similar parasites are found in monkeys, bats, squirrels, and birds.

As proved by centuries of experience, cinchona bark, from which quinine is made, possesses the power of destroying the parasites

and curing the infection. But it will not generally destroy all the parasites in the body unless it is given in sufficient doses and continued for several months; and as long as a single parasite remains alive in the blood infection is continued and the patient may be subject to relapses. At least 5 grains ($\frac{1}{3}$ gramme) of sulphate of quinine should be taken by an adult patient every day without fail for four months; but he should consult a medical man regarding details of the treatment.

(2) **The Mode of Infection.** Besides those forms of the malaria parasite which produce spores in the human body, there are other forms, male and female.

When certain species of the mosquitoes called Anophelines happen to feed on a patient whose blood contains the parasites of malaria, these are drawn with the blood into the insect's stomach.

If the sexual forms of the parasites are present these undergo certain changes in the mosquito's stomach; the females pass through its wall, and finally fix themselves to its outer surface—that is, between the stomach and the skin of the insect.

In this position they grow largely in size, and after a week, in favourable circumstances, produce a number of spores.

The spores find their way into the insect's salivary glands. This gland secretes the irritating fluid which the insect injects through its proboscis under the human skin when it commences to feed; and the spores can easily be found in the fluid by the microscope.

Thus when a proper species of Anopheline, which has more than a week previously fed upon a patient containing the sexual forms of the parasites of malaria, next bites another person, it injects the spores, together with its saliva, under his skin—that is, generally into his blood.

These spores can cause, or may cause, infection or reinfection in this second person, as described at the beginning of this summary.

Numerous birds and men have been infected experimentally in this manner.

Thus the parasites of malaria pass alternately from men to certain mosquitoes, and back from these mosquitoes to men.

A very large number of parasites are known which pass in this manner from one animal to a second animal which preys on the first; and back again from the second animal to the first.

It is not known with certainty when and how this process first

commenced; but probably all such parasites were originally free living animals, which by the gradual evolution of ages acquired the power of living in other animals.

Thus also, it is evident that malarial fever is an infectious disease which is communicated from the sick to the healthy by the agency of certain mosquitoes.

From the time of the ancients it has been known that malarial fever tends to be most prevalent in the vicinity of marshes.

The parasites of malaria have never been found in the water or air of marshes; nor in decaying vegetation; nor in the soil. Attempts to produce infection by these have always failed. But the Anophelines which carry the parasites breed in marshes and in marshy pools and streams.

Rising from these marshes, they enter the adjacent houses and feed on the inmates, mostly at night; biting first one person and then others; and living for weeks or months.

If an infected person happens to be present in any of these houses, the infection is likely to be carried by the Anophelines from him to the other inmates, and to neighbouring houses.

Thus the whole neighbourhood tends to become infected, and the locality is called 'malarious.'

In such localities it is easy to find the parasites of malaria in the Anophelines of the proper species; even in as many as 25 per cent. or more of them.

Such Anophelines when taken from a malarious locality to a healthy one (*e.g.* from the Campagna, near Rome, to London) will still infect healthy persons whom they have been caused to bite.

So also, in malarious localities, the Anophelines bite the healthy new-born children, and infect many of them.

Such children, if not thoroughly treated, may remain infected for years; may become anæmic and possess enlarged spleens; and may spread the infection to others. Later, however, at the age of twelve years or more, the survivors tend to become 'immune.'

In many malarious localities almost every child has been found to contain the parasites of malaria, or to possess an enlarged spleen.

In such a locality, therefore, the infection is constantly passed on from the older children, or from adults, to the new-born infants; so that the locality may remain malarious for years, or for centuries.

Similarly, a new-comer arriving in such a locality is very likely

to become infected, especially if he sleeps in an infected house even for one night.

A locality is said to be malarious only when healthy persons become infected in it; not when persons who have become infected elsewhere happen to reside in it.

A locality is malarious only when it contains persons already infected with the parasites, and also sufficient numbers of the proper species or varieties of Anophelines to carry the infection to healthy persons.

The chances of infection tend to be great in localities where there are already numerous infected persons, not treated with quinine; or where there are numerous Anophelines of the proper species, not prevented from biting.

Conversely, the chances of infection tend to be less where infected persons are excluded, or properly treated with quinine; or where the Anophelines are few in number, or are prevented from biting.

(3) **Facts about Mosquitoes.** Gnats, which in the tropics are commonly called mosquitoes, belong to the zoological family of insects known as the Culicidæ (from the Latin *culex*, a gnat). They are distinguished from other insects by a number of characters; and always possess only one wing on each side, and a long proboscis.

Like that of other insects, their life is divided into four stages, the *egg*; the *larva* (or caterpillar); the *pupa* (or chrysalis); and the *imago* (or adult, winged insect).

The *egg* is laid on water or near it, and in warm, moist weather hatches out in a day or two.

The *larva* is entirely aquatic, and always lives in water. It swims and dives by means of paddles and hairs, and feeds on various aquatic organisms. It cannot, however, breathe under water, but must always rise to the surface in order to obtain air. After a week or more it becomes a pupa.

The *pupa* still remains in the water, generally floating on the surface. After two days or more its skin cracks, and the imago emerges.

The *imago* remains standing for a little while on the empty floating skin of the pupa, and then flies away.

Both males and females are able to suck fluids through the proboscis. As a rule the male feeds only on the juices of plants;

but the female sucks the blood of men, beasts, birds, and reptiles. The female often returns to water every few days in order to lay her eggs, of which she may deposit several hundreds at a time; and then seeks another meal.

Female gnats have been kept alive in captivity for months.

In unsuitable weather both males and females may take refuge in damp places, such as cellars, wells, out-houses, and woods, where they may remain for months until better conditions prevail.

As a rule gnats, like other animals, tend to remain in the locality where they were born; but a few may occasionally stray to the distance of half a mile or more from their breeding-places. If, however, plenty of places where they can obtain food exist near at hand, there is no reason why they should travel further for it. They must also remain near water to drink and to lay their eggs in

Gnats are generally favoured by warm weather, by plenty of water suitable for their larvæ, and by abundance of food. They tend to be diminished by various kinds of bats, birds, fish, insects, and spiders which devour them or their larvæ.

During its life, a single gnat may succeed in biting many persons or animals, and in propagating diseases amongst them.

The family of Culicidæ or Gnats is divided into many sub-families and genera, and contains some five or six hundred known species.

Although all these species have many habits and structural characters in common, yet they all differ in small details. These have been described at length in a number of special books written on the subject.

In the tropics, as a broad general rule, the gnats which most concern human beings belong to the groups called *Culex*, *Stegomyia*, and *Anophelina*.

Culex pipiens is a very common gnat in Europe, and allied species are found almost everywhere in the tropics. The larvæ occur principally in tubs, barrels, cisterns, and other vessels containing water, in stagnant ditches, garden pits, holes in rocks and trees, and so on. They possess a long breathing tube close to the tail fins; and float at the surface of the water with the end of this tube attached to the 'surface film,' and the head hanging downwards. When disturbed, they wriggle at once to the bottom. The adult insects generally present a uniform grey appearance, with

pale yellowish bars across the back of the abdomen, and plain unspotted wings. They bite almost entirely in the evening and night, and principally indoors (in the tropics). The parasite which causes elephantiasis, namely, the *Filaria bancrofti*, is carried by them or allied species in a manner very similar to that in which the Anophelines carry the parasites of malaria.

Stegomyia calopus and allied species are very common in the tropics, but much less so in temperate climates. The larvæ breed in much the same places as those of *Culex*, but more frequently in vessels. Any old biscuit-tin or oil-tin, flower-pot, broken bottle and crockery, tub or barrel, choked drain, roof gutter, &c., in which rain or other water has collected, is almost sure to contain them, and they frequently occur in holes in trees and in certain plants. They possess a short stumpy breathing tube, and float head downwards, like the larvæ of *Culex*. The adult insects are more or less striped or speckled black and white, and have plain unspotted wings. They bite chiefly in the daytime, and often abound in woods and in the shade of trees. In America *Stegomyia calopus* carries yellow fever.

The Anophelines consist of about one hundred and twenty known species, some of which carry malaria and are always found in malarious places. The larvæ occur chiefly in water on the ground, particularly in water which stands or flows amongst grass or water weeds. Thus they abound in the weedy margins of rivers, streams, lakes, and ponds; in small sluggish streams and streamlets; in watercourses, drains and gutters choked with weeds; in pools of rain water lying on grass; in pits from which earth has been removed, such as the 'borrow pits' by the side of railway embankments; in cisterns and pits used for watering gardens; in ornamental waters; in hollows in rocks; and in water at the bottom of boats, etc. Thus while the larvæ of *Culex* and *Stegomyia* occur in the small collections of water which abound in and around houses, on the other hand the Anophelines are principally *marsh mosquitoes* —owing to which malaria is generally more or less connected with marshy conditions, and is called marsh fever or paludism. The larvæ feed chiefly on the surface of the water—on which they float like sticks, and not with the head hanging downwards. When disturbed they swim away backwards on the surface, and sink to the bottom only when much alarmed. They have no breathing tube, like those of *Culex* and *Stegomyia*. The adults are speckled

brown and white, or black and white; and generally the wings are not plain, but possess three or four black marks along or near the front border. When the insect is seated at rest on a wall, the tail projects outward at an angle from the wall; whereas the *Culex* and *Stegomyia* sit with the tail hanging downwards, or even nearly touching the wall. All these facts enable anyone to distinguish at sight both the larvæ and the adults of Anophelines from those of *Culex* and *Stegomyia*. Anophelines bite chiefly at night or in the dusk—owing to which the malarial infection is generally acquired at night. They enter houses, but also bite in the open in spots sheltered from wind.

(4) **Personal Prevention.** If they can avoid it, people should not go to live in known malarious places, nor in the vicinity of marshes, nor close to an infected native population.

Even in such, however, the chances of infection can be much reduced by the careful use of mosquito nets. The net should not have the smallest hole. If should be hung *inside* the poles, when these are provided, and not outside them. It should be tucked under the mattress all round, and should never be allowed to hang down anywhere to the floor; and it should be stretched tight, in order to allow every breeze to enter, and should not be hung in loose folds, which check ventilation.

Those who can afford it should protect the windows of the house with wire gauze, and provide the doors with automatic closing arrangements. It is especially advisable to protect a room, or a part of the veranda, for sitting in during the day or evening.

Punkas and electric fans not only drive away mosquitoes but also keep the body cool, comfortable, and vigorous, even in great tropical heat.

Where there is great danger of malaria, 5 grains (½ gramme) of quinine should be taken regularly every day just before breakfast; but it is advisable to take a double dose at least once a week —say, on every Sunday.

In such localities, the hands and feet may also be protected by gloves and boots; but these cannot always be endured owing to the heat; and it is sometimes preferable to carry and use constantly a palm-leaf fan, with which mosquitoes can be driven off, and the body kept cool.

A small butterfly-net of white (not green) muslin may be kept

in the house for the purpose of catching troublesome mosquitoes during the day; and the servants may be taught to use it. It may sometimes be easier to kill all the mosquitoes in a room in this manner than by fumigation.

Mosquito traps consist of boxes lined with black cloth. Attracted by this colour mosquitoes enter the box for refuge during the day. The lid or shutter is then suddenly closed and the insects within are killed by a little ammonia or chloroform poured into the box through a protected opening. Or the lid can be made to slide down to the bottom of the box in such a manner as to crush the inmates.

To fumigate a room thoroughly for mosquitoes all the chinks in the doors and windows should be closed by pasting paper over them. Then burn the culicide as follows: *

(1) *Sulphur.* Allow 2 lb. of sulphur to 1000 cubic feet. Use two pots, place them in a pan containing 1 inch of water to prevent damage, and set fire to the sulphur by means of spirit.

Duration. Three hours.

(2) *Pyrethrum.* Allow 3 lb. to 1000 cubic feet, and divide amongst two or three pots, using the same precautions as with sulphur.

Duration. Three hours.

(3) *Camphor and Carbolic Acid.* Equal parts camphor and crystallised carbolic acid are fused together into a liquid by gentle heat. Vaporise four ounces of mixture to each 1000 cubic feet; this can be done by placing the liquid in a wide shallow pan over a spirit or petroleum lamp; white fumes are given off. To avoid the mixture burning, the fumes should not come in close contact with the flame of the lamp.

Duration. Two hours.

Remember that sulphur tarnishes metal work and injures pianos, sewing-machines, chronometers, telephones, etc.

The camphor-carbolic mixture is one of the most agreeable and effective of the various agents.

Many mosquitoes may be destroyed, without troubling to cover the chinks with paper, simply by picking up and killing the stupefied insects near the windows after the fumigation.

The householder should always take care that no stagnant water is allowed to remain anywhere in his premises in cisterns.

* As used in the United States (Sir Rubert Boyce).

drains, gutters, tubs, jugs, flower-pots, gourds, broken bottles and crockery, old tins and other rubbish, or in holes in trees, or in certain plants such as wild pineapple—in all of which mosquitoes are apt to breed. If the water cannot be emptied out, the larvæ of the mosquitoes in it may be destroyed by pouring a little kerosine oil, or in the case of drinking water, a little eucalyptus oil, upon the surface. This should be done once a week; and the householder should make it a habit to inspect his premises for this purpose every Sunday. Cisterns and tubs containing drinking water should be kept screened in such a manner as to prevent mosquitoes laying their eggs on the surface of the water. If he follows this advice the householder will generally obtain a great reduction in the number of the insects in his house. If, however, the plague continues, he should appeal to the local sanitary authorities.

It is extremely dangerous to sleep in a house which is occupied, or has recently been occupied, by infected persons, especially native children; or in, or close to, an infected native village.

(5) **Public Prevention.** As a broad general rule, malaria causes a quarter or more of the total sickness in the tropics.

Malaria can always be greatly reduced, or may even be extirpated in any locality.

Large marshes in populous places must be drained, deepened, or filled up.

A proper permanent organisation must be established for dealing with the smaller breeding-places of Anophelines, and for distributing quinine—especially to infected children. Other measures may be adopted where called for.

The cost is likely to be more than recouped by saving in life, labour, invaliding, medical attendance, and hospital accommodation.

The campaign will remove other mosquito-borne diseases as well as malaria; and will tend to improve general sanitation in the locality where it is undertaken.

CLINICAL FEATURES OF MALARIA

From the above account it is seen that malaria may be due to one of three parasites, the quartan, the benign tertian, or the malignant tertian. Each of these parasites produces its peculiar type of fever. In quartan fever the attacks recur every seventy-

two hours, in benign tertian every forty-eight hours, and in malignant tertian in something less than forty-eight hours.

Each of these parasites may, however, produce a daily or quotidian fever. This occurs when different broods of the parasite are maturing on successive days. Thus three broods of the quartan parasite maturing on successive days may give rise to a daily fever of the same character as one due to two successive broods of either of the tertian parasites. In such cases the diagnosis between them is only to be made by the microscope. The nature of the febrile attack or ague in the case of each parasite is much about the same, and the following account of an attack of ague may be taken for any variety of acute malaria.

The Ague Fit. After a certain period of malaise, accompanied by headache, weakness or pains in the limbs, the patient begins to feel cold and to shiver. In some forms there is a well-marked rigor, the teeth chatter, and the bed even may shake. At the beginning of this chill the temperature is found to be about 100° F., but it rapidly rises to 104° or 105° F. This cold stage lasts from a quarter to half an hour and is succeeded by a hot stage. From having previously wanted all the blankets piled on him the patient now begins to throw off all his coverings. The skin is hot and dry, the pulse fast, and the eyes may be bloodshot. At times there is vomiting and diarrhœa. This hot stage lasts four hours, often rather more, and then the sweating stage begins. The sweat is first noticed on the forehead and the palms of the hands, and then becomes general. With the sweat there is general relief; even before sweating is noticed the temperature and pulse-rate begin to fall and continue to do so rapidly. After three or four hours of this the patient feels much better, and often finishes by falling into a deep sleep from which he awakes much refreshed.

Such attacks may occur at the periodic intervals peculiar to the infecting parasite, or they may be daily. In the interval between attacks the patient feels fairly well, but weak; he often goes about his usual work.

Sometimes, usually in the severer malignant forms, the temperature may be remittent instead of intermittent; and this may be accompanied by jaundice with bilious vomiting and diarrhœa. This is known as bilious remittent fever and is a dangerous form, since in spite of treatment the temperature may continue to rise and the patient may die. These remittent fevers were formerly

classed as distinct diseases; but many of the cases so included were really enteric fever, and the majority of the remainder were these forms of severe malaria.

The malignant tertian parasite may also cause what are known as pernicious symptoms, which affect usually either the brain or the gastro-intestinal canal in particular, and may give rise to coma, or various forms of paralysis, or symptoms resembling cholera or dysentery, or to extreme exhaustion in other ways. The above forms are known as acute malaria. In chronic malaria there may be repeated attacks of slight fever, which may be unnoticed, and these will often develop enlargement of the spleen and liver, anæmia, and dark pigment of the skin and tongue, with sometimes a slight yellow tinge in the eyes. In bad cases the anæmia and enlargement of the spleen are very marked. In malaria it is more usual to get relapses than not. Even when an acute attack has been apparently cured by quinine, and the parasite disappears from the blood, yet it may be still present in the spleen and elsewhere. When that is the case, anything that tends to lower vitality, such as a chill or fatigue, may cause the reappearance of the parasite in the blood and another ague attack. This explains how it is that Englishmen returning from the tropics may get malaria in Britain after an interval of years. It also explains how it is some people think that malaria can occur without the mosquito. The mosquito was necessary for the first attack, and the parasite never having been entirely banished relapses may occur at any time.

For the proper *diagnosis* of malaria the microscope is necessary. If, however, any fever shows a definite recurrence every forty-eight or every seventy-two hours with an afebrile period in between, that must certainly be malaria, as no other fever shows this periodicity.

Moreover, any malaria but the malignant type will yield to quinine if 30 grains daily be given for three successive days. So that if a fever will not so yield, it cannot be benign tertian (the commonest form of malaria), or quartan fever.

The *treatment* of malaria consists in the administration of quinine. All other drugs, except perhaps the amorphous alkaloids of cinchona, are inferior to quinine for this purpose. Many people say they cannot take quinine; they mean really that they cannot take it in the form it has been given them. It must be given in some other way. The sulphate of quinine is the commonest form,

but the bihydrobromide, though costing more, is preferable both because it is more soluble and because it gives rise to less buzzing in the ears. The proprietary preparation, euquinine, is very useful as it is nearly tasteless; while for children quinine tannate with chocolate is pleasant.

Where the cost has to be considered quinine sulphate should be given. Whatever form of quinine is used, the drug is usually given by the mouth, and it will act more quickly if given in solution. The Quinine Mixture, Prescription No. 36, will be found very useful for this purpose: four ounces of the mixture, *i.e.* 20 grains of quinine, should be given daily till all fever has gone; two ounces may be given every morning and two every evening.

For travellers or those in camp the quinine must be in easily portable form, either as tablets, pills, or in powder. Any of these will do, though it should be remembered that the drug is somewhat more efficacious when in solution. Powder is the cheapest form of all, and is quite efficient, but the taste is extremely bitter. The powders sold in Indian post-offices at a pice each are very handy for travellers in that country. Tablets are good when fresh; if stale, they may become hard on the outside and may not be dissolved in the stomach.

Nearly always one of the above forms of quinine can be retained by the mouth. In some cases where it cannot be retained, the bihydrochloride, 20 grains dissolved in water, and mixed with two ounces of starch solution, may be injected into the rectum. It is best to add 10 minims of tincture of opium to such an injection.

Better still, and especially to be recommended when the type of fever is pernicious, is the intramuscular injection of the bihydrochloride, 15 grains, dissolved in sterile water; but this must be done with the most scrupulous aseptic care, or fatal infection from tetanus may occur. Children stand quinine well, and to a malarious infant under one year 1 grain six times a day may be given; between one and three years give 1½ grains six times a day. Treatment must be continued after fever has subsided for fear of a relapse. Thus an adult, after the fever has gone, should take 10 grains of quinine every morning and 5 every evening for a week; after that 5 grains morning and evening for another week, and thenceforward 5 grains daily for a month. After that he should take either 10 grains daily on two successive days, or 15 grains on one day every week for three months.

Besides the specific treatment with quinine, phenacetin 5 grains, or acetanilide 2 grains, combined with caffein citrate 2 grains, may be given during the fever to relieve headache; but these antipyretic drugs must not be taken too often. The bowels must be kept open, and for this purpose 3 or 4 grains of calomel before taking the quinine is excellent. Do not delay taking the quinine too long however; many will not take it so long as they have fever; the drug acts better when the temperature is down certainly, and more should be taken then, but at least 10 grains should be taken as soon as diagnosis is certain.

As regards diet, milk during fever attacks; light diet, including solid food, during the afebrile intervals.

The sufferer from chronic malaria should reside for some time in a cooler climate; the change to this should not be sudden, if possible, or a fresh attack of ague may be provoked.

MALTA FEVER

Malta fever, sometimes called Mediterranean fever or undulant fever, was formerly considered to be peculiar to the southern Mediterranean coasts; but is now known to be not uncommon in parts of India, notably in the Punjab and in Bundelkhand. Consideration of the above areas will show that as a whole they are not fertile, but largely rocky and of scant vegetation, the sort of ground where a goat will pick up a better living than a cow. And that is the explanation of their being the source of this disease, since it has been shown that the organism causing the fever is commonly harboured by goats, and appears in their milk, and in this way man may become infected. The obvious means of prevention is not to drink goat's milk unless previously sterilised, and such means have been eminently successful in converting Malta from a very unhealthy to a healthy station for troops.

The incubation of the fever takes fourteen days; and it then begins with the usual signs of fever, gradually increasing for four or five days and remaining at about 103° F. for about two weeks and then gradually declining. The spleen is somewhat enlarged and tender. After this remission there is a relapse, another remission and another relapse, and so on, usually for several months. The disease is not a very fatal one, but is very exhausting, and convalescence is long. The joints are often swollen and painful.

Although such is the typical course of the disease, the gradual waxing and waning of which give it its name of undulant (wavy) fever, this is not the form in which it is more commonly seen in the poorer Indian classes. They have usually passed through most of the febrile stages undiagnosed and with home remedies, and present themselves later for some troublesome complication or sequela. These complications are usually either swollen and painful joints, which might be thought rheumatic, obstinate neuritis, especially in the form of sciatica, or inflammation of the testis.

There is no specific treatment for Malta fever; the treatment must be on the general lines indicated for fevers and their attendant symptoms.

MEASLES

Measles is an infectious fever characterised by an eruption and catarrh of the upper part of the respiratory passages. All races and all ages are liable, but most people receive infection in childhood, especially between the ages of six months and two years, and after recovery become immune to further attacks.

The incubation period is usually ten days, but may be more or less; and after that the disease begins with catarrh of the eyes, nose, and throat, and with a rise of temperature to about 102° F. The eyes water and appear bloodshot, and the child, being unable to face the light, turns his head away to the wall or to the pillow. The face looks puffy and pale, and there is running from the nose which may irritate the upper lip. At this time there is no rash, but on the second day of illness there may be seen on the inside of the cheek, opposite the molar teeth, little bluish-white pin-points. These are peculiar to measles and are called Koplik's spots; they disappear when the rash comes out. The temperature will now be 103° F., or higher, and the child very irritable. On the fourth day appears the rash, first on the forehead and behind the ears, then on the cheek and neck, the trunk, and downwards to the arms and legs. It first appears as small, round, red spots, which extend and merge into each other, forming a crescentic outline which is raised above the skin. The rash begins to fade in twenty-four hours, and has usually gone in four days.

The catarrhal symptoms will meanwhile be worse, and will have extended into the bronchial tubes, causing bronchitis, and so giving rise to cough and to expectoration if the child is old

enough. In a favourable case the temperature will fall gradually with the fading of the rash, and convalescence will soon be established. But it often happens that the catarrh extends still further down the bronchial tubes, going from bronchitis to broncho-pneumonia. This is especially liable to happen to neglected children, and is responsible for much infantile mortality among the poor. It is common for mothers to look upon measles as a mild disease that all must go through; they therefore take insufficient care of the sick child and allow him to be exposed to chills, or to run about when he should be in bed. In such cases the temperature remains high, and the child suffers from broncho-pneumonia, a reference to the account of which disease should be made. If the child recovers from broncho-pneumonia his lungs are only too often left in a weakened condition, a suitable prey to the tubercle bacillus. Death from tuberculosis in this way is a not uncommon late sequel to an attack of measles. In a favourable case, on the other hand, the child may appear quite well a fortnight after the beginning of the measles.

Measles has to be *diagnosed* from scarlet fever and from German measles. The different features of the three diseases may be seen in the Table on next page.

The *treatment* of measles is to prevent complications, the principal of which is broncho-pneumonia. The patient must be kept in bed, and in strict isolation. The room should be well ventilated, but no draught allowed to fall on the patient. Sponging the child twice or thrice daily with tepid water containing vinegar is a useful measure. A bronchitis-kettle is beneficial, and should certainly be employed if the bronchitis is a prominent feature. Let the child drink as much as he wants; milk and water and Imperial drink (Chapter XXI), or barley-water, are useful to quench the thirst. The instructions given for the general treatment of fevers should be followed, but the patient should not be purged after the first or second day, as diarrhœa sometimes occurs in children.

Should broncho-pneumonia occur the treatment for that disease should be followed.

Isolation should be strictly observed throughout the illness for the benefit of other children. No one but the nurse or attendant relatives should be allowed in the room till three weeks after the rash has disappeared, and then only when all clothing has been

	German measles	Measles	Scarlet fever
Incubation period	Nine to twenty-one days, usually eighteen.	Seven to fourteen days, usually ten (fourteen to rash).	Usually, about three days.
Prodromal symptoms	Short and slight.	Three to four days generally marked.	Brief; a few hours; rarely five days. Very rarely seven days. Vomiting frequent.
Koplik's spots	Absent.	Present.	Absent.
Rash	First or second day, commonly first symptom, rosy-red dots. First or early, about mouth.	Fourth day. Papular brick-red or darker and crescentic, appear about mouth or forehead.	Dusky red and often diffuse. Skin burning.
Catarrhal symptoms	Redness of throat, diffuse. Conjunctivæ suffused; watering of eyes slight. Bronchitis slight; broncho-pneumonia rare. Diarrhœa absent.	Redness of throat, patchy at first. Catarrhal conjunctivitis. Much lacrymation and photophobia. Bronchitis usually marked; broncho-pneumonia common. Diarrhœa frequent.	Throat affection proportionate to skin eruption. Dusky red. White plugs in tonsillar crypts. Conjunctivæ unaffected. Lung complications uncommon. Diarrhœa absent.
Lymphatic glands	Generally enlarged, tender, and hard, including posterior cervical, axillary, and inguinal.	Enlargement not marked early. Generally limited to those about the angle of the jaws.	Enlargement of neck glands proportionate to faucial affection.
General symptoms	Little or no depression. Tongue clean or slight fur; appetite often retained. Temperature may be normal. Pulse little altered, or accelerated in proportion to fever.	Depression generally marked, often much prostration. Tongue furred; little or no appetite. Temperature usually 100° or more. Pulse generally accelerated in proportion to fever, often weak and dicrotic.	With much rash; much depression. Tongue coated; peeling on fourth day, leaving "strawberry" tongue. Temperature always raised, often 105° to 106°. Pulse always accelerated, commonly out of proportion to fever.
Albuminuria	Rare and slight.	Very rare.	Very frequent.
Convalescence	Rapid.	Commonly more protracted.	Often prolonged owing to complications.
Desquamation	May be copious; always fine.	Seldom copious; fine.	Generally copious; in shreds.

disinfected. Measles is infectious throughout its course, even during its incubation, and especially so just before the rash comes out.

MUMPS

An infectious disorder, consisting of inflammation of a gland called the 'parotid gland,' situated behind the jaw, below, and in front of, the ear. It generally occurs in children, but sometimes in adults, and seldom attacks the same person twice. It commences with slight 'fever.' After a few hours, or perhaps in a day or two, a swelling, often of almost stony hardness, is noticed on the cheek and under the ear, extending along the neck towards the chin. This lump is exceedingly painful, and continues swollen for four or five days, while the skin is often red. It then gradually disappears, leaving no trace. The swelling of mumps very seldom 'gathers.' It may affect one or both sides of the face. It is contagious, and sometimes runs through a whole family or school. The period of incubation is long, ten to twenty-one days. In severe cases swallowing is difficult from the pressure of the swelling on the throat, and but little food can be taken. The tongue is furred and swollen, and the breath has an unpleasant smell. Occasionally during the course of the disease, but generally at its subsidence, a similar swelling may affect the breasts or the testicles.

Treatment. If mumps is severe, causing difficulty of swallowing or of breathing, leeches to the part may be required; but usually hot fomentations will be sufficient (*see* Chapter XX). During the intervals of fomentation the parts should be wrapped in flannel. The patient should be debarred for a few days from meat; and the aperient draught (Prescription No. 27) should be given, as purgation is most beneficial. Rest and quiet should be enjoined. If the inflammation affects the breast or the testicle, the treatment proper for inflammation of those parts should be employed. The patient should be isolated.

PLAGUE

Plague or pestis, in Hindustani called 'taon,' is now an endemic disease of many parts of India. The disease has been known from earliest times, and appears to have visited India in epidemics about once in seventy years. It reappeared last in India in 1895, and

since then, owing perhaps to altered conditions and improved communications, it appears to have come to stay. Under the name of 'mahamari,' plague has long been endemic in the Himalayas. Plague is really an infectious disease in rats, its appearance in man is only a secondary phenomenon. There is usually an interval of about a fortnight between its appearance among rats in a place and the human epidemic in the same place.

Plague is due to a bacillus, and this bacillus is conveyed from rat to rat, or from rat to man by means of the rat flea. The flea, having fed on the blood of an infected rat, next bites another rat or a man, and defæcates near the wound he has made. The fæces of the flea contain the plague bacillus, and this organism, becoming rubbed into the flea-bite, infects the bitten subject. The lymphatic glands nearest the infected bite enlarge, and these form the bubo of bubonic plague. It follows therefore that one man is not infectious to another unless he carry on his person or clothing infected fleas. There is an exception to this rule in pneumonic plague, which is infectious from man to man by means of the bacilli in the sputum, but such cases form only about 2½ per cent. of the whole.

It is evident that the study both of the rat and of the rat flea are of the greatest importance in forming measures against this disease; but space prevents us from mentioning more than a few salient facts in connection with them. All rats are not equally affected: *Mus rattus*, the old black rat and the common rat up-country, is the rat mostly concerned up-country, and his habits being domestic he comes in closer contact with man than other varieties. Squirrels and monkeys are also affected.

The rat flea can transmit infection for seven to fifteen days after feeding on an infected rat. The flea is said to be able to jump a distance of only 4 inches; so that, if one has to sleep in an infected room, one should be safe to sleep in a hammock if the suspension ropes are tarred, or to sleep in a bed surrounded by Tanglefoot papers. If one visit plague patients it is preferable to do so by day, because the flea avoids the light and is more active in the dark. The incubation period of plague is usually three days, but may be as long as ten.

The onset is usually sudden, the temperature rapidly rising to 103° or 104° F., the pulse and respiration being also rapid. The usual accompaniments of fever are present, such as headache and pains all over, and there is often vomiting and diarrhœa. In only

a few hours the disease is at its height; the eyes are then bloodshot, the nostrils dilated, and the face has an anxious or terrified expression. The spleen is always somewhat enlarged.

Most cases of plague are bubonic; and in them the enlarged glands, either in the groin, the armpit, or the neck, according to the site of the infected flea-bite, appear in the first twenty-four hours of the disease. The disease lasts from seven to ten days, and then the temperature in favourable cases falls gradually. Not infrequently the buboes suppurate, and then the temperature will rise again.

Some bubonic cases are 'ambulatory,' which means that the infection is so mild that the patient walks about with the disease in him.

Other varieties of plague are the septicæmic and pneumonic, which are both extremely grave. The latter variety begins very like ordinary pneumonia, but the sputum is always bloody, and under the microscope the plague bacilli can be seen.

The buboes of plague have to be distinguished from buboes due to other causes, such as venereal disease, or septic wounds in the areas drained by the lymphatic glands affected.

The fatality of plague varies; at the beginning of an epidemic the mortality is high and falls off towards the end. Of fatal cases, 75 per cent. die before the sixth day.

The *treatment* of plague should be both specific and general. If any plague serum, such as Yersin's, is available early in the disease, it should be injected at once.

Besides the general treatment common to all fevers, particular attention should be paid to the heart, as many deaths are due to unexpected cardiac failure. The patient must be kept lying down in bed, and not allowed to sit up for any purpose. Tincture of digitalis, 5 minims four-hourly, may be given as a heart stimulant; and brandy, half an ounce every four hours, will also very likely be necessary. Cold applications should be put on the buboes; if they suppurate they should be incised. It is also a good plan to paint them freely with tincture of iodine from the start.

The Prevention of Plague

Anti-plague measures are of two kinds: (1) measures of permanent utility, and (2) measures of temporary utility.

(1) Measures of permanent utility are designed to mitigate those habits of rats and men which bring about the association of the one with the other. They deal with the erection of well-built houses; the separation of shops, warehouses, granaries, and stables from human habitations; the construction of concrete floors, and roofs of materials which cannot harbour rats. These measures affect the habits of rats. Measures which are directed to improve the habits of men are such as teach him to live in a tidy manner, which prevent him from throwing waste food material out of the window of his dwelling or placing it in any other place, where it may be reached by rats. All these are measures of permanent utility in the fight against plague; but unfortunately such measures will take many years to carry out to completion; nevertheless, in the meantime they should not be neglected.

(2) Measures of temporary utility can be grouped under the following three heads: (*a*) Measures for protecting the people in their homes from rats and their parasites; such measures can be classed under the term 'rat destruction.' (*b*) Measures for removing the people from their homes in order that they may avoid infection from rats and their parasites—measures which are recognised under the term 'evacuation.' (*c*) Measures rendering the individual largely immune from attack and death from plague—measures classed under the term 'inoculation.'

Let us consider for a moment the advantages and disadvantages of each of these measures for dealing with plague. In the first place, it should be noted that all these measures require to be carried out repeatedly; they are only temporary measures. In this respect rat destruction and evacuation possess no advantage over inoculation. While, however, the first two measures can be carried out by the people themselves, the latter requires the employment of a special staff.

(*a*) But to take each measure separately, let us consider first the advantages of rat destruction. Undoubtedly, if there were no rats there would be no plague. This measure strikes at the root of the evil, and has the great advantage that it interferes little with human comfort. Indians who have experienced a temporary freedom from rats have recognised the advantages of living without these pests. Their absence insures less disturbance at night and less injury and loss of property. The disadvantage of rat destruction lies in the fact, that to be successful, this measure must have

the complete co-operation of an entire community, and the operations must be extensive and sustained. The poisoning of rats either by the use of chemical poisons or by the dissemination of bacterial disease among them has not proved as successful as was anticipated. No more efficient rat destroyer than plague itself has yet been discovered. The failure to keep down rats by poisoning them arises from the fact that the operations have, as a rule, only been temporarily carried out, and can never be persistently maintained except at great cost. Trapping rats alive and then destroying them has yielded better results when daily practised. At least one trap for every fifty inhabitants in a town or village should be set every day. The rat infestation of Indian towns and villages is enormous. Rats are so prolific that it is possible to remove from a village, within a period of one year, a larger number of them than the total human population of the place without materially affecting the number of rats remaining alive in the village. In a village of, say, 2000 inhabitants, nothing less than 2500 rats should be captured and destroyed within a period of one year if it is desired to effect a check on the spread of plague.

(*b*) Evacuation to be effective must be carried out early and completely. It is generally useless to vacate a house after a death from plague has occurred in it. Even when evacuation is not practised, only 20 to 30 per cent. of houses yield more than one case. In towns, especially, it must be remembered that infection is frequently not acquired at home, but in the workshop, office, or other place of resort. The greatest disadvantage of evacuation, however, arises from the increased chances of spreading the disease. Many prefer to go to live with friends in uninfected villages rather than submit to the discomforts of camp life. Infection is thus distributed, for man is an important carrier of the infection. Evacuation, too, tends to increase the panic produced by the high mortality associated with the disease.

(*c*) The advantage of inoculation lies in the fact that it is a measure of personal prophylaxis. It matters little who else does or does not co-operate in the measure, those inoculated at least are safe. It is a measure which can be easily and cheaply carried out once a year. A guarantee can be given that at least six times the saving of life will be effected among the inoculated as compared with the uninoculated. When inoculation is more extensively adopted, an even greater saving of life may be obtained. Every

case which is saved from the disease affords many less opportunities for the disease being imported into fresh localities by friends who would have come from other towns and villages to attend the funeral ceremonies. Moreover, inoculation instils into those who undergo the operation that confidence which is so necessary in averting a panic. When the majority in a village are inoculated, the epidemic assumes such moderate proportions that it can be dealt with easily, and it is possible to adopt measures to prevent the spread of infection to adjoining areas. Inoculation checks the spread of plague, directly by lessening the number of attacks and reducing the mortality from the disease, and indirectly by quelling panic and thus reducing the chances of importing the disease into uninfected places.

But, perhaps, the strongest argument in favour of inoculation as an anti-plague measure is found in the steadily increasing popularity of the measure. This is now a well-tried remedy which has withstood the test of time.

The Symptoms Produced by Inoculation

The symptoms caused by inoculation commence, as a rule, in three to five hours, and consist chiefly of swelling and pain at the seat of inoculation and of a rise of temperature. Pain is much increased by the taking of alcohol, or on movement of the part, so this had better be avoided for thirty-six hours after operation. The fever is accompanied by the general discomfort usual to this condition, and no treatment of symptoms is required beyond taking some rest. General symptoms subside after twenty-four to thirty-six hours as a rule; if not, a purge will give relief. The pain at the seat of inoculation lasts for three or four days, disappearing gradually, but a painless induration may remain for some little time. The fluid acts differently on various people, and a uniform reaction cannot be obtained, fever being almost absent in some cases. It is not known whether there is any relation between the presence of high temperature after inoculation and the degree of protection acquired thereafter by the individual, so an absence of reaction does not mean that the inoculation has not ' taken,' as would be said in similar circumstances after vaccination for smallpox.

What Dose of Vaccine to use under varying Conditions

The usual dose for an adult man is 4 c.c. (1 c.c.—17 minims), but the labels on the bottles must always be consulted on this point.

The following Table shows the doses to be given to persons in good health at various ages :

If the dose marked on the bottles is 4 c.c. then—

To individuals of from	10 days	to	1 year	give	0·2 c.c.	or	1/25	of full dose.
„	„	1	to	2 years	give	0·8 c.c.	or	1/5	of full dose.
„	„	2	„	5	„	„	1·6	„	2/5	„
„	„	6	„	11	„	„	2·4	„	3/5	„
„	„	12	„	15	„	„	3·2	„	4/5	„
„	„	16	„	50	„	„	4·0	„	full dose.	

If the dose marked on the bottle is other than 4 c.c., the amount to be given at various ages is to be calculated in the same proportion as above.

Children stand the treatment well, and no fear need be felt in giving the doses above mentioned.

Persons over fifty years of age should get one-tenth less for each decade above that age.

Women of all ages over fourteen years should get one-tenth less than men of corresponding ages.

Pregnant women may be inoculated up to the seventh month inclusive, without making any special reduction of dose. After the seventh month the dose should be given in two instalments separated by an interval of a week or so. Miscarriage has never been known to result from inoculation; and the danger from plague to lying-in women is so great that *a special effort should be made to induce pregnant women to be inoculated.*

Persons suffering from fever should not be inoculated till forty-eight hours have elapsed after the fever has entirely subsided.

With the exception of persons suffering from fever and those obviously ill from any cause, all can be inoculated. No harm has ever been known to be produced by inoculation in the case of persons suffering from chronic diseases as phthisis, rheumatism, diabetes, etc.

How to Sterilise and Fill the Syringe

The first step in the operation of inoculation is to sterilise the syringe and needle. For this purpose Kapadia's sterilising appa-

ratus is conveniently used. The apparatus consists of a pot for heating oil or vaseline. The pot is placed on a block tin stand, which at the same time serves to protect the flame of a spirit-lamp placed beneath from draughts of air. Methylated spirit is used in the lamp. *Never pour in spirit while the lamp is alight.*

The oil for use in the cup may be olive, cocoa-nut, or any similar oil which has not an acid reaction, but vaseline is very convenient, as it becomes solid when cold, and does not spill when packed for travelling.

Fit up the sterilising apparatus and light the spirit-lamp. See that the thermometer is in good order and adjust it properly in the vaseline. Then take out the syringes and needles.

(1) See that the needles are sharp, clean, and patent. If these points are attended to, work is greatly facilitated, and the operation is much less painful. Place the needles in the vaseline.

(2) See that the syringe is air-tight. This is done by placing a finger over the nozzle and at the same time pushing home the piston; if the syringe is working properly, resistance will be felt to the pressure against the piston and it will slip back when released, provided the finger has been retained firmly over the nozzle. The tightness of the plunger in the barrel can be regulated by the screw in the handle.

(3) When the temperature of the vaseline has reached 90° C. fill up the syringe with the heated vaseline and empty it again into the pot. This is done to get rid of moisture in the syringe; at temperatures above 100° C. any moisture is immediately converted into steam, and this causes the vaseline to crackle and splash, and may, perhaps, fracture or burst the glass barrel.

(4) Now wait till the temperature has reached 160° C. Then completely fill and empty the syringe twice with the hot vaseline. A temperature higher than 160° C. injures the india-rubber plunger, and a temperature lower than 160° C. is not so efficient in effecting sterilisation.

(5) With the dissecting forceps fish out a needle, which has been lying in the hot vaseline, and adjust it firmly to the nozzle of the syringe by means of the pliers, which should, previous to grasping the needle, have been dipped momentarily in the hot vaseline.

(6) Now for the third time draw up and eject the hot vaseline from the syringe; on this occasion with the needle in position. The syringe may now be carefully laid on one side, preferably

supported on the lid of the syringe box and allowed to cool. The needle should not be allowed to come in contact with any article or surface.

(7) A bottle of anti-plague vaccine is then taken in hand. The number of the brew and the number of the bottle and dose to be used is noted.

Examine the neck carefully for any cracks or flaws. By handling the bottle in the same way that the index of a clinical thermometer is shaken down, leakage, through such cracks, may be detected. Faulty bottles should invariably be rejected, and the contents thrown out.

The bottle should then be well shaken, so as thoroughly to mix the sediment, which will be seen at the bottom of the bottle, with the fluid. *The sediment consists of the dead bacteria and is an essential part of the vaccine.*

(8) To open the bottle, hold the neck in a flame, turning the bottle round all the time so as to sterilise every part of the neck. When the glass is sufficiently heated jerk up a little of the fluid, and the neck will crack. The tip may then be knocked off by a sharp blow from a pair of sterilised forceps.

(9) Now take up the syringe, draw into it a small quantity of hot vaseline, and again eject it. While the needle is still hot, draw into the syringe 2 or 3 c.c. of the anti-plague vaccine. Place the bottle on its side on the table. Then draw out the piston of the syringe to its full extent, and shake up the small quantity of the vaccine within the barrel of the syringe. Eject the contents of the syringe. This is done to get rid of some of the excess of vaseline which adheres to the interior of the syringe.

(10) Again dip the needle in the hot vaseline, pass the point of the bottle through the flame, and then fill up the syringe. Get rid of excess of air by adjusting the piston. Note the graduation marks on the piston-rod, and read off four marks, counting from the nozzle-end of the syringe. Screw up the discs (to be found at the handle end of the shaft of the piston) to the point noted. The syringe is now ready to deliver 4 c.c. or one dose of the vaccine.

How to carry out the Operation of Inoculation

The most convenient site for the operation is the back of the left upper arm about midway between shoulder and elbow. The

skin at this spot should be well scrubbed with 5 per cent. carbolic lotion (1 in 20). The skin being then puckered up between the thumb and fingers of the left hand, the needle should be pushed through the skin in a sloping direction, more or less parallel to the surface, carefully avoiding the big vessels and not penetrating the muscles, but taking care to enter the subcutaneous tissue. Then slowly inject the dose. Withdraw the needle of the syringe, and apply for a few seconds a pad of cotton wool dipped in 1 in 20 carbolic lotion.

The next patient is operated on in the same way. The needle of the syringe is first dipped momentarily in the hot vaseline, which is kept at hand at a temperature of 160° C. The screw on the shaft of the piston is again adjusted to four spaces from the nozzle-end of the syringe, each space being equal to 1 c.c. The arm of the patient is scrubbed with 1 in 20 carbolic lotion. A drop or two of the vaccine should be ejected from the syringe to get rid of any oil or vaseline within the needle. The needle is then inserted, and the dose injected.

Between each operation the needle of the syringe is sterilised by dipping it into the hot vaseline.

As only sterile fluid has been introduced into the syringe, if proper precautions have been taken to sterilise the needle before each operation, the interior of the syringe need not be sterilised between the filling of each bottle. At the close of the operation the syringe should be thoroughly washed out with 1 in 20 carbolic lotion, and the needles should be covered with vaseline.

PNEUMONIA

There are two sorts of pneumonia. Both sorts are due to microbes, but not always to the same microbe. In one variety inflammation extends down the bronchial tubes to their smallest branches and so reaches the lung tissue; this is called broncho-pneumonia, and will be described in the chapters on Medical Diseases and Diseases of Children. Most of the pneumonias in children and in the very aged are broncho-pneumonia; amongst adults the other form of pneumonia is commoner. This other sort of pneumonia, which we will refer to simply as pneumonia, is a distinct disease, and in this a part of the lung or lungs is affected primarily. Pneumonia may be caused by the bacillus of influenza, or of plague,

or of enteric fever, or by other organisms; but is usually due to one called the pneumococcus. This pneumococcus is found in healthy mouths, and is a very common organism. Pneumonia is caused either by a healthy subject meeting a particularly virulent breed of organism, or by the ordinary organism which is already present finding a subject, or his lung, depressed by some outside influence, a fit soil for its growth. When the former method operates sometimes many healthy men living in close contact are attacked together, and pneumonia is epidemic. The latter method is the more usual, and explains how a severe chill may be followed by pneumonia; the chill is the predisposing depressing influence, the pneumococcus is already at hand.

Pneumonia begins suddenly with a severe chill and high fever, often with vomiting. Soon there is pain in the side, often severe, and a short, dry, painful cough is the rule. The respirations are much increased in frequency; so is the pulse, but not so much in proportion to the respirations. There may be little or no spit, but commonly there is some, soon becoming thick and stained with blood. This coloured sputum is a feature of pneumonia in adults, and distinguishes the disease from bronchitis. Pneumonia may be painless, but nearly always the piece of pleura over the inflamed lung is also inflamed, and this pleurisy gives rise to much pain. The pain may not be felt over the inflamed part, but may be referred lower down, even to the navel (*see* Chapter III on Pain). The temperature remains constantly high, 104° or 105° F., and the patient may be delirious, especially at night, and the general condition will remain much the same until the fifth to eighth day, when in a favourable case the temperature, pulse, and respiration will fall suddenly by crisis to about their normal, and the patient will feel much better. Bear in mind, however, that the crisis leaves him very weak, and he must not stir or be disturbed just now. The fall of temperature may, however, be delayed several days and may then occur gradually. In unfavourable cases the temperature remains high, the patient from delirium passes into stupor and death.

The *diagnosis* of pneumonia in a typical case is easy even to the layman. The sudden onset, high fever, hurried breathing, and pain in the side form a characteristic picture.

The *treatment* of pneumonia is typically expectant. Pneumonia once started has got to run its course, and that cannot be

shortened by medicines. What the patient requires is good nursing, and careful attention to his needs and pressing symptoms. The same treatment and diet recommended for fevers generally should be adopted. It is well to give the patient a preliminary dose of the Aperient Draught, Prescription No. 27, an ounce and a half for an adult. But for the average case no medicines at all are required, only nursing. Do not give the patient expectorant cough mixtures with the idea of helping him to bring up his spit; they will probably do more harm than good. Do not give drugs to reduce the temperature, such as phenacetin, antipyrin, antifebrin. And do not give chloral to promote sleep at night. Certain symptoms, however, may require treatment. For the pain in the side hot poultices of any convenient material are beneficial; they do not shorten the disease, but they relieve the pain, and for this purpose may be applied frequently. Frequent sponging of the body gives relief, especially if the temperature be high. If the temperature go over 105° F., the patient should have a cold-pack (*see* Chapter XX). If delirium be violent the patient must be carefully watched, especially at night, as then he is inclined to leave his bed and wander. For violent delirium a hypodermic injection of morphia, ¼ grain, given as described in Chapter XX, is the best remedy. Brandy, from two to four ounces, should also be given at night in very delirious cases; half an ounce at a time in a little milk. Brandy is also to be given for heart failure, which is especially to be watched for at the crisis. Prescription No. 37 is also useful as stimulant at such times and may be given in addition to the brandy. If no brandy is at hand, whisky may be used.

After convalescence has set in Prescription No. 51 should be given thrice daily till strength is restored. Some special points in the nursing of Pneumonic patients are given in Chapter XIX.

RELAPSING FEVER

Relapsing fever is due to infection by a small organism called a spirochæte, which is conveyed from the suffering to the healthy by means of the body-louse. It will be understood therefore that the disease is found only amongst the uncleanly or those in contact with them; it is more than usually prevalent in times of distress, and this fact has earned it one of its names, 'famine fever.'

Relapsing fever occurs not often in Europe, though it is still sometimes found in Ireland. In India it is not uncommon, epidemics at times being widespread locally. The disease commences with a chill, and the symptoms are headache, pain in the back and limbs, and a high temperature. The temperature may be about 104° F. and may be accompanied by delirium. In some epidemics jaundice is common. After about five or six days the temperature falls suddenly by crisis, and the patient feels much better.

The chief characteristic of this fever is explained by its name; the fever relapses after a period of about six days without fever. There is then a second attack like the first, usually somewhat shorter. After this another period free from fever, then there may be another, and even another relapse. During the paroxysms of fever the spirochæte can be seen in the blood with the aid of the microscope, and on this the diagnosis of the disease depends. It is absent from the blood during the periods without fever. The disease is not very fatal; about 6 per cent. of those attacked die, but epidemics vary in their virulence. There is no specific treatment for this fever; that recommended above for fevers generally should be adopted. Prophylaxis consists in cleanliness; all the patient's clothes likely to harbour the body-louse should be disinfected.

RHEUMATIC FEVER

Although rheumatic fever or acute rheumatism, as it is sometimes called, is not infectious in the ordinary sense of the word, it is yet due to some infective agent or germ. It is much less common in India than in England, and is uncommon amongst the Indians themselves.

Rheumatic fever is more common in the young than the old, occurs especially in damp places, and is liable to follow a wetting or exposure to cold. One attack of rheumatic fever renders the subject more liable to subsequent attacks. The disease is characterised by inflammation of some of the joints and of some of the fibrous structures of the body. It usually begins suddenly with fever up to 102° or 104° F.; pain in one or more joints, and often a sore throat. The pain generally comes on in one of the larger joints, which is highly inflamed, red, and swollen, so that it cannot be moved, and the slightest touch is shrunk from. The inflammation may attack several, or all, the joints, but more commonly

two or three are affected one day, and then others are suddenly attacked, the first joint implicated growing, almost as suddenly, comparatively well. There are also frequent characteristic sour perspirations, which do not afford relief. These perspirations are often accompanied by an eruption of small vesicles, which is caused by the heat and moisture, and is of no serious consequence. The duration of the disease may be a fortnight to three weeks, when complete recovery may occur, or stiffness and pain in the joints may remain.

Rheumatic fever may have many complications; the most important are those affecting the heart, either the membranes outside the heart or those inside the heart, or the heart muscle itself, called pericarditis, endocarditis, and myocarditis respectively. The results of endocarditis we see often in the form of valvular disease of the heart, so common a sequel of rheumatic fever. There will probably be no sign evident to the unskilled observer by which the advent of these complications will be known. It is of importance therefore that a doctor should see the patient frequently, as the early detection of a heart affection will lead to its treatment and may prevent a chronic disease of that organ.

In a typical case rheumatic fever is not difficult to recognise, but there are other diseases that show fever and painful swollen joints, though not as a rule in such an acute form as rheumatic fever. Thus subacute rheumatism may resemble Malta fever and pyorrhœa alveolaris when they are accompanied by joint affections; or some forms of septic absorption, especially those after childbirth, or sometimes bacillary dysentery are followed by joint affection. The reader is referred to those diseases for assistance in the diagnosis.

In the *treatment* of rheumatic fever good nursing is important. The patient should wear flannel and should lie between blankets and not sheets. The diet should be milk; Imperial drink, or lemonade and barley-water for the thirst. The affected joints should be wrapped in cotton wool, and handled with the greatest care. If very painful the application of chloroform liniment may give relief, and if sleep is prevented by the pain, morphia, ¼ grain, should be given hypodermically, as described in Chapter XX. Internally Prescription No. 58, an ounce every three hours till pain is relieved, then three times a day.

During convalescence Prescription No. 51, an ounce three times

a day. The patients should stay in bed about six weeks, and in the event of a heart complication for longer. It is essential to summon medical aid to advise on each case in such event. Some special points in the nursing of Rheumatic Fever are given in Chapter XIX.

SCARLET FEVER

Scarlet fever or scarlatina is an infectious fever common in Europe, but rare in India. Whenever it occurs in India it has either been imported direct from England, or its origin can be traced to the receipt of letters from home. The infection of scarlet fever is conveyed both from the throat and the small flakes of skin of a patient, so it will be understood how small particles from either of these can adhere to a letter or a similar article and carry infection to long distances. Those affected are usually children or young adults.

The incubation period is about three days, and the disease begins suddenly with shivering and frequently with vomiting. The chief characteristics of scarlet fever are the rash and the sore throat. The rash comes early, first as small red points, which run together and give a red blush all over. This is well seen on the face, which appears flushed except for a pale area round the mouth. The rash lasts till about the fifth day, then gradually fades, the skin afterwards beginning to peel off. This latter phenomenon is called desquamation. The sore throat appears very red over the tonsils and back of the pharynx; white patches may also be seen. The glands in the neck enlarge more or less in proportion to the severity of the throat.

The fever beginning with the onset may reach 105° F. and gradually decline, lasting about a week. A not infrequent complication is inflammation of the kidney, evidenced by the presence of albumen in the urine. The chief points by which scarlet fever may be diagnosed from measles and German measles are given under the former disease.

The *treatment* of scarlet fever should be on the lines of the treatment for fevers generally, with especial care in addition to avoid chills or dampness that may promote inflammation of the kidney. For this reason the room should be warm, though well ventilated, the diet be milk, and the patient kept between blankets and not sheets once the temperature has fallen.

The patient should be encouraged to drink, and the Imperial drink (*see* Chapter XXI) is suitable for the purpose; also barley-water.

For the sore throat the patient if old enough should gargle with Prescription No. 21 several times a day. If the throat is very foul, and in any case for a child, much benefit may be obtained by syringing the inflamed area, using a glass syringe and equal parts of chlorine water (Prescription No. 44) and hot water. This should be done every three hours; if the child appears choking use ice-cold water instead of hot water to mix with the chlorine water. A common complication is inflammation of the middle ear. If earache occurs, the procedure recommended in Chapter XII should be adopted.

Remember that the patient remains infectious a long time after he appears well, and must therefore be isolated. In ordinary cases he should be in bed for three weeks, and then, if the weather is dry, allowed up; but not out and about till the skin is quite free from flakes and the throat quite well.

SEVEN-DAY FEVER

Seven-day fever is a non-fatal disease much resembling dengue fever (which see) in that it is accompanied by severe pains in the body and limbs, and is characterised by two maximum rises of temperature with an interval without fever or only mild fever.

The disease is common in Indian seaports, as well as some parts up-country, between July and October: at times the epidemic is extensive. There are a few points of difference from dengue. In seven-day fever the rash is usually absent, the period after the first rise of temperature is usually not entirely without fever, the pulse tends to be slower than in dengue, and the joint pains are usually not so marked in seven-day fever. Nevertheless, many hold them to be the same disease. The question is unimportant so far as treatment is concerned; in both the treatment is on general lines.

It may be very difficult to diagnose this fever during the first few days from enteric fever or from malaria.

In enteric fever headache is more pronounced, the onset is more gradual, the tongue more furred, and the drop in the temperature after the first few days cannot be expected.

In malaria the alternation of cold and hot stages followed by sweating will give the clue; although in both the above diseases examination of the blood by a pathologist may be necessary to determine the diagnosis during the first week.

SMALLPOX

Smallpox is an infectious fever characterised by a typical eruption. This disease is extremely infectious throughout its whole course from its initial symptoms up to the end of desquamation. Few unvaccinated people are insusceptible, and most contract the disease on first exposure to it. Smallpox is especially prevalent in dry weather, and ceases during the rains.

Infection may be conveyed by patients or by the dead, or by infected articles such as clothing, or even some distance through the air. The incubation period is about twelve days.

Smallpox begins suddenly with fever and the usual signs that accompany a raised temperature. Sometimes there are rashes, usually of a general red colour, and especially about the lower abdomen and groins: such rashes usually fade with the onset of the typical smallpox eruption.

There is often vomiting, always headache, pain in the back and loins, and occasionally sore throat. Then 'fever' sets in, the pulse becoming quick, and the skin hot, the temperature perhaps rising to 104° or 105° F. If now the finger is pressed on the forehead, a shotty feeling may sometimes be noticed before the eruption is visible. After two or perhaps three days, an eruption of raised red spots appears on the face and forehead, and this is *attended with temporary diminution* of the 'fever,' the temperature falling to 101° to 102° F. On the third and fourth days the eruption spreads over the body; on the fifth day each pimple becomes a vesicle with watery head, round base, *central depression*, and inflamed margin. This *central depression* is fairly characteristic, and helps to distinguish the malady from chicken-pox. During the next three days 'matter' forms in the vesicles, and they are more prominent. When 'matter' has formed, the peculiar and unmistakable *smell* of smallpox is present. If the case is severe the face is much swollen, and the eyes are closed by the swelling. About the tenth day the *pustules*, first on the face, later on the hands and feet, begin to dry up, and about the fourteenth day

they form scabs; these fall off from the twentieth to the twenty-third day, leaving the skin of a reddish-brown colour. Frequently scars or 'pits' are left by the healing of the pustules. As the eruption attains its height the 'fever' generally for two or three days very much increases, the temperature again rising to 104° or 105° F.; this is called the *secondary fever* of smallpox, and usually occurs on or about the eleventh day, which is the period in bad cases of the greatest danger from exhaustion. The tongue is furred, white throughout, and sometimes swollen. In adults the bowels are most frequently constipated during the whole time; in children there is frequently diarrhœa at the commencement.

In very bad cases the pustules are so thick that they almost or quite join; the disease is then said to be *confluent*. In such instances the 'fever' is much more severe, there is *delirium*, and the patient may die. About half the confluent cases die.

The eruption may also appear in the nose, eyes, or mouth, and in the larynx.

There are very severe types of the disease where bleeding occurs under the skin or elsewhere, known as hæmorrhagic smallpox.

After effects are not uncommon, the most frequent being boils or abscesses.

Smallpox is called 'modified' when it occurs in a previously vaccinated subject. Though the fever may in such cases begin with its usual virulence, the disease tends to run an altogether milder and shorter course.

Diagnosis. There is only one disease that may be commonly confused with smallpox, and that is chicken-pox. And this confusion is only likely to occur when the smallpox is particularly mild. The main point of distinction is the distribution of the rash, which in smallpox tends to be so much more on the face and extremities. Though these areas are by no means free in chicken-pox the eruption here tends to be more evenly distributed over the trunk as well. Some of the points of distinction are tabulated on p. 94.

Treatment. The patient must be isolated, if possible in a separate building. It is best to erect a 'chhapper' hut in the shade of a tree and at some distance from other dwellings. Afterwards the hut and its contents should be burned, including all clothing that has been in it.

The treatment recommended for fevers generally should be adopted, and, though there is no specific cure for the disease, some

benefit may be derived from the administration of pulv. hydrargyri cum creta, 1 grain three times a day.

The great essential is cleanliness, and unless that is adequately carried out the patient will not only smell horribly, but may die of septic complications. He should be washed daily with an anti-

	Chicken-pox	Modified smallpox
Incubation . .	Thirteen to sixteen days.	Twelve days.
Premonitory fever.	A few hours.	Two or three days.
Premonitory symptoms . . .	Mostly nil.	May include headache, backache, drowsiness, vomiting, delirium, convulsions.
Rash . . .	Red spots becoming vesicular in a few hours and drying up in three or four days, leaving crusts ; coming out in crops on four or five successive days on the scalp, trunk, limbs, face, and mucous membranes. The vesicles are mostly unilocular.	Red shot-like papules appearing on face, wrists, body, limbs, and soft palate ; in the course of a day or two the papules becoming vesicles, and developing into pustles by the eighth day, or they may dry up, leaving only scabs.
Temperature .	Intermittent in character.	Sudden rise, reaches its height when the papules are fully out ; then comes a speedy fall. The secondary fever is slight or absent in modified cases.

septic lotion, one part of Prescription No. 16 to two of water ; and it is good to make the patient a mask of lint, with small eye, nose and mouth holes, and to keep this mask moist with the lotion and constantly on the patient. Prominent pocks may be pricked, or if already burst, dabbed with this lotion. This will be found to relieve the intolerable itching.

The eyes should be kept clean with boric lotion, Prescription No. 14.

When the pocks begin to dry, the free use of vaseline, especially on the face, will be of use not only to the patient, but to prevent the scabs blowing about and infecting others.

Constant attention and the free use of the carbolic acid lotion can do much to relieve the pitting resulting from smallpox.

VACCINATION

Smallpox may be prevented or profoundly modified by vaccination. Vaccination means giving the subject 'cow-pox,' which is really a mild and greatly modified form of smallpox.

Vaccination produces no ill effect, and yet the person who has been vaccinated may be as much protected against smallpox as if he had had that disease. If the latter affection is taken after cow-pox, which sometimes happens, it is always mild, scarcely ever leaving any injurious results on the constitution. Experience and statistics show that vaccination protects the individual and greatly diminishes the amount of smallpox in the community. The vast majority of ailments which have been ignorantly attributed to vaccination have no possible connection with it. The most likely ailment to occur after vaccination is erysipelas, if in the neighbourhood. But erysipelas may occur after any trivial injury, and is entirely unconnected with the use of cow-pox lymph.

Vaccination should be performed in infancy, again about the age of seven, and at similar intervals thereafter. Healthy children should be vaccinated within three months after birth, and, when smallpox prevails, at a much earlier period. If, however, a child suffers from disordered bowels, or from eruptions of the skin, or is weakly, and there is no smallpox about, it may be desirable to postpone the operation. In India the cold season is the best time for vaccinating.

On the second day after vaccination a small red spot may be observed at each scratch of the lancet. On the fifth day there are circular pearly vesicles containing a limpid fluid. On the eighth day these are fully developed, the centre of each being *depressed*, with an inflamed red ring around, of the breadth of from one to three inches. There is probably slight 'fever,' often some swelling of the arm, and sometimes enlargement of the glands in the armpits. On the eleventh day the pustules burst, leaving a scab. About the twentieth day the scab falls off, leaving permanent scars or 'pits.'

If these symptoms (excepting the enlargement of the glands in the armpit) do not present, particularly if the red ring or *areola* is not well developed, the operation is not successful, and confers no protection.

During the progress of the vaccine pustule great care should be taken lest the child rubs or scratches the part. If this occurs there may be a troublesome sore, and much redness about the armpit. Under such circumstances it may be necessary to apply a poultice until the sore is clean and healthy, after which boric ointment (Prescription No. 77) is the best application. Shields have been devised for the protection of the part, but they are not necessary.

THREE-DAY FEVER

In some parts of India a fever prevails at times that lasts for three days only. The onset is sudden, the temperature rapidly rising to 103° F., with severe headache and pains in the body and limbs.

There is no specific treatment: fever ceases on the third day, leaving the patient rather weak.

This fever appears to prevail when sand flies are numerous, and some consider the infection to be conveyed by sand flies and call it "sand-fly-fever." A similar fever exists in parts of Southern Europe, due to an insect called Phlebotomus pappatasii, and the disease is there known by either of these names.

TYPHUS FEVER

So far as civilised countries are concerned typhus fever is now a disease of the past. Formerly a common epidemic in crowded and insanitary communities it gained the names of 'gaol fever' and 'camp fever' from its prevalence in such conditions. In Europe it now lingers only among the unclean in parts of Ireland and Russia. It is highly infectious to those who approach near the patient, such as doctors and nurses, but not to those who keep a short distance away. This is explained by the fact that the infection is probably conveyed by the body-louse from the patient to the healthy.

In India typhus is hardly known, but has recently been thought to exist in parts of the hills and perhaps elsewhere.

The incubation period is about twelve days, and the disease usually begins suddenly with a chill and severe body and head pains. Fever is high and remains high for about fourteen days, when it ceases suddenly by crisis. About the fourth or fifth day a rash of dirty pink spots appears on armpits, wrists, then on abdomen, chest, back, thighs and arms. There is usually violent delirium, followed about the tenth day by extreme nervous prostration, and great weakness. The patient may lie in an unconscious state for days and then die, though recovery is the rule. About 10 per cent. of cases are fatal.

The *treatment*, besides that for fevers generally, consists in maintaining the strength, carefully watching the heart. Musk, 5 grains, in low delirium, is useful. Brandy, especially at night, two or three ounces is often required; and other cardiac stimulants hypodermically, to be given by the physician.

Prophylaxis consists in bodily cleanliness.

WHOOPING-COUGH

Whooping-cough is an infectious catarrh of the respiratory passages accompanied by slight fever. It usually attacks children between the ages of two and seven years, but may attack adults. One attack usually gives immunity. The incubation period is from a week to a fortnight. Whooping-cough commences as a common cough, but after some days the cough comes on in 'fits,' after which the breath is drawn in with a long effort, and accompanied by a peculiar 'whoop.' In bad cases there may be twenty paroxysms in a day, several fits of coughing without the 'whoop' being heard. A child with whooping-cough soon learns when the paroxysm is commencing, and is frightened. He rushes to the mother or nurse; or, if of a more advanced age, stamps his feet in a state of agitation, and clutches some article of furniture by which to steady himself. Vomiting frequently attends the fits of coughing, and the suffocation of the child may appear threatened, when suddenly the characteristic 'whoop' is heard, which terminates the paroxysm, and the child returns to its play. From the vomiting, children with bad whooping-cough sometimes cannot retain sufficient food in the stomach to supply the wants of the system, and may suffer from starvation. Simple whooping-cough is rarely fatal; but unfortunately whooping-cough may excite

other maladies. The force of the cough may cause bloodshot eyes, bleeding from the nose, or from the ears, and sometimes *rupture of the drum* of the ear. In most cases there is some degree of *bronchitis* attending the complaint, shown by hurried breathing, feverishness, and by wheezing heard in the chest. In some cases *inflammation of the lungs* (broncho-pneumonia) is induced (*see* p. 133). In other instances, from injury to the air cells from the force of the cough, the foundation of *emphysema* is laid (*see* p. 156). *Convulsions* may also be excited, the approach of which is indicated by contractions of the fingers or toes, or by turning in of the thumb to the palm of the hand.

As with measles, so with whooping-cough, the great danger is not in the disease itself, but in its complication, broncho-pneumonia, which is both dangerous in itself, and even if recovered from may have left the lung a suitable soil for tuberculosis. The reader is referred to the section on broncho-pneumonia in children. It is this that makes whooping-cough such a serious disease, and if mothers would only realise this and not let their whooping children out of doors to come in contact with the public in any way, benefit would be done not only to the patient, but to other children as well.

The disease lasts about six weeks as a rule, but may last months, during the whole of which time the child is infectious.

The *treatment* of whooping-cough should be on the same lines as that of measles, to which section the reader is referred: except that it is not necessary to sponge the patient frequently. For the catarrh give two drachms of Prescription No. 73 four times daily to a child of two or three years. If the fits of coughing are troublesome, give to a child of that age two drachms of Prescription No. 70 when an attack comes on, but not more often than five times a day.

The inhalation of a 1 per cent. solution of formalin in hot water may also be tried. If broncho-pneumonia supervenes treat as under that section. On recovery give the child a change of air to the hills or seaside.

YELLOW FEVER

Yellow fever is not known in India, but is an infectious disease of other tropical countries, prevailing especially on the Spanish Main. It is transmitted by the bite of a particular mosquito. As

this mosquito is also found in Ceylon and India fears have been expressed that improved communications with the New World via the Panama Canal may infect our mosquitoes also, and introduce the disease to India.

The incubation period is three to five days. Yellow fever ordinarily commences suddenly with shivering, followed by fever. There is constipation, much headache, troublesome vomiting, tenderness at the pit of the stomach, redness of the eyes, and pain in the back and limbs. On the third or fourth day the symptoms subside, and the person may recover. But most frequently the stomach tenderness returns and black vomit sets in, *i.e.* the vomit contains blood, the 'stools' being dark from the same cause. Jaundice also occurs, and the patient sinks into the typhoid condition.

The *treatment* should be on the lines of that for fevers generally.

CHAPTER V

DIARRHŒAS

Catarrhal diarrhœa : Food poisoning : Ptomaine poisoning : Cholera : Dysentery : Hill diarrhœa : Sprue : Tropical diarrhœa.

DIARRHŒA is not a disease but a symptom; and a proper understanding of this fact will lead to a more efficient treatment of the condition. In other words, we do not aim at stopping the diarrhœa but at removing its cause, and the cause may be very different in different cases. The first essential is to discover the cause in any particular case, and the reader should determine which, if any, of the heads in this chapter his case comes under. Usually all the varieties are easily diagnosed except that of catarrhal diarrhœa, and we will proceed to indicate the commoner causes of that first.

CATARRHAL DIARRHŒA

By catarrhal diarrhœa is meant a looseness and frequency of motions due to an inflamed condition of some portion of the mucous membrane which lines the intestines; in other words, a cold in the bowels, comparable to a cold in the head. Such a catarrhal condition may be merely a part of some more serious disease involving the heart or kidneys, or other organs; but when other organs appear healthy, catarrhal diarrhœa is usually due to one of two causes :

(1) An irritant taken into the intestinal canal with the food or drink.

(2) A so-called chill.

(1) By far the majority of cases are due to an *irritant;* in fact, many of the cases popularly attributed to chill are really due to this cause. If the irritant is sufficiently strong it will usually

act first on the stomach and cause vomiting; if it passes on to the intestine then the effort the body makes to expel the offending matter is evidenced by diarrhœa. It will be understood therefore that under such circumstances the diarrhœa is a good thing, and nature should be helped in her efforts to expel the irritant. Such diarrhœa usually arises from an error in diet, and the irritant matter is usually indigestible food, unripe fruits, badly cooked vegetables, shell fish, inferior tinned provisions, inferior wine or beer, &c. Diarrhœa of the irritative type may arise from a dirty condition of, or from defective tinning of, cooking utensils. Brackish or hard water may excite *irritative diarrhœa.* When persons pass from districts where the water is good into localities where it is brackish or hard, they frequently suffer from diarrhœa, especially if no precautions are taken in the way of boiling the water. Stale fish, such as is sometimes obtained in the efforts to secure pomfret up-country or in restaurant-cars, is not infrequently the offending cause of such diarrhœa.

Treatment. Nature tends to cure this complaint herself; as already explained, the diarrhœa is her means of treatment; but she should be assisted by an ounce of castor-oil. If there is painful griping, 10 minims of tincture of opium or of chlorodyne should be added to the oil; and turpentine stupes over the abdomen, for which *see* Chapter XX, will also assist in relieving the pain.

Should the diarrhœa last more than two days, by which time the irritant will have been expelled, and the diarrhœa remaining due to the catarrhal condition left behind, then sedatives and astringents may be given. Three minims of tincture of opium added to an ounce of Prescription No. 41, given three or four times a day, should be successful. Prescriptions No. 43 and 59 are also useful for this purpose, one ounce three or four times daily. During the diarrhœa nothing more than milk and barley-water should be taken, and as recovery ensues the diet should be gradually increased to eggs, toast, fish, &c. Do not fly to brandy as a remedy for such diarrhœa; it is a popular fallacy to regard brandy as the remedy for all diarrhœas. Half an ounce of brandy or an ounce with a little milk is useful in allaying the painful gripes; but do not imagine, as so many of the young and inexperienced appear to do, that by taking a brandy peg at dinner instead of a whisky peg, and omitting the principal course, that you are thereby efficiently treating looseness of the bowels.

2. *Diarrhœa due to a Chill.* This often results from sudden changes of temperature, as occur, for instance, at the commencement of an Indian monsoon, or from exposure to damp night air, or from damp clothing or bedding, or even from sitting before an open door or window, or on the first passing out into the cold early morning air. Diarrhœa, which has been erroneously attributed to malaria, occurs after a person has been actively engaged during the day—perhaps snipe-shooting—in the heat of the sun. He returns home, feels a little feverish, has diarrhœa during the night, and in the morning feels well again. This depends on chill and fatigue, or unaccustomed exercise. On inquiry it will be found there has been exposure when fatigued to the evening fall of temperature, or to a dense shade immediately after the skin has been acted upon by a powerful sun ; or the person has been sitting in the wind when perspiring. In any climate diarrhœa may be excited, in a weakly predisposed person especially, on exposure to variation of temperature. This is probably more often the case in India, partly owing to the general tendency to bowel complaints in the East, partly owing to the mental strain to which so many Anglo-Indians are exposed, but chiefly owing to changes of temperature so readily inducing chill on a skin rendered excessively sensitive by heat.

Under such circumstances as the above it is fair to say that the diarrhœa has been caused by a chill. But the chill is usually only a predisposing cause, and some other exciting cause is present in the bowel. Many of these cases are really mild dysenteries and due to the same organisms that cause that disease. The account of dysentery here given should be read. Should the patient find himself subject to recurrence of these attacks of catarrhal diarrhœa from chill, he should have his motions examined for the presence of the amœba, or, if that is impracticable, be treated with emetine hydrochloride in the manner recommended under dysentery.

Never neglect diarrhœa in the tropics ; treat it seriously in its early stages or it may become uncontrollable later. The diet should be as laid down in the preceding section on Irritant Diarrhœa. For medicine, Prescription No. 59 may be taken, one ounce thrice daily. In a mild case one dose of the medicine may be tufficient, if combined with some curtailment of the usual dietary.

FOOD POISONING: PTOMAINE POISONING

Animals whose meat is naturally suitable for food may by feeding on certain substances render their flesh poisonous to men. Any food, moreover, may become infected with the germs of some specific disease, such as milk with cholera or enteric fever. But by food poisoning is usually meant toxic symptoms due to consumption of putrefying food materials. The changes in the food on putrefaction may cause irritation in the intestinal tract, a condition that has already been described in this chapter as the irritant form of catarrhal diarrhœa. Or the chemical changes in the decomposing material may lead to the production of certain alkaloids called 'ptomaines,' small doses of which are intensely poisonous to man. These ptomaines may exist in decomposing meat, &c., without there being signs evident to our senses of their formation; it is not necessary for the meat to smell for it to be bad. The ptomaines differ in different materials; the symptoms that have followed on the eating of sausages, mussels, fish, certain milk products, and meat, are not always the same, because the ptomaines may be different. They agree usually, however, in causing, after a short incubation period, intense irritation of the alimentary tract, giving rise to vomiting, diarrhœa, giddiness, feeble pulse, cold sweats, and the general signs of collapse.

The symptoms may resemble those of cholera, and the diagnosis even to a medical man may be difficult without the aid of bacteriological examination of the stools. One point should be borne in mind, and that is that if a large number of people are attacked simultaneously, the disease is probably ptomaine poisoning. But if a few are attacked one day and a few another, some escaping altogether, and the cases being spread over some days, the indication is for cholera, due to some cause of infection that is still acting, and not, like ptomaine poisoning, due to the ingestion of poison by all or most at one particular meal. In every case of ptomaine poisoning the source should be searched out, and the offending matter destroyed. If the patient be not too exhausted then the stomach should be washed out as described in Chapter XX, and one ounce of castor-oil given.

If he be collapsed then saline injections should be given by the rectum as recommended for cholera. Small doses of brandy in a little water will also be beneficial in such collapse.

CHOLERA

Cholera is an infectious disease due to the presence in the bowel of a micro-organism, called a spirillum or comma bacillus on account of its shape.

The home of cholera is Lower Bengal and the Gangetic valley. On occasions when many people meet, as at religious fairs, cholera in the past has been conveyed by a few infected people to others, who departing in different directions to their homes have spread the disease broadcast and so established an epidemic. Thus it is seen that cholera spreads along lines of communication, and has reached in this way Europe and even America. While the more rapid the means of communication have become with advancing civilisation, the more rapid has been its spread in successive epidemics; on the other hand, modern sanitation has coped successfully with the disease, and its presence in civilised countries is now unusual and not of long duration.

In the parts where cholera is endemic, such as Lower Bengal, though present to some extent all the year round, it is most prevalent in the hot season immediately preceding the monsoon, with the onset of which it falls, to undergo a recrudescence in November, and then fall again to reach a minimum in January and February.

Infection by cholera occurs by contamination of food or drink from the excreta or vomit of a previous patient. It is evident therefore that infection may be conveyed in the ways described under Enteric Fever, where fæcal contamination is also the factor. The cholera bacillus is not so hardy as the enteric bacillus in that it will not stand drying, and cannot resist the pressure of carbonic acid gas in soda-water for many hours; so that soda-water may be considered safe if made at least two days previously. On the other hand, it will survive freezing, and so may be present in ice or in ices; it will live on soiled clothes, if moist, and on fruit and vegetables, such as salads. In any widespread epidemic the bacillus is usually found in the water-supply, and by means of water it may reach milk. Or, again, may stay in an inefficient filter and infect pure water that is being passed through the filter. Flies may convey the bacillus to food; and, as with enteric fever, 'cholera carriers' may harbour the bacillus unknown to themselves and be a constant danger to their neighbours. It is the attendance of

such carriers at religious fairs that has doubtless been responsible for many outbreaks of cholera.

Amongst predisposing causes of the disease are chills and depressing conditions, mental and physical.

Symptoms. The chief characteristics of cholera are the frequent passage of rice-water stools, watery vomiting, early suppression of urine, muscular cramps, and extreme collapse.

The stools are called rice-water because, in their white opalescence with minute floating particles, they resemble water in which rice has been boiled. They have none of the natural bile colour.

Sometimes cholera begins suddenly with passage of such stools setting in very soon and with vomiting; but sometimes there is a stage of diarrhœa before the choleraic stools begin. This diarrhœa may last hours, or even days, and is of importance because vigorous treatment at this stage may effectively check the disease. During any cholera epidemic there are a large number of people attacked with simple diarrhœa. This should be checked at once in the manner described below; once the rice-water stools begin the diarrhœa is entirely beyond control. The 'stage of evacuations' is the name given to the period during which the watery diarrhœa and vomiting are so free. As the fluid passes so freely from the body the appearance of the patient becomes more and more shrunken, the fingers and toes shrivelled, and the eyes sunken. Muscular cramps set in, especially in the legs, and are extremely painful. Before long the patient becomes collapsed, and no pulse may be perceptible at the wrist. No urine will now be passed; and there will be great thirst, which should always be satisfied by drinks of a few ounces at a time, whether the patient vomit them or not. The case may be so mild that no collapse occurs, but usually the 'stage of collapse' now sets in, the patient's voice all but disappears, and the pulse may entirely go, the skin is cold, severe cramps are common, and the patient is restless. In this stage the patient may die; the collapse may last but a few hours; if it lasts more than a day the patient's outlook is grave. If the patient, however, survive so far, the next stage, that of 'reaction,' is entered, and this too has its peculiar dangers, which are two in number; first, that the fever, which now sets in, may rise too high, and the patient in his enfeebled condition succumb to hyperpyrexia; secondly, that the kidneys will be damaged to such an extent that no urine will be secreted, and the patient becomes

poisoned by the waste products that should be excreted in the urine and dies of uræmia. It is therefore of the greatest importance that urine should be excreted freely, as many a patient survives the dangers of the earlier stages of cholera only to die of uræmia at the end. How to obviate, so far as possible, these dangers we will indicate below.

Cholera is a most fatal disease, especially so at the beginning of an epidemic, when about 80 per cent. of thoseattacked die. After raging for about a month, by which time the most susceptible in a district have already been infected, the mortality lessens and may be about 40 per cent. towards the end.

There is usually no difficulty about the *diagnosis* of cholera during an epidemic. Ptomaine and arsenical poisoning may resemble cholera, but the characteristic signs given above, especially the watery stools, should usually lead to a correct diagnosis. In any small outbreak of diarrhœa the fact that everybody is simultaneously attacked, or everybody who partook of a certain dish or meal, is in favour of some form of food poisoning, whilst the illness of two or three only of the number on one day, followed by the sickness of others on subsequent days and the entire escape of some, is in favour of cholera, since by no means every one who eats or drinks cholera bacilli is attacked by the disease. In children diarrhœa may sometimes resemble cholera, but there will be no important difference in the treatment whether choleraic or not. Sometimes the skilled examination of the stools to detect the presence of the cholera bacillus will be the only means of reaching a correct diagnosis.

The *treatment* of cholera may be said to have been put on an entirely different footing by the recent work of Sir Leonard Rogers, whose reduction of the death-rate from cholera in his Calcutta hospital from 59 to 23 per cent. is a splendid achievement. Unfortunately, however, for those who are seized with cholera in places remote from medical attendance, the advantages of Rogers' discoveries are only partly of assistance, since the proper carrying out of the treatment requires skilled medical knowledge for taking blood-pressures, estimating the specific gravity of the blood, and administering intravenous saline injections. Anyone therefore who passes rice-water stools should at once send for the nearest and most efficient medical aid. The measures here recommended are such as may be carried out by one without medical training; they cannot for a moment compare with what might be done by a

doctor in possession of suitable apparatus. When diarrhœa is prevalent during a cholera epidemic, the Pill No. 62 may be given —one after every motion. Or, better still, Mixture No. 59, one ounce five or six times a day. But the moment the motions lose colour and the stools appear rice-water, the above two medicines should be stopped or they will be actually harmful. No opium or morphia should be given once the rice-water stools of cholera have set in. The patient should be at absolute rest in bed, and no food allowed except barley-water. No soups should be given, nor even milk at this stage. Once the rice-water evacuations are established the Permanganate Pill No. 64 should be given, one every quarter of an hour for the first two hours, then one every half-hour. If rejected, the pill should be replaced by another. The patient's thirst will be great, and to satisfy this he should be given the Permanganate Draught No. 28, two or three ounces at a time. Do not be deterred by his frequent vomiting; give it him again. This draught may be given *ad libitum*. Should calcium permanganate not be in stock, it can be replaced by potassium permanganate in both the above pill and draught. At the same time to combat the extreme loss of fluid from the blood, rectal injections should be given by means of a long tube passed into the bowel. The fluid should be a solution of common salt, 1½ drachms to the pint of water, and this should be run in slowly once every two hours and retained by the patient if possible. Later on, when diarrhœa has ceased, this can be reduced to once every four hours until urine is being freely passed. The temperature of the saline solution should be about normal blood heat, *i.e.* 98·4° F.; but if the clinical thermometer shows that the rectal temperature is over 100° F., do not warm the injection at all, but give it at the temperature of the room.

The patient will now feel very cold, especially about the feet; nevertheless do not surround him with hot-water bottles, or warm him in other ways; it may do him harm later.

If the patient survive the stages of diarrhœa and collapse, he then encounters the dangers of excessive fever and of uræmia, already described. If the temperature taken in the rectum is now over 104° F., sponge the patient all over, apply ice to the head, and give an enema of ice-cold saline solution. If it rises further, cold-pack the patient as described in Chapter XX.

Do not be perturbed if some diarrhœa still remains in this

febrile stage, it may do him good. Certainly do not give him opium now, nor any astringents. At this stage, tincture digitalis 4 minims, combined with one ounce of Prescription No. 37, given every four hours, may be of use in promoting the flow of urine. The rectal injections of salt solution should be continued four-hourly until at least two pints of urine are passed in the twenty-four hours. Dry cupping, as directed in Chapter XX, may also be performed over the loins to relieve the congestion of the kidney.

When urine is passed freely the patient may be considered convalescent, and fortunately the convalescence from cholera is usually a rapid process. Whey and then milk may be given to drink, in fact the advance to these may be made in the stage of reaction; and gradually thence on to arrowroot, sago, rice, until a full diet is reached, leaving soups and meats to the last.

Means for the prevention of cholera will already have been suggested by consideration of the cause of the disease given above. The boiling of all water and milk, avoidance of raw fruits and raw vegetables during an epidemic, and general cleanliness are the principal means to be carried out. It is also a good practical rule to eat only hot food at such times, since that will have been recently sterilised by the cooking. In addition there is a specific means of inoculation against cholera which should be undergone by those likely to be exposed to the disease in the immediate future. The inoculation certainly affords considerable protection, but as this protection lasts only for some six months or so, it is not recommended except for those likely to come in contact with cholera in that time. Such people should ask their medical attendant to inoculate them with Haffkine's or a similar vaccine.

DYSENTERY

Until recently dysentery has been described in medical books as if it were one disease, and as if all dysentery cases were of similar nature; but science now knows that there are at least two kinds of dysentery absolutely distinct in nature and requiring different methods for their treatment. One of these dysenteries is due to a small animal organism called an amœba; the other is due to a vegetable organism, a bacillus. So the two kinds are spoken of as amœbic and bacillary dysentery respectively.

In order to differentiate these two varieties medical skill and

the use of the microscope are absolutely necessary. In the event of an attack of dysentery such skilled aid should be requisitioned. The following account is written for those without such aid who are unable to distinguish between the two diseases.

Dysenteries are very prevalent in India and other tropical countries: they are especially prevalent in warm moist climates, such as that of Lower Bengal and Madras. Moreover, in the rainy season the amount of dysentery increases, and it is noteworthy that on the whole the more rain there is the more dysentery prevails. The frequency of diarrhœa corresponds to that of dysentery, and this is an indication that many of the diarrhœas are really mild dysenteries, either amœbic or bacillary.

Besides the presence of the amœba or bacillus being necessary for dysentery, and the influence of the climate and season already referred to, predisposing causes of an attack are chills owing to sudden changes of temperature, errors of diet, bad food and impure water, whilst want of food and the stress of active military service are also factors.

The first *symptoms* of dysentery are feelings of *griping* about the navel, often accompanied by *nausea*, occurring after any of the conditions given as likely causes. This is felt after incautious exposure to night air, particularly during sleep, and more especially if the wind has been suffered to play on the abdomen, even if covered. Next there are frequent calls to 'stool' with irregular loose motions which may continue one, two, or three days, forming the *premonitory diarrhœa* of dysentery. Then the irregular griping pains gradually become worse, with great heat and soreness about the fundament, and frequent straining. Matters now voided consist of liquid fæces, streaked or mixed with white mucus and blood. As the disease becomes more severe, no fæcal matter is passed, only shreds or large flakes resembling the washings of raw meat pass away, and the 'stools' have a peculiarly offensive odour. The desire to 'stool' is generally most urgent during the day; in some instances it is incessant, in others there may be ten or twenty calls in the twenty-four hours; any movement increases this feeling. There is frequent desire to make water. The amount of attending 'fever' is variable, in some instances hardly exciting attention, in others evidenced by a flushed face, dry skin, hard quick pulse, and furred tongue. Pressure over the bowel is painful.

Just as often the onset of the disease is sudden, and griping is

attended with the passage of blood and mucus in the first motion. Sometimes dysentery is very acute with gangrene of part of the wall of the bowel, which then appears in the motion as black sloughs. Sometimes, on the contrary, the disease is unusually mild, and may not appear more than a simple diarrhœa. Even such mild cases, however, have their danger, because all amœbic dysenteries are liable to be followed by inflammation of the liver, which may extend to abscess.

Typical dysentery is not likely to be mistaken for any other disease: the only difficulty will be the differentiation of the two sorts of dysentery we have already referred to. Both kinds of dysentery if neglected may become chronic, and both, therefore, require active measures in their treatment.

Treatment. The treatment should be general, medicinal and dietetic. The patient must certainly go to bed and stay there until he can pass a formed motion without blood or mucus. If seen very early in the attack he should be given an ounce of castor-oil at once, and beginning three hours later one ounce doses of castor-oil emulsion, Prescription No. 42, should be given every five hours. If, however, the patient has already had several motions when he comes under treatment, the initial dose of the pure oil may be omitted and the emulsion alone given. Now for amœbic dysentery emetine hydrochloride is a specific, and on the chance that the dysentery may be amœbic, 1 grain of emetine hydrochloride should be injected subcutaneously (*see* p. 607), and the dose repeated daily till 3 or 4 grains have been given. If the person in charge does not consider himself sufficiently skilled to give a hypodermic injection he may administer the emetine by the mouth in keratin-coated tabloids.

If the dysentery is not very considerably better after two days of emetine, the disease is probably not of the amœbic but of the bacillary variety. No harm, however, will have been done by the administration of emetine. In such case the treatment appropriate for bacillary dysentery should be adopted. One drachm of the strong magnesium sulphate solution, Prescription No. 53, should be taken every hour until all blood has ceased, after that every three or four hours, till mucus has ceased also. Should there be much griping, 2 minims of chlorodyne or 2 minims of tincture of opium may be put into each dose of the magnesium sulphate solution.

If there is much straining with the passage of motions, and the patient remains on the pan passing nothing but a little mucus and blood, it indicates that the rectum is the part of the bowel chiefly affected, and in these cases one-pint injections of calcium or potassium permanganate solution, 6 grains to the ounce, will be of benefit: they should be employed three or four times a day.

As the patient gets better and begins to feel hungry, the Indian medicine isapghul, given as described in Chapter XXIII, is useful.

The sufferer from dysentery should be put on a purely milk diet: if he be found to pass curds, then he should be given whey or equal parts of whey and milk; while albumen water may be used in very bad cases where milk seems to irritate. As the mucus disappears from the stools, the patient can be advanced on to sago, arrowroot, rice and milk, broths, and so on to eggs and solid food. After all mucus has entirely disappeared from the motions, but there still remains a little looseness, the bismuth mixture, Prescription No. 41, may be given: but care must be taken that the patient does not become too constipated, or the site of the ulcers in the bowel will be irritated by the passage of hard motions over them.

CHRONIC DYSENTERY

If dysentery has lasted a month it may be called chronic, and will by that time present features somewhat different from the acute attack. What has already been written about acute dysentery in the preceding section should be read before this, since the same distinction between the dysenteries holds good, and both amœbic and bacillary varieties may become chronic, and each has its appropriate treatment. The patient will now be thin, weak and somewhat anæmic, and one is faced with the difficulty that while he requires free nourishment to maintain his strength, yet any increase of diet may cause a relapse of the dysentery. If emetine has not yet been given, it should certainly be given now until 5 or 6 grains have been taken. Should the emetine cause no improvement, and the case therefore be of the bacillary type, do not give salines as in the acute form of the disease; but, if possible, some albargin with which to perform rectal injections, as described in Chapter XX.

The albargin should be dissolved in water, 1 grain to the ounce, and one pint of this slowly injected daily on three successive days.

The enema should be retained for fifteen minutes if possible. Until albargin is obtained calcium or potassium permanganate should be employed for injection as recommended in the preceding section. Should the disease still prove obstinate the vaccine treatment should be employed, for which it is necessary to consult a skilled physician.

For diet, milk should be still the staple food, and to prevent heavy curding, 3 grains of citrate of soda should be added to each pint of milk. It is necessary also that the milk be taken in a suitable manner. Milk should be taken frequently in small quantities. If quickly swallowed in large quantities it forms a curdled mass in the stomach, difficult of digestion. By taking one and a half ounces of milk every hour during the day and night, one quart would be consumed. At first it is advisable to take one quart, or even less *per diem*, gradually increasing the quantity to two or three quarts in the twenty hours. Not, of course, being roused from sleep to take milk, but taking some in the night if awake. But even the small quantity first mentioned should not be swallowed at once, but should be sipped very gradually. Tepid milk usually agrees best, and it is advisable that it should be previously boiled. If milk given alone does not agree, it may be tried mixed with one-third of lime water; or it may be peptonised. To satisfy the patient a little good bread or sago may also be occasionally given, and exceptionally a little broth, or raw-meat tea. But the less of anything besides milk which is taken the more likely is the treatment to be successful. At first the patient may probably complain of not being able to take, or digest, the milk, or even of feeling weaker.

If he expresses a loathing for milky foods, or seems really unable to digest them, the advice given under Sprue with regard to this point should be borne in mind, and he may be given meat juices and meat to chew. Isapghul, a cup twice a day, may also be given as described in Chapter XXIII.

Should the dysentery prove very intractable it is important that the patient leave the tropics. A return to English food is often beneficial; indeed recovery seems sometimes to occur before the homeward ship has reached Aden.

HILL DIARRHŒA

It is common for visitors to Indian hill stations to be seized with a peculiar form of diarrhœa, especially during the rains. It may begin at once on a new arrival reaching the hills, and may last for months, and may, moreover, be cured at once, if not allowed to go on too long, on the patient's return to the plains. Children are rarely attacked.

The cause of hill diarrhœa is not thoroughly established. It has not to do with the water-supply, nor is it due to the presence of mica particles in hill water, as has been thought. The fact that it usually occurs during the rains, when rapid changes of temperature are frequent, and that at this time of year a similar form of diarrhœa occurs sometimes on the plains, suggests that it is due to the depressing effect of the lowered temperature and atmosphere on the functions of the intestinal glands and liver, that have been accustomed for so many months to a warm and, to them, stimulating climate. The symptoms of the illness are in accordance with this. The stools are semi-liquid, light grey in colour and very frothy. The amount of wind in the bowels is evidenced also by flatulent dyspepsia, which is often present. There is no pain about the passage of the motion, but preceding it a sense of fulness and discomfort, which is relieved by the diarrhœa. The diarrhœa is only troublesome in the morning, usually from 5 A.M. onwards, and the last of the motions, of which there are usually only two or three, is passed by 11 A.M.

The general health is not much affected at first, but the danger is that the disease, if neglected, will go on to sprue, which is a dangerous illness.

Treatment. Never neglect hill diarrhœa. On the first sign of it go on to a light, even a milk, diet, and wear warm woollen clothing, including a flannel belt which should be applied rather tightly round the abdomen.

These precautions, combined with the taking of one of the natural aperient waters first thing in the morning, will often stop the attack.

Or in place of a natural water equal quantities of sodium and magnesium sulphates sufficient to cause one free motion may be taken on waking.

Liquor hydrargyri perchloridi, ½ drachm, combined with

1 ounce doses of Prescription No. 41 three times a day will also be useful.

Should the diarrhœa not yield shortly to a strict diet, to rest in bed and to the above medicines, a lower elevation should be sought. It may be necessary to return to the plains however hot and uncomfortable they may then be. The hypodermic injection of emetine hydrochloride, 1 grain daily for two or three days, is also worthy of trial, as in some cases benefit has been obtained.

SPRUE

Sprue, which is sometimes known as the white diarrhœa, is a chronic diarrhœa arising from residence in the tropics and characterised by the passage of large, frothy, semi-solid, light-coloured stools and by the presence of a raw and often ulcerated tongue and mouth.

The cause of the disease is unknown, but the intestinal glands are found to be atrophied, as well as the liver later on, and the whole intestinal wall thinned. It sometimes follows on hill diarrhœa and sometimes on dysentery, and usually begins just after the rainy season. Children up to the age of twelve seem rarely to suffer.

At first, as in hill diarrhœa, the stools are passed only in the morning, sometimes only one to three a day, but very copious. Flatulent dyspepsia is a common accompaniment. The large grey stools have a peculiar odour. Later on the diarrhœa may be at all times of the day, and leads to great weakness and anæmia.

Treatment. Such diarrhœa as is described above is dangerous if neglected, as sprue tends ultimately to a fatal end. Medicinal treatment is of comparatively small value: that by diet is most important. In the matter of diet we meet with considerable individual differences. For the majority of patients a milk diet is the most suitable, but with others one of the other diets described below will best agree. The patient should be put first on milk; if it disagrees or if he expresses loathing for milk or any of its derivatives then he should be tried on meat, because we find practically that a patient's own cravings in such circumstances are often a criterion of what will best agree with him.

(*a*) *Milk Diet.* Pure and fresh milk is usually the best, and

from small quantities the amount may be increased up to five pints daily. At first it is often best to peptonise the milk.

(*b*) *Meat Diet.* Lean and underdone meat minced fine and well chewed, though perhaps at first objected to by the patient, is often liked and may be digested. Here again it is well to begin treatment by allowing the patient to chew well some underdone chops and then to reject the solid residue from the mouth. If he progresses favourably he may be allowed to swallow some later, and gradually be brought on to eggs and fish.

(*c*) *Fruit Diet.* Fresh fruit has been successful in many cases, and of all fruits strawberries have acquired the best reputation. They are often difficult to obtain in India : pepitas should be tried, and the juices and more digestible parts of other fruits given.

Amongst medicines, liquor hydrargyri perchloride, ½ drachm, added to one ounce doses of the bismuth mixture, Prescription No. 41, should be taken three times a day. A powder composed of 5 grains of salol and 5 grains of compound ipecacuanha powder taken at night may also benefit.

Moreover, emetine hydrochloride should always be tried, given hypodermically in 1 grain daily for three or four days in succession, as reports of its favourable action in sprue have been received.

A warm binder should be worn applied firmly round the belly, especially at night.

Should the diarrhœa prove obstinate, lasting over a month, leave to Europe should certainly and without delay be taken, preferably for at least a year. And should the same sort of diarrhœa recur shortly after return to the tropics, the question of retirement from an occupation requiring residence in a warm country must be seriously considered.

TROPICAL DIARRHŒA

The term ' tropical diarrhœa ' is sometimes used to express the looseness of the bowels that is not uncommon in hot climates, especially during the rainy season, or amongst newcomers to the tropics.

There is no distinct disease, however, that may be called by this name, and the term is best avoided. The cases will usually be either those here described as catarrhal diarrhœa, or early stages of amœbic dysentery, or hill diarrhœa, and the appropriate treatment should be searched for under those headings.

CHAPTER VI

OTHER MEDICAL DISEASES

Alcoholism, Chronic : Anæmia : Angina Pectoris : Apoplexy : Blood, Spitting and Vomiting of : Bowels, Inflammation of the : Brain, Water on the : Bronchitis : Broncho-pneumonia : Chyluria : Cold in the Head : Colic : Constipation : Convulsions : Cough : Cramp in the Legs : Delirium : Delirium Tremens : Diabetes : Dropsy : Dyspepsia : Emphysema of the Lungs : Epilepsy : Fainting : Feet, Burning of the : Fits : Flatulence : Gall-stones : Giddiness : Goitre : Gravel : Headache : Heart, Diseases of the : Heartburn : Heat, Effects of : Hiccough : Hydrophobia : Hypochondriasis : Hysteria : Insomnia : Jaundice : Kidney, Diseases of the : Leprosy : Liver, Diseases of the : Lumbago : Meningitis : Myxœdema : Neuralgia : Neurasthenia : Neuritis : Obesity : Palpitation : Palsy, Scrivener's : Paralysis : Pleurisy : Pleurodynia : Rheumatism : Rheumatoid Arthritis : Sciatica : Scurvy : Sea-sickness : Spleen, Enlargements of the : Stomach, Disorders of the : Swelling of the Feet and Legs : Tuberculosis : Urine, Diseased conditions of : Veins, Inflammation of the : Vomiting : Worms

Alcoholism, Chronic. The treatment of acute alcoholic poisoning is given in Chapter VII. An account of delirium tremens, which is one effect of chronic alcoholism, is given on p. 142 : but delirium tremens is not, unfortunately, the only malady to which excessive drinkers are subject. Delirium tremens usually arises from a fit of drinking, or a debauch ; but persons who do not thus exceed, yet who are constantly taking fermented drinks (although not in sufficient quantities to produce delirium), are liable to fall into a condition to which the term chronic alcoholism has been applied. The signs and symptoms are : restlessness, sleeplessness, growing indecision of character, with loss of mental and moral power—the latter exhibited by a tendency to tell falsehoods about drink. The features become bloated and flabby, the eyes red and watery, and the whites of the eyes often yellowish. The nose may be red, and there are generally enlarged vessels to be seen ramifying about the nose and cheeks. There is also trembling of the hands. Spirit-

drinkers generally become emaciated, but malt-liquor drinkers often grow obese. Then, the digestive organs are always affected, as indicated by disgust for food, especially in the morning, by morning nausea or sickness (which the person probably endeavours to relieve by a secret glass of his favourite drink), by a furred tongue, foul, sour breath, and irregularity of the bowels with fœtid stools. If the constant habit of drinking is not checked, the person probably becomes affected by a special form of liver disease, known as 'gin-drinker's liver,' cirrhosis (*see* Index): or by chronic inflammation of the stomach, chronic gastritis (*see* p. 153).

Chronic alcoholism can be cured if the person will abstain from drink; but so great is the drink-craving that the majority thus giving way are unable to avoid taking liquor, and will do so when opportunity presents, notwithstanding any promise to the contrary. The dipsomaniac who breaks out after periods of abstinence comes under the same category. Both require watching, as they will obtain alcohol by all manner of cunning devices and will even drink eau-de-Cologne, etc., if they can get nothing else. When such patients come under medical treatment, they usually do so for the dyspeptic symptoms detailed above, and are not ready to confess to the amount of drink they consume, or to admit that their ailments arise from such a cause. The great points of treatment are to keep the patient altogether from alcohol, and to give plenty of food; but as there is a disgust for solid food, it should be given in the shape of milk, beef tea, soups, meat extracts, and puddings. The only certain cure is prolonged rest in a home for inebriates. The morning sickness may be often much relieved by soda-water and milk in equal parts, and drop doses of ipecacuanha wine may be given in a little water every two hours, for the same purpose. *Craving* for drink is best combated by 30-minim doses of tincture of capsicum, or of strong tincture of ginger, in 2 ounces of water, every three hours, or when craving or sinking feelings occur. A useful medicine also is Prescription No. 55, to which 15 minims of tincture of capsicum have been added, thrice daily.

Anæmia. Anæmia really signifies lack of blood, but poorness of blood is the principal characteristic. Healthy blood contains a great number of red globules, which are seen under the microscope, and which give the blood its red colour. In anæmia these red globules are lessened in number, and are deficient in a constituent known as hæmoglobin, which contains iron, and which has

the special power of carrying the oxygen, taken in by breathing, from the lungs to all parts of the body. There is also an excess of water in the blood, and some other of the constituents of the blood are changed in character.

The causes of anæmia are numerous, the principal being as below. Insufficient diet not amounting to actual starvation. Want of sufficient sunlight; the bleaching effect of want of solar light on vegetables is well known, and a similar sinister influence is exerted on animal life. Habitually living in darkened rooms and want of sufficient fresh air and exercise lead to loss of appetite and malnutrition. Prolonged fatigue, which causes a greater waste of the body than the digestive organs can meet. Habitual constipation, during which the absorption of the products of retained fæcal matter takes place, which acts as poison. Excessive mental work, which involves loss of sleep and digestive derangements. Worry, anxiety, and depressing mental emotions have long been recognised as causing the 'cheeks to grow pale,' and 'gnawing at our life and health.' Living in damp and malarious localities. In short, bad hygienic conditions of all kinds predispose to anæmia. Anæmia may also arise from various diseased conditions. An unsuspected scorbutic or venereal taint, or a tape-worm, may be the concealed cause. It results in women from bearing children too quickly, and from prolonged suckling. Anæmia is also a consequence of most chronic exhausting maladies, such as Bright's disease, bleeding piles, spleen disease, repeated ague, and excessive menstrual flow, menorrhagia. Anæmia is also the chief symptom of hook-worm disease (*see* p. 231).

It is not, however, the anæmia caused by exhausting diseases which is now considered, but the anæmia which arises as a distinct malady, especially in the tropics. For, in addition to the manifold causes of anæmia, which may excite the malady in any climate, there is in hot climates another potent factor in the heat. Even in extraordinarily hot summers in temperate climates a greater tendency to languor and debility is generally observed. One, or several, of the causes of anæmia mentioned above may be in operation in addition to the heat of the climate, thus rendering anæmia, more or less marked, a very prevalent condition among both Europeans and natives in India; while anæmia itself renders the same sufferer more liable to most tropical diseases. It is, however, quite normal for the European dwelling in India to have a thinner blood than his

home-staying brother, and with the native of India this is even more the case. The standard of blood redness varies in different parts of the country, but averages about 80 per cent. of what it should be in Europe.

Symptoms. The skin becomes pale, and may in dark complexions present a sallow appearance. In the native and half-caste the skin loses its brilliancy and softness, becoming of a lighter tinge and looking more semi-transparent, while ordinarily lighter-coloured palms of the hand become much whiter. The whites of the eyes look pearl-coloured, the eyes are encircled by a more or less dark ring, and the interior of the eyelids, of the nose, and of the mouth, the tongue, and the lips, instead of being rosy red, are a pale pink colour. The tongue is also tremulous. The cheeks lose their colour, being bleached 'from the aspect of the rose, to the whiteness of the lily.' The sallowness of countenance in dark people is readily distinguished from the sallowness arising from affections of the liver, as it is never so yellow, and the whites of the eyes do not become yellow as from liver disease. In addition to the bloodless cheeks, the face often appears bloated or puffy, although the body loses weight. The patient is habitually chilly, languid, and indisposed to exertion, and the extremities, especially the feet, are usually cold, although the palms of the hands may often burn. The system being so sensitive to cold, sore throats, catarrhs, bronchial affections, and diarrhœa result from slight atmospheric changes. The appetite becomes variable, and sometimes depraved. The urine is generally pale and bowels usually costive. There is also headache, mostly felt about the temples, or at the top of the head (*see* p. 169), and often described as throbbing, or as if something were pressing down and out. It is generally relieved by taking food and by lying down, and aggravated by the erect posture or by exertion. Aching of the limbs, coming on suddenly and lasting a variable time, is a frequent symptom. The monthly courses of women become irregular, scanty, thin, watery, and painful; varied sometimes by a profuse flow. 'Whites' in women is an almost certain complication (*see* p. 455). As the malady progresses there is shortness of breath, especially on exertion, such as going uphill, or upstairs; palpitation of the heart, pain in the left side, a tendency to fainting, singing in the ears, spots or sparks before the eyes, the sleep is very heavy, and there may be bleeding from the nose. The previous languor and disinclination for exertion now

give place to a feeling of thorough weariness. The appetite becomes more variable and fastidious, while digestion is more and more impaired. The brain, now being also affected by the deteriorated blood, presents various evidences of weakness. There is capriciousness and irritability of temper, impressions too feeble to be perceived by healthy persons harassing the anæmic. There is also loss of memory, and of the power of fixing the attention. When the malady has lasted some time, the spleen may become enlarged, and swelling of the feet and ankles may be expected, increasing during the day and diminishing after rest in bed.

It is not to be understood that all the symptoms enumerated appear immediately, or in regular sequence, for the process of blood degeneration may be one of months or years, and one organ or the other may be first and most affected. Anæmia may be present in all degrees of severity, from slight pallor and debility to the condition known as pernicious anæmia, when all the symptoms are aggravated, and the person dies, probably from sheer debility, or from apoplexy or paralysis resulting from the anæmic condition. A minor degree of the symptoms described is not incompatible with apparently fair health and with the pursuit of ordinary avocations. But warnings of anæmia should not be neglected, especially by the European in tropical climates, for the anæmic condition induces dyspepsia, neuralgia, nostalgia (or home craving), boils, abscesses, chronic diarrhœa, fatty degeneration of the liver and heart; it predisposes to apoplectiform attacks, and it renders the person more liable to the fevers of the tropics.

Anæmia may be classed into three different kinds:

(1) *Symptomatic*, *i.e.* the anæmia is not a disease in itself, but only a symptom due to one of the causes mentioned above. Such anæmia is sometimes called secondary. By far the majority of the anæmias in India are of this type.

(2) *Chlorosis* or the green-sickness is an anæmia of girls between the ages of 12 and 30; especially amongst ill-fed town girls. The disease has some symptoms different from those of ordinary anæmia. There is a greenish-yellow colour of the skin different from the pallor of ordinary anæmia; there is a more marked dark halo round the eyes; there is a more frequently depraved appetite, causing such things as slate-pencil and dry rice to be eaten greedily; there is more frequent complaint of throbbing pain at the top of the head and in the left side; the urine is paler and more copious, with a pink

sediment; and hysterical symptoms are more frequent. Constipation is also a more marked feature.

(3) *Pernicious* anæmia is a form that tends to a fatal ending: though recovery is not unknown.

The *diagnosis* of the above varieties requires the aid of a medical man, and examinations of the blood are usually necessary in the severer types.

In the *treatment* of anæmia the first essential is to find the cause, especially as most anæmias are of the first types. The possible presence of the hook-worm (p. 231) must not be forgotten, and microscopical examination of the stools may be necessary. If no cause can be found, and in many cases even if it is found but is non-removable, then symptomatic anæmia, as well as chlorosis, may be treated on the same general lines of suitable hygienic surroundings together with the administration of iron or iron and arsenic internally.

There should be moderate exercise every day, and free ventilation of the living, sleeping, or working apartments. The diet should be nourishing, and a moderate amount of animal food should be taken; but anything causing indigestion should be avoided. Stimulants should be resorted to sparingly, if at all. Cold or tepid bathing is of great service, and change of air and scene is always useful. Tonic medicines, especially iron, are of great value. The red globules of the blood, as previously explained, contain iron, and iron given as a medicine tends to increase their quantity. It must, however, be understood that anæmia is dependent as much on scanty absorption of iron into the system as on a deficiency of the supply of iron; hence, unless combined with well-regulated sanitary conditions, as mentioned above, iron will do little good. Some forms of iron are more easily absorbed than others. These matters being attended to, sulphate of iron may be used, and Prescription No. 50 may be taken thrice daily. This prescription will be found especially useful if there is a tendency to constipation, or disorder of the monthly flow as well. A pill containing aloes and iron is also useful in such cases. In others the well-known Blaud's pill is of great benefit and is easily taken. When the digestion is satisfactory, and especially where the appetite requires a stimulus, much benefit may be obtained from Prescription No. 51 thrice daily after meals. For the anæmia of children, Parish's chemical food, the compound syrup of hypophosphites, malt extract with hæmo-

globin, and Iron Jelloids are all both beneficial and pleasant to take. They may also be used for adults.

The treatment of variety (3), pernicious anæmia, can only be carried out, as it can certainly only be diagnosed, by a doctor. Iron is useless here: the treatment is by administration of arsenic and by other measures. When anæmia is long confirmed, change of climate should be taken, the European to Europe, the Indian to the hills. For the European, short sea-voyages or the hill climates are not sufficient. But the change to Europe should not be made in the winter, and the greatest care should be taken to avoid chill.

Angina Pectoris. Angina pectoris or breast-pang is a symptom of disease of the heart or large arteries. An attack is characterised by a paroxysm of severe pain over the heart, especially near its upper part, which pain often shoots down the left arm and may leave that part tender in between attacks. There is also faintness, difficulty of breathing, and anxiety amounting to terror at times. Angina is commoner among men, usually in those of or past middle life. The first paroxysm may occur after some exertion, or when the patient is walking uphill, or after a heavy meal. The attack is very likely to recur, but at no fixed interval, months or years sometimes elapsing. It is rarely that the earlier attacks of breast-pang terminate fatally; but as the spasms depend on organic change in the heart or its arteries, angina pectoris is a most serious malady.

This affection is sometimes called 'true angina' to distinguish it from a less serious condition which resembles it in appearance called 'false angina.' False angina is a neurotic condition and is not dangerous: unlike true angina it is more common in women and may occur at any age, and the pain lasts an hour or so, which is longer than that of true angina. It usually requires skilled medical aid to distinguish between the two.

The *treatment* of angina pectoris consists of two parts, one for the immediate attack, the other to ward off future attacks. For the latter the sufferer must consult a medical man as soon as possible. Meanwhile, for the actual attack and until a doctor comes he should inhale amyl nitrite from a small capsule. Amyl nitrite is put up for the purpose in small capsules to be broken between the thumb and finger, and the sufferer should always carry a little box of these in his waistcoat pocket. A teaspoonful of sal volatile in water, or 1 ounce of brandy in water may also be taken with benefit during an attack.

Apoplexy. The term apoplexy is used to signify an attack, usually sudden, attended with more or less twitching or convulsion, and usually with unconsciousness, and followed by paralysis usually of one-half of the body. Such paralysis is called hemiplegia (*see* p. 202). An attack of this nature is caused as a rule either by the bursting of a blood-vessel in the brain substance, called cerebral hæmorrhage; or by the clotting of the blood in one of the brain blood-vessels (cerebral thrombosis); or by blocking of one of these vessels with some other matter (cerebral embolism). Strictly speaking, the term 'apoplexy' should be reserved for cases of cerebral hæmorrhage alone, the cases of cerebral thrombosis and embolism being called 'softening of the brain' from the nature of the effects they produce there. But as the attacks due to the various causes resemble one another, it will be well to describe them together under the popular term 'apoplexy.'

The causes of cerebral hæmorrhage are disease of the arteries tending to make them brittle, accompanied by chronic Bright's disease (p. 187) and enlarged heart. Such conditions are usually found in those getting past middle life, especially amongst those who have been free livers or strenuous workers; an hereditary tendency is also a factor.

Cerebral embolism usually accompanies heart disease and is seen usually in the comparatively young. It is not so common a cause as the other two conditions.

Cerebral thrombosis or clotting of blood is seen most commonly in the aged, in those with diseased blood-vessels, and in the anæmic. When met with in a young and apparently vigorous man the common cause is syphilitic disease of the blood-vessels.

The *immediate* causes of apoplexy are whatever unduly impedes or accelerates the circulation of the blood within the brain, or exerts a certain degree of pressure on it—such as violent exercise in those not accustomed to it; straining, as in lifting heavy weights, or as at stool; sudden mental emotions, and violent passions; intense heat; overloading the stomach.

Men are more liable to apoplexy than women. Before the attack comes on there may or may not have been warnings, such as giddiness, nausea, headache, numbness of the extremities or even a temporary paralysis. The actual attack is usually sudden, the patient falls to the ground, deprived of sense and motion, and lies like a person in a deep sleep; the face flushed, the breathing

laboured, and the pulse full and slow. The pupils may be dilated, or one may be dilated and the other normal. The mouth may be drawn to one side and there may be convulsions, generally confined to one side of the body. Sometimes there is no apparent unconsciousness, the patient may go to sleep well and on waking in the morning find that he cannot move one side of his body. But as a rule in whatever way it may commence, the fit is usually ultimately characterised by insensibility, accompanied by slow, noisy, puffing breathing, and frothy saliva about the mouth. The teeth are clenched, and the person is unable to swallow ; often fluids put into the mouth run out at the corners ; or swallowing is performed with difficulty ; the countenance becomes flushed or livid ; the eyes are dull and glassy, and the pupils are contracted, or one remains dilated and the other contracted, the mouth is drawn to one side ; the limbs are motionless and rigid, but sometimes convulsed, or the latter conditions present only on one side of the body. The extremities are cold, and the body is bathed in cold sweat ; the bowels are either obstinately confined, or motions may be passed involuntarily. The urine may also be passed involuntarily, or retained till the bladder is full, when it dribbles away. The pulse, at first slow, becomes quicker, fuller, and stronger as the system recovers from the first shock, although it often remains less frequent than natural, and may be irregular. Falling to 60 beats per minute, and rising to 110, are both unfavourable signs.

The duration of an apoplectic fit varies from two to three hours to as many days. The longer the apoplectic condition continues without improvement, the less is the prospect of recovery. It may terminate by gradually passing off, leaving the person *apparently* little the worse, or it may terminate in incomplete recovery, the mind remaining impaired, or some part of the body being paralysed ; or, the person not regaining sensibility, the increasing stupor may end in death.

Often with paralysis of the right side the patient is left unable either to speak at all or to express himself clearly. This is called 'aphasia,' and is usually recovered from to a large extent.

The deep unconsciousness, or coma, that often accompanies apoplexy is to be distinguished from the insensibility of (*a*) fainting or syncope, (*b*) from the effects of alcohol, (*c*) from the results of narcotic poisons as opium, (*d*) from epilepsy, and (*e*) from the insensibility following injury causing compression or concussion of the brain.

(*a*) As a rule persons fainting recover in a few minutes, the pulse becoming more distinct, and intelligence being gradually restored. The apoplectic attack continues as described on the preceding page.

(*b*) Apoplexy is to be distinguished from the effects of alcohol: first, by the history of the case; secondly, by the smell of liquor in the person's breath, although it must be recollected that that is not a certain sign that the patient has been drinking, for some one may, in mistaken kindness, have given the person struck by apoplexy some kind of spirit; thirdly, in the 'drunken fit' the pupils are equal, while in apoplexy one is often contracted and the other dilated; fourthly, the person 'dead drunk,' as it is termed, may generally be roused, when he babbles incoherently—from apoplexy the person cannot be roused; fifthly, if the patient be carefully watched, any movements which occur will be usually found to be restricted to one side of the body in apoplexy, while movements occur on both sides in drunkenness.

(*c*) Apoplexy is to be distinguished from poisoning by opium: first, by the history of the case; as apoplexy may have been preceded by premonitory symptoms, and opium-poisoning is not so preceded. Apoplexy may come on during or immediately after a meal; while if opium is given during a meal symptoms do not occur for from ten to thirty minutes; secondly, by the absence or presence of the smell of opium in the breath or vomit; thirdly, by the equal contraction of both pupils caused by opium; fourthly, apoplexy usually occurs suddenly; the symptoms of opium poisoning come on gradually; fifthly, even while the patient is unconscious it may be evident that one side of the body is flaccid and paralysed, which is characteristic of apoplexy.

(*d*) Apoplexy is known from epilepsy by the presence of puffing breathing, which is absent in the latter malady. In epilepsy also there is convulsive movement of the limbs; the eyes are turned up under the lids, so that the whites only are visible; and the person generally falls down with a loud cry, none of which are symptoms of apoplexy. In epilepsy the patient is as a rule young, and there will usually be a history of previous fits.

(*e*) Apoplexy usually occurs in elderly people, and no signs of injury are necessarily present, thus contrasting with compression and concussion.

Treatment. The first thing in all cases is to loosen the patient's shirt collar, to raise his head slightly, and give free access of air.

The forehead should be bathed with cold water, or, if available, a bladder of pounded ice should be applied. The head and shoulders should be propped to one side to prevent the tongue falling back and obstructing breathing. Unless the patient's temperature is abnormally high, apply hot-water bottles to the abdomen and lower limbs, taking care not to burn him. Further immediate treatment differs according to whether the cause of the fit is cerebral hæmorrhage or thrombosis, and it takes a doctor to decide that. Do not give stimulants. In all cases an enema (p. 603) should be given as soon as possible. If the person lies insensible more than six or seven hours, without making water, the catheter should be used (*see* p. 253). If the urine is retained till the bladder is full, and then *dribbles* away, it is a sign that the urine should have been drawn off before. In the subsequent treatment of the patient special care must be taken to avoid bed sores and to keep the bowels open. The resulting paralysis, hemiplegia, will tend to get better of itself, and improvement may be hoped for up to a year from its onset. Treatment will have no great effect on the course of the paralysis, though electricity and massage should be persisted in.

Asthma. Asthma is a disease characterised by attacks of difficulty of breathing occurring in paroxysms: it is due in some cases to spasm of the muscles of the bronchial tubes, in others to sudden swelling of the mucous membrane lining these tubes, while in some cases both these factors operate. Asthma is very common in India, especially in some parts. There is a considerable neurotic element about the disease. It may begin early in life or at middle age, and is frequently seen beginning about the age of fourteen. It is commoner amongst males. Asthma has certain relations to hay asthma or hay fever (*see* p. 437) and, like that disease, may sometimes be cured by treatment of the nose. A large number of the invalids commonly called asthmatic are not suffering from asthma at all, but from chronic bronchitis and emphysema (*see* p. 156). It is true that asthma after it has been established some time produces emphysema, and that in its turn encourages chronic bronchitis, so that the ultimate state of the patient finds him with signs of all three diseases. In such a case he is usually constantly ill with remissions according to the climate and the time of year. In true asthma in its earlier stages the patient is subject to fits of the spasmodic attacks at more or less frequent intervals; but until he becomes emphysematous is usually fairly well in between

attacks. Attacks of asthma are largely dependent upon the state of the digestion ; so that dyspepsia must be treated where existent and the diet attended to. A fit of asthma is a typical and distressing sight. It may occur at any time, often in the night. The seizure is sometimes preceded by languor, flatulency, headache, heaviness over the eyes, sickness, pale urine, undisturbed rest, and a sense of oppression about the heart. Yet it often comes on suddenly, without such warnings, the patient waking from his first and deepest sleep labouring for breath. When the fit is at its worst there is intense difficulty of respiration, the patient sitting up in bed, or standing holding on to a table or chair, breathing hard with a wheezing noise. The face becomes livid or bluish, the eyes look prominent, the body is covered with cold perspiration, suffocation appears impending, the sufferer often struggles to the window, which he desires may be open, and there may be cramp in the legs. A paroxysm may last minutes or hours, and when subsiding there is often expectoration of little pellets of thick phlegm or mucus, and perhaps a copious discharge of pale urine. The length of time between successive fits of asthma varies much, during which the person, if he takes care, usually enjoys fairly good health ; unless the condition known as emphysema also exists. Too often, however, the patient becomes emphysematous and suffers from chronic bronchitis as well. He is then always wheezing, as described on p. 156, and has times when his asthmatic spasms make him worse than others.

Treatment. The treatment of asthma may be divided into that during a fit and that in between the attacks. During a paroxysm the patient will prefer to sit up, as by this means he can employ his muscles of forced respiration better. If the attack has followed an injudicious meal, as a late supper or dinner, a mustard emetic (*see* Chapter VII) should be administered.

Smoking *dhatura stramonium leaves* sometimes relieves asthma, especially if the smoking is commenced *before* the fit is fully formed. From 10 to 30 grains of the dried leaves may be smoked in a common pipe, which will often, if taken in time, prevent an expected paroxysm. Another way to use stramonium is in the form of cigarettes. But the most convenient form is that of Prescription No. 67, the compound stramonium powder, which may be ignited with a little charcoal on a plate, and the fumes inhaled. Sometimes relief may be obtained from cocaining with a spray the back of the nasal passages ; but this should be done only by a medical man.

In between the asthmatic attacks much may be done for the patient; treatment now will lie upon three different lines, climate, diet, and drugs.

Asthma is oftener relieved by change of climate than by medical treatment, although it cannot be said with certainty what climate will suit each individual case. Sometimes a dry, at others a moist climate affords most relief; sometimes town, sometimes country. A very slight change, as from one street to another, or from one house to another, has been known to check the attacks. As a rule, elevated regions, as hill stations, do not suit asthmatics, on account of the greater rarefaction of the air.

Only practical experiments on the patient's part can determine what climate will suit him. The writer has heard of one patient who gets an attack as soon as he comes near the effluvium from a horse, and of another who is never well unless he lives over a stable. Recently the writer has met another patient who is free from asthma everywhere except in Cawnpore: one mile away from Cawnpore he is safe; but on entering that city he is affected within an hour.

Much may be done by avoiding dyspepsia and regulating diet, and here again personal idiosyncrasy comes into play. However well the person may feel during the intervals between the fits, he should never exceed in diet. Breakfast, which should be the chief meal, should consist of an egg, or chop, or cold chicken; tea is better than coffee, and milk and water better than either. Mutton ought to be the staple dinner diet, with green vegetables and potatoes in moderation, provided they do not cause flatulence. No pastry should be used, and there should be no dessert, but stewed fruits or light pudding may generally be taken with impunity. Sausages, kidneys, salt boiled beef, pickles, or toasted cheese should never be eaten. It has been stated, 'There is as much asthma in a mouthful of Stilton as in a whole dinner.' Water is the best drink. Late dinners are to be avoided, and the asthmatic should never eat as much as he can. It is only by the exercise of self-denial in diet that the sufferer from asthma can live in comparative ease and comfort. Similarly, he should avoid excitement, fits often arising from mental emotions.

Should flatulence and dyspepsia be in evidence, the section on Dyspepsia should be read and the particular variety treated. Relief will perhaps be obtained by Prescription No. 57 thrice daily, either shortly before or half an hour after meals.

Regarding other drug treatment, more benefit will probably be obtained by a course of potassium iodide and arsenic in between the attacks than by anything else. Prescription No 56, 1 ounce thrice daily to which 3 minims of liquor arsenicalis has been added, may be taken after food.

Benefit may be obtained in some cases from a solution of adrenalin chloride, either by the mouth or injected hypodermically; but this should not be employed without medical advice.

Blood, Spitting and Vomiting of. Blood proceeding from the mouth may come from different sources. It may be from the throat or tonsils, in which case the quantity brought up is small, and the bleeding part, probably an ulcer of the tonsils, may be easily seen. This bleeding is of little consequence, and requires no particular treatment. Or blood may come from the gums, as during scurvy, when it should be treated by the remedies proper to that disease. Or blood may proceed from the socket of a tooth which has been extracted, or it may come from the back part of the nose.

Spitting of blood from the lungs, or hæmoptysis, is serious, and is often a symptom of consumption. In young and adult men the spitting of blood is most probably due to tuberculosis of the lungs (consumption) in the absence of other evident causes. It is not such an evident symptom amongst women or children, who are more prone to bleed from other causes as well as from phthisis. The blood coughed up may be slight, just streaking the sputum, or it may be in larger amount (perhaps half a cupful with clots), or there may be a large and sudden gush of blood. The blood is usually bright red and frothy. In any case the patient must consult a doctor at once, and in the two latter events, where the blood is more than slight, he must be in bed at absolute rest and perfectly silent. He should in the severer cases be given nothing to eat nor to drink, except teaspoons of water, iced if preferred, until the doctor's arrival. If there is pain in any one part of the chest indicating the source of the bleeding, a bag of crushed ice may with advantage be put over the spot. Read the article on Tuberculosis of the Lungs on p. 212.

Vomiting of blood or hæmatemesis must be distinguished from *hæmoptysis*, the spitting or coughing of blood. Blood from the stomach is usually dark in colour; from the lungs bright red and often frothy. Hæmatemesis is in some cases dependent on disease of the liver or spleen, and it occasionally occurs when the menstrual

flow is scanty or suppressed. But in the majority of instances it occurs in consequence of an ulcer in the stomach eating into a blood-vessel. In all such cases the blood is vomited, not coughed up, and its colour is almost black, like coffee-grounds—not red; and some blood is often passed by the bowels. It is generally preceded or accompanied by burning pain in the stomach, and if the ulcer is large the loss of blood is sufficient to cause alarming faintness, which may be felt before any blood is vomited, and for which stimulants must not be given. The great point is to keep the stomach at rest, so as to allow the ulcer to heal, or, at least, the ruptured vessel to become plugged up. This will not take place if the stomach is excited to action by food, or if the circulation is excited by stimulants. Ice may be given to suck in small lumps, but nothing else must be given until the doctor has seen the patient. The rest not only of the stomach but of the whole body must be absolute: if much blood has been lost and the patient is faint he should be allowed to lie on the floor where he may have fallen and made comfortable there with cushions. Disturb him as little as possible. If a doctor cannot be obtained for several hours, a hypodermic injection of morphia, $\frac{1}{4}$ or $\frac{1}{3}$ grain, may be given with advantage, if the attendant feels equal to following the directions for this in Chapter XX. The doctor on arrival may consider the patient able to take small quantities of milk by the mouth, or he may order nutrient enemata (*see* Chapter XX). In all cases both of hæmoptysis and hæmatemesis medical advice must be sought immediately; and in the latter case an operation may be necessary, should the bleeding be due to an ulcer in the stomach.

The chief distinctions between the signs of hæmoptysis and hæmatemesis are given here; but not all these distinctions may be present in any given case:

Hæmoptysis, or Spitting of Blood	Hæmatemesis, or Vomiting of Blood
Usually difficulty of breathing, pain in chest.	Nausea, pain, and tenderness at the pit of the stomach.
Blood coughed up in mouthfuls.	Blood vomited profusely.
Blood frothy.	Blood not frothy.
Blood of a florid red colour.	Blood generally dark-coloured.
Blood mixed with saliva.	Blood mixed with food.
No blood passed by 'stool.'	Blood often passed by 'stool.'
Cough and bronchial symptoms.	Symptoms of dyspepsia.

Bowels, Inflammation of the. Under this term are included the different distinctions, as *peritonitis* and *enteritis*, drawn by physicians. For peritonitis *see* p. 354. For enteritis Chapter V on diarrhœa should be read, and for the disease in children read the article on diarrhœa in Chapter XVII.

Brain, Water on the. This is a chronic malady coming on slowly and insidiously, so that its origin can scarcely be dated from any particular time. Children are sometimes born with the disease, which slowly develops after birth. But sometimes water on the brain is a result or continuance of meningitis. The head often becomes of an immense size (known as the hydrocephalic head), but the child may survive as an idiot for months or even for years. Such cases are always accompanied by wasting, languor, drowsiness, irritability, frequent attacks of diarrhœa alternating with constipation, and often a tendency to convulsions. Such cases rarely terminate favourably, and medicines are useless.

Parents often express anxiety about the large size of their children's heads, and fear the enlargement, real or supposed, may be due to water on the brain. It is therefore mentioned that the disease is not nearly so common as is popularly supposed, and that the large size of any child's head is not to be attributed to water therein, unless accompanied by other decided symptoms of the disease.

Bronchitis. This is the term applied to inflammation of the lining membrane of the air-passages, or tubes leading to the lungs. Bronchitis is generally caused by chill, and commences with symptoms of a common 'cold.' There is first, running at the nose, and a feeling of chilliness and aching pains in the limbs; slight rise of temperature; the patient is thirsty and feverish; and there is languor, headache, furred tongue, loss of appetite, and restlessness. There is also a feeling of soreness behind the breast-bone, and of constriction or tightness of the chest. At first there is a dry, hacking cough, the breathing is oppressed and difficult, and very little phlegm is brought up. The fever often becomes considerable, and the pulse may rise to 120 or higher. In favourable cases, in three or four days the cough becomes loose, and the expectoration more abundant. The expectoration during the earlier period of the malady is frothy when first coughed up, but becomes glairy, like unboiled white of egg, when allowed to remain in the receptacle. After some days the expectoration becomes thicker, and of a greenish-yellow colour,

and the feeling of soreness and constriction of the chest then passes away. Throughout the attack, wheezing sounds may be heard with the breathing, and a thrill may be felt when the hand is placed on the chest or back. These signs will partly disappear after phelgm has been coughed up, but occur again with reaccumulation of mucus in the air-passages. The sounds and thrill are due to the air passing through the viscid mucus which more or less fills the bronchial tubes. Exertion or exposure to cold air increases both the cough and difficulty of breathing. In favourable cases the disease abates about the eighth day, the difficulty of breathing subsides, the expectoration is expelled with less difficulty, and the fever declines. In unfavourable cases the expression of countenance becomes anxious and livid, the patient makes more painful efforts to breathe, the lips become purple ; delirium may ensue, and the patient, unable to cough up the tenacious mucus, dies suffocated ; and from obstructed circulation.

Bronchitis often attacks Indians who are suffering from fever during the cold season, especially in the northern districts of India, and on the sea-coasts, which are exposed to great variations of temperature, consequent on the land and sea breezes, and the lulls between. This complication frequently renders the fevers of natives very dangerous. But European adults are less liable to bronchitis in India.

Treatment. Mild cases of bronchitis are benefited by a warm bath, 8 or 10 grains of Dover's powder taken at night, with ½-drachm doses of sweet spirits of nitrous ether, in 2 ounces of water, every three hours, and the encouragement of free perspiration in bed. A little prepared barley, boiled in half a pint of milk, to which is added half a wineglassful of brandy or whisky, with nutmeg, lemon-juice, and sugar according to taste, will be found a very useful and agreeable potion, as it both allays thirst and induces perspiration. The patient should be kept in bed, and be carefully guarded against cold, the temperature of the apartment being maintained day and night as *equable* as possible. A certain amount of moisture in the air is also advisable, and to effect this the steam from a bronchitis kettle (*see* p. 597) should be allowed to escape near the patient. In the early and dry stages of bronchitis, benefit may be obtained from giving four-hourly 1 ounce of Prescription No 40, to which 10 minims of wine of antimony has been added. When secretion becomes free and expectoration is

established, give Prescription No. 39, 1 ounce thrice daily. The diet should be light and on the lines laid down for fevers in Chapter IV. Alcoholic stimulant is often necessary in the severer attacks of the disease.

Chronic Bronchitis is a form of bronchitis that lasts long and is usually without fever: it tends to recur frequently, especially in cold weather and in the aged. When it has a seasonal recurrence it is known as 'winter cough.' This disease tends to produce the condition of emphysema (*see* p. 156).

For chronic bronchitis give Prescription No. 39; if the cough is tight on the chest and the sputum comes up with difficulty, add 2 grains of potassium iodide to each ounce of the mixture. If the cough is dry and irritable, and there does not seem to be much to spit up, relief may be obtained by Prescription No. 38, 1 ounce thrice daily.

Broncho-pneumonia. When the catarrh of the bronchial tubes that exists in bronchitis extends further down the tubes until it reaches their smallest branches, and after that the lung cells themselves, the condition is called broncho-pneumonia. Broncho-pneumonia is common in children, especially after measles and whooping-cough, and a fuller account of the disease in children is given in Chapter XVII. But broncho-pneumonia also occurs in adults, especially in the aged. It has many differences from true pneumonia; it does not begin nor end so abruptly as pneumonia, where the lung is primarily affected; and the fever usually lasts longer.

Treatment should be as given above for the severer forms of acute bronchitis, including the use of a bronchitis kettle.

Chyluria. This term is applied to a milky condition of the urine. Sometimes a milky discharge takes place from the lymph-vessels of the armpit, groin, or scrotum. It may be the accompaniment of elephantiasis, and be due, like that disease, to blocking of lymph-channels by living or dead adult filaria worms. If so, the embryo worms may be found in the blood; *see* Elephantiasis (p. 342) and Filarial Disease (p. 343). The treatment is very difficult and often unsatisfactory: a doctor should always be consulted.

Cold in the Head. A cold in the head, or coryza, is a catarrh of the nasal mucous membrane. Often the membranes of the throat are also involved, and the catarrh may extend downwards to the bronchial tubes, giving rise to bronchitis.

The symptoms of a cold are too well known to need description. It should be noted that there are three stages in its course. First the feeling of being unwell, accompanied, perhaps, by a slight rise of temperature, headache and feeling of chilliness. It is important to recognise this stage, as by active treatment then a cold may often be aborted. In a very short time it goes on to the 'stuffy stage' when, the mucous membranes being swollen, the nasal passage is blocked, and frontal headache is worse. After a day or so of this the stage of free running from the nose is reached, and this may last several days.

The catarrh is due to infection of the mucous membrane by some micro-organism, and if this organism can be eradicated at the very beginning a cure will be effected. It is not always the same kind of organism that causes a cold, but, whichever the causative microbe may be, the infection may arise in one of two ways. Either the infection comes from another person—in popular parlance the cold is 'caught'—or the organism was previously present in the individual, and some depressing factor such as a chill or wet feet was sufficient to lower his resisting powers temporarily to such an extent that the organism, which had hitherto been unable to make its presence felt, is now able to flourish and cause its characteristic symptoms.

It follows from this that besides avoiding proximity to those who already have colds, we must also avoid overcrowded rooms, sudden changes of temperature, cold winds and other depressant conditions that may allow the organisms already present in the nasal cavity to infect us and extend their growth.

Treatment. In the first stage, that is to say immediately the onset of a cold is suspected, the nasal cavities should be washed out by means of one of the many forms of nasal douches now on the market. As a mild antiseptic wash the proprietary medicine glycothymoline in the dilution recommended on the bottle is very useful. This may also be applied by means of an atomiser (*see* p. 615). An efficient substitute consists in a solution of 2 grains each of sodium bicarbonate, sodium biborate and sodium chloride, together with ¼ grain of menthol in 1 ounce of water. The use of such a douche five or six times a day should be combined with frequent doses of quinine; Prescription No. 36, ½ ounce every hour till 15 grains of quinine sulphate have been taken. If the onset of the cold is towards evening, after the nasal douche,

10 grains of Dover's powder should be taken, followed by some hot milk, and the patient go to bed at once. In any case early taking to bed is likely to lessen the severity of the attack. If such vigorous measures be taken in the earliest stages, a cold may often be cut short. Should, however, it go on to the next or 'stuffy' stage, then the cold is bound to run its course, though that course may still be modified by active treatment. The diaphoretic mixture, Prescription No. 40, should be given, 1 ounce every four hours, provided the patient remains in a warm room, preferably in bed.

When the cold begins to run, if the mucus is thick and purulent, the nasal douche should still be employed. If the discharge is only thin and watery and is excessive, relief may be obtained by the use of Ferrier's snuff, which consists of morphine hydrochloride 1 grain, powdered acacia 1 drachm, bismuth subnitrate 3 drachms. As this contains morphia, the bottle should be kept carefully as a poison bottle. Should the cold go down into the chest, as it is called, then bronchitis is produced, and expectorant mixtures will be required.

The patient should take every care to avoid conveying his infection to others; close proximity should be avoided.

Colic. The term 'colic' is used to express different forms of severe griping pain. Thus renal colic refers to the griping accompanying passage of a stone from the kidney; biliary colic accompanies the passage of a gall-stone from the gall-bladder. These colics will be found described on pp. 161 and 365 respectively. Used alone the word colic refers to griping of the bowels, that is to say pain due to violent contraction of the bowel muscle or to distention of the bowel with wind. Colic is sometimes referred to as the 'gripes,' 'cramps,' 'spasms,' or as 'stomach-ache.'

Colic is a symptom of intestinal indigestion, and is due usually to the presence of indigestible or irritant food in the intestine. It will be seen that this cause is the same as that of the irritant diarrhœa described on p. 100. In fact, colic and diarrhœa go hand in hand, the colic being the pain due to the presence of the irritant material and the bowel's efforts to expel it, and the diarrhœa being the result of that effort.

Colic usually comes on suddenly, often in the night, with spasmodic griping and twisting pain in the bowels, often faintness and nausea, and perhaps vomiting. There is also spasmodic

retraction of the muscles about the navel, which part appears drawn inwards. The bowels may be constipated at first, and distended with wind. At a later period there is usually strong desire to go to stool: the passage of a motion is attended with escape of gas, and great relief. Colic is *relieved* by pressure on the bowels, the patient frequently rolling about, or lying on the belly. Often, if the patient is in bed, or lying on the back, the legs are so bent that the thighs press on the bowels, the legs being retained in such position by the hands grasping the shins. The object of this attitude is relaxation of the abdominal muscles. This distinguishes the malady from inflammation of the bowels, in which state pressure is very painful, and the patient lies on the back and remains still, with his legs drawn up. There is ordinarily no feverishness with colic, while inflammation is usually attended with fever.

Colic should be also distinguished from renal colic, from biliary colic, from the beginning of dysentery, from cholera cramps, and from rupture.

In renal colic (p. 365) the testicle is often retracted and there is pain shooting down the inside of the thigh; there is also pain in the loins and frequent desire to pass water. The pain in gall-stone colic is felt just to the right of the pit of the stomach, shooting through to the back and right shoulder.

The griping pains felt at the beginning of dysentery are not so violent as those of colic, are less twisting or wringing in their character, and are attended with diarrhœa instead of constipation. In cholera, there is usually, preceding diarrhœa, vomiting, then purging of white fluid, and stoppage of urine. The symptoms of rupture often at first resemble colic, and in every case of colic inquiry should be made as to the existence of a rupture, which appears as a swelling in the groin, scrotum, inner part of the thigh, perineum, or at the navel.

Treatment. The treatment of colic should be conducted after a consideration of the cause. This is usually an irritant in the intestine, and the efforts of nature to expel this irritant are to be encouraged. For this purpose take 1 ounce of castor oil immediately; if it is vomited, repeat the dose. Should the pain be great 10 minims of tincture of opium should be added to the oil. The pain may also be much relieved by pressure with the hands and by hot fomentations over the belly. The treatment generally is as laid down for irritant diarrhœa on p. 102.

Should the bowels be much distended with wind, after the oil has been taken give 40 minims of sal volatile in 1 ounce of water, or 1 drachm of tincture of ginger in a wine-glass of water.

There is also a variety of colic to which workers in lead, and painters, are peculiarly subject: this is a form of chronic lead poisoning. The treatment of this variety is different from the above, and should not be attempted without medical advice.

Constipation. A tendency to confined bowels is natural to many persons, especially to women.

Ordinarily the bowels should be moved once daily, but to some this does not naturally occur, and the condition is unattended by unpleasant symptoms. For constipation of this description, medicines, as a rule, are unnecessary, exercise and fruit diet will remove the evil.

Constipation may be a symptom of certain acute diseases, such as enteric fever, or of chronic diseases such as affections of the liver or stomach, or of anæmia. Or it may be due to mechanical obstruction of some part of the bowel. With such symptomatic constipation we shall not deal here, but rather with the constipation that exists without obvious cause. Such constipation may be partly constitutional and partly due to sedentary habits, especially in those who neglect the calls of nature. It is usually due to one or both of two immediate causes; either the fæcal matter lacks moisture, and its dryness is the cause of its being propelled inwards by the bowel with difficulty; or the contractions of the large intestine are weak or sluggish and so they retain for long the fæcal matter that should be expelled. In either case the constipation if severe may give rise to certain symptoms, such as lassitude, mental depression, lack of appetite and a furred tongue. Headache is also a frequent symptom, especially either in the forehead or right at the back of the head, as shown on p. 169. In some cases the symptoms may be still more marked, and a sallow complexion with loss of flesh and the symptoms of neurasthenia may be due to retention of fæces in the large intestine.

Where dryness appears to be the cause of the constipation, what is wanted is the presence in the intestines of more liquid. A glass of cold or hot water taken *every* morning on rising is often beneficial. A cup of weak tea taken in bed will have the same effect. Or, these not succeeding, 2 drachms of sulphate of soda should be dissolved in a pint of water and taken as a morning

draught. Fruit, such as baked apples or stewed prunes, eaten in the morning, oatmeal porridge for breakfast, smoking after breakfast, brown bread eaten instead of white, the avoidance of pastry, regular exercise, and regular but not hurried visits to the water-closet, will generally be successful. Vegetables are objectionable if they produce flatulence. Such measures may be assisted at first by Prescription No. 27 in the morning, or Prescription No. 60 thrice daily.

The severer cases of constipation are likely to be those where the movements of the large intestine are deficient. Here there may be occasional attacks of colicky pain, and piles are often present, while the stools are dark or mottled, the part first passed being very hard, and the remainder softer, or even liquid. This is particularly the case when the constipation results from accumulation of fæces in the lower gut close to the fundament, known by the stools consisting of round, hard, black masses or balls. Some persons suffering from torpor of the large intestines state that their bowels are regular simply because they go to the closet every day, when in reality they suffer from habitual constipation, as they only pass small lumps of hard fæces. Occasionally, also, there may be straining, and the hard lumps may be passed with a little watery discharge, the result of the irritation they cause. This is mistaken for diarrhœa (the diarrhœa of constipation), instead of being recognised as the effect of constipation. This form of constipation is more likely to occur in India than in temperate climates. The bowels, particularly the large intestines, partake in the general debility resulting from long residence in the tropics, and become less able to expel their contents, which leads not only to constipation, but to accumulation of fæcal matter and absorption of the toxic products therefrom with resultant disturbance of the general health. In such case the large intestine has been referred to as a 'cesspool,' and it is correct to say that people in this condition are being constantly poisoned with their own excreta. When the large intestine is thus torpid, the pill of Prescription No. 63 will be found very useful; two may be taken at night, followed by 1 ounce of Prescription No. 27 in the morning, or a pill thrice daily may be taken. Compound liquorice powder is also useful; but it is best to rely less on drugs and more on general hygienic measures. Regular massage of the abdomen is invaluable in chronic cases. A good substitute is a bag of shot weighing 4 to

6 pounds, which may be rolled over the belly every morning for five or ten minutes.

In many cases the most efficacious treatment is by means of liquid paraffin, internally in doses of about 2 drachms thrice daily. This is not unpleasant to take and acts as a harmless lubricant to the interior of the bowel. Often instead of medicines enemata are preferable (*see* p. 603), especially when there is accumulation low down in the bowel; and it is better to employ enemata than constantly to use purgative pills. A small injection of glycerine is also valuable, or glycerine may be inserted in the form of a suppository.

If drugs are used it must be remembered that many gradually lose their efficacy after long use: but this remark does not apply to liquid paraffin, nor to cascara sagrada, which latter is a most useful laxative for the milder cases of chronic constipation.

The proper stimulus to the periodical action of the bowels is food perfectly digested. Instead, therefore, of constantly resorting to purgative medicines to remove constipation, it is better to accomplish the object by care in eating, so that the food may be well masticated, by some change of diet, and by attention to the teeth if necessary. On the other hand, constipation, even if requiring medicines, must not be neglected, and the first tendency to it should be guarded against, lest it become habitual.

Convulsions. *Vide* FITS, EPILEPSY, HYSTERIA, TETANUS, HYDROPHOBIA, in all of which diseases convulsions are prominent symptoms. For the convulsions of children *see* Chapter XVII.

Cough. Cough is usually a symptom of disease of some part of the respiratory organs. This is called 'direct' cough as opposed to an 'indirect' cough, which sometimes arises from irritation of other organs not respiratory. The direct cough may result from diseases of the larynx, bronchial tubes, lungs, pleura, or nose, and these headings should be referred to for further information. Indirect cough may arise from disease of the ear (wax in the ear being a common cause in small children), of the pharynx (including enlarged tonsils and uvula), or from enlarged glands in the chest or diseases of the heart and large blood-vessels. Chronic cough is not uncommon in those who follow dusty occupations or in heavy smokers, and then it is due usually to the pharyngitis provoked thereby. The character of the cough gives indications both for diagnosis and treatment, and in this respect there are three main varieties:

(1) The cough is dry. There is no expectoration, or what little there is will be brought up with difficulty. In common parlance, the patient is 'tight on the chest.' This is often the case in early stages of phthisis, bronchitis, asthma, pneumonia, pleurisy.

(2) The cough is loose. The expectoration may be excessive, and often is so in later stages of bronchitis, phthisis, and some other conditions, notably under treatment with potassium iodide.

(3) The cough comes on in paroxysms, fits of coughing. This is especially the case in whooping-cough and in asthma and in emphysema, when the expectoration is scanty. But fits of coughing also occur when the expectoration is excessive and where it has been collecting for some time, as in phthisis with cavities in the lung. In such cases change in the patient's position often brings on a cough.

Fits of coughing may also arise from enlargement of the glands in the chest.

Besides the above main varieties, the cough arising from irritation of the larynx, directly or indirectly, is characterised by its dry hoarseness and ringing, brassy note. Many coughs are purely nervous in character and have become an unnecessary habit in some individuals; while others, again, are deliberate, such as the cough by which an Indian domestic warns one of his presence, or the nightly disturbance of the chowkidar.

A cough that comes every winter is usually due to chronic bronchitis, and tends to produce emphysema (*see* p. 156).

In the *treatment* of cough regard must be paid mainly to the condition that is producing it, and therefore the disease of which the cough is a symptom should be referred to. A good general principle is to consider whether the patient has any expectoration to cough up: if so, he should be encouraged to bring it up and expectorants should be given; if not, then drugs that will make him spit will only bother him more, and he requires his irritation soothed instead.

For instance, in pleurisy, there being nothing to expectorate, give the soothing cough mixture No. 38 thrice daily. Also in pneumonia, at any rate in the early days of the disease, do not give expectorants at all. For an ordinary bronchitic cough, not too tight on the chest, give Prescription No. 39 thrice daily. This will be found the most generally useful of cough mixtures. If the sputum is thick and sticky, add one or two grains of potassium iodide to each dose of Prescription No. 39; and if the phlegm be

very difficult to bring up and cause much straining, then Prescription No. 56 thrice daily may be used. For any cough that is tickling and may hinder sleep, whether with expectoration or not, the compound linctus of Prescription No. 52, a teaspoonful at a time when required, will be found to give relief.

Cramp in the Legs. Cramp attacks suddenly, most often at night. The muscles of the calf are drawn into knots, which may be felt; there is intense pain, and the parts often feel sore afterwards. Sometimes the thighs are attacked; sometimes the small muscles of the foot.

The malady is most prevalent in elderly people, but also occurs to pregnant women. It is often caused by constipation, when a collection of fæcal matter in the lower bowel presses on the sciatic nerve on its way down to the leg.

When it occurs to pregnant women it is usually caused by the pressure of the enlarged womb on the nerves. Constipation must be avoided by the appropriate remedies (*see* p. 137), and any dyspeptic symptom present should also be treated (*see* p. 147). Locally the best plan is brisk rubbing with salad oil and brandy in equal parts, or, if available, with soap and opium liniment. But in cases where the cramps depend on pregnancy the rubbing should be gentle, as the enlarged veins generally also present during pregnancy might be ruptured by hard rubbing. A bandage or garter tied tightly round the leg above the seat of pain will often relieve cramp, but the bandage should not be permitted to remain on for longer than four or five minutes, and should not be used if there are enlarged veins.

Delirium. Delirium is a kind of temporary mania, a disorder of the mind, and is a symptom and not a disease itself. It may vary in degree from slight wandering and incoherence to complete and thorough derangement of the mind. Frequently the patient has some fixed delusion. Delirium tends to be worse at night, or it may only come on at that time, during broken sleep. Delirium also arises from the weakness following continued bleeding, or from almost any cause of great exhaustion, such as bad burns, wounds, or compound fractures. It is also often present during the course of fevers. Of this febrile delirium there are two forms—*one* occurring in the early stages of fever, often marked by great excitement, struggling, and displays of strength; the *second* form supervening in the later stages of fever, when the patient lies

prostrate on his bed, utterly helpless and muttering indistinctly—a condition of low muttering delirium. Lastly, delirium is a symptom of inflammation or other disease of the brain, when the delirium is characterised by great fury and violence.

In most instances of delirium the patient will require to be restrained, so as to prevent his getting out of bed or otherwise injuring himself. Persuasion and gentle force, a soothing manner, combined with watchfulness, firmness and decision, are required from the attendants, for contradiction and the exercise of authority always excite opposition from the delirious. As a general rule, delirious people may be sufficiently restrained without mechanical means; but in exceptional cases, or when sufficient help cannot be obtained, the straight-waistcoat may be employed.

The strait-waistcoat is made of strong cotton cloth, and should extend from the neck to below the waist. It should have no opening in front, but tie down the back with tapes. The sleeves should be long enough to extend half a foot beyond the hands, and should be closed at the extremities, round which a cord or strong tape is tied. The waistcoat should also be furnished with shoulder-straps. When used, the tapes should be tied down the back, and the cords or tapes attached to the sleeves may be tied to the foot of the bed if the patient's hands are required by his sides, or to the opposite sides of the bed if the hands are crossed over the body. Strong tapes or ropes, passed through the shoulder-straps and tied to the bed, effectually secure the patient's body.

A disease with delirium is so serious that if medical aid is not near at hand the patient should be moved to the nearest town and a doctor consulted.

Delirium Tremens. This is the peculiar delirium of the drunkard, and presents certain characteristics, differing from any other kind of delirium. It is generally caused by continuous or prolonged drinking, but may follow a single indulgence in excess. Or it may come on after a person, habitually drinking, suddenly ceases doing so. Drunkards are especially liable to this delirium after a severe injury or when attacked by any disease. The patient is incoherent, and fancies he sees all kinds of frightful objects, rats, snakes, and strangely coloured dogs being the most common, especially at night; his hands tremble, his eyes wander, his pulse is feeble, his skin moist, he has no appetite, and he cannot sleep. The patient, however, is seldom violent, and may be generally

controlled without force or mechanical restraint, although the reverse occasionally happens. But there is cunning with the delirium, and the patient may secrete such articles as razors or knives, so that he requires watching. Often the person exposes himself to injury by endeavouring to effect an escape from his attendants or from imaginary dangers. In fatal cases the delirium is succeeded by insensibility, in which state the patient dies after a period in which heavy breathing, twitching of the limbs, and involuntary discharge of fæces, with perhaps convulsions, are the most marked symptoms.

The mental delusions in delirium tremens are peculiar. The patient may declare there are snakes under his pillow, or he may be seen listening to the arm of a chair, which he believes to be a hissing serpent; or he may accuse a bystander of a design on his life, or imagine he is besieged by a party of soldiers; or he will pretend to be busy with his daily avocations, or imagine himself possessed of great wealth, which he will either hoard or lavishly distribute.

Delirium tremens must be distinguished from the delirium accompanying inflammation of the brain and its membranes. This is accomplished by a consideration of the history of the case, delirium tremens occurring in persons addicted to drink.

In delirium tremens there is an absence of headache, and light is not painful to the eyes, while the reverse obtains in inflammatory delirium. There is in delirium tremens as a rule an absence of febrile symptoms and a moist skin, the reverse being the case in affections of the brain. There is also generally a smell of alcohol with the breath and a furred and tremulous tongue. It sometimes, however, happens that delirium tremens occurs in persons who, while drinking hard, have also, from exposure to the sun or from fever, a congested condition of the brain; in which case the symptoms may then be somewhat less characteristic than as above set forth. Loss of appetite for solids and want of sleep precede the attack. In doubtful cases, in the absence of medical aid, it will be best to treat the case as delirium tremens. Delirium tremens is not infrequently accompanied by pneumonia.

Treatment. Where possible a medical man should always be sent for, since delirium tremens is a serious disease and the remedies that it is necessary to employ are also not without their danger. Treatment should begin with a large dose of calomel, 10 or 15 grains,

at once. In about an hour's time, if the patient is still restless, give 1 ounce of Prescription No. 29. If the patient is very violent, however, and if medical aid is at hand, it is better to give a hypodermic injection of morphia, ¼ grain (*see* p. 607), instead of Prescription No. 29.

The patient must be in bed and be watched night and day, but do not tie him down unless absolutely unavoidable.

Give no alcohol as stimulant unless the pulse becomes feeble. The diet should be fluid: eggs, milk, and soups in small quantities and at frequent intervals. When the attack is over give Prescription No. 51 thrice daily.

Diabetes. This disease begins very insidiously and is characterised by the passage of large quantities of pale urine, which contains a particular kind of sugar called dextrose.

There is, however, another variety of diabetes, called diabetes insipidus, when large quantities of urine are passed but without sugar. This sugary urine often attracts many flies, and the common test adopted by hakims, or Indian physicians, is to notice whether ants are attracted to the urine when it is spilt on the ground.

There are chemical tests for the presence of small quantities of sugar, which are more delicate than these rough observations, and which can be carried out by any doctor.

In many patients in whose urine sugar has been detected, it is found on removing all sugar and starchy food from the diet that the sugar disappears from the urine. This is a milder type of disease and is called glycosuria; but there is no hard-and-fast line between such dietetic diabetes and the more severe disease. The true nature of diabetes has yet to be discovered; in some it appears to be dietetic in origin, in others it is due to disease of pancreas, while in others it appears to be of nervous origin.

When diabetes appear for the first time in those who have reached middle life, especially if they are obese, it is not as a rule a severe disease; when it appears in the young it is very acute. As a general rule it may be said that the younger the patient the worse is the outlook.

Diabetes is prevalent among the better class of natives of India, in some apparently from habitual excessive consumption of starchy and sugary food; in others mental strain appears to be a factor, as it is often the highly educated and those subject to worry who suffer.

The patient's appetite is usually good, sometimes voracious; the skin is always dry; there is constant thirst, and the patient wastes away. As emaciation progresses the general health suffers, there is great debility, the heart becomes weak, and the feet may swell. Such cases often end in a peculiar and fatal form of unconsciousness known as diabetic coma. Diabetics are liable to attacks of eczema, especially of the genitals. They are liable also to inflammation anywhere, such as boils and carbuncles, or even to gangrene of a limb. Diabetics are especially liable to pulmonary tuberculosis (phthisis), which often gives the fatal ending. They are also subject to cataract.

The *treatment* of diabetes is more by appropriate diet than by medicines. We give here a suggestion as to what foods may be allowed and what should be forbidden:

Allowed	Forbidden
All clear soups and broths.	Sugar and starch in any form.
Fish of all kinds, except oysters and cod's liver.	Bread especially.
Meat of all kinds.	Biscuits.
Eggs in any form.	Rice, tapioca, sago.
Cream.	Vermicelli, arrowroot.
Butter.	Cornflour, oatmeal.
Cheese.	Potatoes, peas, broad beans.
Bran, almond, or gluten bread or biscuits.	Beetroot, carrots.
Greens, spinach, cabbage, etc.	Onions.
Mushrooms, cucumber, lettuce.	Pastry and puddings of all kinds.
Tomatoes.	Fruit of all kinds, fresh or preserved, except those named.
French beans, cauliflower.	Milk, except a little.
Oranges and lemons.	Flour to fry food.
Nuts of all kinds, except chestnuts.	
Pickles, vinegar, oil.	
Jelly.	
Saccharin for sweetening purposes.	
Custards.	
Tea, coffee, cocoa nibs.	
Claret or whisky in moderation.	

A good recipe for bran bread will be found on p. 621. The above diet is a strict one; usually more freedom can be allowed. Milk and potatoes in moderation often do good. Bread and sugar itself are usually the things that must be avoided more than anything else; but individual cases must be considered, and medical advice taken on any alteration of diet. Special diabetic foods are

made by some manufacturers; they are expensive; but the bran bread of which the recipe is given on p. 621 will be found cheap as well as suitable.

Dropsy. Dropsy is a consequence and symptom of other diseases. Dropsy consists of swelling caused by the escape of the watery portion of the blood through the coats of the vessels into the surrounding tissues. This is often produced by some impediment to the circulation of the blood causing stagnation of that fluid, as, for example, swelling, or in reality dropsy of the leg, may be caused by a tight ligature, as a garter, if allowed to remain sufficiently long. Dropsy may also be caused by injury to the vessel coats through some poison circulating in the blood, as in kidney disease; or by a watery condition of the blood, as in anæmia.

The most usual positions of dropsy are the lower extremities and the belly. It may, as in diseases of the kidneys or heart, affect the face or the entire body. The malady is recognised when external by the parts affected 'pitting' on pressure: that is, if pressed upon by the fingers depressions are left which only gradually fill up.

Dropsy is generally connected with, and traceable to, one or other of the following conditions: (*a*) Disease of the kidneys; (*b*) Disease of the heart or lungs; (*c*) Disease of the liver or spleen; (*d*) Disease of the peritoneum or membrane surrounding the bowels; (*e*) Anæmia.

(*a*) *Dropsy from disease of the kidneys* begins generally in the loose structure of the eyelids and privates, the feet and legs quickly becoming affected. The forehead will be found to pit on pressure.

(*b*) *Dropsy from disease of the heart or lungs* will begin in the feet first if the patient is up and about; but usually in the belly first if the patient is in bed. It spreads, and in course of time may involve the whole body.

(*c*) *Dropsy from liver or spleen disease* first affects the belly, which swells, and may be felt to contain fluid; a condition called *ascites*. But ascites is not as a rule due to disease of the liver or spleen, though that may be present, but to

(*d*) *Disease of the peritoneum.* It is the chronic inflammation of the peritoneum covering these organs that is responsible as a rule for the watery outpouring in the belly, and because of its pressure on the big veins in the belly for dropsy of the feet and legs as well. The peritoneum may similarly cause dropsy of the belly in tuber-

culous disease, or in cancer, or from the irritation caused by the presence of any other tumour there.

(*e*) *Dropsy due to anæmia* is usually seen only in the feet and face ; but in severe anæmia may be more extensive.

Dropsy is therefore due in the great majority of instances to some organic internal disease, meaning thereby some disease involving change of structure in the parts implicated, which sooner or later will prove fatal. The treatment of dropsy must therefore be that of those diseases of which it is a prominent symptom.

Ascites, however, may be tapped with great temporary relief, sometimes apparently with permanent benefit. Dropsy of the interior of the chest or thorax, usually due to heart disease, may also be tapped with relief to the heart and the general symptoms. In a few cases even ascites may be permanently cured by an operation.

Dyspepsia. Indigestion in one or other of its numerous forms is very common in India, sometimes occurring as a simple dyspepsia unconnected with any other malady ; at other times as the result of disease of the stomach, liver, or bowels, temporary or permanent. Dyspepsia is, therefore, in various instances, a symptom of other maladies, and not the primary disease.

Before dyspepsia can be properly understood it is necessary to have some idea of the process of digestion and of the organs concerned, and for this purpose the part of Chapter II which deals with the processes of normal digestion and the nature of foodstuffs should be read here. It will be understood from this that a defect in the process may arise at any part of the alimentary tract, starting from the deficient mastication due to want of teeth down to sluggish action of the large intestine. Indigestion is due usually either to defect in the stomach digestion, gastric dyspepsia, or to defect in the intestine, intestinal dyspepsia. Intestinal dyspepsia shows itself as a rule by such symptoms as colic, diarrhœa, or constipation, and to those headings the reader is referred for a further account. What follows here deals alone with gastric dyspepsia, which is the commoner type.

Gastric Dyspepsia may be either A., an *Acute* and sudden event of short duration ; or B., *Chronic* and of long standing.

A. *Acute Dyspepsia* is also of various kinds.

I. In some cases the first symptom is violent headache, which, after lasting some time, is relieved by vomiting. The patient gets to

discover this fact by experience, and so is inclined to encourage vomiting by tickling the back of his throat. This type of dyspepsia is really a *migraine*, and the section on Nervous Headache should be read in reference to this. The best means of dealing with such dyspepsia is to wash out the stomach (*see* p. 617); failing that vomiting should be induced by one of the emetics mentioned on p. 232. These attacks often occur periodically: when expected they may be sometimes averted by a course of Prescription No. 55, 1 ounce morning and evening; while the powders recommended for nervous headaches on p. 172 will often give relief at the time.

II. Another form of acute dyspepsia is an inflammation of the mucous membrane lining the stomach and is called *Acute Gastritis*. In this case the first symptom will be discomfort at the pit of the stomach, followed by increasing pain and tenderness at the pit of the stomach, with constant hiccough, nausea, and vomiting, even water being rejected. The vomit consists of thick, mucous fluid, often tinged with bile; the breath is sour, the tongue furred in the centre, with great thirst and much feverishness, and the mouth may be sore. It is to this condition that the term *gastric fever* has been applied. But a disordered stomach will usually recover itself in the course of two or three days, and it is best to avoid the term gastric fever, and give the disease its scientific name of acute gastritis. Acute gastritis may occur in the course of chronic forms of dyspepsia from undue irritation of the stomach; when it occurs by itself for the first time it is usually due to something in the quality or quantity of the food or in its temperature that has given rise to intense irritaton. Mere excess of the food is sufficient, though more often some putrefaction is the cause, especially in the case of fish or tinned foods. An excess of ice-creams or cold drinks may induce gastritis; and so may a bout of alcoholic drinking. The *treatment* of acute gastritis should consist in absolute starvation by the mouth for twenty-four hours or longer. Children or the very weak may be given nutrient enemata (*see* p. 605). Warm water by the mouth may be allowed, however, and after forty-eight hours if vomiting has ceased give a tablespoon of iced milk every hour. From this advance may be made to egg albumin, whey and Bovril. No cooked meats should be given for a week. At first washing out the stomach (*see* p. 617) usually has a good effect on the vomiting. After that give 2 ounces of Prescription No. 60. To allay nausea and retching give 1 ounce of Prescription No. 41

every four hours, to which 10 mininms of liquor morphinæ may be added if and so long as there is much pain. A hot fomentation on the the pit of the stomach will also relieve pain.

B. *Chronic Gastric Dyspepsia* may be of several varieties, and their methods of operation may be very complicated. It is important to realise this, because at first sight one might think that, because we can make gastric juice artificially, and can digest food with it in a test-tube, that all we should have to do if digestion did not proceed correctly in the stomach would be to drink some of this gastric juice and let that carry out the processes. But that is far from being the case, because the stomach is unlike a test-tube in many ways, and the factors influencing its work are many and complicated. When any one of these factors does not operate the work of the others is interfered with.

We give here the commonest varieties of chronic dyspepsia in as simple a form as possible.

I. There is *excessive secretion* of gastric juice.

II. The muscle of the stomach-wall loses its power: this is called *Atony of the Stomach.*

III. There is chronic inflammation of the mucous membrane lining the stomach: *Chronic Gastritis.*

IV. The nervous mechanism of the stomach and perhaps of the whole body is deranged: *Nervous Dyspepsia.*

I. There are again two principal varieties of the dyspepsia characterised by *excessive secretion.*

(*a*) In one variety the secretion contains an unusually high proportion of hydrochloric acid, the acid of the gastric juice; but the excess of gastric juice is only poured out during digestion. This is called *hyperacidity.*

(*b*) In the other variety the excess of secretion is continuous even when the stomach is empty and when there is nothing to excite the flow of juice.

(*a*) *Hyperacidity* is a very common form of dyspepsia, especially amongst the better classes who get plenty to eat. The subject of this form may appear well and strong and have a good appetite. This dyspepsia is sometimes due to excess of food, especially in porportion to the amount of physical exercise taken. Or it may be the quality of food that is at fault. There are certain articles of food that excite the flow of hydrochloric acid in the juice; such are spices, meat extracts as soups, alcohol, and aerated waters.

These, as well as tea and coffee, help to produce hyperacidity. Insufficient mastication of the food is sometimes a cause; so also are exhausting conditions and worry. The disease is not uncommon amongst vegetarians, and sometimes is associated with ulcer of the stomach.

As a rule pain or discomfort are not felt until one to three hours after a meal, and then are felt in the pit of the stomach, especially after the midday meal. From thence the pain may spread over the belly, sometimes more on the left upper side, and may reach round to the back, sometimes being felt in between the shoulder-blades. There is a feeling of fulness in the pit of the stomach, ending often in acid eructations, which give relief. Vomiting is uncommon; if it does occur, it gives immediate relief. There is always flatulence, usually more than an hour after food. In the *treatment* of hyperacidity the first essential is to avoid worry, and the other causes given above, that predispose to this dyspepsia. Make sure that the teeth are efficiently masticating the food, and do not eat in a hurry. In the matter of diet avoid any of the acid exciters mentioned above: avoid also indigestible foods, especially nuts, fruits and salads. Milk is excellent; and if the condition is severe milk should be relied on alone. In severe cases half a pint of milk should be given every half hour, and in each half pint 15 grains of sodium citrate. From that the patient can advance on to oatmeal, sago and boiled fish. No bread or toast to be allowed. Salt is to be reduced to a minimum, and is better omitted altogether. Certainly no condiments of any kind. As the patient gets better potato may be taken, and poultry, and a little cauliflower. But not cabbage, lettuce, peas, beans, carrots, turnips, fruit or nuts. Butter and cream are allowed. Fluids in moderation are allowed at the end of a meal. For medicine bismuith lozenges may be sucked after meals, and sodium bicarbonate tablets taken about one to two hours after a meal, about three 5-grain tablets. In mild cases this will be sufficient. If the hyperacidity is more severe give Prescription No. 41, 1 ounce thrice daily, two hours after meals, and if there is much pain add 10 minims of liquor morphine to each dose.

If there is constipation, 2 drachms of sodium sulphate in water in the early morning should be taken.

(*b*) When the secretion of gastric juice is continuous, irrespective of the presence of food in the stomach or not, the condition is called *hypersecretion*. This disorder may come at intervals in an acute

form or be chronic. It usually begins at intervals and later becomes permanent. It is a common complaint. Sometimes it begins as hyperacidity. Pain is always present, and it is like the hyperacidity pain already described, though it has peculiarities of its own. One is that it is apt to come on before a meal. When this occurs with a sinking at the pit of the stomach it is called a 'hunger pain.' Another is that night attacks are frequent, usually between 1 and 3 A.M.; the later the dinner the later the pain. Extreme discomfort due to distension often wakes the patient up at that hour. He gets relief by belching, or better still by vomiting. Another feature of hypersecretion pain is the relief given by a little food, such as milk or a biscuit. Many patients find this out for themselves and carry biscuits about with them. There is usually great thirst and constipation and often vomiting. There is always flatulence, and often acid eructations occur, especially at night. One difference from hyperacidity is that the patient does not look so well as a rule: he always loses flesh.

The importance of hypersecretion is that its presence is only a symptom of some serious organic lesion in the bowels, usually a gastric or duodenal ulcer, or appendicitis or gall-stones. A physician should always be consulted when the above symptoms occur, because palliative *treatment* such as described below, though often successful in giving comfort to the patient, does not aim at removing the cause of the disease, and some cases may require surgical treatment.

For the pain and sickness the best remedy is methodical lavage, or washing out the stomach (*see* p. 617). This should be done once daily whenever night vomiting occurs. If sleep is disturbed wash out the stomach on going to bed. For this purpose use warm water containing 1 grain of sodium bicarbonate to the ounce. A firm abdominal belt should be worn and readjusted night and morning.

As regards diet the list of articles given under hyperacidity that stimulate secretion must be avoided. Avoid also starchy foods that are not partly digested, such as sugar, bread, and green vegetables. Avoid excess of fats.

As some starchy food must be taken it is best to give what is necessary just after the lavage, and to take a spoonful of extract of malt with it. Oatmeal or a milk pudding is the most digestible form of starch for the purpose. A little cauliflower may also be allowed, also asparagus. Fruit is to be avoided, especially stone fruit and strawberries. Stewed apples or oranges without sugar

may be given. No alcohol; no tea or coffee. Milk is excellent; and a natural alkaline water in the early morning is good. Some of the benefit of a residence at a spa for this complaint is the effect of the water taken in washing out the stomach. If milk disagrees give whey or the malted milk of Mr. Horlick. Minced meat is allowed, and other meats as a rule. Eggs are allowed.

For medicine take 1 ounce of Prescription No. 41 two hours after each meal. If there is much flatulence add 10 minims of the glycerine of carbolic acid to each dose; or if pain is severe add 10 minims of liquor morphinæ to each dose. For constipation 2 drachms of sodium sulphate in the early morning.

Should the symptoms become severe a surgeon should be consulted.

II. *Atony of the Stomach.* In this condition the wall of the stomach loses its strength and elasticity, so that besides not being able to churn the food up and so promote digestion and to propel it onwards into the intestine, it also becomes unduly distensible. The food therefore is liable to stagnate and decompose in the stomach, and later the stomach may become permanently dilated.

This is a common variety of dyspepsia, especially amongst the poorer classes, and more so in women than in men. It sometimes comes on after other illnesses, such as fevers, where the stomach is left weak like the rest of the body. Too frequent meals, especially those containing much liquid or starchy food, and excessive tea drinking tend to this dyspepsia: so also does residence in a hot climate.

When the movements of the stomach have been sluggish for some time and the food is beginning to stagnate there, the principal feature will be discomfort or pain beginning as soon as food is taken; not, as in the varieties already described, one or two hours after meals. The pain that begins just after a meal commonly reaches its height in an hour or two, though in this there is much variation. A feeling of weight is felt behind the breastbone or between the shoulder-blades, and there is much distension of the stomach. This is more noticeable after fluids than after solids, because they are more bulky. Belching is a constant symptom, usually within an hour after meals. Vomiting is uncommon. The appetite is small and sometimes capricious, and constipation is always present. There is often an aversion to fluids, especially to milk. The tongue is broad, pale, flabby and often indented by the teeth. There is often palpitation after meals if the disease is allowed to progress, and the stomach may become dilated, and vomiting may occur.

In the *treatment* of atony of the stomach much benefit may be obtained from massage if intelligently performed. One skilled in the art should be consulted. A useful movement is by pressing the tip of the thumb on the centre of the stomach (not of the belly) and, using the thumb as the centre of a circle, making brushing movements with the finger-tips. This should be done night and morning for ten minutes.

As regards diet, fluids and bulky foods are to be avoided. No milk, tea, coffee, beer or wines. A little whisky at meals is allowable. Avoid much of the sweet dishes. No green vegetables or fruit, nor excess of fats and butter. Eggs and boiled fish are allowed, so is underdone meat, and in some cases the curdled milk treatment is useful.

At the beginning of treatment give 1 ounce of Prescription No. 41, to which 10 minims of glycerine of carbolic acid have been added, twice daily in between meals. If the tongue is foul give Prescription No. 57 instead.

After the first week or ten days of this treatment, and if the tongue is now clear, give 1 ounce of Prescription No. 33 or No. 34, to which 5 minims of tincture of nux vomica have been added, thrice daily with or immediately after meals. If anæmia is a feature give Prescription No. 51 immediately after meals instead. A little extract of malt with meals is also useful. If constipation is troublesome a large enema twice a week will keep the bowel clear: or cascara may be taken with the malt extract.

III. *Chronic Gastritis* is a form of dyspepsia not uncommon in the aged. It is commoner in men. About half the cases arise apart from disease elsewhere, *i.e.* are primary, whilst the other half are secondary to serious disease of other organs, such as the heart, lungs, or kidneys, and are therefore best treated by attention to those organs. In the primary form the commonest cause is alcoholism, especially spirit drinking; abuse of tobacco is the next commonest cause. Deficient mastication and hurried eating are also causes: as also are the abuse of tea and coffee, highly spiced foods, and condiments, and the taking of iced drinks in large amounts.

The disease begins insidiously, with discomfort during digestion, distension of the stomach, belching, nausea and great lassitude. Vomiting may occur at times, and in the alcoholic form is especially common in the early morning. The bowels are irregular; there is usually thirst, often headache, always depression. Thirst is frequent, and a bad taste in the mouth at times. The discomfort is

felt at the pit of the stomach and usually about an hour after meals. The breath is sometimes offensive. The appearance of the tongue varies, it is usually coated with a thin fur, moist, and flabby. The appetite is capricious; there may be an increased desire for spiced or salted or acid articles of diet. Belching during digestion is a very common feature.

The best *treatment* of chronic gastritis consists in avoiding those things that predispose to it that we have mentioned above. The teeth should be attended to. Where vomiting is a feature or excessive belching, lavage or washing out the stomach should be resorted to. This should be done morning and evening for ten days with water at about 65° F. containing 1 grain of sodium bicarbonate to the ounce. As regards diet no definite rules can be given, because cases vary so much in their digestive powers. The food should be bland, and in severe cases should be given three hourly.

Milk is very good if it agrees. For medicine, residence at a mineral spa is extremely useful, though the discipline and course of treatment can be adopted without the necessity of travelling to one. Prescription No. 41 thrice daily in between meals should be taken. If alcoholism is the cause, 15 grains of chloretone twice daily in capsules may benefit. To stimulate appetite lavage is most useful, or a little beef tea or hot water fifteen minutes before a meal. Constipation must be avoided, and for this an early morning saline draught is best, equal parts of sodium sulphate and phosphate in a tumbler of water.

IV. In *Nervous Dyspepsia* the symptoms may be as mentioned under one of the other forms of dyspepsia, more resembling those of atony of the stomach; except that they occur at irregular intervals and are accompanied by other nervous phenomena, especially depression. In some cases, usually women, there is falling down of the stomach or bowels to a lower level; this is called gastroptosis.

Nervous dyspepsia is really a variety of neurasthenia, where the stomach occupies the first place in the general nerve upset. It is commoner in women and in the better class of Indians, male and female. The *treatment* should be more general than directed to the stomach alone. A change of scene, freedom from worry, or suitable exercise may be the thing required to put matters right. In very severe cases a rest cure may be necessary, *see* p. 614.

It is impossible to lay down detailed rules; each case must be treated on its own merits.

It may be of help to give here a list of the average periods of digestion of some of the commoner foods in a healthy stomach. Too much reliance, however, should not be placed on these figures, because individual differences are marked, not only in health, but more so when the digestion is deranged. Besides, apart from individual differences the periods of digestion given may be greatly changed by disease of the digestive organs, and may be more changed for some foods than for others.

TABLE OF TIME NEEDED FOR NORMAL DIGESTION

Beef, boiled	3 hours	Cheese	3–4 hours
„ roasted	3–4 „	Apples	3–4 „
Fish, boiled	1½–2½ „	Cabbage	3½–4 „
Lamb	2½ „	Carrots	3–3½ „
Mutton, boiled	3 „	Potatoes	2½–3½ „
„ roasted	3–3½ „	Turnips	3½–4 „
Pork, roasted	5 „	Oatmeal, Rice, Sago, Tapioca, Arrowroot well cooked	1–2 „
Poultry, boiled or roasted	2½–4 „		
Tripe	1 „		
Veal, roasted	4½ „		
Hen's eggs, raw	1½ „		
„ fried or boiled hard	3–3½ „	Wheat bread	3–4 „

PERCENTAGE COMPOSITION OF FOODS

The following table gives the percentage composition of some principal food-stuffs:

	Water	Proteins	Starch	Sugar	Fat	Salts
Bread	37	8	47	3	1	2
Wheat Flour	15	11	66	4·2	2	1·7
Oatmeal	15	12·6	58	5·4	5·6	3
Rice	13	6	79	·4		·5
Peas (split)	15	23	55			2
Potatoes	75	2	18			·7
Milk	86	4	—	5	4	·8
Cheese	37	33	—	—	24	5
Lean Beef	72	19	—	—	3	5
Fat Beef	51	14	—	—	29	4
Mutton	72	18	—	—	5	5
Veal	63	16	—	—	16	4
White Fish	78	18	—	—	3	1
Salmon	77	16	—	—	5·5	1·5
Hen's Egg	74	14	—	—	10·5	1·5
Butter	15	—	—	—	83	2

Emphysema of the Lungs. The lungs are composed of a vast number of air cells. Emphysema signifies the excessive dilatation of these air cells, and their eventual rupture into each other. The excess of air which constitutes ordinary emphysema of the lungs is in the 'air sacs'—vesicular emphysema. Emphysema occurs in connection with, and may be caused by such maladies (chronic bronchitis and asthma) as are attended by violent or prolonged cough. The straining consequent on whooping-cough may lay the foundation of future emphysema. It may originate from violent athletic exercises, which necessitate holding the breath long. It may also be induced by playing on wind instruments. But in the majority of cases there is hereditary predisposition. When emphysema occurs the lung tissue loses elasticity, and acts slowly, the air not being properly expelled. The consequences are: difficulty of breathing, especially on exertion, and cough with expectoration of a thin character. There is no acute pain, but a feeling of oppression in the chest, and often 'asthmatic' attacks. As the disease grows worse the blood is imperfectly purified, or aerated, and the countenance may become dusky, especially the lips. The breath is inspired, in a peculiar manner, shortly and quickly, followed by prolonged, and wheezing, expiration: the nostrils often dilate with each inspiration. There is frequently in advanced cases some swelling of the feet and ankles of a dropsical nature, and, as the disease grows worse, the voice becomes feeble, the body wastes, and more decided dropsy may ensue. Emphysema of the lungs is always accompanied by chronic bronchitis and 'winter cough,' and may be complicated by affections of the heart and asthmatic attacks.

Treatment. When the lung cells have broken into each other the condition is incurable. But much may be done to alleviate by careful diet, as mentioned under Asthma, especially by avoiding articles which cause flatulence; and most of all by residence in a warm, humid and equable climate, such as may be obtained at most of the seaside resorts in India, as well as at many of the down-country stations.

Violent exercise must be avoided, as well as exposure to cold night air; and the sufferer should be warmly clad. The potassium iodide mixture, Prescription No. 56, 1 ounce thrice daily, will be beneficial; or 2 grains of potassium iodide in each ounce of Prescription No. 39.

For asthmatic attacks see under the heading of that disease, and read also the section on Bronchitis.

Epilepsy. Epilepsy is often called 'the falling sickness,' or commonly 'fits.' Epileptic fits vary in character, severity, and duration. A very minor degree of epilepsy often occurs, the 'little evil' (*petit mal*). There is a momentary staggering, or peculiar sensation, or transient loss of intelligence; the person stops doing what he was about for a few seconds, and there may be a spasm or convulsive movement of a limb. Between such slight epileptic manifestations and the typical seizure described below, there may be infinite modifications. The 'little evil' is nevertheless a serious disease.

In epileptic subjects the fit is very often preceded by a period during which unusual conditions give notice that an attack is likely to occur. There may be dyspepsia, irritability, or excitement; headache and constipation. Vigorous treatment at this time will sometimes ward off an attack. More immediate warnings are of a very varied and interesting nature. They are known as epileptic auræ. These auræ may begin in the limbs, in the head, or in the organs of the special senses. There may be giddiness, a feeling of nausea, specks before the eyes, a bad smell evident to the patient only, buzzing in the ears, twitching or creeping sensations beginning in hand or foot and passing up the limb. These auræ in the limbs may occur on both sides of the body or be confined to one limb. As a rule, each sufferer has his own form of aura, but this is not always the case, the aura changing at different times. In about half the cases there is no aura or warning at all.

The symptoms of an epileptic fit are as follows: After a short warning, the patient is seized with loss of consciousness and loss of power, so that, if standing, he immediately falls to the ground. Or he may fall without any previous warning. The fit is often preceded by a loud cry, and consists of strong convulsive movements of the limbs and trunk, with spasms of the muscles of the face and eyes, producing distortions of the countenance. Sometimes, the first spasm twists the head round so that the sufferer appears to be trying to look over his shoulder. The brows are knit, the eyes fixed and staring, or turned up beneath the lids, so that only the whites can be seen. The eyeballs roll, and the pupils are dilated and insensible to light, but commence to oscillate towards the close of the paroxysm. The face is at first pale, afterwards becoming

red. The skin is cold and clammy. The hands are clenched, and the arms tossed about. The breathing is difficult, generally noisy, or may appear arrested, as if the person were unable to breathe. The teeth are clenched, and foam (often bloody, from the tongue being bitten) issues from the mouth. The fæces and urine are often expelled involuntarily. After the convulsions have continued from one to two, five, ten minutes, or even, in exceptionally severe cases, several hours, the patient becomes motionless, and remains almost insensible; or looks round with a bewildered expression, and generally sinks into a profound sleep. Fits, of a greater or less degree of violence, may occur almost daily, or at intervals of months or years.

In many cases of epilepsy there is a neurotic family history, a history either of epilepsy itself or of some other nervous complaint. Those who have been subject to convulsions in infancy (*see* p. 517) are more likely to be epileptic in later life. In only a few cases can a definite cause be found, such as the pressure of a fragment of bone, after an injury to the skull, upon part of the brain matter. In this minority of cases surgical operation may cure the disease. Epilepsy usually begins in youth; less commonly after the age of twenty. If it begins before the age of seven years it is likely to affect the subject mentally to a greater or less extent.

Epilepsy may have to be diagnosed from hysterical fits. The chief distinctions are here tabulated:

	Epilepsy	Hysteria
Preliminary cry	One cry	Many shrieks.
Fall	Sudden, may hurt himself.	Sinks to the ground safely.
Urine	Often passed during fit.	Not so.
Tongue	Often bitten during fit.	Not so; but lips may be.
Struggling	Without purpose.	Often fight with those around.
Presence of others	Fits occur at any time.	Usually occur when others are present.
Duration	A few minutes.	Often a long time.
Fits	Typical, as described.	Often peculiar attitudes adopted, such as that of a cross.
Injury	May hurt himself, never others.	May try to bite or injure others.
Sex	Either	Commoner in young women.

Treatment. During a fit the patient should be placed on his back with the head slightly raised. Fresh air should be admitted

freely, and the face should be fanned and freely douched with cold water. No treatment is so certain as this drenching with cold water. The neck and chest should be bared, cravats, stays, and all tight strings or garments about the body being loosed. The patient must be prevented from hurting himself. Support his head, and after wrapping a piece of wood or any other hard material in a handkerchief, hold it in his mouth to prevent biting of the tongue. Do not forcibly restrain his limbs; prevent him from hurting himself by pulling him away from a source of danger, such as machinery, a wall, or fire-place; light pieces of furniture should be pushed out of the way.

The treatment of epilepsy in between fits is both medicinal and hygienic, and success therein lies in attention to details. The medicinal treatment consists in the administration of regulated doses of bromides, usually potassium bromide, as given in Prescription No. 55. The drug may be given twice or thrice daily according to the time of the fits; it being better to anticipate a fit by a dose shortly before the expected time if possible. So much bromide should be given as just to keep the fits in abeyance, and a bit more; this may vary from 10 to 80 grains a day. When cure is apparent, the dose must be reduced very gradually, and treatment must be persisted with over many months, or even years. An epileptic should lead a very quiet daily life, if possible in the country. All excitement is to be avoided; but the patient should not be allowed to idle or to day-dream. A mechanical occupation is advisable. Diet must be simple and plain. Meat must be taken only in moderation, if at all. No alcohol or coffee can be allowed: only very weak tea. Sometimes a fit can be warded off by force of will: by the patient clenching his teeth or by grasping something tightly, such as his own arm. Attempts at such control are to be encouraged. Sometimes inhalation of amyl nitrite from a capsule will arrest the onset of a fit.

Epilepsy, Feigned. Epilepsy is sometimes feigned, but an impostor does not fall violently, but throws himself down carefully so as to avoid injury. The eyes are closed, instead of being fixed and staring; the pupils contract on being exposed to light; the tongue is not bitten; the face is red instead of pale; the skin is hot from the necessary exertion; and neither urine nor fæces are voided. Under such circumstances the best thing is to douche freely the subject with buckets of cold water.

Fainting or **Syncope** occurs from numerous causes. It may result from loss of blood, or from sudden shock; it may be produced by a blow over the stomach, or by intense pain; or it may be connected, in women, with irregularities of the monthly flow. It may be caused by a disordered stomach, or may arise from certain diseases of the heart. It may even arise from great heat, or the vitiated air of crowded rooms; bad smells or unpleasant sounds. Persons most liable to fainting are young women, and young men of nervous temperament. The first symptoms are giddiness, swimming in the head, and pallor. A person in a deep faint is pale, unconscious, with feeble pulse, dilated pupils, relaxation of the limbs, infrequent, irregular, scarcely perceptible breathing, pale lips and extremities, and a death-like countenance. The body should be *at once placed in the recumbent position*, the head being allowed to hang down lower than the body; cold water should be dashed on the face and cold air admitted into the room, or the person should be taken out of doors. The limbs should be well rubbed, and a burnt feather should be held smoking under the nose, a better remedy than ammonia. If a feather is not at hand, smelling-salts may be held to the nostrils for half a minute, every two or three minutes; strong salts should not be applied continually, as injury to the nostrils may arise therefrom. The subsequent feeling of languor will be relieved by rest. For the *prevention* of a fainting fit, lying down at full length, without a pillow under the head is recommended; or if not able to lie down, the head should be bent forward between the legs. Persons subject to fainting usually require tonics and *outdoor exercise*, and should avoid constipated bowels. If the patient is held for a few seconds inverted so that the blood runs to the head, recovery will often follow at once. Fainting due to a temporary weak action of the heart, *i.e.* syncope, as above described, must be distinguished from similar attacks of unconsciousness due to mild epilepsy, *i.e. petit mal*, *see* p. 157. *Petit mal* should be treated as epilepsy. Sometimes hysteria (p. 183) may give brief periods of unconsciousness, which are not syncopal or true fainting fits. It is usually evident from the nature of the attacks and of the patient which kind it is, and the treatment should be carried out accordingly.

Feet, Burning of the. This is not a very common, although often a very troublesome affection. It occurs both to Indians and Europeans, but rarely to the latter. It may range from an

uneasy sensation of warmth in the soles of the feet, sometimes in the palms of the hands, to the most painful sensation of burning in feet and legs, preventing sleep, and thus destroying the general health. There are usually distinct periods of increase and diminution of the burning, neuralgic pain. In some instances the part affected is moist, in others quite dry. Emaciation and debility accompany the progress of the malady. It sometimes occurs unconnected with any other malady; at other times it appears as a sequela of fever, bowel complaint, or neuritis. It is itself of the nature of neuritis or neuralgia.

Treatment. Bathe the feet at night in strong brine, or in alcoholic spirit. Take quinine (Prescription No. 36), about 10 grains daily. Change of climate is a valuable remedy.

Fits. The term 'fit' is commonly used to signify almost any sudden attack; especially such as apoplectic, epileptic, fainting, and hysterical. These are treated of in the order named at pp. 123, 157, 160, and 183.

Flatulence. Flatulence is an accumulation of gas, a symptom of dyspepsia, to which the reader must refer.

Gall-stones. Gall-stones are small concretions that form in the gall-bladder. Their formation is favoured by sedentary habits, want of exercise and dyspepsia. They are more common in women than in men, and especially in the middle-aged. Very often their presence gives rise to no symptoms at all. Usually, however, there is dyspepsia with a feeling of weight or oppression at the pit of the stomach, and flatulence. Sometimes, too, gall-stones give rise to the variety of dyspepsia called 'hypersecretion,' an account of which is given on p. 159. It is, however, when the gall-stones leave the gall-bladder and tend to pass down the bile duct to the intestine that prominent symptoms may ensue. The pain that occurs at this time is called biliary colic, and is very severe. A small stone may pass through the tube without causing any, or only slight, pain; many such have been seen in the stools. A larger stone, however, causes sudden attacks of shivering, and excruciating pain, immediately to the right of the pit of the stomach, shooting to the back, with vomiting, first of the contents of the stomach, and then of sour bile. There is occasionally sudden jaundice, when the stone blocks the main duct. In the absence of bile the stools will be clay-coloured. If a small stone remains impacted in the duct the flow of bile is prevented, but not altogether

stopped, and jaundice comes on more slowly. From the pain mentioned above there are intervals of comparative ease, and pressure will, to a certain extent, relieve it, the person throwing himself about the bed, or pressing his thighs on the belly to get relief from change of posture. This distinguishes the malady from inflammation, when pressure and motion are painful. After a period of agony the stone may pass and the attack cease, to be followed by others. In exceptional cases an impacted gall-stone may excite inflammation of the parts, producing an abscess or an ulcer opening into the gut or stomach. And a gall-stone 3 to 4 inches in circumference may sometimes cause obstruction of the bowels.

The passage of gall-stone, or biliary colic, may be mistaken for the passage of stone from the kidneys, or renal colic, especially if the right kidney is affected. The distinctions are as follows:

Renal Colic	Biliary Colic
Pain in loins, usually on one side.	Not.
Pain shooting from loins down the groin and thighs.	Pain to right of pit of stomach shooting to the back, sometimes to right shoulder.
On either side, rarely both.	Pain most on right side.
Testicles drawn up.	Not.
Frequent desire to make water.	Not.
Making water may be painful.	Not.
Water scanty, high-coloured, or bloody.	Not altered.
Previous history of gravel, gout, or rheumatism.	Previous history of gall-stone, jaundice, and pale stools.
More common in men.	More common in women.

In cases of doubt the X-rays may be employed to assist diagnosis, as a kidney stone can usually and a gall-stone sometimes be made visible by their aid.

The *treatment* of gall-stones depends upon the severity of the symptoms to which they give rise. In every case where their presence has been diagnosed the question of operation must be considered and a surgeon consulted for that purpose. No medicines can dissolve gall-stones in the body: some claim to do so, but they are inefficacious. When the symptoms are those of hypersecretion dyspepsia, the treatment recommended for that should be adopted. When biliary colic occurs the stones should be removed by operation. During an attack and until operation, a

hot bath may be given to the patient, and hot fomentations (p. 590) applied over the liver. It is usually necessary to employ morphia, of which ¼ grain may be given hypodermically (*see* p. 608). At the end of an attack the fæces passed should be examined for gall-stones, by washing the stools through muslin or through a sieve. Gall-stones are brown or greenish-yellow in colour, are round or oval, or where several have been in the gall-bladder rubbing together, they may present flattened facets. They vary in size, from that of a millet-seed to that of a racket-ball. It is always desirable to ascertain whether gall-stones have or have not been passed, because if a single stone comes away *smooth and round*, it may be assumed there are none left behind, and that the trouble is over. Persons subject to gall-stones should always keep the bowels well open, for which a morning saline draught is recommended. Gall-stones may give rise to other complications, such as abscess or inflammation of the gall-bladder, for which a surgeon should be consulted.

Giddiness. *Giddiness* or *Vertigo* is a symptom of disease characterised by the apparent movement of surrounding objects or by a sense of falling backwards or by both these phenomena. The term giddiness is also applied more loosely to the sensations that commonly usher in a fainting fit, such as a sense of dimness or darkness, and perhaps sounds of bells, or drums, in the ears. There is loss of power to balance the body, with more or less mental confusion. Vertigo varies much in intensity, and may be frequent or occasional. In many cases it is only felt on movement, as on rising quickly, or in certain positions, as when the head is hanging down. Giddiness may occur as a symptom of simple anæmia or debility; or as a premonitory to a fainting fit. Or it may be connected with disordered stomach, indigestion, or gout. It may arise from excesses of various kinds, from tobacco, alcohol, and from too much mental work. It often occurs to women at the 'change of life.' In other instances it may be premonitory of epilepsy or apoplexy, disease of the inner ear (Menière's disease), or be consequent on diseased heart. It follows, therefore, that the cause of the symptom is to be discovered and the treatment appropriate to that condition adopted. The commonest causes are neurasthenia and dyspepsia, to which diseases the reader is referred: if the giddiness is severe and frequent it may arise from disease of the brain. When the attack comes on the patient should lie down flat.

Goitre. *Disease of the Thyroid Gland.* Two varieties of goitre must be briefly noticed. These are: (1) *Simple goitre;* with overgrowth (hypertrophy) of all the tissues constituting the gland. The enlargement may be uniform, or greater on one side, confined to one of the lateral lobes or to the middle portion. The tumour is generally irregularly ovoid, elastic, and free from the pain present with tumours of foreign growth. As a rule the symptoms are those produced by pressure; but occasionally the growth may check the secretion of the gland and bring about a swollen condition of the limbs, face, etc., with mental weakness. This condition is known as myxœdema (*see* p. 194).

Another condition due to defect of the thyroid gland is *cretinism.* A cretin child is an idiot of a particular type: the children of goitrous mothers are sometimes cretins. Goitre is common in some parts of India, especially in or near the Himalayas. It is thought now that the enlargement of the thyroid gland is due to a micro-organism which reaches the subject through an infected water-supply.

The gland lies on either side the middle line just above the breastbone. The two side lobes are joined across the trachea by the isthmus and the pyramidal lobe. It sometimes attains a great size, causing, by pressure on the windpipe and blood-vessels of the part, difficulty of breathing, difficulty of swallowing, headache, and change in the pitch of voice.

(2) Quite a different sort of disease is *exophthalmic goitre*, or 'Graves' disease,' in which prominence of the eyes is a very marked symptom, and the heart is liable to be affected. The enlargement of the thyroid may be general or partial. Sometimes there is slight pain, and the swelling is soft and pulsates. Considerable tremor of the hands especially is generally present, and the patient looks startled. This disease is apparently not conveyed by an infective organism as simple goitre is, but is more of the nature of a nerve disease, the feature of which is an excessive amount of thyroid secretion. The symptoms in this disease are serious, and the very opposite to such as may follow in rare cases of simple goitre. The myxœdema produced by diminished thyroid secretion derives benefit from feeding with fresh thyroid glands, or from thyroid extract. 'Graves' disease' is aggravated by thyroid feeding, and often relieved by *removal* of portions of the gland. Pressure symptoms are present in exophthalmic goitre as in simple

goitre. In both they may be so serious as to require surgical interference, either for tracheotomy to relieve difficulty in breathing, or removal of part, greater or less, *never all*, of the gland where breathing and swallowing are affected. In 'Graves' disease' the pulse and respiration are more rapid than normal. Exophthalmic goitre is much less common than the simple variety.

Treatment. Simple goitre, when small, should be treated with iodide of potassium internally, Prescription No. 56, and steadily for months, to give it a chance. An ointment of the iodide of mercury, Prescription No. 79, should be freely applied, and the neck then exposed to the rays of the sun or to a brisk fire. This will blister the skin, but it has been known to reduce even large goitres. It acts better in India and other hot countries than in cold or temperate climates. Persons using the iodides in large doses, or for long periods, may find themselves attacked with *iodism*, a group of symptoms as follows: itching and swelling of the eyelids, nausea, pain in the parotid gland and *salivation*, nasal catarrh, occasionally purging, and an eruption of pimples on the face, neck, and upper part of the trunk. In a few cases *eczema* takes the place of this eruption. Some persons are very sensitive to iodine, but these are the exception; iodism except as catarrh and a mild eruption is rare. Should any appearance of myxœdema (*see* p. 194) take place, fresh thyroids or thyroid tablets will be of benefit. Only when a simple goitre is so large as to cause danger by pressure is an operation necessary or even desirable. The whole of the gland must never be removed. Benefit may sometimes be obtained by means of the X-rays: and sometimes by means of a vaccine.

Exophthalmic goitre is best treated by rest in bed in its severe stages, and by means of the X-rays. A doctor should be consulted at once, as the disease is serious. Sometimes it is advisable to operate and to remove part of the gland.

Gout. Gout is a general disease of the body showing itself usually in acute attacks of pain in one of the joints; but sometimes in less definite affections of other parts of the body. Gout is not due to uric acid, as has been thought, but its occurrence is connected in some way with an upset of the usual chemical changes that occur in the body during the assimilation of proteins, and uric acid and substances allied to it are often in excess at such times. A tendency to gout may be hereditary, or it may occur as

the result of prolonged excess in eating or drinking. The subjects of gout are usually the middle-aged, meat-eaters and non-abstainers, but gout may occur in a vegetarian Brahmin.

An attack, or, as popularly termed, 'a fit of gout,' is usually preceded by irritability of temper, feverishness, headache, and symptoms indicating indigestion. Gout most frequently comes on during the night. There is acute grinding pain in the part, most usually the great toe, abating towards morning, but leaving the toe red and swollen, tender and shining. There is also acid perspiration; the patient's temper is increasingly irritable; and the urine, at first scanty, high-coloured, and clear, afterwards becomes more copious, and deposits a sediment resembling pounded brickdust. For several nights the pain may return, although it is usually lessened as the swelling increases. As the pain and swelling subside the skin of the part peels off in flakes. The disease then disappears, perhaps not returning for months. Repeated attacks may lead to ulcers and *chalk-stones*. Gout may occur in the fingers with similar results. The nails of gouty persons become hard, brittle, and marked with lines. In rarer cases it may suddenly leave the toe and attack the stomach, which will be known by sudden and excruciating pain at the pit of the stomach, with flatulence, faintness, nausea, and feeble irregular pulse. This is called 'suppressed' gout. Gout may also attack other internal organs, causing giddiness, bronchitis, asthma, and affections of the skin, eye, ear, heart, and brain. These latter manifestations are included in the term 'irregular gout.'

Treatment. On the approach of the attack, or fit, the bowels, if confined, should be moved by Prescription No. 27, and in the absence of colchicum, sulphate of soda should be given in 2-drachm doses three times a day. But the medicine must not be allowed to depress the patient, and should be reduced in quantity if it acts too much on the bowels. The local treatment consists in wrapping the inflamed part in cotton-wool, and then keeping the limb well raised from the ground, and as still as possible. In all cases warmth is the great thing, cold having a tendency to drive the gout to some internal organ. Hot fomentations may be applied. Rest must be absolute, and the diet must consist only of milk, arrowroot, barley-water and the like. Mineral waters and Imperial drink (Chapter XXI) may be given freely. Those liable to gout should obtain colchicum wine, and during an acute attack take

20 minims of the wine in 2 ounces of water every four hours till the pain has abated. The wine should then be promptly stopped. Those with weak hearts should not take the colchicum at all, except under medical advice. Stimulants are best avoided by the gouty: if necessary Scotch whisky is the best form in which to take the alcohol.

After the 'fit' the diet should be mainly vegetable. Fish is better than flesh, and chicken than beef or mutton. Sweets and articles containing sugar must be altogether avoided. As a rule fermented liquors should not be taken. Regular exercise and attention to the bowels are also enjoined. Residence for a time at a spa is often of great benefit to the gouty: Harrogate, Buxton and Bath are all to be recommended.

Gravel. Gravel signifies a deposit in the urine. There are two principal kinds, viz.: red and white gravel.

Red Gravel is composed of uric acid, or of other salts termed urates (the principal being urate of ammonia or soda) more or less mixed with the colouring-matter of the urine. Sometimes, from variation of the latter, such deposits are rather pink than red. The urine of persons passing red or pink gravel is clear, acid, of dark golden colour, and often less abundant than the urine of health. After it has cooled, the red or pink deposit appears as a sediment.

Sometimes these urates become deposited in the kidney to form a stone there, and it is the passage of such a stone down the ureter that causes renal colic (p. 365). If the stone reaches the bladder it may not leave that again, but remain there and, with additional concretions, grow larger to form a stone in the bladder (p. 332).

White or *Yellowish Gravel* consists chiefly of crystalline salts formed from the urine, the principal being oxalate of lime, phosphate of lime, or ammonio-magnesium phosphate of lime. The white or yellowish gravel is formed from the urine before it passes from the body, and the urine is therefore turbid when passed, and if heated does not become clear like urine containing urates. The oxalates occur in acid urine, the phosphates in alkaline urine.

The passage of red or pink gravel is connected with a variety of conditions. Tawny or reddish sediments arise from a common cold, and are frequently associated with heartburn, acidity of the stomach, and other symptoms of indigestion or disordered liver consequent on too rich diet. The pinker varieties are generally associated with acute rheumatism or gout, often following or

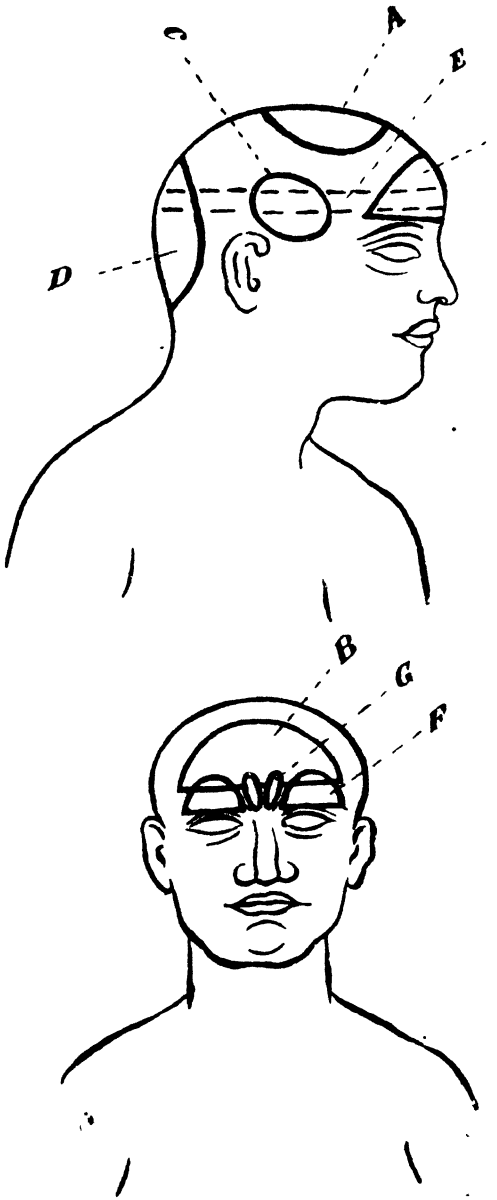
alternating with attacks of the latter malady. Sometimes passing red gravel causes dull pain in the loins, and repeated calls to make water, but frequently there are no symptoms. Large collections of gravel amount to a 'stone' either in the kidney or the bladder, and the symptoms that stone may give rise to should be consulted under those headings.

Treatment. Except in so far as the passage of red gravel may be symptomatic of gout or one of the other diseases mentioned above, it does not require treatment. Neither, in fact, does the passage of white or yellow gravel, which is largely dietetic in origin. Many people become extremely anxious at the appearance of a cloudy urine, either turbid when they pass it or becoming so shortly after and giving a heavy white deposit. They think they must be losing valuable material, and some even imagine that the deposit is formed by semen. It is true that in neurasthenia the deposit of phosphates is liable to occur; but in any case the phenomenon is nothing to provoke anxiety. The appearance of the urine depends upon its acidity or alkalinity. When acid, as it normally is, the phosphates are dissolved; but after a meal the acid of the body is wanted for gastric juice, and then the urine is likely to be alkaline for a time, and phosphates deposited. A vegetarian diet will give more phosphatic deposit than an ordinary mixed diet.

No treatment is necessary as a rule, but the phosphates may often be made to disappear by taking Prescription No. 33 or No. 34 thrice daily after meals, and by taking plenty of exercise and less vegetables in the food.

Headache. Headache is not a disease itself, but a symptom of disease, and a very common symptom. A few individuals seem so fortunate as never to have a headache, on the other hand some women seem to be never without a headache of more or less severity. Most people are between these two extremes and are subject to occasional headaches, and the symptoms are so familiar as not to need description. To treat a headache it is above all necessary, as with other diseases, to discover its cause and remove that if possible. According to their causes we can class most headaches into one of the following groups:

(1) *Toxic*, that is to say due to poisonous matters circulating in the blood. Such harmful matters may either be eaten, drunk, or smoked, such as alcohol or tobacco; or they may be made in the



A. Hysteria.
Neurasthenia.
Anæmia.
Irritation of Womb and Ovaries.

B. Toxic, including Fevers, Dyspepsia, Constipation.
Eye-strain.
Neurasthenia.
Frontal sinuses.
Anæmia.

Teeth.
Disease of Ear.
Also Neuralgia, Migraine.

D. Constipation.
Teeth.
Neurasthenia.
Eyes.
Meningitis.
Kidney Disease.
Disease of Womb.

E. Neurasthenia.

F. Eyes.

G. Nose.

FIG. 10. Diagram to show the different parts of the head that are especially liable to headache from various causes. Disease of the bones of the skull or their membranes may give pain in any part: such pain tends to be worse at night. Chronic rheumatism of the scalp may also give pain in any part.

body, such as the toxins of the fevers which are made by micro-organisms. Another variety of a toxic headache is that arising from dyspepsia or from constipation due in such cases to the absorption of harmful matters from the bowel. Sometimes in the malarious a headache will take the place of an attack of ague. A toxic headache is usually frontal, that is to say in the forehead : it is a common variety.

(2) Another very common variety of headache is the *Nervous.* Here again some help in the diagnosis of its cause may be obtained from noting the part of the head affected. In this matter the diagrams here given will be of help.

A nervous headache may be due either to hysteria or to neurasthenia, to an account of which diseases the reader is referred. The typical hysterical headache is felt on the very top of the head, as of a nail being driven in. The commoner cause by far, however, is neurasthenia. It will be seen in the diagrams that neurasthenia may cause an ache in almost any part of the head, including the feeling of a constricting band round the whole head. Of similar nature is the headache due to fatigue. A combination of two factors, the dyspeptic (toxic) and the nervous together often cause a headache. Of such nature is the headache of the busy man who hurries over his food, or remains at work too much without exercise, or drinks tea immoderately : or the headache of the equally busy pleasure-chaser who sits up late and perhaps drinks, eats, or smokes without discretion.

(3) A third common variety of headache is that due to *irritation* from other organs. The commonest variety of this is the eye headache, and this may be felt in the forehead or back of the head. Eye-strain, due to defective refractive powers of the eye, are common causes of headache in children, especially when they begin to go to school, and any such child should be taken early to a competent oculist (*not* to an optician) to have his vision tested. In adults the pain may be produced by close work, such as reading or sewing (*see* p. 427). Headache from irritation of the womb is usually felt either on the top or back of the head. Bad teeth also may cause headache, usually either at the back of the head or on the temple. A nose headache may be caused by congestion of the mucous membrane in the nose and is felt at the top of the nose first as shown in the diagram : it is made worse by bending over or coughing. A similar sort of headache is that arising from catarrh of the frontal

sinuses, which are in the forehead; such catarrh frequently accompanies an ordinary cold in the head or coryza and accounts for the headache so common on these occasions.

(4) Other causes of headaches may be classed as *brain* diseases, including therein abnormal conditions of the blood-vessels of the brain. Thus the brain may be underfed, owing to the poorness of the blood in anæmia; or there may be only temporary anæmia of the brain, due to disease of the arteries, which occurs in some diseases of the kidney; or the brain blood-vessels may be congested as in some diseases of the heart and lungs; or there may be actual disease of the brain matter itself or of its membranes. In all such instances the headache will usually be only one of many symptoms, and not the most striking one to the observer, though troublesome to the patient. In the early stages of disease of the kidneys and blood-vessels headache may however occur alone and is then of help in diagnosing the real condition.

The above description and a study of the diagrams will account for most headaches; but it must be understood that the strict localisation to certain areas does not always hold good, as a nervous pain is inclined to spread and apparently involve other areas than that specifically affected. Moreover, as already explained, two causes may act together, or some outside cause may be the exciting factor in a subject already predisposed by other reasons. For instance a depressing atmospheric condition such as a thunderstorm may cause a headache in one already neurasthenic.

The *treatment* of headaches must be based on the diagnosis of their cause. The most direct in their indications are those arising from (3) irritation of other organs, where attention to eyes, teeth, nose, or elsewhere may cure permanently. The next clearest indication is in the class (1) of toxic headaches. If the toxin be from without, such as tobacco or alcohol, the obvious treatment is to discontinue the supply.

In the headache of fevers, worst in enteric fever, only palliative measures can be adopted. The application of crushed ice to the forehead, or of some cooling evaporation lotion, such as eau-de-Cologne and water, will help to relieve the symptom. If severe, 10 to 15 grains of potassium bromide may be given in such cases. Where the cause is dyspepsia or constipation, and these are common causes of children's headaches, if the attack be not chronic but of brief duration, then abstention from food for a short period, com-

bined also with one or two mercury pills, Prescription No. 65, followed by a night's rest, with 1 ounce of Prescription No. 27 next morning if necessary, is usually sufficient to procure a feeling of health once more. Of such nature are many of the so-called 'sick headaches'; others are of a neuralgic nature. But if the dyspepsia or constipation be chronic, then a longer course of treatment for these conditions must be undertaken.

The headaches of class (4) require treatment based on the conditions present. Anæmia should be treated if present (*see* p. 117); if there is congestion from heart or lung disease, a smart purge may relieve, but medical advice should be sought. Medical advice is also necessary in the treatment of headache due to kidney disease, as the drugs suitable for such may be harmful in other conditions.

In the treatment of (2) nervous headaches or of those where neurasthenia is a factor, much will depend upon the idiosyncrasy of the patient. Here again if the nerve fatigue is chronic, measures must be directed primarily to the general condition. The hard work, late nights, sources of worry and other deleterious causes mentioned above must be stopped, and a holiday will often be advisable. Personal hygiene must be attended to. If, however, the condition is temporary and acute, relief may be obtained by many of the antipyretic drugs commonly used and sold for the purpose. Phenacetin, 5 grains, combined with caffeine citrate, 3 grains, is a common remedy: or 2 grains of antifebrin with 3 grains of caffeine citrate is also often useful. Five to 10 grains of acetyl-salicylic acid, better known under its German name of aspirin, is preferred by many (and aspirin is especially likely to be useful in those headaches of rheumatic origin); or 5 grains of dimethyl-amino-antipyrine (German synonym, pyramidon) may be dissolved in a wine-glass of water and slowly sipped over the space of half an hour. These drugs will be found to act better if taken with a little warm milk on an empty stomach, and followed by the patient's lying down in a dark room for at least half an hour. There are some cases of chronically recurring headache which are best controlled by regulation of diet, and such are those patients who are devotees of certain food cures, such as vegetarians and purin-free adherents. These cases are toxic in nature as already described, and many of them are benefited by such diet because by its adoption they eat less than they did formerly, when they were probably overfeeding. In every case then of chronic or frequently recurring

headache search first of all for some local cause, such as an error of refraction or decayed teeth : it may be necessary to consult specialists on these subjects before the seat of mischief can be located.

Heart, Diseases of the. To distinguish the diseases of this organ requires a high degree of medical skill, and accurate knowledge of the anatomy of the organ, a correct ear to judge of the sounds of the heart, and much practice. When the heart is affected there are sometimes alterations of the sounds only to be appreciated by the educated ear of a medical man. But in addition to alteration of sounds, there are other symptoms indicative of heart disease. Intermittent pulse, palpitations, fainty feelings, a sense of weight and oppression, shortness of breath, livid face, cold extremities, pain in the left arm, and swelling of the legs all more or less accompany heart disease. But some of these symptoms also accompany dyspepsia, so that without a skilled knowledge of the heart a proper conclusion regarding the true significance of such symptoms cannot be arrived at. If, however, pain or uneasiness in the left breast is accompanied (without any evident cause) by pain in the left arm, or by other signs as enumerated above, and if dropsy or swelling of the legs occurs, some serious malady may be suspected. When such is the case the following rules may be always adopted ; (1) The work of the heart should be lessened by resting a good deal in the recumbent posture, by avoiding stimulants and sudden changes of temperature. (2) Regularity of the heart's action should be insured by avoiding mental excitement, by avoiding sudden muscular exertion (as rapid walking, lifting heavy weights, etc.), by not partaking of a large, distending meal, by not drinking large draughts of cold fluid, by guarding against indigestion and constipation.

The significance of palpitation as a symptom is dealt with separately on p. 201. A short account of angina pectoris, which is an accompaniment of some forms of heart disease, is also given on p. 122. For an account of fatty heart read Obesity on p. 198. In the young, heart diseases are usually a sequence of rheumatic or some other acute fever (*see* Rheumatic Fever on p. 89). In the middle-aged, heart diseases are often the result of muscular strain, overwork, syphilis, or fevers. It would be out of place to give any further account here ; a physician should be consulted when symptoms pointing to inefficient heart action arise.

Heartburn. This term is applied to a feeling of heat in the chest and throat, often accompanied by hot, or cold, acid eructation of

watery matter. This malady has nothing to do with the heart, but is a symptom of indigestion, and should be treated as dyspepsia (*see* p. 147). Ten grains of bicarbonate of soda in a little milk-and-water may be taken.

Heat, Effects of. There has been much confusion hitherto in the nomenclature and description of the different affections due to excessive external temperature whether caused by the direct rays of the sun or not. We include all these conditions under the title *Effects of Heat*, and avoid the term *Sunstroke*, which if used at all should be limited to affection of immediate onset and due to the direct rays of the sun. According to the nature of the affections, we may subdivide them thus :

Heat stroke	1. *Heat Syncope.*	May result from exposure to the direct rays of the sun or otherwise.	Usually comes on during exposure to heat, but may be delayed a little.
	2. *Heat Apoplexy.*	May result from exposure to the direct rays of the sun or otherwise.	Always comes on during exposure to heat, but not necessarily at the time of maximum heat to which the patient has been exposed.
	3. *Sun Fever.*	Only from direct rays of the sun.	Usually delayed in onset till after exposure is over. May be delayed several hours.

From this classification it will be seen that heat syncope and heat apoplexy may rightly come under the inclusive name *Heat Stroke*, since they are sudden in onset as the name 'stroke' signifies ; but to make a further subdivision of *Sunstroke* to include those heat stroke cases due to the direct rays of the sun is unnecessary ; since in their nature and treatment there is no difference between strokes due to direct sun rays and those due to a high external temperature, such as the stokehold of a ship. The liability to heat stroke is increased by fatigue, mental excitement, depression of spirits, unduly heavy clothing, living and sleeping in crowded apartments, lack of ventilation, want of water, constipation, and especially by the abuse of alcoholic drinks.

1. *Heat Syncope* begins with feelings of faintness, sickness, giddiness, shivering, cold extremities, frequent desire to make water, and sometimes drowsiness. The face is pale, the surface of the body is cold, and often bathed in perspiration. The breath-

ing is of a sighing or gasping character, the action of the heart and pulse is weak, sometimes intermittent, the pupils of the eyes are dilated, and there may be more or less insensibility. The temperature is often subnormal. Frequently there is no such beginning of which the patient is conscious, but he falls insensible with the above signs. If he recovers, as this type usually does, there is a tendency to reaction, and the temperature may rise high above the normal.

Treatment. When the patient is faint, sick, giddy, shivering, and cold, lay him on his back in the shade, rub the limbs and loosen the clothing. It is best not to give stimulants, because of the tendency of a reaction later to high temperature. But if the rectal temperature is below 97° F. the patient may well be put in a hot bath (Chapter XX) if available, to rally him; removing him as soon as the rectal temperature shall reach the normal.

2. *Heat Apoplexy,* when not due to the direct rays of the sun, is sometimes preceded by certain premonitory symptoms. For instance, the person affected becomes irritable, restless, and complains of headache. He feels dull and listless, and is unable to make much exertion without a great effort. The appetite fails, and a feeling of nausea with constipation is often present. An absence of perspiration may also be noticed, the skin may be unusually hot and dry, there may be slight sensation of giddiness, and there may be frequent desire to make water, although little fluid is passed. Such premonitory symptoms may prevail for hours or for days previous to the fully developed attack, or they may not occur; or, occurring, may pass away. When anything of the kind is noticed in persons exposed to a high temperature, every means possible should be used to secure ventilation and movement of air, shade and coolness should be sought, cold water should be plentifully drunk, and the body should be well sponged with water, or a bath should be taken. A purgative, Prescription No. 27, 1 ounce, or 2 ounces of Prescription No. 60, will generally be desirable. If however the heat apoplexy ensues and, when due to the direct rays of the sun, it usually comes on without any such warning as above, then there is flushing of the face, heat of body and head, bloodshot eyes, strong quick pulse, stertorous snoring, or puffing breathing, or noisy, irregular, and incomplete breathing. In a very short period insensibility

ensues, and sometimes convulsions. The temperature will be found very high, perhaps over 110° F.

Treatment. The patient is to be taken into the shade, or, if one is at hand, into as cool a room as possible. A bathroom may be the best place because of the water available. No stimulants are to be given. The temperature of the patient must be reduced as quickly as possible. Sponging is of little avail. The patient must have either a cold pack or a bath (*see* Chapter XX). Ice should be used for the pack or bath or for application to the head either by cap or by the coils (*see* Chapter XX), if it is procurable. Ice-water enemata may also be given, and the body rubbed with ice. The temperature should be taken in the rectum every fifteen minutes in severe cases. Where breathing is laboured and the lips blue, much benefit may be obtained by bleeding the patient about 10 ounces (*see* Chapter XX). Quick purging is desirable. If obtainable 2 drops of croton oil mixed with sugar may be placed on the back of the tongue.

Although recovery is often rapid and complete, more commonly fever and oppressed breathing prevail more or less for some days. All forms of heat stroke are frequently followed by periodical headaches, by fever, by neuralgic affections, by dysentery, and sometimes by paralysis. They occasionally leave permanent injury of the brain, which may terminate in softening of that organ, or in insanity. Often, when recovery seems complete, the person is unable to bear any exposure to the sun, and is unfitted for active life in the tropics.

3. *Sun Fever* results from the direct rays of the sun only. It may come on during exposure to the sun; but often not till hours afterwards. Of such nature are the cases where people attribute their headache or feverishness to a 'touch of the sun.' It is a common affection in children who have been playing in the sun, and the fever may not be evident till the evening or till the next day. The symptoms of severe cases indicate congestion of the membranes of the brain, and of some cases even meningitis. Sun fever may be very trivial or very severe. Many people who are exposed to the sun during the day experience some feverishness afterwards, and often take no notice of it. It may disappear in a few hours, or it may cause a restless night, and perhaps diarrhœa. Or it may continue with languor, weakness, loss of appetite, etc., the symptoms that commonly accompany any fever. The affec-

tion may last for twenty-four hours, or when severe may last a few days and end fatally. In the severe cases the temperature rises very high, hyperpyrexia; there is pungent heat of the skin and great thirst, the tongue is parched, red, and dry, the pulse quick and strong. There is much headache, flushed face, throbbing of the temples, restlessness, nausea, and bilious vomiting.

Treatment. For a minor degree of sun fever, or for irritability after exposure, a cold or tepid bath according to habit, rest and quiet under a punkah, and, if the bowels are confined, an aperient dose, are desirable. For the severer cases the head should be shaved and cold applied to the scalp by ice bags or coils (Chapter XX). Hyperpyrexia must be reduced by the cold bath or cold pack (p. 586), and ice must be used freely. No alcohol is to be given; but the bowels are to be opened, and for this purpose give 5 grains of calomel, following it in four hours by 1 ounce of Prescription No. 27. On recovery from a severe attack leave to a cold climate or to the hills is advisable; and if headache is persistent, a course of potassium iodide and bromide should be taken under medical advice.

Hiccough. Consists of sudden, short, convulsive, spasmodic inspirations, attended by a peculiar sound produced in the larynx or upper part of the windpipe, spasmodic closure of the glottis, immediately followed by expiration. These convulsive inspirations often occur in paroxysms, succeeding each other at intervals of a few seconds. The paroxysm may last only a few minutes, or may extend to hours or days. Hiccough, in most instances, arises from indigestion, or from food too hastily swallowed. But it is sometimes present, as a symptom, during the progress of diseases of the liver and stomach, and it may come on after cholera, or during the fatal close of other diseases. When depending on indigestion it may be generally relieved by taking a few grains of bicarbonate of soda and ginger, or by a little water. Sometimes in the case of indigestible food lodged in the stomach vomiting is required to produce relief, and a mustard emetic may be given. Spirits of camphor, chlorodyne, and sal volatile are also good remedies. Swallowing a piece of ice will sometimes give relief. When the attack is slight it may often be stopped by making a very full inspiration, and then holding the breath as long as possible. Strong pressure, with a belt tightly drawn round the body, over a pad on the pit of the stomach, will some-

times stop hiccough. Or pressing firmly near the end of the collar-bones next the throat with the thumb may be successful.

Hydrophobia. The saliva from the mouth of a rabid animal, dog, jackal, wolf, or cat, contains the poisonous agent causing this disease. A very slight wound, either from the teeth or claws, if saliva be on the latter, is sufficient to introduce the poison into the system. Following a bite from a mad dog hydrophobia may come on after some weeks, or months; but the usual *incubation* period is about six weeks. It does not follow that every one bitten by a mad dog must suffer from hydrophobia. The saliva may be wiped off by clothing, through which the animal's fang passes; or the person may escape without any assignable reason.

Symptoms. In most cases there is slight irritation at, or near, the scar of the wound, and there may be vague feelings of uneasiness, melancholy, gloom, with irritability of temper, frightful dreams, or shivering. Sometimes there is twitching of the muscles of the face, also, in many cases, fear and dismay lest hydrophobia should occur. After a few hours or days the patient complains of stiffness of the neck and difficulty of breathing, which suddenly pass into suffocative spasm, most probably on some occasion when the patient attempts to drink. These spasms recur at variable intervals of minutes or hours, and eventually extend from the throat and chest to the muscles of the whole body, which are convulsed. The face is turgid, the eyeballs protruding, the patient foams at the mouth, and claws at the throat as if to remove some obstruction. These general spasmodic seizures are succeeded by intervals of ease and relaxation. Between the spasms saliva which cannot be swallowed collects about the mouth, causing perpetual 'hawking' and spitting. At first these spasmodic attacks are excited only by attempts to swallow fluid; later the sound or sight of fluids, suggestions to swallow anything, movements or looks of bystanders, draughts of air, rays of light, the sight of anything white, or of a dog, may excite spasms. There is generally some rise of body temperature. As the throat spasm spreads to wide convulsions, so the mental distress may proceed to frenzy, causing the patient to rush wildly about, in a state of maniacal fury. It is popularly supposed that the patient barks like a dog, for which the 'hawking' has been mistaken; and that he tries to bite his attendants, for which the spasmodic movements of the jaws have been mistaken. The ordinary duration

of hydrophobia is from one to four days, after which the person dies exhausted, or suffocated from spasm of the throat. Hydrophobia may be mistaken for tetanus, and the distinctions are given under the latter disease.

There is an affection, arising from nervous influence, or fear, after an injury by an animal which is *not* mad. This is called *spurious* or *false hydrophobia*, but the symptoms are very similar to those of the real disease. Instances of reputed recovery from hydrophobia are usually from this false form of the malady, which may be regarded as present when it can be proved that the sufferer has *not* been injured by a rabid animal.

Treatment. Once hydrophobia develops death is certain to follow. All our efforts therefore should be devoted to the prevention of its onset in cases of bites from rabid animals. It is essential for this purpose to go at once to one of the Pasteur Institutes established by Government at Kasauli and Coonoor and in Burmah. The measures that should be adopted are here given in full as recommended by the Pasteur Institute at Kasauli.

I. Measures to be Adopted in the Case of an Animal Bitten by a Rabid Animal and Matter relating to Rabies in Animals.

The biting animal should on no account be destroyed unless dangerous to human beings. Much more satisfactory evidence of rabies is got from observing the suspected animal than by killing it and sending its brain for examination. Moreover the brain is often found to be useless for test on its arrival. In any case a negative result of the test does not allow the inference that the animal was not rabid. The animal therefore should be carefully chained up and observed for ten days. If it remain alive and well for ten days after the date of the bite, then rabies may be excluded altogether and consequently anti-rabic treatment becomes unnecessary.

The case of the animal bitten must be distinguished from that of the biting animal. If the former is not very valuable it had better be destroyed at once and so prevented from causing any danger to human beings or other animals. The incubation period of rabies, *i.e.* the period subsequent to a bite, during which no symptoms show themselves, varies from about three weeks as a minimum to several months as a maximum. If then the owner

decides to keep the bitten animal it should be securely tied up and must be kept under strict restraint for at least three months from the date of being bitten. If taken for exercise it should only be on a stout chain and securely muzzled. No animals are treated at the Pasteur Institute, Kasauli.

Rabies occurs in two forms, known respectively as furious rabies and dumb rabies. Some of the symptoms and signs of developing rabies are those of brain irritation, some are those of paralysis. A rabid animal may show: (1) Skulking and changed demeanour or a tendency to snap, bite, or attack unprovoked other animals or human beings. It may at the same time exhibit signs of affection towards and no inclination to bite its own master. (2) Tendency to stray from home. (3) Perversion of appetite. (4) Paralysis of the lower jaw. Paralysis or weakening of the extremities. (5) Escape of frothy or ropy saliva from the mouth. (6) Altered character of the bark. (7) Proneness to attack savagely a stick or other object held out towards it. Biting at imaginary objects. Tearing up ground in its neighbourhood.

Fear of water is not a symptom in animals; inability to eat or to lap fluids may not appear till very late in the disease.

II. Measures to be Taken by a Person Bitten by a Rabid or Supposed Rabid Animal

The wound made by the bite should be washed, dried, and then thoroughly cauterised with pure carbolic acid, permanganate of potash crystals, silver nitrate or other caustic. There are two methods of diagnosing rabies from an examination of the brain, namely the inoculation method and the microscopical method. Both of these methods require that a portion of the brain be sent to a laboratory, and consequently the skull of the animal must be opened. Take a hammer and, with a few hard sharp blows, fracture into pieces through the intact skin the top and sides of the brain cavity. With a knife throw back the skin and then remove as carefully as possible the pieces of fractured bone, in this way exposing the brain. For the inoculation method remove with a clean knife a small piece of brain about the size of a walnut and place it in a small bottle of pure glycerine. The bottle should be filled to the top with the glycerine. On no account is an antiseptic to be allowed to come in contact with the piece of brain nor is anything to be added to the glycerine. For the micro-

scopical method a special portion of the brain is desirable, namely the *Hippocampus major*. As this is somewhat difficult to dissect out by anyone unaccustomed to such work, it is best to remove the brain entire. It should be at once wrapped in wool or tow and put into a wide-mouthed bottle filled to the top with the following solution :

Zenker's fluid	Potassium bichromate	5 drachms.
	Mercuric perchloride	7 drachms.
	Glacial acetic acid	7 drachms.
	Water	up to 20 ounces.

If glacial acetic acid is not available, ordinary acetic acid (21 drachms) will serve the purpose.

If the brain is a large one, one-half of it only need be sent, as there is a *Hippocampus major* on each side; for this purpose it should be divided exactly down the centre. The brain or half brain should be wrapped in tow or wool. The bottle should be filled to the top with fluid and plenty of fluid used. If the above solution is not available, country spirit or methylated spirit or 10 per cent. formalin will allow of a fairly good microscopical examination. It is important that the brain of the biting animal should be so sent that both inoculation and microscopic tests can be done. In removing the brain of a rabid animal, the greatest care must be taken not to allow the saliva or brain substance, both of which, as we have seen, contain the rabies virus, to come in contact with any cuts or abrasions on the hands or indeed with the hands at all. Both the bottles should now be carefully and firmly packed with sawdust or cotton-wool in a box and dispatched to the institute to which the person bitten has been sent. The experimental method takes from two to six weeks to obtain any result, while the microscopical method can be carried out in a day or two; but a negative result in either instance is for various reasons not proof positive that the animal was not mad. If the animal is under observation and appears quite healthy, the person bitten may with safety wait until it is settled from the observation of symptoms whether the animal is rabid or not. In cases of doubtful infection it is better to send a detailed telegram of the facts to the Director, Pasteur Institute, for an opinion than to send a man off immediately on what may be a useless and expensive journey. The course of treatment lasts from seventeen to twenty days.

Hypochondriasis. This is a condition partly mental, partly physical. It is commoner in the male sex, and occurs both in Indians and Europeans, especially amongst well-to-do Indians. It may arise from too good living and too little exercise, combined with absence of mental occupation. Or it may originate from overworking the brain. The person fancies himself the subject of various bodily ills, and does not believe if told there is little the matter with him. There is usually a certain small physical basis for the patient's feelings of ill-health, but this is exaggerated by his mental condition into the idea of dire disease. The physical side of his illness is usually one of three things: some digestive trouble, brain trouble, or overwork, or some supposed sexual disability, the patient often thinking, sometimes correctly, that he is sexually inefficient. Perhaps this last is the commonest form amongst Indians. Frequently there is some functional disorder of the liver, or indigestion, present, which laxative medicines and exercise, in the open air, will soon carry off. Next to slight dyspeptic symptoms, the most common complaints of the hypochondriac are of neuralgic pains of a burning character, but not the throbbing, excruciating aching of true neuralgia. For the proper *treatment* of this malady the cause must be sought and removed. The person suffering from the effects of severe or long-continued mental labour will require relaxation and bodily exercise; the man having nothing to do will require some employment. Medicines are not of much use.

The most efficient means of treatment is a rest cure (*see* p. 614), preferably carried out in some sanitorium. These cases, though sometimes ridiculous, are to be taken seriously, as the condition may, if neglected, pass on to melancholia. In the milder cases change of air and scene and habits are often sufficient. A very short time will often work wonders, and it is in such cases that the ability to take three months' leave, for the trip to England, is invaluable. It often happens that home-sickness, or longing for home, known as *nostalgia*, is a prominent idea in the mind of the hypochondriac. And this is especially the case with natives of one part of the Eastern Empire serving in another, for such are often the subjects of the hypochondriacal condition. It would appear as if this longing for home were Nature's method of pointing out the path of cure. Tobacco and alcohol should be given up, or used with strict moderation. A cold

bath in the morning, with exercise and dieting, is a great aid to recovery.

Hysteria. Hysteria is a mental condition in which wrong ideas control the body and produce unnatural changes in its functions. It is much commoner in women; but does occur amongst men, both European and Indian. Hysteria may manifest itself in one of two ways, either by some disturbance of function and train of nervous symptoms or by convulsive fits. The principal nervous symptoms are: Flatulence, flushings, hiccough, palpitations, choking sensations, and loss of voice. Pain in various parts of the body, loss of all sensation in parts of the body, or paralysis of one or more limbs. Nearly every ailment may be simulated by hysteria, and the patient will plaintively detail symptoms very similar to those of real disease. Thus it may be supposed that an hysterical woman is suffering from inflammation of the bowels, or of the womb, or of the throat, when there is nothing of the kind the matter. Stiffness, or even paralysis of a joint, affections of the spine, retention of urine, stricture of the gullet, may all be hysterical manifestations.

The reader must not regard the hysterical patient as a malingerer. Although sympathy should not be shown, yet the disorder really exists in the mind of the patient, and the pains are actually felt. In some cases however the hysterical patient goes so far as to make disease, apparently for the purpose of creating that sympathy for which she has a morbid craving, and she may then stick pins or needles into the flesh, or swallow them. They will sometimes refuse food, but will obtain it surreptitiously; or they will secrete and swallow blood or other fluid, so that they may afterwards vomit it up, as if from disease. Frequently, in cases of hysteria, the monthly functions are irregular.

When convulsive hysterical fits occur, they are usually characteristic. The patient, usually a young girl, in consequence of mental excitement, suddenly loses command of her feelings and actions. She subsides on a couch or in some comfortable position, throws herself about, grinding her teeth, clenching her fists, shaking her hair loose; she clutches at anyone or anything near her, kicks, cries, and laughs alternately. The eyeballs may be turned upwards and the eyelids opened and shut rapidly. At times froth appears at the lips, and other irregular symptoms may develop.

Sometimes such attacks are difficult to distinguish from epileptic

fits. The distinctive features are given on p. 158, under Epilepsy. Hysteria should not be confused with neurasthenia (*see* p. 196).

Treatment. During the paroxysm the dress should be loosened, plenty of fresh air should be allowed, a fan should be used, and cold water, vinegar, or eau-de-Cologne may be sprinkled on the face, smelling-salts, or the smoke from burnt feathers applied to the nostrils, and the extremities should be well rubbed. There is no remedy like a bucket of cold water. Throw the water quickly over the head and chest: it acts 'like a charm.' Hysterical persons should not, however, be treated roughly; for it does not follow that because a person is hysterical she may not have some other disease. On the other hand, *sympathy is misplaced,* and will usually make an hysterical person worse. Although hysterical patients cannot altogether avoid their attacks, they can, to a certain extent, guard themselves against the seizures; and this, they should be made to understand, they are expected to do. In the intervals between the fits, good food, good air, exercise, employment for the mind, *attention to the bowels,* and cold bathing are necessary. If the monthly flow is deficient or irregular, attention must be directed to this condition.

The treatment of hysteria apart from the fits should be more mental than medicinal. Drugs are not much required. Any physical cause of ill-health or depression should be removed and the patient placed under the care of a firm but kind friend in quiet surroundings. A rest cure, sometimes a modified one, is often necessary for the cure of such patients (*see* p. 614).

Insomnia. Insomnia or sleeplessness is a symptom that may arise from various causes, of which the commonest in India is neurasthenia (*see* p. 196). But in the absence of neurasthenia or of anæmia from any cause, sleeplessness may arise from dyspepsia, mental anxiety or excitement, late meals, alcohol, tobacco, or strong tea or coffee at night, want of exercise, close, unventilated rooms, too soft or too hard beds, from cold feet, and, in India, from heat, and mosquitoes. Every case must therefore be treated on its own merits. The dyspeptic should not go to bed with an undigested meal in the stomach, and should avoid alcohol, tobacco, tea, and coffee at night. Regular hours of retiring should be adopted, so that the force of habit may be enlisted. Exercise is necessary, and should be taken to the verge of fatigue. The work of the day should be dismissed from the mind, and any excitement,

such as reading works of fiction at night, should be avoided. Intervals of relaxation must be insisted upon, and in bad cases entire mental rest. When the tone of the system is lowered, as in neurasthenia, a moderate supper of plainly cooked and nutritious food frequently predisposes to sleep, and may with advantage contain onions in some form, and light beer. In other cases a glass of water taken before retiring often does good, but a night-cap in the form of stimulants is often only of temporary benefit. In all instances the bedroom should be well ventilated, the window open, the bed in the middle of the room, or else have the bed on the veranda or out of doors entirely. When the patient is neurasthenic, the treatment laid down for that condition (p. 196) must be adopted. In the case of the European long leave home will often be necessary to deal adequately with insomnia. For old people, or those with weak circulation, a hot bottle to cold feet is desirable. Bromide of potassium, Prescription No. 55, may be taken at bedtime—a medicine especially useful in cases of sleepiness by day and wakefulness at night. But, as far as possible, it is best to avoid drugs. Sometimes motoring, or a warm bath at bedtime, produces the necessary amount of sleepiness. An excellent and simple remedy for insomnia is a hot shower bath. The temperature should be not less than 103° F., and the fall of water not less than 2 feet. The patient should get into bed immediately after.

Jaundice. In this disease the skin becomes yellow, which has led to the malady being spoken of as *yellow jaundice*. The two main classes are: Jaundice, due to some obstruction, mechanical or caused by disease, which prevents the *outflow* of bile from the liver; or to an obstruction, generally due to disease, which prevents the flow of bile in the liver. In either class the excess is absorbed by the blood. The whites of the eyes assume a greenish or yellow tint; the bowels are confined, the fæces are white, or clay-coloured, but the urine is of a deep yellow; the skin generally itches, and there is a bitter taste in the mouth, coated tongue, and nausea, especially in the morning. The cause of all these appearances is bile in the blood. Other symptoms that commonly accompany jaundice are a slow pulse, undue tendency to bleeding, and great depression of spirits and irritability.

Jaundice may be *temporary* or *permanent*.

Temporary jaundice may be the result of congestion of the

liver (*see* p. 190). Or it may arise from a gall-stone in the bile-duct preventing the passage of bile (*see* p. 161). It also occurs during certain kinds of fevers. But usually, temporary jaundice is the result of a catarrh in the small bile-ducts. This catarrh often is accompanied by catarrh of the stomach, from which organ the process has extended. As the main bile-duct empties into the intestine near the stomach, any inflammation of that part is likely to extend up the bile-ducts and give rise to jaundice. For jaundice of this nature, known as *catarrhal jaundice*, from 3 to 5 grains of calomel should be taken at once, and 1 ounce of Prescription No. 60 thrice daily. The food must be of the lightest, and no alcohol can be allowed. If there is any rise of temperature the patient must be in bed and on milk. In addition to this 5 grains of hexamine should be taken twice daily for a week; and hot fomentations or poultices (*see* p. 590) applied over the liver. It is essential that the bowels be freely open.

Permanent jaundice depends on some serious or organic disease of the liver or other internal organ, and the disease thus producing the jaundice generally ends fatally.

Kidney, Diseases of the. The kidneys are subject to inflammation and to certain other diseases. Of the other diseases stone in the kidney is described on p. 365, while accounts of gravel and of other urinary conditions are given on pp. 167 and 224 respectively. Besides this the kidney may be infected by tuberculosis (*see* p. 224), by tumour, or by other conditions unnecessary to mention here.

Inflammation of the kidneys or *nephritis* is sometimes called after the name of the physician who described it, *Bright's disease.* The inflammation may be *acute* or *chronic.*

Acute Nephritis. The principal cause of acute nephritis is exposure to cold and wet. Besides this, the toxins of some of the fevers, especially scarlet fever, diphtheria, small-pox, may cause it. And sometimes in pregnancy nephritis occurs without evident cause. The symptoms are slight dropsy (*see* p. 146), especially about the face, and pain in the loins, the pain being on both sides if, as usually is the case, both kidneys are affected. The pain strikes downwards towards the groin, and in males the testicle is often drawn up by spasmodic action of the muscles. The pain is of a dull, diffused, deep-seated character, increased by firm pressure, by coughing, or sneezing. It is also increased by

straightening the leg on the affected side, and the patient lies on his back or perhaps on the affected side, with his leg or legs drawn up. There is also often numbness in the inner part of the thigh. The urine is scanty, and voided painfully, at short intervals; it frequently contains albumen, and often becomes dark from the presence of blood. There is usually considerable feverishness, and the bowels are mostly confined.

Acute nephritis has to be diagnosed from lumbago (*see* p. 194). There may be no dropsy at all. The course of this disease is variable; sometimes it is brief with complete recovery: too often it is long and leaves a permanent weakness of the kidney establishing the condition known as chronic Bright's disease.

Treatment. The patient must be in bed and remain there till well. To encourage sweating, he should lie between blankets and wear flannel pyjamas. The diet should consist of milk only, with water, barley-water, and lemonade, to drink, and Imperial drink (p. 625). As he gets better, bread and butter and fruits are allowed. A minimum of salt is to be given. At the onset if the back pain is severe, the patient should be cupped (*see* p. 602). Hot poultices are also grateful. If dropsy is marked, the patient should have a hot pack, a hot-air bath, or a vapour bath, all of which are described in Chapter XX. The bowels must be kept freely open; Prescription No. 27 in the early morning will be suitable. Medicines will have no influence on the course of the inflammation of the kidney. As recovery occurs an iron tonic should be given to combat the anæmia which is commonly present.

Chronic Nephritis. Chronic Bright's disease exists in several forms. One form follows the acute nephritis just described Another, though apparently due to the same causes as acute nephritis, starts insidiously instead of with a sudden onset. Another form is due, as a rule, to degeneration of the arteries, both those of the body generally and those of the kidney especially, and this form is seen in the strenuous worker, the gouty, the syphilitic, or alcoholic; and sometimes is due to lead poisoning. Whatever form presents, certain changes in the structure of the kidneys occur which lead to a number of different symptoms. The most prominent early sign is the occurrence in the urine of a substance called albumen. But the fact of albumen being found in the urine is *not* always demonstrative of Bright's disease. Albumen occurs in the urine of some persons after a cold bath or

after certain articles of diet. Albumen not infrequently occurs during, or after, an attack of any fever. In some persons it occurs after any great muscular exertion. In most of these instances there is little or no actual disease of the kidney. If, in addition to albumen, casts of the tubes which secrete the urine and which form part of the structure of the kidneys are found in the urine, it is evidence of kidney disease. But to discover these casts the urine must be examined with a microscope. In addition to albumen in urine, the early symptoms of Bright's disease are: Diminution in the amount of urine passed, having to rise several times in the night to make water, a dull uneasiness in the lower part of the back, indigestion, and debility without any evident cause. When such symptoms occur and albumen is also found permanently in the urine, there is grave cause for uneasiness. But oftentimes Bright's disease comes on so gradually and imperceptibly that it is only discovered by the condition of the urine. As the disease progresses it is further marked by increasing debility with headache, drowsiness, pallor, puffiness about the eyes, shortness of breath, frequent disposition to make water, especially at night, dyspeptic symptoms, and sometimes nausea, or even vomiting. At a later stage the heart usually becomes implicated, and dropsy almost always occurs (*see* p. 146). There is also a great tendency in those suffering from Bright's disease to bronchial affections, convulsions, epileptiform, and apopleptic attacks. In some form of chronic nephritis severe dropsy is a feature throughout, even before the heart becomes involved.

Treatment. The various forms of chronic nephritis require considerable skill in their diagnosis and treatment. Forms that have scanty urine and dropsy and somewhat resemble acute nephritis should be treated on the lines of that disease. That is to say, the bowels should be kept freely open, the diet should be liquid, and the skin made to act freely by means of vapour baths and the other means above described. As these patients are invariably anæmic, Prescription No. 50 may be given thrice daily with benefit. The most important thing in the treatment of these cases is to get them to reside in a warm and equable climate, such as that of Bengal, Bombay, or Madras. It is the cold season of Upper India that we find so bad for these cases.

In the other varieties of chronic Bright's disease, it is still more difficult to lay down rules for treatment, because the indica-

tions will differ with the needs of each case. Often the disease is latent, and treatment is sought for some trifling symptom apparently unconnected with the kidneys. The urine is usually freely secreted; where it is not, Prescription No. 45 may be given thrice daily with benefit. When dropsy occurs or there are signs of heart implication, the need is pressing. A medical man must be called in now; as indeed he should be at the beginning.

Some special features in the nursing of cases of kidney disease are given in Chapter XIX.

Leprosy. Leprosy is a chronic disease due to infection by a special bacillus.

This bacillus may take up its situation more in the skin or in the nerves, or in both, and according to this selection the appearance of the patient will vary. Where the skin is more affected there will be much thickening of eyebrows, nose, ears, and other parts, especially of the face, which may give the patient the characteristic 'leonine' expression. Where the nerves are more affected there will be patches over the body either coloured or with loss of pigment, which are insensitive to touch and pain. Especially insensitive are such regions to the sensation of heat and cold, and often the first appearance of a leper before the doctor is for treatment of a burn that the patient has received because, ignorant of his disability, he was not aware that he had his hand and foot subjected to unusual heat. Most lepers are of the 'mixed' variety of the disease, showing both skin and nerve lesions. As the disease progresses the trophic changes in the nerves of the extremities become more marked, and the ends of fingers or toes will drop off, or part of the substance of the digits become absorbed. Leprous lesions in the eye sometimes render the unfortunate blind.

There is a specific *treatment* in the form of injections of leprolene, a substance analogous to tuberculin.

Besides this, Chaulmoogra oil should be given internally and externally; internally in emulsion beginning from 5 minims, working up to 1 drachm twice daily, and at the same time rubbing the oil into the affected parts.

Isolation of the sick should be carried out so far as possible, as leprosy is certainly contagious.

Liver, Diseases of the. The liver is the largest gland in the body and, for the reasons given herein, is especially subject

to disease in the tropics. The following are the commonest affections of the liver, though it should be remembered that the liver, like other organs, is subject also to tumours and to signs of syphilitic and other disease. Other affections of the liver have already been described under Gall-stones and Jaundice, to which reference should be made.

Liver, Congestion of the. Congestion of the liver may be active or passive ; that is to say, there may be an active dilatation of the liver vessels which allows more blood to circulate in that organ, or the blood may be dammed back into the liver by reason of mechanical obstruction to the onflow of the blood from the liver to the heart.

Passive congestion is found as a result of heart and lung diseases. The liver may be so much enlarged and so tender in these cases as to lead one to think that organ itself is diseased, when really the trouble is due to the heart or the lungs. Such passive congestion should be treated by attention to the cause, usually the heart. Rest in bed on a light diet, combined with 1 drachm of jalap powder, or 3 grains of mercury pill at night, followed by 1 ounce of Prescription No. 27 in the morning, will benefit. Hot fomentations over the liver and abstraction of blood by means of leeches (*see* pp. 590 and 611) applied carefully to the anus will also relieve this symptom.

Active congestion or *hyperæmia* of the liver is a condition especially common in warm countries, and one that demands attention, because if neglected it may lead to actual inflammation of the organ. The causes of this frequency in the tropics lie partly in the feeding and partly in the liability to chills. Scanty clothing, especially on a hot night, may expose the surface of the organ, active after a meal, to a cold current of air from wind or punkah. While a sedentary life, excessive eating, especially of rich and spiced foods, and drinking, especially of alcoholic liquors, are causes that bring more blood to the liver. Not only a local chill over the liver may produce this condition, but any undue exposure to cold in a dweller from the tropics may drive the blood from the surface of the body to the internal organs and produce the liver congestion. This is sometimes seen in Anglo-Indians during the winter in England or as a result of a cold bath.

The *symptoms* of hepatic congestion are : Coated tongue, a bad taste in the mouth, depression of spirits, defective appetite, head-

ache, bowels acting irregularly, 'stools' dark, or sometimes too light in colour, occasionally bilious diarrhœa, but often constipation, nausea, a sense of weight and fulness in the right side, and pain or uneasiness in the tip of the right shoulder, or under the shoulder-blade. Similar symptoms are sometimes spoken of as torpor of the liver. When such symptoms exist in a minor degree, the person is regarded as bilious. Biliousness may, however, be evidenced by dyspeptic headache.

The *treatment* of active congestion of the liver consists in the avoidance of those factors mentioned above that predispose to it. Warm covering to the part and a light non-stimulating diet are essential. If pain is severe a poultice over the liver will give relief. At night take one or two pills of Prescription No. 65, and the next morning, if necessary, 1 ounce of Prescription No. 27. The bowels must be kept well open. As the patients gets better moderate exercise should be taken; but even after that alcohol must be strictly avoided. If the condition is obstinate a change home and the discipline of a spa is advisable. Should the above symptoms be accompanied by rise of temperature a doctor should be consulted at once, as it may be indicative of actual inflammation of the liver and amenable to emetine treatment.

Liver, Inflammation of the. The causes of inflammation of the liver, or hepatitis, are similar to those of active congestion, above described. But there is one other important factor, and that is the connection of liver inflammation with amœbic dysentery (*see* p. 108). The same amœba which causes this dysentery may travel from the bowel to the liver, causing inflammation there, which may go on to abscess. It is very important to recognise this, because in emetine we have a specific ready against the amœba, and so can prevent abscess coming on. It is also important to know that the dysentery may have occurred several months previously and have been forgotten, or may even never have been recognised. There may have been only a mild diarrhœa or not even that.

The *symptoms* of inflammation of the liver are: Pain in the right side, increased by pressure under the ribs, by a long breath, by coughing, by lying on the left side. There is also pain in the shoulder, and often a dragging sensation at the pit of the stomach. The whites of the eyes may turn yellow, the urine is highly coloured, there is nausea or vomiting, there may be either costiveness or

diarrhœa. The disease is generally marked by febrile symptoms, but in some cases there is little fever. Sometimes it may be distinctly made out that the liver is enlarged, but this is not always the case. Sometimes the fever is the only thing complained of and it may be high and continuous, or only with an evening rise.

For the *treatment* of hepatitis a doctor should be consulted at once as he may be able to determine by microscopical examination or otherwise whether the amœba is causing the inflammation. Meanwhile no harm can be done by hot fomentations over the liver, and if pain is severe there, six to ten leeches. An ounce of Prescription No. 27 should also be taken unless diarrhœa is actually present. If no doctor is available, inject emetine hydrochloride subcutaneously, 1 grain a day for three days, as recommended on p. 607. If emetine is unobtainable, give ipecacuanha powder by the mouth in one dose of 40 grains, preceded by 10 minims of tincture of opium taken 20 minutes previously.

Liver, Abscess of the. Liver abscess may be due to various causes, and there may be one or many abscesses present. But much the commonest kind in India is one abscess only and that due to the action of the amœba that has travelled to the liver from the large intestine. In this connection all that has been said under Amœbic Dysentery should be read here so that the connection between the two may be understood. The symptoms of hepatic abscess may show themselves in various ways :

(1) *Rapidly, during an attack of inflammation of the liver.* If during such a condition shivering occurs, followed by cold sweats, obstinately furred tongue, scanty and high-coloured urine, depositing much sediment, fever increased at night, and diarrhœa, there will be every reason to fear formation of abscess.

(2) *Gradually, or during chronic inflammation.* The most frequent manner, however, in which abscess manifests itself is after the prominent symptoms of acute inflammation have been relieved. The patient does not recover health, remains weak and languid, and after a variable period experiences occasional chills, with feverishness towards evening. This soon assumes a hectic character, and is accompanied by a tongue furred in the centre, red at the tip and edges. Weight and uneasiness are experienced in the right side, and the palms of the hands are dry.

(3) *Insidiously, or without previous inflammation.* But liver abscess sometimes occurs without any previous decided symptoms,

or there may be simply loss of flesh, or a vague sense of uneasiness, or obtuse dull pain, or a feeling of weight in the side, with perhaps slight cough. These anomalous feelings are signs often scarcely appreciable; or, if observed, are considered too trivial to induce application for medical advice. Often it is not until shivering and cold sweats, with swelling of the liver, appear, that the serious nature of the disease is recognised.

(4) *During the progress of dysentery.* If the languor, the emaciation, and evening fever are greater than can be accounted for by the violence of the dysentery, if the tongue becomes furred in the centre and red at the tip and edges, and if there is uneasiness and weight in the side, there will be little doubt that abscess has occurred. A fit of shivering in addition would render the matter certain.

When abscess forms it may appear as a swelling in the side or near the pit of the stomach, when it is said to point externally; or it may burst into the stomach and be emptied by vomiting; or into the bowels, and the matter may pass away in the stools; or into the lungs, when the contents may be coughed up; or otherwise into the cavities of the chest and bowels, from which there is no escape.

The presence of an abscess should, however, be recognised before it has gone so far as these signs would indicate.

In the absence of medical aid the *treatment* of liver abscess must consist in the injection of emetine subcutaneously, 2 grains a day for several days (*see* p. 607). If the abscess points, emetine may also be injected into the abscess cavity. Do not open the abscess; but get the patient under medical aid as quickly as possible. In the absence of emetine, ipecacuanha powder in drachm doses is to be given, as described on the preceding page. If the dose is vomited, repeat it.

Liver, Cirrhosis of the. Cirrhosis of the liver is of the nature of a chronic inflammation of the organ. In course of time the liver becomes hard from the fibrous tissue that is formed in it, and usually shrinks in size. In Europe the commonest cause is chronic alcoholism; in India there are other causes at work, that act through the bowel.

In cirrhosis of the liver the countenance becomes sallow, the skin dry, the patient despondent and debilitated. The stools, which may be loose or the reverse, are generally clay-coloured, while the urine is often high-coloured from bile. Sometimes the

person becomes jaundiced. Discharge of blood from the bowels and bleeding from the nose are also liable to occur. The face becomes pinched, and the limbs thin, though the belly often is prominent. Sometimes dropsy of the belly occurs and the patient has to be tapped.

The complaint is a chronic one and a doctor must be consulted for *treatment*. All *spices* in food are to be avoided as well as all alcohol; and the bowels must be kept open, if necessary, by morning saline draughts.

Lumbago. This term implies severe pain and tenderness of the muscles of the loins, aggravated by motion, often preventing the patient from walking, and frequently occurring suddenly. It is a variety of rheumatism. It generally arises from cold; or follows unaccustomed labour, such as digging, or any similar muscular strain. The site of the pain may lead the sufferer to think he has disease of the kidneys (*see* p. 186), but the absence of frequent desire to pass water and of other symptoms indicating renal trouble should set his mind at rest. It is by reliance on this fear that the vendors of quack medicines for pains in the back are able to frighten people into purchasing their nostrums. *See* the diagrams of pain on p. 33.

The *treatment* should be on the lines of that given for Sciatica on p. 208. The same remedies, internal and external, are of avail. Keep the bowels open and apply hot fomentations locally. Ironing the back with a hot flat iron, a piece of brown paper intervening, is often beneficial. The same drugs as given for sciatica should be taken.

Meningitis. Meningitis or inflammation of the membranes round the brain and spinal cord may occur as an infectious fever called cerebro-spinal fever, an account of which is given on p. 44. Meningitis may also result from injury or extension of inflammation from the outside to within. Or meningitis may occur as a complication of certain fevers, such as pneumonia, enteric fever, or small-pox.

But the commonest cause of all meningitis is the tubercle bacillus, and a fuller and separate account of tuberculous meningitis will be found under the head of Tuberculosis on p. 218.

Myxœdema. Myxœdema results, except under conditions noted on pp. 164, 165, more in connection with atrophy or shrivelling of the thyroid gland than with enlargement. It is characterised by swelling

of the skin, especially of the face, which appears enlarged, and of the hands, which lose shapeliness. The skin looks dry and rough. But the skin does not pit on pressure with the finger as in dropsy (*see* p. 146), the cause of the swelling not being water but a gelatinous (*colloid*) deposit. A similar deposit takes place in internal organs. Irritability of temper, slowness of speech, loss of memory, are other results. The malady principally occurs to adult females.

Myxœdema can be cured by administration of thyroid extract in tablets.

Neuralgia. The term neuralgia is applied to pain along the course of any nerve, when there is no evident disease of the nerve such as inflammation, neuritis. Very often neuralgic pain is really 'referred' pain, the cause of the trouble being somewhere else (*see* p. 34). Although neuralgia may be in any part of the body, its commonest situation is on the face. It is usually confined to one side of the face, and comes on suddenly. The pain can be most severe. Often it leaves after a certain number of hours, to recur again the next day at the same time. This may go on for several days or weeks, and then be cured. Or a period of remission may extend over months, after which the pain may start again.

In the *treatment* of neuralgia we must consider first of all the cause. Very often the pain is referred from a carious or otherwise unhealthy tooth, even though the tooth should itself appear painless. A dentist should be consulted. The next most common local cause is an error of refraction in the eyes, for which purpose an oculist should be seen. Apart from such local causes, sometimes general diseases such as malaria, syphilis, anæmia, rheumatism, and gout may be the cause of the neuralgia, and by treatment of these conditions cure may be obtained. Sometimes it is impossible to find a cause. There are some cases that do well if an immediate aperient, such as 4 grains of calomel, is given. In other cases if no local cause has been found, nor any special indication amongst the general diseases named above, give 10 grains of quinine sulphate in the morning and 5 grains in the evening; even in non-malarial cases this often does good. In addition to that take Prescription No. 55, to each dose of which add 5 grains of butyl-chloral hydrate and 10 minims of tincture of gelsemium.

If that gives no relief try 3 grains of caffeine citrate with 2 grains

of acetanilide in a little milk, and lie down in a dark room for half an hour. In addition to these internal medicines, the painful course of the nerve may be painted with aconite liniment, or rubbed over with a little menthol.

Neurasthenia. Neurasthenia is a condition of weakness or exhaustion of the nervous system, giving rise to various forms of mental and bodily inefficiency. It should be understood that neurasthenia is a distinct disease from hysteria, though the two resemble each other in some ways. Hysteria is a disease of the mind: neurasthenia is a disease of the bodily nervous system with a definite physical cause. Neurasthenia is extremely common in India, both in Indians and Europeans. The hot-weather, early-morning irritability of the average European male in India, commonly called 'liver,' is an example of neurasthenia. One cause in India is the trying climate; this, together with overwork and worry, are the principal causes. The East was not intended to hustle in; but the modern demand for efficiency and the strain of competition have been introduced, and tire out the conscientious worker before his time. Neurasthenia or nerve weakness is likely to accompany any other form of fatigue or weakness, such as that following a long illness, especially enteric fever. Other causes are abuse of drugs, alcohol, or sexual excesses. One strong predisposing cause lies in heredity: some people are born with neurotic constitutions.

The sufferer may appear physically debilitated, or he may not seem much altered. His face, as a rule, shows chronic tiredness. He is usually extremely irritable: if a woman, she may be emotional. He worries unnecessarily over trifles that he knows to be trifles; but is unable to persuade himself not to do so. Sometimes his mind is unusually active: this may be the case at night when he should be sleeping, and so he often suffers from insomnia. Sometimes gastric symptoms predominate, and he is dyspeptic and constipated (*see* Nervous Dyspepsia on p. 154). Fatigue comes very quickly after any occupation he takes up. He often jumps at any noise, and is readily startled. The neurasthenic is, in brief, easily tired and easily frightened.

For all this there is a physical cause, and the *treatment* is to remove it. Obviously for a tired nervous system the correct thing is rest, and a holiday is necessary for the neurasthenic; a quiet holiday with a suitable friend. If he suffers from insomnia he

should, if possible, go home to England, as once insomnia starts it may be obstinate.

Apart from this the gastro-intestinal canal requires attention. In some cases the neurasthenia is due to accumulation of decomposing products in the large intestine. Read the article on Constipation, and adopt the measures therein given for promoting movement of the large intestine.

In those physically equal to it, cold baths and moderate exercise should be adopted. If the condition has become severe, especially if there has been insomnia, the use of hydrotherapy in a sanitorium is indicated. Or even a modified rest cure (*see* p. 614).

Either of these courses may be followed by a holiday in a bracing climate, or a month in Switzerland. Sometimes a motoring tour makes a good after-cure, especially where there has been insomnia. Massage is also useful.

Drugs should be avoided as much as possible. The glycerophosphates may be taken in moderation under medical advice. But the patient must not be led astray by the numerous advertisements for drugs and foods, British, German, or American, for so-called 'brain-fag' that abound in papers and magazines. A little faith will go a long way; the patient should decide that he is going to get better, as undoubtedly he will, and this decision will accelerate his recovery.

Neuritis. Neuritis means inflammation of a nerve, and this may occur as a sequel of some fevers, as enteric fever or malaria, or it may result from the effect of certain poisons as alcohol, or it may result from cold. A good example of the last cause is seen in the facial paralysis which may result from exposure of the face to a cold wind, as for instance at an open carriage window. In this case a neuritis of the facial nerve occurs.

When inflammation of several nerves in different parts of the body occurs simultaneously, the condition is called multiple neuritis. Multiple neuritis is a feature of certain diseases, notably beri-beri and leprosy (pp. 41 and 189).

When only one nerve is affected, called '*simple*' *neuritis*, there is not usually much disturbance of the general health. The chief feature is a partial or total loss of function of that nerve. As a nerve has both motor and sensory functions, either or both of these may be lost. Thus the part may be paralysed. Usually pain is the principal characteristic; pain of a boring or stabbing

nature, felt along the course of the nerve and in the parts to which the nerve is distributed. The complaint may last for days or months.

The *treatment* of simple neuritis must depend on the cause, and it is by no means always easy to ascertain this. A physician must be consulted, not only for purposes of diagnosis, but also to advise on the uses of electricity and massage, which will vary in individual cases. If malaria is the cause, energetic treatment by quinine should be undertaken. In any case Prescription No. 51 is likely to be of benefit.

In cases of *multiple neuritis* there may be fever, and there is likely to be more general disturbance than in simple neuritis. The causes of this condition are so numerous, lead-poisoning, alcohol, diphtheria, beri-beri, leprosy, and others, that the layman cannot expect to be able to differentiate between the different varieties. The appearance of the patient varies according to the nerves affected: thus in the alcoholic form the legs are chiefly involved, and besides paralysis of the lower limbs there is usually much pain felt on pressing the calves. Multiple neuritis from immoderate use of spirituous liquors chiefly affects women. The onset is gradual, with pain, followed by numbness in the feet and legs, weakness of the knees, loss of power, and uncertain gait. This is a *peripheral paralysis*, or one that begins in the ends of the nerves farthest away from the spinal cord. As the disease advances the legs waste, and the person becomes bedridden. The arms are rarely affected. The malady is generally ascribed to an accident or chill, the habit of drinking being concealed. The brain and spinal cord are not implicated, the malady being in the local nerves. The treatment is strict abstinence from fermented drinks, good diet, massage, galvanism, tonics, and carriage exercise. Recovery is likely even when the disease has made considerable progress.

In the *treatment* of multiple neuritis of any form rest in bed is essential. If there is fever, in the absence of an indication to treat any particular cause, give Prescription No. 58 three or four times daily.

Benefit may be obtained from electricity and massage, but skilled advice is necessary on this matter.

Obesity. Both Europeans in India and Indians often grow very stout; and sometimes this increase of size occurs rather suddenly, not only giving rise to inconvenience, but sometimes

constituting disease. The cause is, probably, too much fat-forming food and too little exercise at that period of life when the accumulation of a little fatty material is probable. When the fat is equally distributed about the body no immediate disadvantage may be experienced; but when it is accumulated in distinct parts, interfering with the functions of particular organs, its evil influence becomes apparent. The heavier man carries greater bulk, and his heart has to propel, into a larger mass of tissue, a larger amount of blood. Hence one form of evil, viz. an overworked heart, results from accumulation of fat, and is characterised by shortness of breath, and sometimes by palpitation. In addition to this, fat may collect about the substance of the heart, giving rise to the malady known as *fatty infiltration* of that organ. Or the muscle of the heart itself may even degenerate into fat: this is more serious and is called *fatty degeneration* of the heart. Besides the above symptoms there may also be attacks of giddiness and fainting, while unusual exertion may even cause sudden death. The subjects of fatty heart are usually much distressed on exertion, such as going upstairs, especially in the hot weather.

Fatty heart is a dangerous malady, as it may lead to dilatation of the organ, and any suspicion of such affection should lead to application for medical advice. In the meantime, persons so affected should avoid all kinds of sudden or unusual exertion, hurry, or excitement, should reduce their diet and take regular, but not violent, exercise in the open air.

It must be recognised that certain people have an hereditary tendency to obesity, and such are extremely difficult to treat as they are likely to become fat in any case, although with care the adiposity may be kept within reasonable bounds. Apart from such hereditary tendency, when a man is growing fat the first great principles of prevention are less food and more exercise. If he leaves off fatty and carbonaceous foods, of which butter and sugar may be taken as the types, he will achieve his purpose the more quickly. There is no royal road both to become thin and to keep so. No system of dietary will achieve this. But spare food and physical exercise will do so.

Amongst exercises, cycling, horse exercise (not a mild walk on a confidential gee), and skipping are suggested; but the form and amount of exercise must be carefully adapted to each case. Massage of a vigorous kind is also useful.

The second great principle of prevention is the avoidance of those articles of food which are known, when taken in excess, to produce obesity. Fat of meat, bacon, fat pork, bread, butter, thick soups, salmon, stews, preserves, beer, wines, liqueurs, articles containing much starch, as potatoes, tapioca, rice, arrow-root, and sago, sugar, all forms of pastry, duck and goose, peas and broad beans, carrots and beetroot, ices, crystallised fruits, cream and milk (except in moderation), cocoas and sardines, are all to be absolutely avoided in most cases, while in others they can be allowed only in the greatest moderation. For sugar saccharin should be substituted. Other articles allowed are clear soups (a little only), eggs, fruit, green vegetables (except those named), thin toast, gluten and almond bread, biscuits and milk in great moderation, junket, poultry, meats (except those named), tea and coffee.

It is better to avoid all alcohol, though in cases where the deprivation is felt, weak whisky and water may be taken in moderation between meals. Besides this, the entire quantity of liquid taken, of all kinds, should be reduced to a minimum, and that taken not less than two hours after meals. There are some cases of obesity that are benefited by thyroid extract, taken thrice daily; but this should only be taken under medical advice and observation, as otherwise harm may be done.

Apart from thyroid extract, and apart from the importance of maintaining a free action of the bowels, by saline draughts if necessary, there is no drug treatment of obesity. This fact should be well understood as there are so many otherwise intelligent people who, believing the advertisements they read in the papers, waste their time and money on so-called obesity remedies. These much-advertised 'cures' consist usually either of the seaweed *Fucus vesiculosus*, which is useless; in fact it is used in Ireland for fattening pigs! Or else they contain citric acid, an example of the popular but fallacious belief in the efficacy of sucking a lemon. Some of the so-called remedies act by giving the patient dyspepsia, and so by rendering him unable to absorb what nutriment he takes, they may indeed make him thinner; but his last state is certainly worse than his first. What real success does attend these quack medicines is due as a rule to the discipline and regimen that sometimes accompany their use: and herein also lies much of the success of the spa treatment of obesity, for

which latter there is indeed much to be said, especially as the patient is all the time under the observation of a medical man. In brief, we advise one who is threatened with obesity to consult a doctor before adopting any form of treatment or changing his usual mode of life.

Palpitation. Palpitation means consciousness of the heart's action. We are usually unaware that our heart is beating, but under some circumstances we become uncomfortably aware of its action. Often then it beats too frequently. But, as a rule, palpitation is not a dangerous symptom and does not signify disease of the heart itself. Usually it is caused by indigestion, especially with flatulence, and the reader is referred to the section on Dyspepsia for relief of that condition. It is more liable to occur in those of excitable nervous disposition, especially in women, and is common in them at puberty, during menstruation, or at the change of life. It also occurs in anæmia, neurasthenia, and from the over use of tea or coffee. It is not uncommon during pregnancy. Palpitation usually comes on in short attacks, but may be more or less constant. Though commonly due to one of the above causes, yet palpitation may arise from serious disease of the heart.

Palpitation arising from disease of the heart itself and palpitation depending on other causes may be distinguished as below.

Palpitation depending on Disease of the Heart	Palpitation arising from other Causes
Equal in two sexes.	Most common in women.
Comes on gradually.	Comes on suddenly.
Constant, though more marked at one time than another.	Occurs with intervals of perfect freedom.
Frequently accompanied by pain in the left shoulder.	Frequently accompanied by pain in the side.
Lips and cheeks often livid, and countenance florid.	Countenance pale.
Often not much complained of by the patient.	Usually very much complained of.
Sounds of the heart altered.	Sounds of the heart healthy.
Increased by exercise.	Often relieved by exercise.
Relieved by rest.	Often relieved by remedies for flatulence.

Palsy, Scrivener's, or **Writer's Cramp,** is a local spasm or, in bad cases, a local palsy. In the spasmodic variety attempts to write call forth uncontrollable movements of the fingers or

wrist, so that the pen starts up and down, and a mere scrawl results. This is generally accompanied by pain or 'cramp.' In other instances the pen cannot be held, and the wrist is almost powerless. There is a tired feeling in the latter part, in the ball of the thumb and in the little finger. Occasionally the arm is painful to the elbow. The causes are, too much writing, aided, often, by general debility from other causes, and especially by an originally wrong education in the method of writing. The only means of relief is perfect rest from the accustomed work, frequent shampooing in all directions, and strengthening the system by tonics, fresh air, and exercise. As prevention is better than cure, the first warnings of this malady, viz. a tired feeling in the thumb or little finger after writing, should be accepted as a hint that the parts are being used too much.

In true writer's cramp the outlook is not good; it usually means permanent abandonment of penmanship unless the amount of writing to be done is very small. The disability however is only for the particular movement that brought on the palsy: and so the sufferer from writer's cramp should set to work to learn typewriting. That is allowed to him.

Among telegraph clerks and typewriters a similar kind of cramp occurs. Pianists, bricklayers, and nailmakers suffer from a very similar affection, caused by continual strain on the wrists, involved by their employments. The remarks under 'Writer's Cramp' regarding prevention and cure are applicable.

Paralysis. Paralysis signifies loss of the power of motion of any part of the body. It is sometimes accompanied by loss of sensation over the same area and by other nervous changes.

There may be paralysis of one limb, either an arm or a leg, this is called *monoplegia*; or paralysis of one or both sides of the face. Or there may be paralysis of both legs, the arms being healthy; this is called *paraplegia*. Or one half of the body may be paralysed, that is to say, the right half of the face, the right arm and the right leg; this is called *hemiplegia*.

Paralysis may arise from injury or disease of the nerves, of the spinal cord and its membranes, or of the brain and its membranes. When one limb is paralysed, *i.e.* monoplegia, the most likely cause is neuritis (*see* p. 197), which is a disease of the nerves. Sometimes, as in multiple neuritis, more than one limb at a time may be paralysed from nerve disease.

In paraplegia the cause as a rule is in the spinal cord. For instance, in such a disease as locomotor ataxy, the spinal cord is affected. A disease of a somewhat different type, but one which also has its seat in the spinal cord, is infantile paralysis, of which a fuller account is given in Chapter XVII. In infantile paralysis the upper or lower limbs may be picked out independently as in nerve paralysis.

In hemiplegia the seat of affection is in the brain, on the opposite side to that on which the paralysis is evident. Hemiplegia commonly follows apoplexy, as described on p. 123.

Paralysis of the face may be either a monoplegia due to neuritis, or it may be part of a hemiplegia, in which case the limbs on the same side will be affected as well.

Something may be learnt also from the method of onset of the paralysis. Thus it may come on:

(1) *Suddenly.* The patient, apparently healthy, is paralysed in a few seconds. Such an onset is seen in apoplexy (p. 123), and is due to sudden destruction of nervous tissue from breaking of a blood-vessel or to blocking of a blood-vessel.

(2) *Rapidly.* The paralysis establishes itself in the course of a few days. Such an onset is seen in infantile paralysis and in most cases of multiple neuritis, and is characteristic of inflammation of the nervous matter.

(3) *Gradually.* The paralysis may be many years coming on; sometimes with temporary improvements, but on the whole tending to a slowly progressive advance. This onset is seen in many spinal cord diseases, such as locomotor ataxy, and is characteristic of gradual degeneration of the nerve matter.

It would be out of place in this book to go further than the above in the differentiation of the forms of paralysis: since high medical skill is required very often to diagnose between the various nervous diseases that produce apparently similar conditions. A fuller account of some of the commoner diseases producing paralysis, as infantile paralysis, apoplexy, and neuritis, is given elsewhere in this book under those headings. It should be remembered also that hysteria may produce paralysis apparently similar to that caused by gross nervous disease.

The *treatment* of paralysis will depend upon its cause. The more obvious indications have been given under the other headings already mentioned.

Pleurisy. Pleurisy is inflammation of the pleura or serous membrane covering the outside of the lungs and lining the inside of the chest, and separating one from the other. Under normal conditions the two surfaces of the pleura are in contact, moistened by serous fluid which the membrane secretes. At the commencement of acute pleurisy there is, generally, shivering followed by fever, and by pain, or 'stitch,' in some part of the chest. This in a few hours becomes acute stabbing pain, and is generally most felt in the side about the level of the nipple, shooting to the front of the chest, to the collar-bone, or to the armpit. There is short, dry cough, the breathing is short and catching, being frequently attended by an expiratory groan, and the pain is increased by coughing, by taking a long breath, or by lying on the affected side. The tongue is furred white, the urine scanty and high-coloured, and the skin hot, the temperature rising to 100° or 102° Fahr.

Pleurisy may be caused by cold or by injuries, and often arises during the progress of fevers. It may follow fracture of the ribs; may precede or follow an attack of pneumonia, and in one variety is due to the presence of tubercle. In some cases there is an effusion of watery fluid between the lungs and the chest wall, forming a dropsy of the chest. In favourable cases the acute pain and fever subside about the fourth or fifth day; but if there be much fluid effused, the cough and difficulty of breathing may persist indefinitely.

Pleurisy may be distinguished from inflammation of the substance of the lungs (pneumonia) by the following points: the onset of pneumonia is as a rule more sudden than that of pleurisy; the fever in pneumonia tends to run at a higher level and there is greater distress of breathing; there is likely to be more frequent cough in pneumonia than in pleurisy and there will probably be more phlegm expectorated in the former disease, in which case also the phlegm is liable to be bloody or rusty; in pneumonia as a rule the patient looks more seriously ill than with pleurisy alone. But it is to be remembered that pleurisy frequently, in fact usually, accompanies pneumonia, and that most of the pain felt in pneumonia is really due to the pleura being affected.

Mild cases of pleurisy may also be mistaken for the neuralgic pain in the side known as pleurodynia (*see* p. 206), and *vice versa*. Pleurodynia is distinguished by its generally affecting the left side in women, and by there being no attendant fever.

Treatment. The patient must be in bed, warm and kept free from draughts. He should move and talk as little as possible, as motion accelerates the breathing and increases the pain. The diet should be light. Over the site of the pain hot fomentations should be applied, and a jacket poultice (*see* p. 593) is often a comfort to the patient. When the acute pain has subsided and frequent local applications are unnecessary, the ribs should then be immobilised as far as possible by means of strips of diachylon plaster, each about 2 inches wide and overlapping the strip next to it, placed round the affected side of the chest; the strips to extend beyond the middle line both in front and behind. Prescription No. 38, 1 ounce thrice daily, may be given; or if the cough is unusually troublesome teaspoonfuls of Prescription No. 52 at times. For restlessness at night 1 ounce of Prescription No 32 is useful.

Pleurisy, Chronic. Chronic pleurisy is sometimes a consequence of the acute form, but often it commences as a sub-acute disease, generally in those subject to tuberculosis. As a result of the thickening of the inflammatory exudation adhesions often form between the two layers of the pleura. If extensive they may cause some difficulty in breathing, but as a rule the effects are not serious. In either case feverishness at night, a permanently quickened pulse, emaciation, difficulty of breathing increased on exertion, and inability to lie on the healthy side are the principal symptoms. These symptoms may be more or less severe according as the pleurisy is of greater or smaller extent. Such a condition is apt to alternate with symptoms of the more acute form, such as more severe pain, and fever of a hectic nature. Chronic pleurisy may exist for months or years, the person so affected sometimes feeling little of the ailment, at other times suffering from repeated sub-acute attacks. But in such patients the breathing is generally difficult, particularly on exertion, and there is tendency to night fever and night sweats. Such pleurisy is nearly always tuberculous, and very frequently the lung is tuberculous at the same time. The section on Tuberculosis, p 212 *et seq.*, should be read.

One result of either acute or chronic pleurisy may be accumulation of fluid in the cavity of the pleura, or space (not present in health) between the lungs and walls of the chest, or accumulations of pus in the same position, called empyema. These conditions may be suspected when, after pleurisy, night fever and pain

remain, when the person grows emaciated, and when one side of the chest appears more prominent than the other. Such a condition requires skilled medical attention. It is often necessary to draw off the fluid; and if the fluid is found to be purulent, a surgical operation is necessary.

The *treatment* of chronic pleurisy depends principally on its nature. Relief for the pain may be obtained from local applications such as a mustard plaster or a blister (*see* p. 596), or from daily painting iodine, Prescription No. 9 and p. 610, over the painful part. But as the nature of the disease is usually tuberculous, treatment directed against that is required. The reader is referred therefore to p. 217.

Pleurodynia. Pleurodynia is nervous pain generally occurring in the left side, and especially to debilitated women. It may be associated with dyspepsia, neuralgia, or rheumatism. A poultice on the side will usually give relief: sometimes it may be necessary to strap the side, for which see the description given under Pleurisy. For the distinction between pleurisy and pleurodynia *see* p. 204. In cases of rheumatic association Prescription No. 58, 1 ounce thrice daily, will be useful.

Rheumatism. Rheumatism may be acute or chronic. For acute rheumatism *see* Rheumatic Fever on p. 88.

Chronic Rheumatism may follow an acute attack, but usually comes on insidiously in those past middle life; especially in the poorer classes who are exposed to vicissitudes of weather. Much of what is called chronic rheumatism is strictly speaking not rheumatism, but joint and muscular pains due to some other toxin circulating in the blood, such as the pains that sometimes accompany spongy gums (*see* p. 351). Chronic rheumatism may be either in the muscles or in the joints. The former variety is called myalgia, and examples of it are lumbago and stiff-neck.

For the *treatment* of muscular rheumatism consult the articles on Lumbago and Sciatica.

Chronic joint rheumatism usually attacks the larger joints only, usually several joints at once; but sometimes only one. The chief symptoms are stiffness and pain. The joints may be a little swollen and tender to touch; but are rarely reddened. There is generally neither fever nor perspiration. Sometimes the pain is relieved by warmth, in other cases warmth increases it.

Treatment. The first thing to attend to is the removal of the

causes by which the malady is kept up. Rooms with damp floors and walls, insufficient clothing, especially want of flannel, and absence of nourishing diet, are among the most prominent. Internal remedies are not often of use; though benefit may be obtained from Prescription No. 56; or 10 grains of acetyl-salicylic acid in powder or tablet thrice daily—this is the drug that has a reputation under its German name of aspirin; or 10 grains each of guaiacum powder and potassium iodide in cachets thrice daily. Massage is often of great benefit and Turkish baths are of use. Residence at a spa, especially with hot alkaline springs as at Bath, is often the best thing. Apart from spas climatic treatment is also good; the locality chosen should be dry. Benefit may also be obtained in some cases from vaccines and similar specific injections: and from the local application of drugs by the tonic method; and from baths of radiant light and heat.

Rheumatoid Arthritis. Rheumatoid arthritis is a chronic disease of the joints affecting usually people in middle life. In the past there has been much confusion between this disease and rheumatism and gout—hence one of its names 'rheumatoid arthritis'; while another of its names formerly used was 'rheumatic gout.' It is probably distinct from rheumatism: it is certainly distinct from gout. It is not so common in India as in Europe. The disease may affect the big joints; but usually is found in the small joints, especially those of the fingers. It shows itself especially in little lumps on the sides of the backs of the second phalanges of the fingers. Sometimes it attacks the vertebræ, causing rigidity of the spine; and sometimes the big joints, such as the knee, causing much alteration in their structure.

Treatment. A physician should be consulted early, because sometimes in its early stages the disease may be arrested by removal of some source of toxin absorption, such as suppuration of the gums. When fully established, the disease is rarely curable, though capable of benefit. Medicines internally are of little use, though potassium iodide may do good. Fresh air and attention to hygiene are important, and residence at a spa such as Bath should be undertaken when possible. Massage should be carried out early, and the hot-air treatment often gives great relief. A vaccine may do good if the case is seen early enough.

Sciatica. Sciatica is a painful affection, sometimes neuralgia, sometimes neuritis (*see* pp. 195. 197) of the large nerve passing

down the back of the thigh. There is acute, agonising pain extending from the buttock to the ham. It is known from rheumatism by the pain, being limited to the course of the sciatic nerve, and continuous, although aggravated by motion, and increased by pressure. But sometimes the muscles near the nerve are also affected with rheumatism, when the distinction is not so clear, as the pain is felt in the whole of the back part of the limb instead of in a line nearly in the centre. It may originate from cold, or from sitting on a wet seat; or, in more rare cases, it is a consequence of constipation, being then on the left side and produced by the direct pressure of fæcal matter in the bowels on the sciatic nerve before it passes from the pelvis. Sciatica may be merely a symptom of a tumour pressing on the sciatic nerve; so it is necessary to go to a doctor to find out if that is so in the particular case.

The *treatment* consists in rest, wearing warm flannel drawers, hot fomentations, the use of the hot flat iron, and mustard poultices or small blisters over the more painful parts. Purgatives, as Prescriptions Nos. 27 and 61, in full doses, should also be given. In cases connected with rheumatism the treatment appropriate to chronic rheumatism should be employed. Prescription No. 58 taken four times daily may benefit some cases; but relief is more likely to be obtained from a course of potassium iodide. For this purpose take thrice daily 1 ounce of Prescription No. 56, to which 10 grains of potassium carbonate have been added.

In some cases also cachets, each containing 10 grains of potassium iodide and guaiacum powder, taken twice daily, will relieve when the other medicines have failed. Sometimes the pain is so severe that the injection of morphia is necessary. Do not apply massage when the pain is bad, but in between the attacks it may do much good. So also may high-frequency electric currents.

Scurvy. Scurvy is not nowadays a common disease amongst adult Europeans; it occurs not infrequently amongst Indians who are not getting sufficient fresh food. It occurs also amongst European hand-fed children, who are brought up only on sterilised milk or other prepared foods. There is much popular misapprehension as to the nature of scurvy. Some people think that everyone showing spongy and bleeding gums has a scurvy taint. This is not so; in nearly all cases this condition is a local disease of the gums alone, and is called pyorrhœa alveolaris. It is described on p. 352. Scurvy is a disease of the blood and body tissues

generally, and is due to a lack in the food-supply of some living material. That is why children fed only on sterilised foods and sailors fed only on tinned or otherwise preserved foods are liable to suffer from scurvy. The chief symptoms of scurvy are great and progressing weakness with a tendency to bleeding anywhere, either from one of the mucous membranes or underneath the skin in the form of a bruise, or into or around one of the large joints. The disease may first be evidenced by soreness of the gums, weariness, dejection of spirits, dull pains in the limbs, palpitation, and shortness of breath. The tongue becomes pale and flabby, the complexion muddy, the lips bluish, or livid, the eyes surrounded by a dark circle. The gums grow more affected, swollen, spongy, and bleed on the slightest touch. The teeth are often loose, the breath foul, and as the disease advances blue spots, like bruises, appear on different parts of the body. Slight pressure or injury now produces a bruise, scratches become ulcers, and old wounds or scars open afresh. The joints become swollen and stiff, great emaciation takes place, puffy dropsical swellings appear, diarrhœa or dysentery sets in, bleeding may occur from the gums, nose, or bowels, and the patient dies exhausted. The heart becomes weak, and easily affected by shocks, or violent exertion.

Treatment. From the above account of the causes and symptoms of scurvy it is obvious that its prevention is a much simpler matter than its cure. Fresh vegetables should form part of any ordinary dietary: potatoes are especially valuable. Where such are unobtainable by travellers and where fresh limes cannot be got, then fresh meat or milk should be provided. The efficacy of the bottled, artificially prepared lime-juice in this disease has been exaggerated, though it is some good. Where scurvy actually exists a similar treatment by fresh vegetables and meats and unboiled milk is necessary. Sodium citrate in 20-grain doses should also be given thrice daily. For infantile scurvy, a teaspoonful of meat-juice with a little mashed potato is excellent. Orange-juice should also be given thrice daily. A separate account of scurvy in infants is given on p. 532.

Sea-sickness. Sea-sickness is a form of brain sickness, due to irregular stimulation of the organs of equilibration, the semicircular canals, by violent and irregular changes of position and direction. Disorders of the stomach and of the eyes may increase the liability to sea-sickness; but its direct cause lies in the upset of

equilibration. It is unnecessary to describe the symptoms of sea-sickness.

The *treatment* of sea-sickness may consist of a course of preparation for the voyage by one who knows himself to be a bad sailor, and of treatment on the day of embarkation and subsequently. A course of preparation may start from a week previous to embarkation and consist of a preliminary purge and the adoption of a light diet, together with a course of bromides. Prescription No. 55 may be taken twice daily for this purpose, up to the starting of the ship. The more immediate treatment consists in taking chloretone in 5-grain capsules. There are other proprietary remedies of reputation; but the active principle of the best of them is chloretone. One capsule may be taken in the boat-train, one on going on board, and another as the ship begins to meet waves. Do not defer the taking of it too long, for the mere fact of swallowing a capsule under adverse circumstances may provoke nausea. If the voyage is to be a long one, the chloretone may be taken again at intervals: thrice daily should be sufficient. In addition to this a firm abdominal belt should be worn, and the expectant sufferer should lie on his back as much as possible. It is much better if he can arrange to do this on deck, and have his food brought him at intervals; only retiring below when absolutely necessary. The food should be light, but starvation should not be indulged in. Acid and salt substances such as a lemon squash to drink, and a little cold meat with pickles, or a cup of Bovril, are usually better borne than other food. In severe cases iced champagne in small but frequent doses may be kept down when other things are not; but some are too ready to fly to this remedy, which should be kept in reserve. For bad sailors undertaking the voyage to Europe from Bombay in the monsoon, a preliminary day in Bombay is advisable to enable them to recover from the long train journey, to repack their luggage so as to avoid much of this labour on board, and to take in a stock of chloretone. Before leaving harbour they should do what unpacking is necessary in expectation of the tossing they may receive a few hours after sailing.

Spleen, Enlargements of the. Enlargement of the spleen is a common accompaniment of disease in India, and may occur in acute or chronic illnesses. For instance in acute diseases, as malaria and enteric fever, the spleen is almost always enlarged, though it may not be so large as to be palpable below the ribs on

the left side. The great enlargements of the spleen occur in chronic diseases, and in these the spleen may become so large as to reach right across the belly to the right side. A hard swelling felt coming from below the left ribs towards the belly is usually an enlarged spleen, and this opinion is supported if a notch is to be felt in the edge of the swelling, as the margin of the spleen is naturally irregular. With enlargement of the spleen there is usually a history of previous fever, often of high fever that has lasted for weeks, and later of irregular and occasional rises of temperature. The diseases that may give rise to this condition are commonly malaria, kala-azar, and certain abnormal states of the blood, and chronic inflammation of the peritoneum or membrane that covers the spleen as well as the rest of the abdominal organs. It is quite impossible to diagnose between these diseases without microscopical examination of the blood, and this should be undertaken whenever possible. Details of the diagnosis and *treatment* of kala-azar and malaria should be read under those headings. Where examination of the blood and accurate diagnosis is impossible, as malaria is probably the commonest cause of enlarged spleen, at any rate in children, the patient may be treated under the supposition that he has malaria; but it should be remembered that this is only guessing and not diagnosis. In such cases quinine should be given, about 15 grains daily; that is to say, 1 ounce thrice daily of Prescription No. 36. More quinine up to 25 grains daily should be given if the fever is high. If there is no fever at all and the case is very chronic, Prescription No. 50 should be given thrice daily and continued for several weeks. In some cases arsenic is of use also, and 3 minims daily of the liquor arsenicalis should be given if there is no diarrhœa. At the same time, local applications over the spleen will help its reduction in size. If there is pain over that area, hot fomentations should be applied. Otherwise the ointment of Prescription No. 79 should be rubbed over the spleen twice daily. If it causes much blistering it may be made weaker. The application of X-rays to the spleen may also help to reduce its size.

In Europeans, chronic enlargement of the spleen necessitates change to England, or at least to a cooler climate. When British children suffer from enlarged spleen they should be sent home, or, if that is impracticable for the time, to the hills.

Stomach, Disorders of the. The stomach may be disordered by a multitude of causes, the principal of which are improper food,

alcoholic liquors, fevers, and other exhausting diseases. Disorders of the stomach in adults will be found described under the head Dyspepsia in this chapter, while the symptoms Hiccough and Vomiting are also dealt with separately under those headings.

Stomach diseases in children are dealt with under various headings in Chapter XVII.

Swelling of the Feet or Legs. Occurs from causes specified under dropsy (p. 146); and under diseases of pregnancy (p. 479); or at the change of life (p. 456); or in connection with amenorrhœa (*vide* p. 447); or from scurvy (p. 208); or from enlargement of the spleen (p. 210); or as a consequence of anæmia (p. 117) or of debility or of heat. Swelling of the feet is common in India, especially towards night: the swelling subsiding with the rest in bed at night. As this swelling is a symptom and not a disease in itself, the cause should be sought for and treated.

Tuberculosis. Tuberculosis is a disease due to the activity of the tubercle bacillus. The bacillus may be present in any part of the body: most commonly it is in the lungs. Infection of the healthy by this bacillus is caused either by their inhaling or swallowing it. Usually tuberculosis is caused by inhalation of the bacillus from dried phlegm that has come from a previous case of tubercle of the lungs. But it should be recognised that tuberculosis is of the same nature in any part of the body, and that a case of tubercle of the bowels in one person or of the brain in another may arise by infection from a third person suffering from tubercle of the lungs. We will now give accounts of the commonest forms of tuberculosis.

(1) *Of the Lungs.* Tuberculosis of the lungs is commonly known as phthisis or consumption. It is extremely common. Taking the civilised world as a whole about one person out of every nine born dies of phthisis; and these figures appear to be correct for India also. It used to be thought that consumption was hereditary; but this is impossible, as one cannot inherit a bacillus. What may, however, be inherited, is a weakness that may allow the patient to be a more suitable soil for the growth of the tubercle bacillus than his fellow. Only in that sense, that one may inherit a liability to the disease, can consumption be called hereditary. Consumption without infection by the bacillus is impossible. There are in fact three factors necessary to produce consumption in any case; one of these is the bacillus. Another is the general weakness, either inherited as already spoken of, or else acquired after a long

illness or from work especially in badly ventilated rooms, or from insufficient food, or from intemperance of any kind. These two factors together will give the patient tuberculosis. The third factor is a local weakness in the lung, and it is that factor that decides the bacillus to settle in the lung in cases of consumption in preference to settling elsewhere in the body. That is why consumption is so common after prolonged bronchitis, especially in children who have had bronchitis after measles or whooping-cough.

As so much depends upon the early diagnosis of consumption, because when we get the patients early enough we can usually cure them, therefore it is important to know how consumption usually begins. One or more of these three symptoms is usually the first :

(*a*) *A cough.* The cough at first is usually a dry one, later on there will be phlegm unless a cure is brought about early.

(*b*) *Fever.* The fever at first will be slight, and in the evening only. Or perhaps a little feverishness is felt after meals or after exertion. If no attention is paid to this and the disease progresses, the fever will become more evident ; it may become continuous or last longer than it did before, and be followed by sweating, especially at night.

(*c*) *Dyspepsia.* Sometimes dyspepsia is the earliest and only symptom of tubercle of the lung, and for some time there may be nothing to direct attention to the respiratory organs. Most consumptives suffer from loss of appetite and feel repugnance to certain foods, especially to fats.

Sometimes the first sign of anything being wrong is bleeding from the lung (*see* Spitting of Blood on p. 129). When the blood spat up is only a little these people may be considered more fortunate than their fellow sufferers, because the spitting of blood indicates that there is something strikingly wrong and sends the patient at once to a doctor. Thus this patient comes under proper treatment relatively earlier than his fellows, and so he has more chance of recovery. Yet other patients may have no symptoms at first beyond continued lassitude, and poor general health, with gradual wasting. Sometimes at first a patient is rather pleased to find he is getting thinner ; but loss of weight should take him to a doctor. Other cases of consumption may begin by showing tuberculosis of the pleura or of the glands, whence infection may spread to the lungs. The great majority of consumptives, however, first complain of cough and fever, which two symptoms are, as a rule, not far removed

from one another in the date of their onset. Anybody suffering from the above symptoms should at once consult a doctor, and should take with him a specimen of the phlegm, if any, that he has spat up that morning. Often the phlegm or sputum will show the presence of tubercle bacilli under the microscope, and when the doctor sees these, then there is no doubt at all that the patient has tuberculosis. If no bacilli are found, however, it does not follow necessarily that the patient has not got tuberculosis; early cases do not show the bacillus. The patient must also buy a clinical thermometer and record his temperature at 6 A.M., noon, and 6 P.M., always keeping the thermometer in the closed mouth *for five minutes*.

In the further stages of the disease the cough grows worse, the expectoration more profuse, and becomes of a yellow colour, formed in globular masses which float in water, and are sometimes streaked with blood. Hectic fever occurs, followed by profuse night sweats; and although the appetite may continue good, flesh and strength are lost. There is often a pronounced dislike to fatty foods. There are often now sharp, cutting pains in the side and chest, the patient may lose his voice, and diarrhœa may occur, pointing to the spread of the disease to the throat and bowels. Ultimately the patient dies from exhaustion, or from a large blood-vessel giving way in the lungs, when large quantities of bright-coloured blood are passed by the mouth. This bleeding, however, may occur several times without causing death. Until the latest stage of this malady the patient is often hopeful of recovery, and frequently fails to recognise his danger.

Treatment. It is absurd to try to conceal from a consumptive the fact or even the possibility that he may have consumption. The facts of the case must be faced by the patient, because it is only by his active and intelligent co-operation that success can be attained in the treatment, and he is not likely to do what is required unless he understands fully the position. It has been truly said that no fool ever recovers from this disease; but intelligent people who will subject themselves to the discipline required usually do recover, provided the disease is diagnosed early enough. Half measures are useless. It is absurd for a patient to think that by taking medicine thrice daily he may still continue at his work. Much greater sacrifices are necessary. The moment phthisis has been diagnosed the patient should put himself entirely in the hands of his doctor and, if possible, go to a sanatorium. There is one

excellent sanatorium in India in the King Edward Memorial Sanatorium at Bhowali in the Kumaon Himalayas: doubtless other good ones will arise in time. Many Europeans if fit to travel will do best to go home for treatment. If not they should try to get to Bhowali, but the accommodation there is limited and admission is not easy. For those who stay at home there is excellent advice contained in a little shilling book by Dr. Warren Crowe, called 'Consumption: Home Treatment and Rules for Living,' published by Wright of Bristol. This book is well adapted for those who are up and about: those who are not must, of course, rely on their doctor's advice entirely, and should try to get to a sanatorium or, if not there, to the hills, provided they are fit to travel and that their temperature is not over 101 degrees. Cases with high fever do not do well in the hills. We give here the advice that we give on printed slips to our out-patients at the Lucknow Tuberculosis Hospital: it is intended principally for Indians.

YOU ARE SUFFERING FROM A SERIOUS DISEASE OF YOUR LUNGS, AND IF YOU WISH TO RECOVER IT IS ABSOLUTELY NECESSARY FOR YOU TO OBSERVE THE FOLLOWING RULES:

1. It is best if you can leave your house and live in the open air in a shady bagh; but if you cannot do that you must live in the open air as much as possible, sleeping quite out of doors, or if there is much dew, sleeping in the veranda at night. At the same time you should be sheltered from winds, especially from dusty winds. You must not cover up your mouth or nose when you sleep.
2. You must buy a thermometer and learn to take and record your temperature every morning before you get up from bed and every evening at 6 o'clock. This is to see if you have any fever. The thermometer should be kept in the closed mouth for five minutes.
3. If you are having fever, you must not walk about, but rest on your bed in the open. In any case you should ask the doctor how much exercise you are to take.
4. You should eat as much as you can: milk and ghi and fat things are especially good for you. If you have much fever you should only take light and digestible food; but if you have no fever eat as much as you can of everything.

5. Tell the doctor at once if you have diarrhœa, and if that is so, take only milk and sago and stay in bed.
6. You must give up eating pān and smoking tobacco altogether.
7. You must take great care to keep your mouth and gums clean, rubbing them carefully after every meal. If the gums are not quite clean then ask the doctor for a mouth wash.
8. All your sputum must be expectorated into a small vessel, which should be emptied and the sputum burned twice a day. It is very dangerous for you to spit on the ground, as by that means other people catch this disease. You should not cough in the direction of other people.

The sufferer from any form of tuberculosis should, unless kept in bed, have himself weighed once a week, and note down his progress or otherwise. The advice about living in the open air requires modification in the hot weather, when it becomes impossible. The hot weather, and rains also, are very bad times for consumptives, and most die then. The worst things for consumptives are heat, dust, and wind : and it is difficult to avoid these in the months of May and June on the plains.

Besides the general rules of hygiene and the use of rest we have other weapons with which to fight tuberculosis. One of these is the regular and systematic injection of tuberculin, which, when done in suitable cases and by one skilled in its use, is of great benefit. Other special means of treatment, such as putting the diseased lung at rest by means of compressing it with certain gases, are now employed with much success in suitable cases. One important thing to realise is that too much reliance must not be placed on medicines. Medicines are sure to be required to relieve cough : Prescription No. 39 thrice daily will be the most generally employed ; or Prescription No. 52 for occasional use. Cod-liver oil has a great reputation in this disease, and certainly does good in many cases. It may be purchased in one of the advertised proprietary preparations, or taken in the form of Prescription No. 46, 1 ounce thrice daily. Sometimes 1 ounce of Prescription No. 35 taken before meals will help to promote appetite, especially if 1 or 2 minims of liquor arsenicalis be added to it ; but this must not be given if there is a tendency to diarrhœa. Creosote and many of its derivatives, as guiacol, also have a reputation in the treatment of tuberculosis ; but their efficacy is doubtful, as also is that

of the method of treating the disease by dry inhalation. There is at any rate one thing the patient must not do, however disappointed he may be with the results of the treatment he has been ordered by his previous doctors—he must not fall into the hands of the numerous advertising ghouls who prey upon the flesh of the victims of this disease. They are unfortunately too numerous, and vary from electrical quacks to self-claimed discoverers of hitherto unknown herbs.

The prevention of tuberculosis is better than its cure. It consists mainly in the burning of all sputum, and cleansing of all utensils used by the patient. The patient should also sleep alone.

Some special features in the nursing of phthisis cases are given in Chapter XIX.

(2) *Tuberculosis of the pleura* frequently accompanies tuberculosis of the lungs. It may occur alone; but too often signs of the involvement of the lung are discovered during the course of the illness. The symptoms of tuberculous pleurisy are like those of any other chronic pleurisy, and will be found on p. 205. Most pleurisy is tuberculous. Besides the treatment given on p. 206 for the relief of the pain in chronic pleurisy, the patient should also, if the case be tuberculous, go to a sanatorium, and be treated in other respects as if he had the bacillus present in the lungs, as indeed he probably has. For instance, treatment by tuberculin is also of use in these cases, and similar medicines, such as cod-liver oil, as recommended in the previous section, should be employed.

(3) *Tuberculosis of the glands* may affect any of the glands in the body. It is especially common in children, and the glands of the neck are those most usually attacked. When tubercle infects glands, it produces chronic inflammation and enlargement of the glands, as is described in the section on Enlarged Glands on p. 346, to which reference should be made. When several glands are affected they tend to become matted together in one mass. Some glands are found to contain cheesy (caseous) matter, whilst others go on to softening and suppuration. Besides the situations described on pp. 346, 347, the glands inside the chest and around the bronchial tubes also often become tuberculous in children. They cannot be seen, but the fact that they are enlarged may be evident to a medical man from certain signs. Often tuberculosis of these glands is the starting-point of tuberculosis of the lungs.

Treatment. When a child gets tuberculous glands, he should be taken to a surgeon and kept under his observation from time to time, so that he may note the progress of this chronic complaint, may perhaps discover a cause of local irritation, and may be able to decide if they should be removed ; because sometimes it is advisable to remove the glands by operation, and at other times necessary to evacuate pus that may have formed in them.

Besides this local treatment, the treatment of the general health is most important. An European child should if possible be sent home and should live on the East Coast of England ; if kept in India he should live in the hills. Cod-liver oil is an excellent thing for him, Prescription No. 46 ; or the oil may with advantage be given with one of the extracts of malt. Prescription No. 71 is especially useful for these children ; two teaspoons may be given thrice daily. The iodine paint of Prescription No. 9 may be painted over the glands ; but it is doubtful if it does much good. When a gland becomes red and soft and appears like an abscess, do not attempt to open it yourself. Take the child to a surgeon and let him decide whether it should be opened or not. Injections of tuberculin are often of the greatest use in the treatment of these glands. But most important of all is attention to the general hygiene of the child, the provision of an outdoor life in a good climate, and the removal of any local irritation, such as enlarged tonsils or adenoids.

Besides the glands already described here and on p. 347, those around the bowels, called the mesenteric glands, sometimes become tuberculous. As this condition usually accompanies tuberculosis of the bowels, it will be found described under that head on p. 220.

(4) *Tuberculous meningitis* is the commonest form of meningitis (*see* p. 194). It may occur in the course of tuberculosis of other parts, such as the lungs ; or tuberculous meningitis may be the first indication of tuberculosis anywhere. In this disease tiny nodules containing masses of tubercle bacilli form on the membranes covering the brain, with inflammation of these membranes and the subsequent production of a watery effusion into the cavities of the brain. But sometimes the tuberculous deposit is not confined to the brain, but also takes place in the lungs and the glands of the bowels. When this occurs the disease is termed *acute general tuberculosis.*

Tuberculous meningitis generally occurs in young children of poor constitution, and is not common after seven years of age. In children thus predisposed it often follows the convalescence from small-pox, scarlet-fever, or whooping-cough. It is often preceded for some time by loss of general health, the child taking food freely but not thriving, and suffering from alternating constipation and diarrhœa. There is loss of flesh in the body and limbs, but the face is less affected. The child is fretful and drowsy; there are sudden startings during sleep, and often grinding of the teeth. The tongue becomes furred, the breath offensive; there is also headache, and often a peculiar, staggering gait. Except the last mentioned, the early symptoms are very much like those of (*see* p. 539) wasting. After a variable period, during which these early symptoms may have been so strongly marked as to suggest danger, or so trivial as to have escaped notice, more definite symptoms begin.

The first symptoms of tuberculous meningitis (brain-fever) of children, are: after more or less of the premonitory symptoms noted above, the child being seized with high fever and obstinate vomiting, which continues whether the stomach is full or empty. One of the most characteristic symptoms of meningitis is obstinate vomiting; and whenever obstinate vomiting shows itself in a vaccinated child, meningitis may be suspected; if in an unvaccinated child, it may be premonitory of smallpox (*see* p. 92). The peculiar gait becomes more staggering, and there is a tendency to cling to surrounding objects. There is squinting, and marked aversion to light, from which the child turns the head away; there is alternate flushing and paleness of the face, which is sometimes sad and frowning, at other times vacant and stupid. The skin is harsh and dry, the temperature rising to 102° or 103° F. every evening. There is severe pain in the forehead, coming on in darting paroxysms and causing the child to scream with a characteristic piercing cry. The pain causes the child to put its hands to the head, which is incessantly rolled from side to side. As the disease advances the belly looks shrunken and hollow but is not tender, the obstinate vomiting continues, the eyes squint, there is delirium and often repeated convulsions. When not convulsed, the child is generally picking at the bed-clothes, or boring the fingers into the ears and nostrils. When the malady occurs in infants before the bones of the head have united, there is prominence and strong

pulsation visible at the fontanelles, or where the bones of the head join. In some cases occurring in very young children, before the bones of the skull are consolidated, the head is visibly swollen. Often a fallacious remission of symptoms takes place; but at a later period, or from one week to three after the commencement of the disease, the face assumes an aged expression, vomiting ceases, diarrhœa sets in, the pulse becomes slower, the breathing has a sighing or moaning character, the pupils of the eyes are dilated or they may oscillate, the child becomes drowsy, insensibility ensues, and the child dies. Or death may take place during an attack of convulsions.

When, as previously referred to, the disease attacks the lungs and bowels, symptoms referable to these organs will also arise. When the lungs are implicated there will probably be cough and also expectoration. When the bowels are affected there will be enlargement of the glands and other symptoms, described as *tabes mesenterica* (*see* p. 221).

Treatment. If the signs of tuberculous meningitis are established there is not much chance of recovery; practically the only hope is that the diagnosis is wrong. This sometimes is the case, because the diagnosis of tuberculous meningitis in its early stages, even to a medical man, is not always easy. Other less serious conditions stimulate it, especially in children. The treatment is mainly palliative. In the sick room the air should be maintained as fresh and pure as can be, only the necessary attendants being admitted, and the utmost quiet being observed. When the child has to be moved, it should be raised in the most careful manner, without shaking. All sources of irritation must be sought for and removed as soon as possible. Mercury (blue) ointment may be given by means of rubbing half a drachm of it on the child's binder daily. Cold applications, as powdered ice in a bladder, or india-rubber bag, or, this not procurable, evaporating lotions (as Prescription No. 17) should be constantly applied to the head, and every day a mustard poultice or leaf may be applied to the nape of the neck. The proper method of use of these cold applications and mustard poultice will be found detailed in Chapter XX. There are other means, such as lumbar puncture and surgical measures, of relieving the intense headache in meningitis; but they require medical skill for their employment.

(5) *Tuberculosis of the bowels* is a common accompaniment of

the late stages of consumption; and the diarrhœa, indicating this, has already been mentioned on p. 214. Tuberculosis may also start in the bowels, especially in children and young adults; and the disease may show itself in one or more of three ways. Either the tubercles are present in the intestinal wall and cause ulceration and diarrhœa, often with the passage of mucus and blood; or from the intestine the disease may extend to the membrane, covering the bowels, the peritoneum, giving rise to tuberculous peritonitis. This disease is sometimes accompanied by dropsy of the belly. More commonly the tuberculous infection is in the glands round the bowel, and partakes of the nature of other tuberculous gland enlargements, *see* pp. 217 and 346. These glands are called the mesenteric glands and the malady is sometimes known as *tabes mesenterica*. In an early stage there may be nothing but occasional tenderness of the belly, slight fever and loss of flesh. But when the disease is further established, the belly grows large, and the glands of the bowels being diseased, constipation alternates with diarrhœa, and fever of a hectic character and night perspirations become more apparent. The bowels now grow hot and tender to the touch, and the enlarged glands may often be felt hard and knotty underneath the skin. There may be frequent vomiting and the feet may swell. As the disease advances the evacuations change, becoming slimy, bloody, and sour-smelling; the breath is very offensive; and the urine is scanty, depositing a whitish sediment. The appetite is very capricious; the skin is extremely irritable; and the child, instead of being plump and rosy, presents the aspect of shrivelled old age. The more the child wastes, the more restless and irritable does it become, until it dies from diarrhœa and exhaustion.

The *treatment* of bowel tuberculosis should be principally hygienic. If an European, the child should be sent to England and live by the sea; in India, he should be in the hills, unless diarrhœa is a feature of his illness. If there is any rise in temperature, the patient should be in bed. Diet must be light and non-irritating: milk, eggs and other easily digested and nutritive foods should be given. But the quantity and quality of the food must depend largely on the presence or not of diarrhœa. When the belly is tender, especially if there is mild fever, the daily rubbing in of ½ to 1 drachm of iodoform ointment is of benefit. If there is a definite lump of glands to be felt, then mercury oint-

ment, ½ drachm daily, may be rubbed into the belly, the gums being watched for any signs of mercurial poisioning. If there is much pain in the belly, relief may be obtained by hot fomentations. Sometimes, as for tuberculous glands elsewhere, tuberculin may be used with advantage. Sometimes also the glands may be removed by surgical operation. For children, Prescription No. 71 is of benefit in mild cases; while for both children and adults large doses of creosote, gradually getting up to 10 or 15 minims thrice daily, in mucilage are useful. Where diarrhœa is the principal or only feature, then Prescription No. 41, in doses suitable to the age of the patient, should be given four times a day. If there is much pain, add 5 minims of tincture of opium to this prescription for an adult; and, if the motions are foul-smelling, add 30 minims of liquor hydrargyri perchloridi to each dose for an adult. Guiacol and its allies have some popularity in this disease, but it is better to give the original creosote from which these are derived, if the drug is to be given at all.

(6) *Tuberculosis of bones* is not uncommon in children. Fixed dull pain in a bone, as the shin bone, for instance, increased at night, is generally the first sign, which is eventually followed by redness, swelling, and abscess, either in the bone itself, or in a neighbouring joint. The first symptom mentioned should lead to early application to a surgeon. In the meantime the part should be kept at rest, and cold or hot applications (*see* Chapter XX), may be applied to the part, whichever is found to relieve the pain more.

(7) *Tuberculosis of joints* is a chronic inflammation of the joints due to the tubercle bacillus and occurring usually in older children. The affection is commoner in the hip and knee joints, and these will be described here separately.

(*a*) *Tuberculosis of the hip-joint* frequently arises without any assignable exciting cause, but is often due to slight accidents. The earlier symptoms are trifling, and therefore often remain undetected, or unattended to. If, after a slight injury, a child complains of pain in the hip, or in the knee, if the child limps when tired, or if it drags one leg, a suspicion of incipent hip-joint disease should be aroused. The limb should be carefully measured, both when the child is standing up and when lying flat on the back. If one leg appears slightly longer than the other, the suspicion of hip-joint disease of the limb, thus apparently lengthened, is materially

confirmed. For, in order to take the weight of the body off the affected joint, when the child stands he bears upon the sound limb, throws out the sound hip, and lowers that of the opposite side. Even if this lengthening cannot be detected, a suspicion of hip-disease may be usually confirmed by the following tests. If the projecting bone of the hip-joint is smartly tapped, or if the heel is struck, when the child is lying down and the leg is straight, pain, more or less acute, will be felt in the affected hip-joint. As the disease progresses the child becomes less able to walk, the lameness increases, and at last he unable is to stand. The buttock becomes flattened from wasting of the muscles, and the joint grows tender; while movement of the limb is very painful. Instead of the limb being lengthened, it now becomes gradually shortened; the knee of the affected limb becomes directed over towards the opposite thigh, the foot is turned inwards, chronic abscesses form (*see* p. 328), and hectic fever prevails.

Treatment. The most important point is perfect and early rest of the affected limb. On suspicion of hip-disease the child should be kept on a hard bed; and if there is certainty of disease, motion of the limb should be prevented by the use of a long, well-padded splint, as figured at p. 302 for fracture of the thigh. The bowels should be kept open. Cod-liver oil and malt extract are of benefit, and Prescription No. 71 may be given with advantage to a child. But the disease requires treatment by a skilled surgeon. Here it will suffice to mention the great importance of good hygienic conditions, rest, and good feeding.

(*b*) *Tuberculosis of the knee-joint* is not uncommon in children and young adults. It has sometimes been called white swelling, because, although the joint may be considerably enlarged, and the parts inside much diseased, the skin retains a white colour and gives little indication ot the inflammation underneath. It is generally attributed to some injury, but the malady is constitutional, and the injury can only be regarded as the determining cause of a constitutional taint showing itself in a particular part of the body. The pain and enlargement are, at first, trifling, causing merely stiffness of the joint, and uneasiness only when moving or attempting to use it; so that the disease often makes considerable progress before it is recognised. There may be enlarged glands in the neck or some other manifestation of tubercle. Afterwards the pain is greater, and generally worse at night. The

malady, if not checked, usually terminates in abscess, and in disease of the bones of the joint. Stiffness, swelling, or tenderness of the knee, limping, occurring to children, should lead to application for medical advice. In the meantime it should be recollected that a diseased joint requires absolute rest, although fresh air should be afforded to the patient. The diet should be light, but nourishing.

The reader will understand from the above how important this absolute rest on a splint is ; and how very wrong would be any treatment that involved massage or free and forcible movements. Such movements would tend not only to make the joint worse, but to disperse the tubercle bacilli throughout the body. Herein lies the danger of consulting bone-setters and similar quacks, who are untrained to recognise the natures of the diseases that are brought before them. Their manipulations may do excellently for chronic rheumatic joints ; they would be harmful for a tuberculous joint.

(8) *Tuberculosis of other parts* of the body may occur, such as of the kidneys and the eye. These conditions will not be described here, as only a skilled doctor could recognise them. It will be apparent that something is wrong with the urinary organs or the eye in either case, and the sufferer should consult a doctor.

Urine, Diseased Conditions of. The quantity of urine passed by a healthy adult in twenty-four hours is from 30 to 40 ounces. But it varies with the amount and influence of fluids consumed. Also it varies with the weather, being more copious in cold weather, when there is less perspiration from the skin. The quantity of urine is increased in diabetes, also often in hysteria. It is scanty in most forms of inflammation of the kidneys and of albuminuria, and in most fevers. It is retained in stricture, sometimes in hysteria, and sometimes by infants. It is suppressed (*i.e.* there is none secreted) in collapse, and in cholera. It is passed more frequently when there is enlarged prostate, gravel, stone, irritable bladder, or inflammation of the bladder or kidneys. It is passed painfully in most maladies connected with the urinary organs, excepting diabetes and Bright's disease.

The colour of healthy urine is a pale straw or amber, and it should show but a very slight quantity of mucus, which appears as a filmy cloud. A heavy whitish deposit, clinging to the utensil when turned, indicates much mucus, which forms in chronic affec-

tions of the bladder. A yellowish-brown colour is characteristic of bile and jaundice. A smoky hue denotes the presence of a small quantity of blood; a dark brown colour more blood; and a distinct red colour much blood. Blood in the urine (hæmaturia) may occur from a great number of causes. Such causes may be either local affections of the urinary organs themselves, as venereal ulceration of the urethra, stone, tumour in the kidneys or bladder; parasites, either hydatids in the kidney or the bilharzia hæmatobia in the bladder; or such causes may be general, as scurvy, the presence, of a parasite in the blood, fevers, etc. In one fever blood in the urine occurs so frequently that one form has been specially designated blackwater fever (*see* p. 43). Blood in the urine has been found in malarial fever, but it is not generally present. High-coloured urine attends most fevers, and may be difficult to distinguish from blood without the aid of a microscope. A milky appearance indicates the condition known as chyluria, due to a parasitic worm, filaria (*see* p. 133). 'Matter,' or pus, renders urine turbid, and it does not clear on boiling. The smell of urine is faint and peculiar. In diabetes there is a sweetish whey-like odour. In various chronic maladies of the urinary organs there is an ammoniacal smell. Blood or bloody discharge causes a smell like that of faintly tainted meat.

The principal salts seen as deposits in the urine are given under Gravel, p. 167. Other but invisible unnatural conditions, the presence of albumen and sugar, are mentioned on pp. 144 and 187.

Caution. On standing, healthy urine undergoes change. After a variable time, according to the temperature, it becomes cloudy, and emits a characteristic odour. This is not indicative of disease, but of decomposition.

Veins, Inflammation of the. This, technically termed phlebitis, may occur in any part of the body, but the limbs are most frequently affected. It may originate from injury, as a consequence of varicose veins, after childbirth, from a gouty tendency, or as a complication of enteric fever. When the veins become inflamed the blood usually clots in them. A clot is called a 'thrombus,' and the process of clotting is called 'thrombosis.' The danger of a thrombus is that part of it may become detached from the main clot and travel up the veins to the heart, whence it may lodge in the lungs or elsewhere, blocking the vessels and forming an 'embolus.' If a thrombus is infected, *i.e.* contains pus-making

micro-organisms, then the embolus that leaves it will be infected also, and the lodgment of such an embolus elsewhere may give rise to an abscess. This is the means of origin of the disease called pyæmia, the chief characteristic of which is the occurrence of abscesses in different parts of the body. Even if a thrombus is not infected the detachment of part if it as an embolus may be fatal from blocking of one of the pulmonary arteries.

In phlebitis the veins of the parts affected are hard, swollen, knobbed, painful and tender. There is stiffness and difficulty of moving the part, and often swelling of the whole limb. There is also fever, and the temperature may be 100° F. or upwards. If the superficial veins are affected, they may be seen of a red or purple colour. In severe cases abscesses may form in the course of the veins, or absorption of putrid matter may take place producing blood poisoning.

Treatment. From what has been said above, it will be understood that the most important thing in the treatment of phlebitis is absolute rest; especially in the early stages before the clot has hardened, when a piece of it may more easily become detached.

Further treatment must depend upon the cause of the particular case. The limb should lie horizontally and be wrapped in cotton-wool. At first it should be moved only with the greatest care, if at all, even for purposes of washing. A period of six to eight weeks must elapse before a clot can be considered firm enough to warrant active movement of the limb; massage should then be undertaken gently.

Vomiting. Vomiting means the return of the contents of the stomach and sometimes of the upper part of the intestine, and is a symptom of disease, not a disease itself. The causes of vomiting may be in the (1) stomach itself; (2) brain; (3) some other organ, which acts reflexly upon the stomach.

(1) When the cause is in the stomach, the affection may be chronic inflammation of that organ, which often gives rise to early-morning vomiting, such as is seen in chronic alcholism. Or acute indigestion or other forms of dyspepsia may cause vomiting. Vomit sometimes mixed with blood may occur also with ulcer of the stomach, or with cancer, or from irritant poisons.

(2) Brain vomiting is seen in the vomiting of infectious fevers, where the circulating poisons excite it, and in Bright's disease, or in diseases of the brain itself, such as tumour, and in meningitis,

epilepsy, or emotion. Such vomiting occurs more easily in children.

(3) Irritation of other organs account for vomiting in sea-sickness, when the organs of equilibrium are disturbed; also in eye-strain, much coughing, appendicitis, cholera, and diseases of the liver, or womb, especially in early pregnancy (*see* p. 477).

The colour, smell, and taste of vomited material are instructive and characteristic. Thus, in cholera the fluid vomited is whitish. In hæmatemesis, or bleeding from the stomach, it is black. In certain diseases implicating the urinary organs the odour is ammoniacal. When there is stoppage of the bowels, fæcal matter is often vomited. When bile is vomited, the taste is acid and bitter, and the colour yellowish. In some forms of dyspepsia, fluid, looking like water and tasting sour, is brought up.

As vomiting is only a symptom, the *treatment* must be devoted to removal of its exciting cause. Vomiting may even be beneficial, as for instance when it is directed to the removal of an irritant in the stomach, and in such cases the effort should be assisted either by washing the stomach out, or by administration of the emetic draught, Prescription No. 30. Where the vomiting itself calls for relief Prescription No. 41 may be given in ounce doses, repeated after half an hour or sooner if vomited. To the first dose 10 minims of liquor morphinæ hydrochloratis may be added with advantage and repeated if vomited.

Worms. There are four common varieties of worms affecting the human intestine in India. Tape-worms and hook-worms occur mostly in adults: round-worms and thread-worms occur both in children and adults. The variety of worm present can be ascertained only by actual observation. In the case of tape-worms and thread-worms, naked-eye observation may show segments of the worm in the former case and complete worms in the latter. In the case of round-worms and hook-worms, though a worm might be seen, yet it is unusual and diagnosis must usually be by the microscope, which will show the eggs of these worms in the fæces.

Tape-worm, of which there are several species, lives in either the large or small intestines, sometimes stretching throughout their whole extent. Its length is therefore sometimes very great, varying from six to twenty feet, or more. It is a flat, ribbon-like worm, of a white colour, from one-third to one-half of an inch

broad at the widest part, and composed of segments or pieces about half an inch long, each segment fitting into the preceding one, and a fully developed worm may number 1100 of these joints.

Each joint possesses a male and female organ, and each worm is therefore a chain of individuals. Towards the head the worm tapers very much and the segments are shorter. The head is triangular in shape, about the size of a pin's head, and is further known by four black spots which are the suckers by which the worm clings to the bowels. The worm increases in length by fresh segments, developed at the neck, while the fully formed segments at the tail drop off, and pass away with the stools. The pieces thus expelled contain myriads of ova in which are embryos provided with a boring apparatus. On the extrusion of the joints putrefaction sets in, liberating the ova, which are carried by wind, water, or other agencies, wherever accident may determine. These ova may be taken into the stomachs of animals, such as pigs or oxen, with their food. When thus swallowed by an animal the egg breaks, and the embryo, by boring, lodges itself in the flesh, there developing into a bladder-like substance or 'cyst,' and causing the affection known as 'pig measles.' The 'measle' when eaten with meat attaches itself to the human intestine, and there grows into the adult worm.

The principal cause of tape-worm is eating underdone infected pork or beef. The flesh of the Oriental pig is particularly dangerous in that respect; hence the hygienic rules of the Jews and Mussulmans. Complete cooking however will destroy any ovum.

The symptoms of tape-worm vary. There may be none. Sometimes there is a loss of weight, sometimes uneasiness or gnawing pain in the bowels, foul breath, or furred tongue. But the most striking thing is the passage of small, white, tape-like segments about half an inch long: there is no mistaking them.

Treatment. Tape-worm is treated by some specific remedy as mentioned below. The reason of success or failure of worm medicines depends much on the manner of taking them: if they reach the worm they kill or at least expel it; if not, they fail. In the case of tape-worm it is particularly necessary that they should reach the head of the worm, for, although many yards of tape-worm may be voided, if the head remains it will grow again, and the old symptoms will return. But the head is exceedingly tenacious of its hold, and is protected by the thick mucus which

the irritation of its presence causes the intestines to secrete. It is therefore necessary that preliminary steps should be taken before giving worm medicines. For two days the patient should be on an entirely milk diet: it will be better still if for the latter half of the second day only clear soup or beef tea is allowed. On the evening of the second day castor oil should be given in dose suitable to the age of the patient. Next morning early, after the castor oil has acted, the specific remedy is to be taken on an empty stomach. For a tape-worm the remedy is Prescription No. 31: an adult may take a dose and a half of the amount here prescribed. The patient must still fast for another three hours, and if at the end of that time the bowels have not acted again, *i.e.* since the worm medicine was taken, he is to take Prescription No. 27. After that he may have a light breakfast. The worm will probably come away with the first motion after Prescription No. 31. The worm should be carefully washed and the head sought for. Sometimes there is more than one worm; and one may be entirely expelled and one remain. If no head is seen, the patient should continue his usual life, watching carefully for re-appearance of segments in the motion. They may reappear in a few weeks, in which case the treatment must be gone through again. If after two or three attempts with male fern (Prescription No. 31), the worm still reappears, some other remedy should be tried, for which purpose it is best to consult a doctor.

Round-worms may exist in any part of the intestines, and even in the stomach, from which they may be vomited or passed by the mouth. They may wander into the nose and frontal sinuses, or, invading the liver, may rarely cause jaundice. They are most common in children from three to ten years of age, who may be infested with one or many. In shape they resemble the common earth-worm, and are of a pale pink, or white colour, and semi-transparent. There is a circular depression behind the head, and the latter presents three small elevations, between which lies the mouth. The symptoms of round-worm are usually none; if any, they are similar to those of tape-worm. The certain proof of the existence of round-worms is the sight of one passed with the stools, or the eggs seen by the microscopic examination of the fæcal matter.

Round-worms do not require, like tape-worms, to complete their life cycle by passing through the body of an intermediary

animal. The ova of the worm, being discharged, are conveyed again into the system chiefly through the medium of insufficiently washed vegetables, also through the water of infected wells and tanks. In dirty persons the food may be infected by the hands and nails.

In the *treatment* of round-worms the same preliminary dietetic and castor oil routine must be gone through as given above for tape-worms. The third morning the specific remedy to be taken is santonin, as contained in Prescription No. 75. The dose of the powder there given is sufficient for a child of four years. Take double that dose for a child of eight, and three times the dose for an adult. The worms can be easily seen if expelled: if there is any doubt as to whether all have come away, a microscopic examination of the fæces should be made to detect the presence or otherwise of ova. If santonin is unsuccessful, male fern may be used as recommended for tape-worm; but santonin should always be tried first.

Thread-worms. Thread-worms are about one-third of an inch long, slightly bent, white and semi-transparent. They almost invariably infest the lower part of the bowels near the fundament, where they create much itching and irritation; but their headquarters, where they principally breed, is much higher, in or about the cæcum. They are not only passed with the fæces, but crawl out during the night on the clothes; they may also excite mucus, or bloody stools. In women they may crawl into the private parts, creating irritation and discharge.

Although most of the worms, including all the males, are in the cæcum, the pregnant females come down to the anus and outside it, to deposit their eggs, and it is this movement that creates such intense itching round the anus, especially at night. Often too there is reflexly produced an itching at the nose, and this itching at two places serves an important purpose so far as the worm's reproduction is concerned. The patient scratches the anus, often in his sleep, and later picks at his nose, or may rub his finger against his mouth. In this way the eggs are conveyed from the anus back to the stomach and so the life history of the worm is maintained.

The *treatment* of thread-worm is easy so far as reduction of their numbers is concerned, but extremely difficult if total eradication is aimed at: since after a few months it will usually be found that they are still present. A diminution of the amount of starchy

food, as bread, rice and vegetables, in the diet will lessen the number of worms, since they flourish best apparently in an excess of such material. Measures should be taken to prevent reinfection from the anus: the child may sleep in closed drawers; or may have a little ointment, half mercury ointment, half vaseline, rubbed on the anus to prevent itching and kill the ova. The worms should be attacked both from above for those in the cæcum, and from below for those lower down. To attack from above, after the preliminary discipline of castor oil and diet given under tape-worm, administer santonin as advised under Round-worms (Prescription No. 75) and in the same doses. This aims at the younger worms. The older forms may be attacked in adult patients by injecting the lower gut daily with 20 grains of quinine dissolved in 8 ounces of lukewarm water, or with a tablespoonful of common salt in 8 ounces of water. Children should be given an enema containing 6 or 8 grains of quinine, or a teaspoonful of salt.

For an account of how to give an enema, *see* Chapter XX. The enema treatment should be continued daily for ten days.

Hook-worms. The scientific name of the hook-worm is the *anchylostoma duodenale.* This worm inhabits the duodenum and upper part of the small intestine.

Hook-worm disease is extremely common in India: in some parts of the country 100 per cent. of the natives are infected. Many Europeans also harbour the parasites. Although visible to the naked eye, the worm is too fine to be seen easily in the fæces unless special search is made. Diagnosis is usually made after microscopical examination of the fæces has discovered the eggs of the worm. Infection is thought to take place through the skin, usually through that of the feet. The symptom of hook-worm disease is anæmia; sometimes severe, sometimes slight. It may be so severe as to cause death; but in India it is usually mild. The best *treatment* for expelling the anchylostomes from the bowel is by means of large doses of thymol: but this is not to be undertaken without close medical supervision. Another method, though less efficient, is, after preliminary dietetic treatment, as described under tape-worm, to use the following medicine: oil of eucalyptus 30 minims, chloroform 45 minims, castor oil 10 drachms. Take half of this first thing in the morning, the other half after thirty minutes. Repeat this on three or more successive days. After that the stools should be re-examined to see if ova have disappeared.

CHAPTER VII

POISONING

THE instructions here given for action in a case of suspected poisoning are of the tersest, because reference to this chapter is likely to be made only in emergency, when time is all valuable and the presence of too many directions may confuse more than it helps. Only in the case of snake-bite are the directions more explicit; because, snake-bite being a common fear in some parts, that section is likely to be read before necessity for its use arises. If further instruction is required on details of the treatment recommended in the case of some poisons, it can be found by reference to other parts of the book: thus 'Artificial Respiration' will be found described on p. 284 and the method of washing out the stomach on p. 617.

POISONS AND THEIR TREATMENT

Emetics. When an emetic is ordered, one of the following may be employed, unless a special emetic is mentioned:

(*a*) Mustard and water.—A tablespoonful of mustard stirred up in two-thirds of a tumbler of lukewarm water.

(*b*) Sulphate of zinc.—Thirty grains dissolved in half a tumbler of lukewarm water.

(*c*) Warm water.—Given copiously alone or after one of the above.

(*d*) Mechanical stimulation of the sides and back of pharynx with finger or feather.

Demulcent Drinks. When demulcent drinks are ordered, one or more of the following may be given:

(*a*) Linseed-tea.

(*b*) Barley-water.

(*c*) Milk.

(*d*) Compound almond mixture.

Scorpion-sting. The pain is at first like a prick from a needle, but in a few seconds it assumes an agonising form, as if many needles were being thrust into the part, and it also shoots up towards the body, reaching a climax in about ten minutes. The parts injured swell; frequently the absorbent vessels (*lymph vessels*) running from the sting are implicated, as evidenced by a red line seen in the skin; and the joint above the part feels stiff. Death from scorpion-sting has been recorded, but to a person in good health such injuries are not dangerous. The best treatment is the hypodermic injection of cocaine, ¼ grain, around the site of the sting. After that ammonia may be applied to the part; and then cold applications such as crushed ice or evaporating lotion (*see* p. 584) for the rest of the day. Next day hot fomentations should be applied, and 1 ounce of Prescription No. 27 taken.

Snake-bite. Snakes inject their poison through punctures made by two prominent upper teeth, the fangs: the tongue of the snake, which so many people seem to think poisonous, is harmless. The bites of poisonous snakes, as a rule, show two marks thus, ·· When there are more than two marks, ⁝⁝ it may be safely assumed that the reptile was not poisonous, or that the wound has not been inflicted by the poison-fangs. The parts most frequently bitten are the fingers, toes, ankles, and hands, and the person, if asleep, is aroused by the pain, which is of a stinging character, but not very severe at first. Thereafter the symptoms are somewhat different according to the kind of snake. There are two principal families, the *Colubrine*, of which the best-known example is the cobra, and the *Viperine*, of which a good example is the Daboia or Russell's viper. The action of colubrine poison is chiefly on the nervous system, causing paralysis and being fatal by its paralytic action on the breathing centre; to a less degree colubrine poison acts on the blood. The action of viperine poison is chiefly on the blood, which it prevents clotting; to a less extent it acts on the nervous system. The existence of this difference is the reason for making antivenene out of a mixture of both kinds of poison, so that whatever snake makes the bite the antivenene will have some action against its poison. In the case of the cobra or other colubrine bite, after the initial pain at the seat of the bite, faintness, sickness, loss of power in the legs, drowsiness, and perhaps vomiting are the next immediate effects. Then the breathing becomes short and laboured, the pulse quick and intermittent, the powers of speech and swallowing

Name of Poison	Symptoms	Treatment
Aconite. Vernacular: mithazahar, bish.	Numbness and tingling of the tongue and lips, burning of the throat, spitting, 'hawking,' frothing at the mouth, vomiting, pupils dilated, but contracting on exposure to strong light, delirium, stupor, paralysis, insensibility, convulsions.	*Immediate.* Stomach-tube or emetic; hypodermic injection of tincture of digitalis, 20 min. *Later.* Brandy, warmth, friction; artificial respiration.
Alcohol. Vernacular: Sharáb.	Face flushed, pupils dilated, confusion of thought, bounding pulse, vacant expression, coma; often vomiting.	*Immediate.* Stomach-tube or emetic; cold to head. *Later.* Hot strong coffee, warmth, artificial respiration.
Almonds, Essential Oil of Bitter.	As for Hydrocyanic Acid.	As for Hydrocyanic Acid.
Ammonia.	As for Caustic Potash.	As for Caustic Potash.
Antifebrin.	As for Antipyrine.	As for Antipyrine.
Antimony, Salts of. Such as tartar emetic.	Burning heat, choking in throat, nausea, incessant vomiting and purging, pain in belly, cramps, collapse.	*Immediate.* Encourage vomiting by draughts of warm water. Give emetic if no vomiting; tannic acid, 1 dr.; strong tea or coffee. *Later.* Demulcents; brandy, opium, warmth.

Antipyrine.	Vomiting, face blue, profuse sweat, collapse; sometimes a rash.	Warmth; tincture of digitalis, 20 min., hypodermically; brandy; artificial respiration; recumbent position.
Arsenic and its Salts. Vernacular: sunkiah, sufed sumbul.	As for Antimony.	*Immediate.* Stomach-tube or emetic, followed by a mixture of oil and lime-water, soap suds, milk, flour-and-water, powdered charcoal in water, or Wyeth's dialysed iron in large quantity, 2 or 3 oz. followed by very weak rust scraped off iron. *Ferric hydrate*, which must be fresh and can be prepared as follows: *Tincture of perchloride of iron* ℥ iss, *water* ℥ iii: to which add *carbonate of soda* (washing soda)) ℥ ss; *water*, ℥ iv. This dose should act as an antidote to 5 gr. of arsenic, and may be repeated as necessary. *Later.* Demulcents, brandy, opium; hot fomentations to belly.
Atropine.	Throat and skin dry, skin flushed, no urine passed, pulse quick, pupils dilated, delirium, often purging and raised temperature. Headache, faintness, dimness of sight, giddiness, thirst, excitement, voluble talking, laughter, fatuity, insensibility, stertorous breathing, frothing at the mouth.	*Immediate.* Stomach-tube or emetic; hypodermic injection of pilocarpine nitrate, $\frac{1}{8}$ gr.; hypodermic injection of morphine sulphate, $\frac{1}{4}$ gr. *Later.* Brandy, hot coffee, warmth; artificial respiration.

Name of Poison	Symptoms	Treatment
Belladonna. As Nightshade berries.	As for Atropine.	As for Atropine.
Benzol.	Delirium, contracted pupils, coma, great weakness, difficulty of breathing.	*Immediate.* Stomach-tube or emetic. *Later.* Brandy, inhalation of ammonia.
Bichromate of Potash.	Vomiting, dilated pupils, cramps, insensibility.	*Immediate.* Stomach-tube; chalk in milk. *Later.* Demulcents, olive oil, warmth; opium and stimulants if necessary.
Calabar Bean.	Vomiting, muscular tremors, slow pulse, contracted pupils.	*Immediate.* Stomach-tube or emetic. *Later.* Hypodermic injection of liquor atropinæ sulphatis, 2 min.—to be repeated; or tincture of belladonna, 20 min., by the mouth; brandy, sal volatile.
Camphor.	Excitement, dilated pupils, delirium, convulsions.	*Immediate.* Stomach-tube or emetic. *Later.* Inhalation of sal volatile; subcutaneous injection of brandy; warmth.
Cannabis. Vernacular: gunja, bhang, hashish.	Appears like a drunken person, fits of laughing, alternating with intervals of stupidity, which gradually increase to insensibility. At times violent mania.	Stomach-pump or emetic; treat symptoms as they arise.

Cantharides. Blistering fluid; Spanish fly.	Burning pain in throat and stomach, vomiting and diarrhœa. Incessant desire to pass water. Headache, quick pulse, convulsions.	1. (*a*) If patient is seen shortly after poison is swallowed and mucous membranes are not yet blistered, use stomach-tube; (*b*) if throat blistered, produce emesis with apomorphine hydrochloride (hypodermic), $\frac{1}{10}$ gr. 2. (*a*) White of egg in water or barley-water, or (*b*) thick gruel. 3. Stimulants. 4. Relieve pain with morphine sulphate (hypodermic), $\frac{1}{3}$ gr. 5. Avoid oils and fats.
Carbolic Acid. Phenol.	(*a*) Pain in mouth, throat and belly. Intense thirst, vomiting of altered blood, brown or black, and of mucus. Profound collapse, skin pale; cold and clammy; eyes sunk and wild-looking; temperature subnormal, respiration laboured. (*b*) Lips and mouth white and hardened, urine greenish.	No emetic; but, if a soft rubber tube can be carefully introduced into the stomach, wash it out well with solution ($\frac{1}{2}$ oz. to a pint of water) of sulphate of magnesia (Epsom salts) or sulphate of soda. Failing this, let these solutions be swallowed: olive oil, milk, white of egg freely given will act well after the poison, if just swallowed, is removed from the stomach. Where there is failing of heart and weak respiration, hypodermic injections of strychnine—hot saline solution by the rectum—artificial respiration; brandy.
Caustic Potash.	As under (*a*) for Carbolic Acid. Also purging, weak and rapid pulse.	*Immediate.* Do *not* use stomach-tube or emetic; give freely vinegar and water, lemon juice, orange juice. *Later.* Demulcents, olive oil, warmth, opium; brandy subcutaneously.

Name of Poison	Symptoms	Treatment
Caustic Soda.	As for Caustic Potash.	As for Caustic Potash.
Chloral.	Skin cold, temperature subnormal, pulse and respiration slow, deep coma.	*Immediate.* Stomach-tube and emetic; prevent sleep by wet towel to face, head and neck, hot blankets, hot bottle to feet. *Later.* Hot strong coffee, artificial respiration; hypodermic injection of liquor strychninæ hydrochloratis, 4 min.
Chlorodyne.	As for Opium.	As for Opium.
Chloroform. Inhaled.	Respiration ceases, pupils dilate, pulse ceases.	*Immediate.* Clear the throat, pull forward the tongue, place head lower than the body; fresh air; artificial respiration; inhalation of nitrite of amyl; hypodermic injection of liquor strychninæ, 5 min., and of adrenalin hydrochloride, 1 in 1000, 10 min.
Chloroform. Swallowed.	As for Alcohol.	*Immediate.* Emetic and stomach-tube; cold water to face; nitrite of amyl inhalation; artificial respiration.

Cocaine.	Pale, pul tin	ldine and	fainting, quick ıvulsions some-	*Immediate.* Stomach-tube, brandy ; inhalation of amyl nitrite, and of ammonia ; hypodermic injection of ether ; artificial respiration. *Later.* Potassium bromide.
Colchicum.	Griping ir times l pinchec	›miti ned eak ;	purging, some- .tter ; features ay be delirious.	*Immediate.* Stomach-tube or emetic. *Later.* Demulcents, stimulants, strong tea, tannic acid, warmth ; artificial respiration.
Conium. Hemlock.	Weakness of l pupils dilat nes ; ret	diffi ›ss o	:y of breathing, ght, conscious-	*Immediate.* Stomach-tube or emetic ; liquor strychninæ hypodermically. *Later.* Strong tea, warmth, brandy ; artificial respiration if necessary.
Copper, Salts of. Verdigris, blue vitrio	Vo ing ; vati (vuls	or l pu a.		*Immediate.* White of egg and warm water ; stomach-tube or emetic if vomiting has not occurred. *Later.* Demulcents, morphine or tincture of opium and hot fomentations if much pain.
Corrosive Sublimate.	As · Me	lts of		As for Mercury, Salts of.
Croton Oil.	As · Co			As for Colchicum.
Cyanide of Potassium.	As · Hy			As for Hydrocyanic Acid.
Datura.				As for A

Deadly Nightshade.			As for Atropi
Digitalis.		g and p onvuls ular, p	g, h co dila	*mmediate.* Stoma h- be or emetic. *ater.* Strong tea or coffee in abundance, brandy, warmth, recumbent position for long time ; an aperient
Emerald Green.	or Ar			As for Arseni
Elaterium.	As for Colchicum.			As for Colchic
Ergot.	Vomiting, giddiness, disturbances of vision, loss of sensation in hands and feet, spasms, convulsions.			*mmediate.* ch-tu ic ; amyl nitrit ation *ater.* Branc l vol ea, aperient.
Eserine.	or C			As for Calaba n.
Ether (inhaled).	or (| ıaled).		As for Chloroform (inhal
Fungi, Poisonous.	rst, ent	ing, p coma n, pup		*Immediate.* Emeti or stomach-tube ; tincture of belladonna, 15 min., by mouth, sal volatile. *Late* dants, aperient.

Gases, Poisonous. Acetylene, carbon dioxide, carbon monoxide, coal gas, marsh gas.	Giddiness and singing in ears, loss of muscular power, pupils dilated, violent action of heart and breathing, convulsions, coma, or asphyxia.	Fresh air, artificial respiration, ammonia to nostrils, warmth and stimulants, cold douche to head and chest.
Henbane (Hyoscyamus).	As for Atropine.	As for Atropine.
Hydrochloric Acid. Spirits of Salt.	Pain in mouth, throat and belly; intense thirst, vomiting of altered blood, brown or black, with mucus and shreds; profound collapse, skin pale, cold, clammy; face blue, eyes sunk, pulse fast and weak, breathing laboured, temperature subnormal.	*Immediate.* Do *not* give stomach-tube or emetic; give soap and water, chalk, plaster off the wall, magnesia, carbonate of soda with *plenty* of water. *Later.* Demulcents, olive oil, white of egg, morphine, $\frac{1}{8}$ gr., hypodermically.
Hydrocyanic Acid. Prussic Acid.	Symptoms come at once: giddiness, loss of power, insensibility, panting breath, may be convulsions, profound collapse, skin cold, clammy, eyes fixed, pupils dilated, pulse imperceptible, breath may smell of bitter almonds.	*Immediate.* This poison is very rapid; dash cold water over head and chest, give emetic or promote vomiting by tickling back of throat, inhalation of ammonia, brandy, artificial respiration, hydrogen peroxide.
Iodine.	Pain in throat and stomach, yellow vomit, purging, thirst, giddiness, faintness.	*Immediate.* Emetic and stomach-tube. *Later.* Starch and water, demulcents, morphine sulphate, $\frac{1}{8}$ gr., hypodermically.
Iodoform.	Giddiness, vomiting, rapid pulse, dilated pupils, drowsiness, hallucinations, delirium; symptoms vary much.	Starch and water, demulcents, warm baths, sodium bicarbonate.

Name of Poison	Symptoms	Treatment
Lead, Salts of.	Metallic taste, dry throat, intense thirst, griping pain, may be vomiting, giddiness, convulsions, coma.	*Immediate.* Stomach-tube or emetic; dilute sulphuric acid, ½ oz. in water; magnesium sulphate, ½ oz. in water. *Later.* Demulcents, white of egg, aperients, stimulants.
Mercury and its Salts. Corrosive sublimate, white precipitate, red precipitate, vermilion.	Metallic taste, pain in stomach, vomiting and purging of mucus and blood, skin cold and clammy, pulse feeble and fast.	*Immediate.* First give white of egg, and milk or water; then stomach-tube or emetic. *Later.* Demulcents, stimulants, tincture of opium, 20 min. in water.
Nicotine. Tobacco, weed killer.	Depression, giddiness, nausea, vomiting, cold clammy sweat, loss of consciousness, sighing breathing, coma.	*Immediate.* Stomach-tube or emetic; stimulants, warmth, artificial respiration; strychnine hypodermically. *Later.* Stimulants.
Nitrate of Silver.	Pain in throat and stomach, vomiting of white matter, turning black on exposure to light.	*Immediate.* Two tablespoons of common salt in milk or water; repeat if necessary, then give emetic. *Later.* Demulcents, tincture of opium, 20 min.
Nitric Acid.	As for Hydrochloric Acid.	As for Hydrochloric acid.

Nitroglycerine.	Violent headache, sleep; sometimes vomiting and purging.	*Immediate.* Recumbent posture, cold affusion. *Later.* Hypodermic injection of liquor atropinæ sulphatis, 2 min.
Opium. Battley's solution, chlorodyne, codeine, dionin, Dover's powder, heroin, laudanum, morphine, nepenthe, paregoric. Vernacular: afeen, amal.	Preliminary stage of mental excitement, followed by giddiness, drowsiness, stupor, succeeded by total insensibility and stertorous breathing, skin cold, face pallid, eyes closed, pupils contracted; sometimes smell of opium about breath.	*Immediate.* Stomach-tube or emetic; wash out stomach at half-hour intervals with solution of potassium permanganate, about 10 gr. to a tumbler of water; dash cold water on face; ammonia or nitrite of amyl to nostrils. *Later.* Hot strong coffee, liquor strychninæ 2 min., hypodermically; artificial respiration if necessary.
Oxalic Acid. Salts of Lemon.	As for Hydrochloric Acid.	*Immediate.* Do *not* give stomach-tube or emetic; give chalk or whiting and water, wall plaster, a pint of lime water, milk. *Later.* Brandy, castor oil.
Paraffin. Petroleum, petrol.	Burning pain in mouth and stomach, vomiting, matter has odour of paraffin, thirst and restlessness, breath smells of oil, body cold, face pale, pulse feeble, respiration sighing; may be coma.	*Immediate.* Stomach-tube or emetic; hypodermic injection of strychnine. *Later.* Stimulants, warmth.
Phenacetin.	As for Antipyrine.	As for Antipyrine.

Name of Poison	Symptoms	Treatment
Phosphorus. Rat paste, matches.	Few hours after taking: burning pain, thirst, vomiting of blood and material that is phosphorescent in the dark. If death does not occur now, after 2 or 3 days' interval there ensues jaundice, enlargement of liver, great prostration, cold sweat, twitchings, coma.	*Immediate.* Stomach-tube or emetic; a good emetic is copper sulphate, 3 gr. dissolved in 4 oz. of water, every five minutes till vomiting induced; then every fifteen to thirty minutes as an antidote. *French* oil of turpentine or sanitas, ½ oz. in mucilage every half hour; magnesium sulphate, ½ oz. *Later.* Avoid oils and fats; opium.
Pilocarpine.	As for Calabar Bean.	As for Calabar Bean.
Picrotoxin.	Vomiting, purging, dimness of vision, convulsions.	*Immediate.* Emetic or stomach-tube; chloral. *Later.* Potassium bromide; chloral.
Potash Caustic.	*See* Caustic Potash.	*See* Caustic Potash.
Ptomaines.	*See* p. 103.	*See* p. 103.
Rat Pastes.	As for Phosphorus or Arsenic.	As for Phosphorus or Arsenic.
Resorcin.	As for Antipyrine.	As for Antipyrine.
Salts of Lemon.	*See* Oxalic Acid.	*See* Oxalic Acid.

Santonin.	Vomiting, diarrhœa, dilated pupils, yellow vision, convulsions.	*Immediate.* Stomach-tube or emetic; stimulants; if convulsions, chloral and potassium bromide. *Later.* Stimulants.
Savin.	Vomiting, diarrhœa, bloody urine, suppression of urine.	*Immediate.* Emetic. *Later.* Demulcents, castor oil, opium.
Scorpion.	*See* p. 233.	*See* p. 233.
Silver, Salts of.	As for Nitrate of Silver.	As for Nitrate of Silver.
Snake.	*See* p. 233.	*See* p. 247.
Soda, Caustic.	*See* Caustic Soda.	*See* Caustic Soda.
Sorrel, Salts of.	As for Oxalic Acid.	As for Oxalic Acid.
Stramonium.	As for Atropine.	As for Atropine.
Strychnine. Nux vomica, vermin killer, brucine.	Feeling of suffocation, convulsions with short intermissions causing sweating and exhaustion, distortion of face, staring eyeballs, fixed chest, arched back, consciousness retained.	*Immediate.* Wash out stomach at half-hour intervals with potassium permanganate in warm water; emetic and stomach-tube; apomorphine hypodermically, potassium bromide, 1 drachm in water every half hour, inhalation of chloroform to control convulsions. *Later.* Inhalation of chloroform if convulsions are severe; artificial respiration.

Name of Poison	Symptoms	Treatment
Sulphonal.	Pain in stomach, vomiting, confusion of mind, partial paralysis, suppression of urine, profound collapse, unconsciousness.	*Immediate.* Stomach-tube or emetic; stimulants, strychnine hypodermically. *Later.* Warmth, artificial respiration, recumbency.
Sulphuric Acid.	As for Hydrochloric Acid.	As for Hydrochloric Acid.
Tartar Emetic.	*See* Antimony, Salts of.	*See* Antimony, Salts of.
Tin, Salts of.	Vomiting and purging.	*Immediate.* Emetic and stomach-tube; milk or white of egg. *Later.* Demulcents.
Trional.	As for Sulphonal.	As for Sulphonal.
Turpentine.	Smell of turpentine in breath, noisy breathing, contracted pupils, convulsions, coma; urine smells like violets.	*Immediate.* Emetic or stomach-tube; demulcents. *Later.* Magnesium sulphate, 1 oz. in water; opium.
Veronal.	As for Sulphonal.	As for Sulphonal.
Zinc, Salts of.	Pain in throat and stomach, lips and mouth corroded; blood-stained vomit, rapid pulse, convulsions, coma.	*Immediate.* Do *not* use stomach-tube or emetic; large draughts of white of egg and milk, carbonate of sodium or potassium in large quantities in warm water. *Later.* Demulcents, strong tea, warm fomentations, tincture of opium.

are lost, the tongue protrudes, and frothy saliva issues from the mouth. Twitchings of the muscles also occur, followed by loss of power to move the limbs. The pain from the wound extends upwards towards the body; the absorbent vessels become inflamed, appearing on a fair skin as painful red lines stretching up from the wounded part towards the groin or armpit. Cold sweats and often convulsions succeed, and the patient, becoming insensible, sinks, sometimes in a few hours. More commonly, however, the case is prolonged several days, blood-poisoning occurring. The wound becomes discoloured, the limb swells, blisters may form near the injured part, abscesses may occur in any part of the limb, and the glands of the armpit or groin (according to the limb injured) enlarge, inflame, and suppurate. Sometimes there is diarrhœa, at other times bleeding from the snake-bite, or from scarifications made in the neighbourhood. In some cases there is also bloody urine, or bleeding from the nose, bowels, or gums. The depressing effects of fear will aid the operation of the poison; and the symptoms will be more or less intense, according to the amount of venom inserted into the wound.

In the case of viperine bite, though the nervous symptoms are, as a rule, less marked than in the colubrine, convulsions are often present early in the case. The principal action is on the blood, however, and the effect here depends partly on the dose of poison injected. If that has been large then death may be very rapid, and is then due to abnormal clotting of the blood in the vessels; especially in the large pulmonary arteries. If the patient survives this stage there ensues later a condition where the blood has lost its power of coagulation, and so the wound at the bite may ooze blood continuously, hæmorrhage may start from mucous membranes and elsewhere and nothing may be able to stop the patient bleeding to death.

One of the first things to do after snake-bite is to secure the snake: it is important that the species be identified, above all to ascertain whether it be a poisonous snake or not.

Treatment. The first thing to do if the bite is from a poisonous snake is to ligature the part above the bite *immediately*. If the bite is anywhere on the limbs, tie a tight bandage or string round the limb, a few inches *above* the wound. The ligature should be tight enough to arrest the circulation, which may be known by the part below becoming red, and then darker coloured. Then let the

wound be *well* incised and solid permanganate crystals placed directly into the wound. A solution of potassium permanganate in water should also be made, and about 2 grains of the permanganate in solution injected into two or three spots round the wound by means of a hypodermic syringe or else by the antivenene syringe, which should also be at hand. If there is no potassium permanganate at hand at the time, a substitute for it is chloride of gold, which may sometimes be found in the equipment of photographers: it should be used similarly to the permanganate. If there is nothing available for this local treatment the wound should be well sucked; care being taken that the person performing this office has no sore on the mouth or lips; or, if a ligature cannot be applied (as, for instance, if the body is bitten), let the wound be sucked first. For neutralisation of the poison in the body antivenene should be used as early as possible; an account of what antivenene is and how to use it is given below. Antivenene should always be in stock in snake-infested districts, while those leading a life that takes them much into the jungle should carry on them one of the small potassium permanganate and lance equipments sold for the purpose of dealing with snake-bites. To sum up the treatment:

(1) Act as promptly as possible.

(2) Ligature the part above the bite.

(3) Incise the wound, and rub into it solid potassium permanganate crystals.

(4) Inject potassium permanganate solution into tissues round wound.

(5) Inject antivenene.

Antivenene and How to Use It. Antivenene is the serum of horses highly immunised with cobra and Russell's viper venom.

Its curative properties have been tested on animals against these venoms and found effective.

In a case of cobra or Russell's viper bite, when the patient is seen early and before symptoms have set in, 30–40 ccm. should be injected subcutaneously into any part of the body where the skin is loose (preferably in the flanks). When the snake is a large one it would be advisable to give more.

Children and small persons require a larger dose of antivenene to save them than well-grown adults.

The syringe and needle should also be made sterile before use.

For practical purposes filling and refilling a few times with boiling water is quite sufficient. Time being a most important item, it is not advisable to waste it. The skin over the seat of inoculation should be washed with an antiseptic lotion beforehand if such is quickly available.

TO OPEN THE BOTTLE. Heat the narrow neck in a flame, rotating the bottle at the same time so as to heat the glass all round. Then jerk up some of the fluid contents. The cool liquid coming in contact with the heated glass will crack the latter, when the top may be knocked off by a gentle tap with a sterilised forceps or other metal instrument. To withdraw the contents, turn the newly opened bottle boldly upside down ; the hole in the neck being so small the fluid will not run out. Insert the needle of the syringe. Withdraw the piston of the syringe and the fluid will enter in the ordinary way.

The bottles should be kept in a cupboard or press in the coolest room available and should not be exposed to the light.

Heat and light are the most important factors in bringing about a deteroriation in the strength of the antitoxic properties of the serum.

When kept in the dark and in a fairly cool place the serum loses very little of its antitoxic properties in a year—probably not more than 5 to 10 per cent., if as much. An increase of dose would make up for this loss.

With the exception of applying a ligature above the seat of the bite (where this is possible) and adopting the permanganate of potash treatment, no other form of local treatment does much good.

It is also a mistake to dose the patient with alcohol, ammonia, or strychnine. Hot coffee or tea cannot possibly do any harm, and may do some good.

A ligature applied early above the seat of bite produces œdema, and in this way prevents the absorption of some of the poison, or at least delays it from entering the general circulation. More time may thus be gained for the administration of antivenene before symptoms of poisoning have already set in.

The above instructions are those given by the Central Research Institute at Kasauli ; from whom as well as from the Bombay Bacteriological Laboratory antivenene may be purchased.

CHAPTER VIII

ACCIDENTS AND SURGICAL EMERGENCIES

THE following articles will be required in the medicine chest for use in surgical cases :

(1) A surgeon's clasp knife with two blades, all metal, to be used for opening abscesses.

(2) A pair of dressing forceps, used for taking off dressings, seizing foreign bodies, &c.

(3) A director, a deeply grooved piece of thick silver wire, used to guide the knife when opening an abscess. It may also be used as a probe to ascertain the depths of wounds or if foreign bodies are present or not.

(4) A gum lancet, this has a small cutting surface projecting near the end, used for lancing the gums.

(5) A pair of scissors with blunt pointed ends.

(6) Absorbent cotton-wool, a half-pound packet, used for dressings and instead of sponges for wounds.

(7) Boracic lint, ½ pound, used for dressing wounds. Plain lint or old linen that has been boiled will do almost as well.

(8) A curved needle ; this is a bent, flat-shaped needle used for stitching wounds.

(9) Ligature silk, used for sewing up wounds and tying bleeding blood-vessels. Strand of hair from a horse's tail may be used instead.

(10) Adhesive plaster, used for strapping splints, &c. This may be bought in convenient rolls and in a width of 1½ inches. Narrower strips, when required, can be cut from this.

(11) A thermometer.

(12) Catheters, flexible (*see p.* 253).

(13) Bandages, triangular and roller (*see* p. 256).

(14) Antiseptics, which are chemical bodies used for the pro-

tection of wounds from infectious germs and for the destruction of germs already present. The following antiseptics are the most generally useful and are efficacious. Their use will be indicated under treatment of various wounds. They are :

(*a*) Carbolic acid—4-ounce bottle of the crystals.
(*b*) Tincture of iodine—1-ounce bottle.
(*c*) Permanganate of potassium crystals—1 ounce.
(*d*) Boracic acid—2 ounces.

(15) The two small books published by the St. John Ambulance Association, St. John's Gate, Clerkenwell, London, E.C., price 1*s.* each, entitled (*a*) " First Aid to the Injured " and (*b*) " Hints and Helps for Home Nursing and Hygiene."

ANTISEPTICS AND THEIR USE : SURGICAL DISINFECTION

All wounds heal readily if they can be kept free from organisms. The common organisms which are apt to infect wounds are the pus-producing germs, and it is the object of the use of antiseptics to prevent the entrance of such organisms and to stop their growth and kill them if they have already gained admittance. Another organism, which is especially to be guarded against in wounds received in or near the stable, and also in cities, is the bacillus of tetanus (or lock-jaw). Accidental wounds are in all case to be considered as already infected, and the first aim of the surgeon, as soon as it is ascertained that the bleeding, if any, has ceased, is to prevent further infection. This is done by tightly covering the wounds with the cleanest material at hand, for example, a handkerchief or the inside page of a book, and tightly binding these on. At a later time, but as soon as possible, the wounds should be thoroughly disinfected by an antiseptic. When a wound is deliberately made, as when an abscess is opened, infection is prevented by disinfecting the skin and with cleansed hands using a knife and forceps, which have been boiled. Disinfection is most important in all surgical work and can be efficiently carried out by the use of boiling water together with the three chemicals—carbolic acid, tincture of iodine, and potassium permanganate—recommended.

Boiling Water. A few minutes in this will serve to disinfect the knife and forceps, also to disinfect pieces of cotton-wool to be used as swabs or sponges, ligatures and material, such as lint and gauze, used for dressings. After boiling for five minutes the water may be poured off and the instruments, &c., tilted into a basin containing antiseptic lotion; they should not be touched with the hands.

Carbolic acid added to water in the proportion of ½ ounce to 10 ounces makes a solution of 1 in 20, which may be used to wash out wounds at the first dressing. A swab of disinfected cotton well soaked in this lotion and applied to all parts of the wounds will efficiently cleanse the most dirty fresh wound. A weaker solution of 1 in 40, *i.e.* ¼ ounce to 10 ounces of water, is sufficiently strong to use at the secondary dressings of a wound. (*Caution.* A wet dressing, if soaked in strong carbolic lotion, should never be left on a wounded finger or toe for more than 2 hours at a time unless free evaporation is allowed. Such a dressing, if covered with gutta-percha tissue, may lead to death of the part, if not attended to.)

Pure carbolic acid may be used in the case of a small dirty wound, especially in a wound dirtied by manured garden earth or received in a stable (*see also* Dog bite). The application makes the part smart a good deal, but this quickly passes off, and should be made by winding a piece of cotton-wool round the end of a twig, dipping this probe into the pure acid and then applying it to the wound.

Tincture of Iodine. By means of a camel-hair brush or cotton-wool probe this chemical should be applied to all abrasions of the skin. The slight smarting immediately passes off. To larger wounds it may be applied with an equal part of water and the skin around painted with the undiluted tincture. In a strength of one teaspoonful to 20 ounces of water the lotion may be used as a mild antiseptic to wash healing wounds or to wash out an abscess-cavity.

Potassium Permanganate (*see* Snake-bite and Cholera). In the strength of 10 grains to 10 ounces of water the lotion is useful as a mild antiseptic wash to wounds. In the absence of tincture of iodine all abrasions of the skin should be thoroughly washed in a solution of this substance. (On account of its non-poisonous quantities it is sufficient to pack up a pinch of the crystals and throw them into a bowl of water.)

Boracic Acid. The powder may be dusted on drying wounds as a dressing. As a solution of 20 grains to the ounce of water it is useful as a mild antiseptic lotion to wash wounds.

Catheters, Flexible. Catheters are instruments for drawing off the urine, and three, of different sizes, of the flexible—not metallic—kind should be carried in the medicine chest. The use of silver or metallic catheters, or of flexible catheters with the wire inserted, requires special surgical skill and should not be attempted. The size of the catheters recommended for the travelling chest are those known as Nos. 2, 4, and 8. But as flexible catheters are liable to get stiff and break from age and heat, their condition should always be carefully examined before being used. It sometimes happens after accident, as, for instance, fractured thigh, or from spasmodic stricture (*see* p. 367), that the person cannot make water and may require the catheter. And, although this is an operation demanding surgical skill, it will be better for it to be attempted without special skill than for the patient to be left without endeavours towards relief and exposed to the risk of the urinary passages bursting, often with fatal consequences.

By attention to the following directions, and with a flexible catheter, injury can scarcely be inflicted. The wire should be taken out of the catheter, and the latter should be soaked in warm antiseptic solution, then dried and oiled. If the water is too hot the instrument will become too soft to pass without the wire. The patient should lie on his back with the head and shoulders raised and the knees elevated and separated. The operator should stand on the left side of the patient. Next, let the head of the penis, after it has been washed with antiseptic lotion, be grasped with the fingers and thumb of the left hand and the organ extended upwards and forwards. Next hold the catheter in the right hand and insert the point into the orifice of the urinary passage; then press gently, steadily on, and the instrument, in the absence of permanent stricture, will pass into the bladder, and urine will probably flow. The passage is between 8 and 9 inches long; and if, when the instrument has been passed so far, urine should not flow, the catheter should be withdrawn for about an inch. If urine is still absent, the probability is that the eye of the instrument is stopped

up and requires cleansing. After use the instrument should be carefully washed and syringed out with hot water and carbolic solution (*see* Antiseptics).

A condition known as catheter shock or collapse (*see* p. 273) sometimes follows the passing of an instrument. The person may be merely faint, or there may be more decided symptoms of collapse. The treatment should be as for collapse. Sometimes a shivering fit occurs after the passage of an instrument, followed by fever, pain in the back, loins and limbs, and perspiration. To this condition the term catheter fever has been applied. Treatment as for any other septic fever.

The Immediate and General Treatment of Accident and Injuries or First Aid. (Reference is strongly advised to the St. John Ambulance Association book entitled "First Aid to the Injured," the contents of which should be at the fingers' ends of all who wish to be prepared to render help to their fellows. What here follows is complementary to the advice and instructions contained therein.)

(1) First of all see if there is bleeding; if so, see where it comes from and follow the directions given under Bleeding (p. 262).

(2) The history of the accident (if possible). This may be ascertained by a few clear questions, addressed to the patient if he is sensible and able to speak, or, otherwise, to the bystanders.

(3) If the patient is insensible, place him on the ground or floor, lying rather on the right side and with the head raised to the level of the body by a pillow, folded coat, or other soft substance. This will render the breathing more easy than it would be if the patient lay on the back. Then split open or unbutton any clothing pressing upon the neck, chest, or bowels.

(4) The face and chest should be sprinkled with cold water and then wiped dry, and some cold water may be drunk if the power of swallowing remains. Wine or brandy should not be hastily given without evidence of its being needed, especially if there is bleeding. Strong hot tea or coffee or milk are safer and of more general use as stimulants than spirits. Other methods of immediate stimulation are: (*a*) Sal volatile, a half-teaspoonful in a little water, when the patient can swallow. (*b*) Rigorous friction of the limbs upwards. (*c*) A hot bottle or hot fomentation to the pit of the stomach or over the heart.

(5) The prominent parts of the limbs may be examined with

very little movement of the body, and any change of form will probably be recognised by the eye after the clothing has been taken off, which should be accomplished by cutting open, not pulling off. If necessary to remove clothing, do so first from the uninjured side, and carry out the following rules :

Coat. Remove from the sound side first, and if necessary slit up the seam of the sleeve on the injured side.

Shirt and Vest. Slit down the front and remove as the coat.

Boot. Undo the laces and slit the back seam.

Sock. Cut off.

(6) If there be local injury, it should be treated, if possible at once, as described under the different headings.

(7) Allow no useless talking to or in the hearing of the patient,

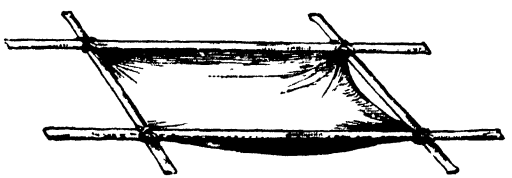


FIG. 11

and send away all except those necessary for his attendance. See that he has plenty of fresh air.

(8) In all cases of serious injury aid should be procured immediately. When sending for a surgeon the message should be as clear as possible, and if practicable a written one.

(9) If it is necessary to remove a person after injury in which a limb has been injured, means must first be taken to protect the injured limb, especially in a fracture of the lower extremity. The measures necessary are detailed under " Fractures." The greatest possible care is necessary when a fracture of the spine or pelvis is suspected.

After any injury of a severe nature, where it is necessary to move the patient, the person should be carried while lying down. An exception to this rule is injury to the arm or forearm. A hurdle, shutter, door, or *charpai* (string bedstead) covered with straw, coats or blankets, may be converted into a litter. If poles are procurable, they may be fixed beneath each end of the litter, which will thus be carried long distances more easily. If neither hurdle,

door, *charpai*, nor shutter can be obtained, a good substitute may be made by fastening four stout poles together and tying a blanket securely to them (*see* Fig. 11). Even the cross poles can be dispensed with.

The foot of the litter should be placed at the patient's head in a line with his body. Two people should then place themselves one on either side of the patient, and join hands underneath the body and hips. Another person should take charge of the injured part. The patient should be then lifted, carried backwards over the litter, and lowered on to it. The litter should be carried by the hand, and not on the shoulders, as the patient would be out of sight. The front and rear bearers should start with opposite feet, which prevents lateral motion, resulting from keeping step. In ascending a hill the patient's head should be in front, in descending behind, except in the case of a broken leg or thigh, *when such a course would throw the weight of the body on the injured part.*

Bandages are of two kinds: (1) Esmarch's Triangular Bandage, which is described in detail, together with its application and uses, in the St. John Ambulance first-aid book, already mentioned.

(2) *Roller Bandages* are made of strips of linen, calico or flannel, or of porous or solid rubber. A bandage for the arm should be about 2 inches wide by 8 yards long; a leg bandage 2½ inches wide by 10 yards long; and a bandage for the body 5 inches wide by 12 yards long. A bandage ought to be made of one continuous piece without any joinings, and the selvedges should always be torn off. The surfaces and edges should be smooth and even, and there should be nothing which can press unequally on the skin. Bandages should be kept ready tightly and longitudinally rolled up; hence their name 'roller.' This may be done perfectly well by hand, another holding the end of the strip of cloth (*see* Fig. 12); or it may be fastened to the leg of a table or to any fixed point. Unless this is done there is a difficulty in rolling the cloth smoothly. Besides the roller there are compound bandages, as the 'T'-shaped bandage, the 'figure-of-eight'-shaped bandage, the 'four-tailed' bandage, and various other forms all described elsewhere in this book.

The principal uses of bandages are: to keep on splints and 'dressings,' to protect diseased or wounded parts from injury, to place restraint on motion of injured parts, and to afford support to muscles and vessels. In applying a bandage the first thing necessary is to obtain a point on which the required traction may be

made. Therefore a turn round the *arm* or *ankle* should be taken before the bandage is applied symmetrically to the *hand* or *foot*. Then the roll should be held in the manner represented in Fig. 13,

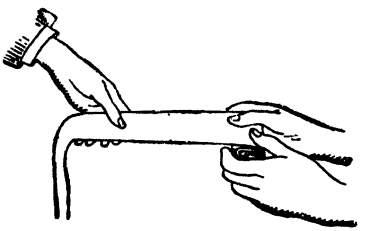


FIG. 12

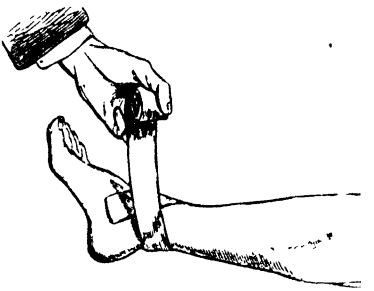


FIG. 13

and it should be passed from one hand to the other as it encircles the limb. A bandage should always be first applied to the extremity of the limb, where it should be tightest, gradually becoming more slack as it ascends, and each fold should overlap about one-third

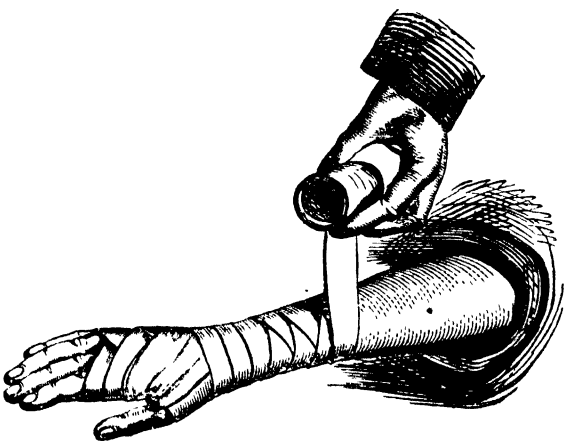


FIG. 14

of the previous one. *No part must be 'skipped' or left uncovered* by the bandage, or swelling of such part will very probably occur, and the roller will become loosened and easily detached (*vide* Figs. 12–14). Further, the bandage should be applied so that it crosses in front from the inside to the outside of the limb.

Where the limb increases in size the bandage must be turned on itself, as represented in the sketches. This is called the 'reverse.' When a bandage is changed, the part over which it has been applied should be sponged with soap and water and then dried, both for cleanliness and also to prevent irritation from the bandage. When a bandage has to be applied to the head, the hair ought to be combed, so that it may lie flat and not make unequal pressure on the scalp. When a bandage is used to give support or to make pressure, great care should be taken that it is not too tight in any part of its course, as mortification of the limb has been caused by too tight a bandage. It is particularly necessary to bear this in mind when applying a bandage to a limb that has been recently fractured. In such cases the parts are liable to swell, and a bandage which at the time of its application was sufficiently easy may soon become so tight as to cause a dangerous constriction, and this is especially liable to happen if the limb is allowed to hang down. In cases of bad fracture or any severe injury, the bandage should be applied loosely in the first instance, particularly in the neighbourhood of the injury, and as the swelling decreases the bandage may be tightened. As the nails are always left uncovered in the application of bandages, it is a good test of the state of the circulation to make pressure upon them. If the circulation is free, the white mark which is made by pressing upon the nail ought to disappear at once when the pressure is removed. But if it lingers and fades away slowly, the injured limb is too tightly bound, and bandages and splints should be loosened.

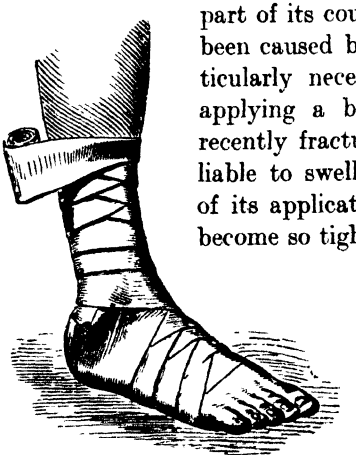


FIG. 15

For first-aid treatment the triangular bandages are to be preferred, and their use is soon learnt; their further advantage for first aid is that they can be readily fashioned from a large handkerchief, a scarf, or a piece of torn-off clothing.

Blood-vessels, Course of the. The circulation of the blood throughout the body is carried on by the heart, as the central receiving and propelling organ, and by blood-vessels connected with it. These blood-vessels consist of two distinct divisions,

named *arteries* and *veins*—the former carrying bright red arterial blood to the different parts of the body from the heart and having a distinct pulse at each beat of the heart, the latter carrying dull red or dark blood from the various parts of the frame back to the heart and not possessing in health any distinct pulsation. The main arteries pursue a tolerably direct course to the various limbs, and are placed, as a rule, not very near to the surface of the body; the position they occupy is the sheltered one on the inside of each limb. The veins run in two sets: superficial, which are abundant in number, communicate freely with each other, and run a tortuous course; deep, which for the most part are situated side by side with the large arteries and are more direct in their course. The veins and the arteries are connected in the skin and in the other tissues of the body by a system of very minute vessels termed capillaries. A knowledge of the course of the principal arteries may be obtained by seeking out their course on the living subject by the pulsation they afford; and an outline of the course of the main vessels will not be difficult to remember, and will be a necessary guide to the ready arrest of bleeding.

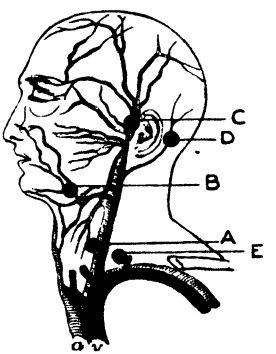


FIG. 16

In the following drawings (Figs. 16–20) the dark vessels represent veins and the light vessels arteries. The letter *a* in the drawing signifies artery, the *v* signifies vein. The dots in Figs. 16–20 mark the places where pressure can be best applied to stop arterial bleeding in wounds distant to these pressure-points.

There is on each side of the neck a large artery (carotid, Fig. 16) which carries blood from the chest to the neck and head. It runs in a line from the inner end of the collar-bone to the angle of the lower jaw, and the pulsation is throughout fairly evident to the finger. The deep jugular vein lies very nearly parallel to the artery; the superficial jugular vein is near the surface, and can be seen under the skin. The carotid artery divides just below the level of the angle of the jaw into the external and internal carotid arteries. The latter ascends deeply in the neck and enters the skull to supply the brain with blood. The external carotid continues up in front of the ear, where it is called the temporal

artery, to supply the scalp of the side of the head. The important branches of the external carotid are the lingual to the tongue, the facial going to the face, and the occipital to the back of the head.

The large artery (*subclavian*, Figs. 16 and 17) which supplies the arm and hand with blood *passes out of the chest directly over the uppermost, or first, rib*, and then curves downwards. In the armpit the artery (here termed *axillary*) may be felt beating by pressing against the arm-bone (*humerus*) near the top of the hollow of the armpit. From this point it runs onwards to the elbows, *keeping on the inside of the arm*, and to the inner side of the prominent muscle (*biceps*) of

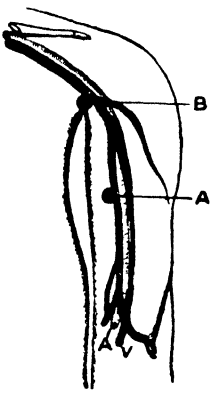


Fig. 17



Fig. 18



Fig. 19

the upper arm (where it is termed *brachial*). It is accompanied by parallel veins. Finally it divides into ulnar and radial arteries.

Just below the bend of the arm the artery (Fig. 18) divides into two ; one (the *radial*) taking the line of the *outer bone of the forearm*, the other (the *ulnar*) *lying almost parallel with the inner bone*. In the upper part of their course pulsation is not well felt, as they are covered with muscles. Close above the wrist joint both vessels may be felt beating.

Other branches pass onwards (Fig. 19), forming arches in the palm of the hand and in the ends of the fingers.

The large artery for the thigh, leg, and foot (*femoral*, Fig. 20) passes *out from the groin lying about the middle of the crease of the groin*, and almost at right angles to it. From this point it runs onwards, *inclining to the inside*, and turning round, a *little below the middle of the thigh-bone*, into the ham. A line drawn from the

centre of the fold of the groin to the inner side of the knee marks its course. In the upper 3 inches of its course the artery lies very superficial, and may be felt pulsating. It then becomes deeper-seated, but may still be compressed against the thigh-bone. The artery is accompanied by a large vein which lies at first to the inner side, but afterwards behind. Several smaller and one large branch are given off as the artery passes through the thigh (*see* Fig. 20).

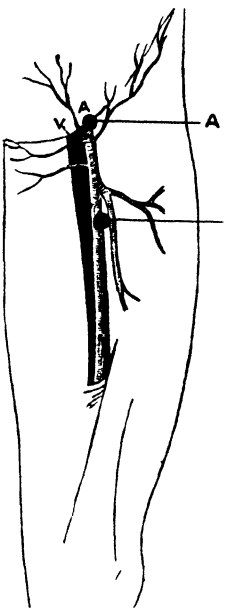


FIG 20

The main artery at the knee (*popliteal*) divides into two (the *anterior* and *posterior tibial*); one passing down the inner front of the leg, the other through the calf. Both are deeply seated and covered with muscles, and their pulsation, except near the ankle-joint, is not easily detected.

The foot, like the hand, is supplied with small branches from the two arteries.

Bleeding or Hæmorrhage, Varieties of. *Bleeding from arteries* is ordinarily recognised by *vividly scarlet* blood *rushing out in jets, or jerks. Bleeding from veins* is known by the *darker appearance* of the blood, and by its *flowing in a continuous stream*, and not in jets. When, however, an artery is wounded deep in the substance of a limb, the jet, or jerk, may be absent, and, from retention in the deep wound, the blood, although arterial, may become darker than it would otherwise be. At p. 259 it is stated that arteries carry blood *from* the heart to all parts of the body, while veins take the blood *back* to the heart. The practical application of this knowledge is that bleeding from arteries is further distinguished by the fact that pressure on the side of the wound nearest the heart stops the flow of blood from arteries, while pressure on the side of the wound furthest from the heart stops bleeding from veins. In other words, bleeding from arteries in the limbs is to be stopped by pressure above the wound, and bleeding from veins by pressure below the wound. But for bleeding in the head or neck the reverse obtains. Bleeding from a large artery is dangerous, and will not stop without surgical treatment; but bleeding, except from a wounded artery of considerable size, is seldom

dangerous to life. It generally stops on the application of pressure to the part (as afterwards described), or when the person becomes faint. Bleeding from veins is not often dangerous, and will generally stop without surgical treatment. The reasons why arteries continue bleeding and veins do not are found in the difference of structure and in the manner of the circulation of the blood.

As the matter is important, the distinctions between bleeding from arteries and from veins are placed in contrast.

Bleeding from Arteries.	*Bleeding from Veins.*
Blood scarlet.	Blood dark.
Rushes out in jerks.	Flows continuously.
Pressure on the side of the wound nearest the heart stops the flow.	Pressure on the side of the wound furthest from the heart stops the flow.
Dangerous from a large artery, and will not stop.	Not often dangerous, and generally stops.

Bleeding: Means of Stopping when not violent. Slight bleeding from a wound may generally be stopped by sponging the part with very hot or very cold water, or, if more copious, by pressure with the finger or with a bit of cork or a hard linen pad, especially if the wounded part is over a bone where pressure can be made against the bone. At the same time the bleeding part should be raised as high as possible above the level of the heart and the patient should be laid flat, as in this position the heart-beats are less frequent. If the bleeding cannot be stopped by the above, as seen by a recurrence of the bleeding on removal of the pressure applied for a few minutes by a graduated pad, heat or pressure, the artery supplying the part must be compressed by pressure at the nearest pressure-point to the bleeding spot (*see* the dots on Figs. 16–20). The procedure, after compression has stopped the bleeding, is given in the paragraph headed ' Bleeding, how to proceed after compressing the Artery ' on p. 266.

Bleeding from a Wound in the Head or Neck. Moderate bleeding from any part of the *head or face* may be stopped by placing a *graduated pad* over the wound and bandaging firmly. If very copious or from the neck, it will be from some branch of the carotid artery. Firm pressure should be made in the neck over the course of this artery (*see* Fig. 16, A, p. 259 and Fig. 21), in a direction rather

inwards and backwards, so as to press the vessel against the side projections of the bones of the spine. The pressure is best accom-

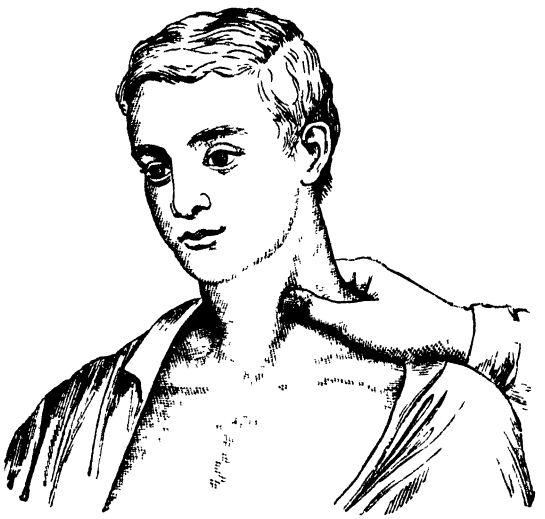


FIG. 21

plished with the fingers or thumb, and care must be taken not to compress the windpipe.

Bleeding from the face below the level of the eye is from the facial artery, which may be compressed as it passes across the side of the lower jaw-bone (Fig. 16, B). Hæmorrhage from the region of the temple is from the temporal artery, which is to be compressed in front of the ear Fig. 16, C). The occipital artery which supplies the back of the scalp is to be compressed four finger breadths behind the ear (Fig. 16, D).

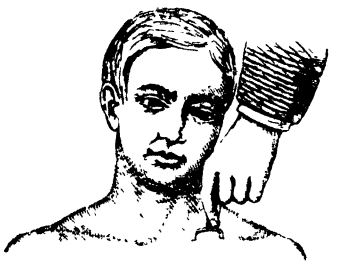


FIG. 22

Bleeding from the Arm, near the Armpit. A bystander should press his thumb firmly into the neck *behind the middle of the collar-bone*, which will stop the flow of blood through the great artery of the arm (*subclavian*) as it is first coming out of the chest (*see* Fig. 16, E). As, however, the pressure thus made soon tires the thumb, the handle of a large key, or other object of similar shape

wrapped in three or four folds of linen, may be pressed behind the middle of the collar-bone and held without fatigue for an indefinite time till surgical assistance can be obtained, or, if the bleeding comes from a small artery, until the blood ceases to flow, which may be ascertained by slightly and gradually diminishing the pressure (*see* Fig. 22).

Bleeding from the Upper Arm, or from the Forearm below the Elbow. The brachial artery may be controlled by compression with the fingers on the inner side of the arms in the position of the artery, as at the pressure-point A in Fig. 17. The arm must be grasped by the hand or hands with the thumbs at the back of the arm while the fingers press the artery against the bone at the inner side of the front (or biceps) muscle. More permanent compression may be made by a tourniquet or by placing a large hard pad in the armpit (this may be substituted by a thick ruler or stick) and binding the elbow tightly to the chest. The brachial artery may further be compressed at the bend of the elbow by placing a pad in the middle of the bend and then flexing the arm, which may then be tied in the bent position.

Bleeding from the Palm of the Hand. An elongated pad should be placed over the radial artery at the wrist (where the pulse is felt), and another over the ulnar artery on the other side of the front of the wrist (*see* Fig. 19, p. 260) and bandaged tightly. If this does not stop the bleeding, a graduated pad should be placed over the wounded part. Another thick piece of lint or cloth should be placed at the back of the hand. Then two pieces of wool, or two paper-knives, should be laid transversely, one across the front and one across the back of the hand, and their ends should be tied firmly together. The forearm should then be bandaged, the elbow bent, and the hand bound to the opposite shoulder. The whole should be allowed to remain for twenty-four hours, after which the part should be dressed as an ordinary wound. If pieces of wood, such as paper-knives, are not at hand, the bleeding may be stopped by binding the fingers over a ball, or tightly rolled cloth, placed in the palm, then bending the elbow, and binding the hand to the opposite shoulder.

Bleeding from the Upper Part of the Thigh. The great artery which supplies the limb (the *femoral*) should be pressed so as to prevent the flow, by applying the thumbs with some force immediately below the middle of the crease of the groin (Fig. 20, A).

This pressure is made with less difficulty than when necessary behind the collar-bone, but the door-key or other convenient instrument may be used. *See also* Fig. 23.

Bleeding from below the Middle of the Thigh, or from the Leg. When bleeding is below the middle of the thigh a tourniquet may be used, composed of a stout pocket-handkerchief and a piece of tough stick, which is to be applied as follows: Pass the handkerchief once or twice round the limb, some distance, if possible, above the wound. Then push the stick between the handkerchief and the skin, and twist the stick so that

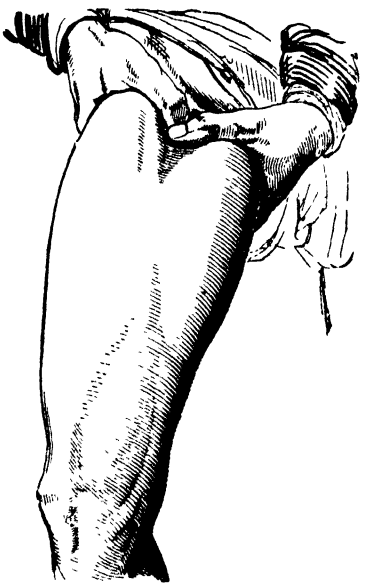


FIG. 23

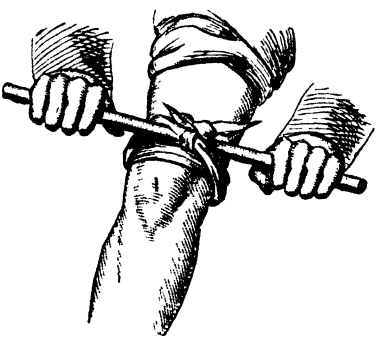


FIG. 24

it screws the handkerchief until the blood ceases to flow (*see* Fig. 24). The twisting should only be continued till the bleeding stops, as the application of more pressure than is necessary to effect this may bruise the limb. A pad, or wine cork, placed underneath the handkerchief, over the course of the vessel, will lead to more direct and therefore more efficient pressure without so much tightening of the bandage.

Bleeding from the Sole or Front of the Foot. When there is bleeding from the sole a pad should be placed in the hollow behind and below the inner and outer ankles and bandaged tightly. If this does not stop the bleeding, a graduated pad should be applied to the wound as for bleeding from the palm of the hand (*see* p. 264). When the bleeding is from the front of the foot a pad and bandage

should be tightly applied. In all cases of bleeding from the foot it should be raised on a pillow above the level of the body.

Bleeding. How to Proceed after Compressing the Artery. When the flow of blood has been controlled by compression of a distant artery, all clothing, bandages, or dressings should be removed from the wound and all clots of blood should be washed away with lotion, so that it may be seen exactly where the blood comes from. When the wound is quite exposed, the tourniquet or other means used for applying pressure should be slightly relaxed. The sides of the wound should be turned up or drawn back with hooks or retractors, and any bleeding vessel seen should be sponged with cold or hot water, pressed, twisted or tied, and the wound should be dressed as described at p. 318. To twist or tie any bleeding artery proceed as follows : With the pressure-forceps seize and clamp the mouth of the bleeding vessel and while holding it fast make three complete twists. If on opening the forceps the bleeding is not now stopped, the vessel will require tying (in the case of larger-sized arteries do not try to stop by twisting). To tie the artery its mouth must be again seized by the forceps, slightly pulled on, and then, while the forceps are firmly held by an assistant, a piece of silk ligature, double horse-hair or thread, disinfected (sterilised where possible), is passed round the picked-up artery beyond the forceps. A single knot should be made and the ends drawn tight steadily ; the forceps may then be opened, and if no blood flows the knot should be completed and the ends of the ligature cut about ½ inch from the knot. The pressure on the artery above should be gradually released when all such bleeding-points have been tied. In the case of injury to a large artery, such as the femoral, a loosened tourniquet should be left round the limb so as to be available on the instant if bleeding should break out afresh, as it may do on any undue exertion, or after a week or ten days if the wound is an infected one and much matter (pus) forms.

Bleeding from the Gums or Throat. Give ice to suck or cold water to hold in the mouth ; if not successful, give hot water as hot as can be held in the mouth. If necessary, make pressure on the carotid arteries.

Bleeding from the Tongue. Treat as in the gums and throat. If in the front, the bleeding part can be held firmly by the finger and thumb covered with a piece of cloth.

Bleeding from the Socket of a Tooth. This is sometimes very troublesome after the extraction or accidental loss of a tooth. It may be stopped by applying a plug of lint to the part, shutting the teeth close, and running a bandage round the chin and head to prevent the mouth being opened for several hours, during which time the pressure thus exerted stops the bleeding; or the extracted tooth may be returned to its socket to act as a plug, the chin being bandaged as above. The pad may be soaked in tincture of perchloride of iron.

Bleeding from Varicose Veins of the Leg. Profuse bleeding may occur from the bursting of enlarged or varicose veins in the leg, especially in pregnant women. The person should lie with the leg higher than the body, and pressure should be made on the bleeding part with a pad of lint or cotton cloth soaked in cold lotion, till the bleeding stops. Afterwards a pad and bandage from the foot upwards should be applied. The best remedy is ligature of the bleeding vein.

Bleeding from Leech-bites. Leech-bites, whether made for curative purposes or by leeches attaching themselves to travellers or sportsmen, sometimes give much trouble from bleeding. If the person is moderately strong and the loss of blood is only from one or two wounds, it may be allowed to go on, and it will stop in a few hours. But if in delicate people or children, the loss of blood must be stopped at once, more especially if the patient is to be left during the night. This is usually effected by the application of cold water or by pressure with the finger, through which bleeding cannot take place, continued, if necessary, for an hour. If this does not succeed, a pinch of powdered alum should be pressed into the bites.

Other means are pledgets of lint dipped in spirits of wine, which may be pressed into the bite; or the latter may be touched with a finely pointed stick of caustic. Occasionally it has been found necessary to pass a needle through the skin under the bite, and to tie a ligature below the needle in the form of a figure-of-eight knot.

Bleeding, Internal. This occurs from injury to, or disease of, internal blood-vessels. The bleeding may take place into the lungs, when the blood is *coughed up* (*Hæmoptysis*); into the stomach, when the blood is *vomited up* (*Hæmatemesis*); into the bowels, when it is *passed by 'stool'* (*Melæna*); into the bladder, when it *escapes with the urine* (*Hæmaturia*); or into other cavities of the body,

from which there is no outlet, as, for instance, within the skull. Internal bleeding, excepting when into the cavity of the skull, is accompanied by great depression and faintness, by cold perspirations, by feeble intermittent pulse; the condition described as *collapse* (*see* p. 273) being present. When bleeding takes place within the head, laboured breathing and insensibility, as described under *Apoplexy*, are the chief results. *Perfect rest*, cold acid drinks, as lemon-juice and water, keeping the body cool and the feet warm, are the principal requirements.

Bleeding, General Treatment of, and when to give Stimulants. Stimulants, as wine and brandy, should *not be hastily given* even if there is faintness. Faintness is nature's method of staying bleeding, and stimulants, by exciting the circulation, tend to increase bleeding. On the other hand. if faintness passes beyond a certain limit it may be fatal. When faintness (syncope) occurs in a case where there has not been much bleeding, and when no large wound exists, if there is no internal bleeding the faintness will probably be more from fright than loss of blood. The person should keep the recumbent posture, and should be placed between blankets, bottles of hot water or hot bricks, wrapped in flannel, being placed near the feet and in the armpits, taking care that the heat is not sufficient to burn the patient. Warm brandy-and-water should be given frequently in small quantities, the brandy being diluted with an equal quantity of water. But if there is profuse bleeding brandy must not be administered so freely, and only in the greatest need before the bleeding is controlled, and it should be given cold. With respect to the actual amount of brandy to be given, no positive rule can be laid down. A tablespoonful every half-hour if there is no bleeding, and a teaspoonful if there is, may be accepted as some guide. If brandy is not at hand, some other spirit, as whisky or rum, should be used. Until the bleeding has been stopped warmth should only be applied to the feet, and while faint the person must not be raised to an upright position. Under all circumstances milk or broth may be given, but while there is any fear of bleeding everything must be given cold. Thirst is best quenched by small pieces of ice, which will help to stop bleeding.

Blisters. This term signifies the formation of watery fluid between the upper and middle layers of the skin. They generally result from friction, as of an ill-fitting boot, on the toes or heel, or on the hands from rowing, etc.; or they may be produced by irri-

tating substances applied to the skin, or may arise from burns or scalds. The proper method of treating a blister, however produced, is, if very small, to paint it with flexible collodion or to apply pressure with a pad and bandage, and then to let it alone, when the contained fluid may be absorbed, and the upper layer of the skin will eventually peel off, leaving a healed surface below. If the blister is large, it should be pricked at the most dependent position and the water should be allowed to drain out, and a piece of worsted may be passed through the blister and tied in a loop, which will prevent the aperture closing up before the water has drained away. If very large it is better to lay it open with a knife, squeeze out the fluid and apply a pad of antiseptic lint or wool, with a firm bandage. The loose skin above should be preserved as long as possible, as it forms the best covering for the tender surface below. It should be protected by simple ointment (Prescription No. 88), or vaseline spread on lint, and the part should be carefully guarded from any injury.

To prevent blisters on pedestrian excursions, thick woollen hose and a well-made boot with broad sole, so cut that the upper leather does not unduly compress the foot, are desirable, and the socks should be well soaped previous to long walks After some hours on the road, changing or turning the socks is desirable. If walking must be performed while blisters are present, take all pressure away from the part by cutting a hole in the leather of the shoe over the blister. Pain is also relieved temporarily by a piece of sticking-plaster, which prevents further direct friction.

Ulcers of the Toes and Heels may result from neglected blisters, want of cleanliness, or from a bad state of health. These are troublesome to heal, requiring perfect rest of the part, great cleanliness, dressing with simple ointment (Prescription No. 88), and attention to the general health; if the ulcer is between the toes, these must be kept apart by a piece of lint.

Bruises. Bruises are injuries in which the skin is not broken. They may be slight or severe. In the first variety only the surface of the skin is injured; but, the little blood-vessels therein contained being ruptured, blood becomes effused into the skin, and discoloration occurs. This is at first bluish-black, then it passes through shades of violet, green and yellow, until, by the end of ten days or a fortnight, it disappears. The familiar instance of a 'black-eye' will illustrate this description of bruise. If the injury is more violent, a similar rupture of blood-vessels and escape of

blood takes place in structures beneath the skin; or, as sometimes happens, *the skin may escape injury* and the deeper parts alone suffer. In this case discoloration does not become apparent until twenty-four hours, or longer, after the injury. For slight bruises, such as occur to children falling down, the old-fashioned remedy of brown paper steeped in brandy is not a bad application, or spirits of camphor or tincture of arnica may be painted over the injured surface. For more severe bruises, keep the bruised part well raised, if practicable lying on a pillow, and apply a lotion of whisky-and-water in equal parts, or a cold lotion of 1 ounce of vinegar to 4 ounces of water. If the bruise is of a serious nature, blisters will now probably form on the surface of the skin. After washing with an antiseptic lotion the blisters must be snipped with scissors sterilised by boiling and the contained water allowed to run out; but the raised skin should not be taken away. The whole must be covered with a dressing of sterilised wool or lint. At a still later period, rubbing the part with brandy and salad oil in equal parts, or, if obtainable, with soap liniment, may be adopted.

Sometimes bruised parts are so injured as to inflame, or a large blood-vessel may be ruptured, and much blood escapes into the tissues. Abscess may form, the skin may burst, and mortification may occur. Hot fomentations should be applied until the mortifying parts separate and the wound becomes clean. Surgical interference, in the form of incisions to promote exit of 'matter' (or pus), is not infrequently necessary.

Bruises or contusions of the head are frequently followed by effusion of blood beneath the skin, which is called a blood-tumour. This is frequently seen on the heads of newly born children (*see* p. 487), caused by the pressure during a prolonged or difficult labour. A blood-tumour occurring to an adult after an injury may give rise to a suspicion of a fracture with depression of the bone, as the blood-tumour has generally, after a short period, a hardened margin with a softness, or depression, towards the centre.

There will, however, be an absence of the symptoms of fracture (*see* p. 287), and firm pressure with the finger on the hardened part will discover the uninterrupted surface of the harder bone beneath. In ordinary cases of bruised scalp, followed by blood-tumour, time and the application of a cold lotion will effect a cure.

Burns and Scalds. The effect of burns and scalds on the skin is, in the first instance, the same.

Three different degrees of burning or scalding include all varieties: first, when the contact with fire or water has been slight and the injury is that of redness or inflammation of the skin; second, where blisters have formed from a greater amount of heat; third, when there is destruction of the skin or underlying structures, or where they are changed into a black or yellow mass and all vitality destroyed.

A slight burn or scald may be treated by the application of lint or cloth, or plantain-leaf soaked in salad oil; or ice pounded or scraped, made as dry as possible, mixed with lard or butter or oil spread on cotton cloth, and kept on until it melts; or, if not available, the part may be covered with a layer of cotton-wool secured by a bandage. The main object is to exclude air from the injured part. Cold cream or glycerine will also act in this way.

Severe burns most frequently happen from the clothing catching fire. The sufferer should not run about, as every draught of air will fan the flame. He should lie down on the floor and roll, or be rolled, in a rug, table-cover, carpet, or any convenient article sufficiently voluminous and thick to stifle the flames; or, such not being available, the person should roll on the floor until the flames are mechanically put out. If water is at hand, it should be dashed on the person. Then the patient should be laid on a bed, and if there is much shock (*see* p. 273), which always follows severe burns and is indicated by cold, shivering, pallor and faintness, some hot coffee or wine-and-water or brandy-and-water, whichever may be first available, should be given at once, and bottles of hot water should be applied to the feet. If the respiration tends to flag, artificial respiration must be carried out. After the first shock has passed away opium may be given to relieve pain, in doses according to age (*see* p. 6). The clothing should be removed by cutting it away from the injured parts. If the skin adheres to the dress, *the piece of the latter should be left, rather than the skin be torn in taking it away.* The stockings must be removed with great care lest the upper layer of the skin separate with them, which would increase the sufferings of the patient. It will facilitate the removal of the stockings if they are first soaked with salad oil. In the case of slight burns or scalds of the hands or feet, it is a good plan to immerse them, with the gloves or stockings on, in cold water. After a few minutes they should be removed and partially dried with a towel. A mixture of equal parts of tepid milk-and-water should then be frequently dropped on the glove or stocking. After five or six hours the coverings may be cut carefully away, and the

blisters may be snipped. Then, in the absence of antiseptic ointment, the parts may be covered with lint wet (preferably) with salad oil or milk. Where the burn has not gone beyond the formation of the blisters it is not necessary to use antiseptics, but where there is destruction of the skin much care must be taken to keep the parts very clean by the use of antiseptics, since the great danger to the sufferers after recovery from shock is the occurrence of blood-poisoning (*i.e.* sepsis). Emergency dressing, if applied, should be removed as soon as shock has passed off and the burnt area thoroughly cleansed with antiseptic lotion. For this purpose it is dangerous to use carbolic acid lotion for fear of absorption, but a thickly coloured, warm lotion of permanganate potassium may be used to thoroughly wash the part, and the skin around should be washed with soap and lotion. Sterilised linen or lint is then to be laid in strips over the part, and if the cleansing has been thorough need not be changed till the third day; at each subsequent dressing only a part of the area, if large, should be exposed at once, and the covering lint must be thoroughly wetted by lotion before it is removed. The same care must be taken in cleansing and applying the new dressings. When the surface becomes red, healthy and clean-looking, a simple ointment (Prescription No. 77) spread on strips of butter-muslin may be substituted for the lint. If 'proud-flesh' forms it should be lightly touched with alum. If it can be obtained, a saturated solution of picric acid (Prescription No. 11) may be painted with a camel's-hair brush once daily over the burnt area instead of the above dressings. This, by its coagulating effect on the secretions of the wound, forms a protective layer and is also antiseptic. Carron oil is a filthy application and should not be used, neither should poultices or water dressings or dusting with flour.

During the stages of treatment a nutritious diet, plenty of milk, and the use of stimulants is of the greatest importance. Among useful tonics are the tincture of perchloride of iron and quinine (Prescription No. 51).

Superficial burns and scalds, although only producing redness of the surface, are if extensive, and particularly if occurring to children, very dangerous. Stupor and insensibility are especially liable to occur to children after extensive burns; burns of the body are more dangerous than those of the limbs; comparatively small burns of the neck may be attended with marked shock. Shivering is a bad symptom; insensibility to pain, stupor, and twitchings of

the limbs are the usual precursors of death. Persons with bad burns are peculiarly liable to attacks of bronchitis or inflammation of the lungs, to diarrhœa accompanied by ulceration of the intestines, also to *pyæmia* (blood-poisoning).

Burns or Scalds of the Fingers and Toes must be treated with great care, that the different parts may be kept separate so as to prevent the raw surfaces of the fingers or toes touching each other. This may be readily effected by separate 'dressings.'

Internal Scalds of the Throat, affecting the upper part of the windpipe or *glottis*, are very dangerous, from the swelling they occasion inside the throat. Such injuries most frequently occur to children, the symptoms being suffocative cough and difficulty of breathing. Ice to the throat, ice to suck, hot flannels or poultices to the front of the neck, water and milk to moisten the mouth and throat, and a teaspoonful of cream or salad oil every three hours are the best remedies. But such cases frequently require the windpipe opened by a surgical operation (*Tracheotomy*).

Burns from Corrosive Liquids, as oil of vitriol and other mineral acids, should be treated in the first instance by copious washing and water, or, if available, with lime-water or soda and water, and afterwards as ordinary burns.

Burns and Scalds, Sequelæ of. As burns heal there is always tendency to contraction of the parts, especially if the injury is about the neck or joints. During healing every endeavour should be made, by bandaging, pads and splints, to keep the parts in their natural position, and thus oppose the tendency to deformity. Cicatrices, disfiguring scars, contracted joints, and deep ulcers, sometimes the results of burns and scalds, require treatment by a surgeon.

Collapse, Shock, or Prostration. This is an accompaniment of severe injuries, as gunshot wounds, laceration of joints, blows on the stomach or privates, bad burns or scalds, and great losses of blood. Collapse may also be produced by fear, by cold, and from large doses of certain poisons.

The condition differs from fainting (*see* p. 60), as in the latter there is entire loss of consciousness. Shock may be recognised by marked pallor, cold clammy skin, feeble pulse, and shallow breathing. There is a feeling of cold and the bodily temperature is below the normal. The chief object in treatment is to prevent a further fall of temperature, and for this purpose warmth is of the highest importance. The patient should be covered with extra clothing, then

apply heat by means of hot-water bottles, hot flannels, or heated bricks to the feet, sides, pit of the stomach, and armpits. Care must be taken, by wrapping these well up, that the skin is not burnt. Hot drinks such as coffee and tea should be given if the patient can swallow. Ordinary stimulants, such as brandy and strychnine, are not of much use in the condition of shock, as this is due to over-stimulation by the injury of the nervous system, which is thus exhausted. The giving of brandy at such a time is like beating a tired-out horse. Further warmth should be given by the administration of a hot enema: the water, as hot as the hand can well bear, may be slowly injected up to the quantity of two pints. The enema may be repeated after two hours.

The patient must be kept lying down perfectly flat and still, and the feet, or if in bed the foot of the bed, raised.

In the case whose shock is largely due to or is accompanied by hæmorrhage, of course the first duty is to attend to the stopping of the bleeding if this is external. When this is controlled the methods already described to apply warmth must be followed, and in addition bandaging of limbs from the toes and fingers upwards. If the bleeding is internal, treatment in the absence of shock will be as described (p. 268), but where shock is present the treatment for the latter must be carried out.

On recovery from shock the stage of reaction may be marked by slight fever, restlessness, and even slight delirium. Vomiting is often a prelude to recovery. Nourishing broths or beef-tea should be given to help in recovery, and restlessness treated with sedatives such as chloral and bromide (Prescription No. 29).

Concussion of the Brain. This condition, commonly called 'stunning,' signifies sudden interruption of the functions of the brain by a blow or other injury to the head, either direct or indirect. In the mildest form the patient experiences a sudden weakness and trembling in the limbs, cannot walk without staggering, and there is a ringing sound in the ears and dimness of sight. These symptoms soon pass away after the person has rested for a time in a darkened room. In the *more severe* form of concussion the person falls and lies motionless, pale, and unconscious. The skin is cold and the pulse weak. The eyelids are closed, the pupils of the eyes contracted, and the arms and legs generally bent on the body. The breathing is feeble and sighing, and if the patient is roused and questioned loudly, he opens his eyes and answers hastily and again

relapses into insensibility. *The two facts stated in the last sentence mainly serve to distinguish concussion from compression of the brain* (*vide* p. 276), when the breathing is heavy and laboured (*stertorous*) and the patient cannot be roused. After a variable time, ordinarily about an hour, the patient moves uneasily, vomits, and recovers his senses, but remains giddy, confused, and sleepy for some hours. In a *still more severe degree* of concussion the patient is more profoundly insensible, the surface of the body pale and cold, the pulse not only weak but also intermittent, and the breathing drawn in sighs. If the patient cannot be temporarily roused, if the pupils of the eyes are insensible to light, and if the legs are not drawn away when the soles of the feet are tickled, the condition is very unfavourable.

Concussion of the brain often leaves mischief which may be permanent and of serious import. There may arise an *irritability of the brain*, marked by hasty, violent temper or by very speedy excitement *after exposure to extreme heat or after drinking spirits of wine;* there may be defects of sight, hearing, smell or speech, muscular weakness, and nervous debility; or temporary or permanent insanity may result. These sequences are due in many cases to indiscretion on the part of the patient, who as soon as the symptoms of concussion have passed away, and *while the brain is still irritable* and enfeebled, returns to his former habits, and probably to brain work.

Treatment. No case of concussion, or of partial concussion, is so trivial that it may be neglected with impunity; even a momentary loss of consciousness must be taken seriously. The patient should be placed on a bed or couch in a quiet, darkened room, the neck and chest should be freed from articles of clothing, the head should be slightly raised, and a cold wet cloth should be applied to the forehead. In more severe cases, when the surface of the body is cold, the patient should be placed between blankets, bottles filled with hot water and wrapped in flannel should be applied to the feet and armpits, and the legs, hands, and arms should be well rubbed. Stimulants must *not* be administered, but as soon as the patient can swallow, a little water may be given, or, if procurable, milk, broth, or beef-tea. If the collapse is marked a hot-water enema may be given.

Natural sleep should be encouraged. The after-treatment consists of *perfect rest* both of body and mind and in maintaining the bowels freely open by aperients (Prescription No. 27), with a mild, nutritious diet. Stimulants of all kinds must be avoided, and the person must return gradually to former occupations. If headache or feverishness comes on, or any impairment of the mental faculties

is observed, a strong mustard-poultice (or, if procurable, a blister) should be applied to the back of the neck, and the bowels should be still more freely purged. If unfavourable symptoms persist, it may be necessary to cut the hair close and to apply leeches to the temples.

Concussion of the Spine usually occurs from severe shakings, as happen in carriage or railway accidents, or from blows on the spine. Concussion of the spine is marked by more or less severe pain at the seat of injury, bodily prostration, weakness of the lower limbs, or difficulty of walking, numbness in the feet, and diminished sensation of the lower extremities. In more severe cases there may be difficulty of making water, and swelling of the bowels, due to their distension by gas. If the injury has been only shaking of the spinal marrow, and nothing has been torn or ruptured, these symptoms usually subside in the course of two or three weeks and the patient recovers. In some instances permanent weakness of the lower limbs results. Treat in severe cases as for fracture of the spine.

Compression of the Brain. This results either from blood being effused beneath the skull or from a piece, or pieces, of bone being detached or depressed and driven down on the brain or it membranes, which the blood or other substance compresses. Both conditions may be the result of injuries. At a later period compression may result from the growth of a tumour or as the consequence of 'matter' formed within the skull as a sequence of an injury. When after the symptoms of concussion of the brain, or after severe injuries without such symptoms, the patient does not revive, or, reviving, afterwards sinks into stupor from which he cannot be roused, with heavy laboured breathing, accompanied by puffing movement of the muscles of the mouth, with one or both 'pupils' of the eyes dilated, with the surface of the body becoming warmer and the pulse quicker and full, and perhaps with bleeding or watery discharge from the ears and nose, serious injury of the brain may be suspected. Stimulants must not be given, but a cold lotion may be applied to the head and purgative injections (enemas) should be administered. The condition requires skilled advice, as the operation of 'trephining' may be necessary.

The principal distinctions between concussion and compression of the brain are given below.

Concussion	*Compression*
Insensibility takes place immediately on receipt of injury.	Insensibility, although sometimes present from the first, generally comes on gradually.
Breathing feeble, intermittent, diminished in force, often sighing, never stertorous.	Breathing slow and laboured, often stertorous, and accompanied with puffing movement of the lips and cheeks.
Pulse small, thready, intermittent, sometimes quick.	Pulse full and not much quickened, sometimes slowed.
Pupils of the eyes generally contracted.	Pupils generally dilated.
Skin sensitive to prick of a pin or to pinching.	Skin not sensitive.
Surface of body cold and pale.	Surface of body warm, moist, and of natural colour.
Patient can be roused so as to answer questions.	Patient cannot be roused.
Retching and vomiting are very constant symptoms.	Retching and vomiting absent.

Dislocations. A bone is dislocated, or 'put out,' when the head of the bone slips from the socket in which it plays. Therefore the injury must be at a joint. If there is much swelling round the joint diagnosis is difficult and should be deferred.

Symptoms. (1) Pain. (2) Deformity, there being an alteration of the normal shape of the joint, such as an unnatural prominence in one part and a depression at another, with, generally, shortening, but in some varieties lengthening, of the limb. (3) Loss of the power of motion of the joint. (4) Swelling about the joint.

Fracture of a bone near the joint may simulate a dislocation, and is to be distinguished by carefully comparing the limbs on the two sides.

Dislocations are distinguished from fractures near the joint: first, by the absence of grating on movement of the injured parts; secondly, a fractured bone is more freely movable than natural, a dislocated is less; thirdly, if a fractured bone is drawn into its proper place it will return as soon as the 'extension,' or pulling, is discontinued, but a dislocated bone drawn into its proper position will remain there; fourthly, by measurement the bone, if fractured,

will be shortened, while the dislocated bone is of the natural length or may even appear longer than its fellow. Comparisons of length and other conditions should be made with the bone of the sound limb.

Dislocations are distinguished from sprains by the fact that neither lengthening nor shortening of the limb is caused by sprains, while natural movement of the joint, although painful, is possible.

A dislocation is only too often complicated by a fracture at or near the end of the bone; it is chiefly for this reason that no attempts, with few exceptions, should be made by any one to reduce a dislocation, except in the total inability to get medical assistance within two weeks. If it is necessary, the attempt should be made as soon as possible after the injury, while the patient and muscles around are still in a state of shock, as later the muscles contract and more firmly fix the bone in its new position. The reduction of dislocation will only be described in the case of dislocation of the lower jaw, wrist, knee, thumb, and fingers. In all other cases act as for the immediate treatment of any injury (p. 254), supporting the limb in the position easiest to the patient while being moved, and when on a couch rest the limb on pillows in the most comfortable position. Ice or cold water should be applied over the joint, or hot applications may be preferred from the first. Any shock present must be treated. Treat generally as for severe sprains (*which see*). After the reduction of a dislocation the subsequent treatment is as for a severe sprain. A dislocation is said to be compound when an external wound opens down to the dislocated joint. Such injuries are always very dangerous. After removing all clothes treat with antiseptics as in wounds, taking care to thoroughly cleanse the skin around, and after washing out the wound with strong antiseptic (1 in 20 carbolic acid) wash this away with weak lotion such as tincture iodine, 1 drachm to the pint, and apply a dressing (*see* Wounds).

Dislocation of the Lower Jaw. This may be caused by a blow, by trying to introduce large objects into the mouth, or from spasmodic action of the muscles when a person yawns. The mouth is open and cannot be shut, as shown in Fig. 25. Speech and swallowing are scarcely possible, the saliva dribbles away, and the chin protrudes, so that the lower row of teeth project beyond the teeth of the upper jaw. Sometimes one side of the jaw only is dislocated, and then the teeth are displaced laterally *away* from the side dislocated.

Treatment. Put the patient in a chair, with the back of the head against a wall. Then let the operator wrap a napkin or handkerchief round each of his thumbs. Place the thumbs, thus protected, on the *back teeth of the lower jaw*, on each side, the fingers clasping the under part of the jaw outside. Then press the thumbs firmly downwards and backwards, elevating the chin at the same time with the fingers. The jaw will generally return to its proper place with a snap, and if the thumbs of the operator were not protected they would probably be injured by the patient's teeth. Afterwards a four-tailed bandage, as described for a broken jaw (*see* p. 292), should be worn for a week, during which time the patient should have only fluid food.



FIG. 25. Dislocation of Jaw

Dislocation of the Shoulder-joint. The humerus, or upper arm-bone, may be thrown from its socket in several different directions, but most commonly it slips by the side of the socket, or below the socket, into the armpit. If the bone slips by the side of the socket the arm is slightly shortened; if below the socket, the arm is lengthened. A hollow is seen or felt under the tip of the shoulder where the head of the bone should be, and the whole shoulder looks flattened with the opposite side. The elbow projects out from the side and cannot be brought to touch the side. The head of the bone can be felt in the armpit, becoming more evident if the elbow is raised. There is also great pain and numbness of the fingers, caused by the pressure of the dislocated head of the bone on the



FIG. 26. Dislocation of Shoulder

nerves of the arm. The patient leans over to the side of dislocation, and endeavours to support the elbow of the injured side with the opposite hand.

In addition to the above-mentioned signs (or without such features if the dislocation is in other directions), the shoulder may be recognised as 'out of joint' if the fingers of the injured limb cannot be placed by the patient, or by some one else, flat on the sound shoulder while the elbow touches the side. In the natural state of the parts this can be easily done; and if it can be accomplished there is no dislocation. Again, the shoulder should be measured by carrying a tape round the prominent bone at the tip (×) and under the armpit. If the shoulder is out, *the injured side will measure about 2 inches more than the sound one.* Thirdly, if there is a dislocation, a straight stick, or ruler, will touch both the tip of the shoulder and the elbow at the same time, which it cannot do when the bones are in their natural places. *Treatment* as for a severe sprain until medical assistance can be secured.

Dislocation of the Elbow. This may occur backwards or to either side, and one or both bones of the forearm may be displaced. In complete dislocation there is much deformity and swelling, the joint being bent at a right angle and remaining almost immovable, while the elbow protrudes behind the *humerus*, which can be felt in front of the elbow, and the thumb and outer surface of the wrist are turned forwards. In dislocation to one side there is more deformity on that side. In dislocation of one bone only the deformity is less. Dislocation of the elbow is chiefly to be distinguished from fractures about the joint by the absence of grating and absence of mobility. Treat as for severe sprain till medical attention can be got.

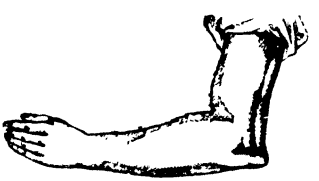


FIG. 27. Dislocation backwards of Elbow

Dislocation of the Wrist. This may be distinguished by the altered position of the hand, which is thrown backwards or forwards, or is twisted if only one bone is dislocated.

Treatment. Extension of the hand and, if the natural position is not retained, the application of splints as for fractured forearm. Fractures of the lower end of the forearm are sometimes mistaken for dislocations, and it often happens that when the inner bone of

the arm (the ulnar) is dislocated the outer or radius is broken. In all cases of doubt, after extension it will be best to apply splints as for fracture (*vide* Fracture of the Forearm).

Dislocation of the Thumb and Fingers. These accidents are known by the deformity present, and in consequence of the strength and tightness of the ligatures fixing the joints such injuries are often difficult to treat.

Treatment. If the dislocated bone does not return into position by simple extension with the hand, a firm hold must be obtained by a piece of tape fastened as represented below, by the clove-hitch knot. Then the wrist must be held by one person, while another pulls the tape till the bone slips into its place. In the case

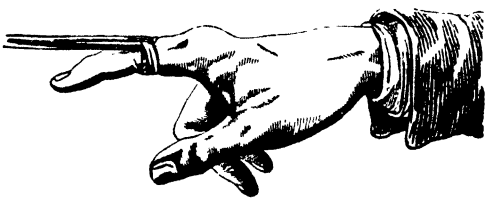


FIG. 28. Dislocated Finger

of the thumb it may be necessary to perform a slight operation before a reduction can be effected.

Dislocation of the Knee-cap. This bone may be dislocated either inwards or outwards, most frequently in the latter direction. The symptoms are that the knee cannot be bent, and the bone may be felt in its new position, while there is a depression in the natural position of the bone.

Treatment. It should be rectified by placing the patient on his back, straightening and well raising the leg so as to relax the muscles in front, and then lifting the bone with the thumb and fingers into the middle of the joint, after which a splint should be applied loosely behind the knee. Then the patient must be put to bed, and cold should be employed to prevent inflammation. Passive movements (*see* Sprains) must be employed after the first, with the knee-cap steadied so that the dislocation will not recur. The person should not attempt to walk for a month, and then use a bandage round the knee or an elastic knee-cap. In three months' time all support can be discarded.

Dislocation of the Knee-joint. The leg may be displaced from the knee forwards, backwards, or to either side, but owing to

the large extent of the opposed surfaces forming the joint and the strength of the ligaments, dislocation of the knee is always partial. In lateral displacement there is an unnatural projection of the inner or outer extremity (condyle) of the thigh-bone on the one side and a projection of the inner or outer extremity of the leg-bone on the other, while the foot and leg are generally more or less twisted. Dislocations of the knee-joint, either forwards or backwards, are still more serious injuries, and are associated with much tearing of ligaments and soft parts surrounding the joint. In the backward dislocation the lower end of the thigh-bone projects in front, and the hollow at the back of the joint is occupied by the displaced head of the leg-bone.

Treatment. The thigh should be fixed by being tightly held while the patient lies on his back. Then extension should be made by pulling steadily from the ankle. After the parts have resumed the natural position cold should be applied, and the patient should be kept in bed for at least three weeks. Very cautious attempts at passive movement should be made in the second week; as a rule it will be necessary to wear a laced-up knee-cap for six months.

Dislocation of the Semi-lunar Cartilages of the Knee-joint. The semi-lunar cartilages are two flat, gristly structures of a horseshoe shape, which are fixed to the margins of the upper surface of the larger leg-bone (tibia). One (usually the internal) or both may, in consequence of a sprain or twist, become detached and slip out of the place, or a piece may be broken off. The symptoms are sudden, severe, sickening pain in the knee and inability to walk. But the leg, though stiff and painful when the person is erect, can be generally moved when he lies down. After the accident the knee begins to swell, and remains swollen for some days. When the swelling subsides a painful spot is usually left, generally at the inside of the joint, where sometimes the displaced cartilage, or the piece broken off, may be felt or seen projecting if it has not been properly replaced. If the patient is seen immediately before the joint begins to swell, reduction of the cartilage may be readily effected by first of all fully bending the knee, rotating it inwards, and then quickly extending; should the cartilage be prominent, pressure must be made over it while the manipulations are being carried out.

The first limb should then be put on a splint and cold applied to the knee, which becomes swollen. As soon as the swelling has

subsided the patient may be allowed to get about, but wear a splint which keeps the knee from bending for at least three months. After about three weeks the splint may be temporarily taken off in order that massage and passive movement (*see* Sprains) may be performed. This is done for about one-quarter of an hour per day, and while doing it a finger should be kept over the spot where the cartilage protruded. The thigh and calf muscles should be massaged from the first. The injury is liable to recur, especially if not carefully treated at its first occurrence, after even most trivial injuries. Nothing but operation will prevent entirely the possibility of recurrence. If for any reason contra-indicated, a splint which will impede the flexion of the knee must be worn. A well-moulded lace-up leather is the best kind to wear. An elastic bandage is useless. The patient must be instructed to walk with the toes turned inwards.



FIG. 29

Dislocation of the Ankle. This is generally caused by jumping from heights or from carriages in motion, and is nearly always complicated with fracture of the small bone of the leg above the ankle. The dislocation may be either inwards or outwards, and the swelling on either side will be the chief distinguishing mark. The dislocation outwards, involving fracture of the small bone on the outside, generally 2 or 3 inches above the ankle, is the most common variety. The shape of the limb will then be as in Fig. 29, presenting a hollow on the outer side at the site of the fracture of the small bone, the sole of the foot being turned rather inwards. The treatment should be as for a severe sprain until medical attendance can be got.

Drowning. The injurious effects of submersion in water may be varied. If the water is warm, the principal hurtful effect will be the suspension of respiration, or suffocation; but if, as is often the case, the water be cold enough to extract heat from the body, a very powerful depressing action or shock is added. Again, persons falling into the water may die from fright or syncope; or they may be stunned, if they fall from a great height, by impact with the water or striking a rock, pier, etc. Those who sink at

once are usually effected in one of these ways. Artificial respiration has restored persons who have been completely immersed in water up to fifteen minutes. Absence of signs of life, if the body has been recovered within a reasonable time, must not negative immediate attempts at restoration. *Artificial respiration* then should be promptly resorted to and perseveringly continued. The following are the rules in the treatment of drowning. Send at once for medical assistance, blankets, and dry clothing, but proceed to artificial respiration instantly. Secure as much air as possible. The points to be aimed at are, firstly, restoration of breathing, and, secondly, when breathing is restored, the promotion of warmth and the circulation. To induce respiration (Schafer's method), lay the patient on his stomach and with his head turned to one side, so that his mouth and nose are kept away from the ground. If available, a rolled coat should be placed under the lower part of the chest. Kneel at patient's side and put your two spread-out hands, with the thumb nearly touching in the middle line of the back, over the patient's loins and lower ribs on each side. Press firmly with the weight of your body straight downward, thus pressing the patient's stomach against the ground and the air out of the chest. Do not press too violently. Draw back your body while keeping the hands in position, and thus relax the pressure ; in this way air will be drawn into the chest. Then pause and repeat the movements. Some fifteen complete, deliberate movements of this kind should be made per minute. The tendency is to make the movements too quickly. The movements must be persisted till natural breathing returns or until the pulse and breathing have ceased for at least an hour. Success has followed even after two hours' time.

When natural breathing recommences regulate the artificial respiration movements to correspond with it.

By Schafer's method the tongue naturally falls forward and fluids run out of the mouth. Fluids in the tubes of the lungs also are forced out and flow from the mouth.

A method useful in children and when the ribs are broken is the Laborde's method of artificial respiration, as described in the first-aid book of the St. John Ambulance Association, and is as follows : The patient is placed on his back or side, the mouth cleared of any froth or mucus by the finger ; the tongue is caught hold of by the fingers, using a handkerchief to prevent slipping, and is then

pulled forward for two seconds : it is then allowed to recede without losing hold of the tongue. These movements are repeated about fifteen times a minute. During the whole time the lower jaw should be kept well depressed.

While artificial respiration is being done, and without for a moment interrupting it, the following means should be employed to excite breathing :

Excite the nostrils with snuff or smelling salts. Rub the chest and face briskly, and dash cold and hot water alternately on them. Friction of the limbs and body with dry flannel or cloths should be had recourse to while artificial respiration is in progress. Should a galvanic apparatus be at hand, apply the sponges over the heart and back of the neck.

Rectal injections of ½ ounce of brandy or whisky to 2 ounces of hot water may be given every half-hour.

When a spontaneous effort to respire is perceived and becomes regular, *cease* to IMITATE THE MOVEMENTS OF BREATHING, and commence TO INDUCE CIRCULATION AND WARMTH (*as below*).

TREATMENT AFTER NATURAL BREATHING HAS BEEN RESTORED. *To Induce Circulation and Warmth.* Wrap the patient in dry blankets, and continue to rub the limbs upwards energetically. Promote the warmth of the body by hot flannels, bottles or bladders of hot water, heated bricks, to the pit of the stomach, the armpits, and to the soles of the feet. When the power of swallowing has returned, a teaspoonful of warm water, small quantities of wine, warm brandy-and-water, or coffee should be given. The patient should be kept in bed and sleep encouraged. During reaction, large mustard plasters to the chest and below the shoulders will relieve the distressed breathing.

The patient should be carefully watched for some little time after regular breathing is restored : if any signs of failure in breathing are seen immediately resort to artificial respiration again.

Foreign Bodies in the Stomach. When any foreign substance has passed into the stomach—as, for example, a coin or artificial teeth—the object is to allow it to pass through the intestines well enveloped in food, and as it passes on, in fæcal matter. For the purpose such articles of food as porridge, thick rice pudding, or figs should be given. The person should abstain from fluids and no purgative should be given.

Leeches have sometimes been swallowed, giving rise to very

unpleasant symptoms. A tablespoonful of salt dissolved in 4 ounces of water should be immediately taken and repeated in half an hour, when the leech will be probably killed or vomited up.

Foreign Bodies in the Skin. Splinter of wood, thorns, needles, fish-hooks, nails, etc., may be embedded in the skin. Splinters of wood or similar shaped substances should be, if possible, seized by forceps and dragged out. To accomplish this, slight enlargement of the wound with a lancet may be necessary; or they must be left a day or two and the part fomented with hot water, when, becoming loose, they may be more easily extracted. Needles and fish-hooks in the person will be generally more easily extracted by pushing them out by the points, care being taken that they do not break. Needles introduced beneath the skin often travel to distant parts of the body, and therefore no operation should be undertaken for the extraction unless the substance can be plainly felt.

To take a Tight Ring from the Finger. Hold up the hand for three minutes. Then wind a moderately broad piece of elastic round the finger, commencing at the nail. Still keep the hand well up; take the elastic off after five minutes, and if the ring will not come away repeat the procedure. Soap or oil the finger before attempting to remove the ring.

Foreign Bodies under the Nails. Thorns, splinters of wood, etc., must be extracted after gradually paring down the nail until the foreign body can be seized by forceps. If this cannot be effected after the nail is pared to the quick, the outside end of the splinter should not be wasted by fruitless picking at it, but the nail immediately above should be scraped as thin as possible; after which a triangular piece may be cut from the top, when the splinter may be readily seized and drawn out. If all this cannot be accomplished it will be best to poultice for a day or two, when probably the intruding substance will be loosened and may be extracted.

Foreign Bodies in other Parts. Foreign bodies sometimes become impacted in the private parts or fundament, and may consist of substances which have been swallowed, as fruit-stones and fish-bones, or of articles introduced from without. As they cannot be extracted easily the assistance of a surgeon will probably be required.

Fractured or Broken Bones. These accidents are spoken of as simple fractures, when there is no external wound leading from

the surface of the skin to the injured bone. When there is such a wound they are called compound fractures (*see* p. 310). Compound fractures are much more dangerous than simple fractures. When the bone is broken into several pieces it is called a comminuted fracture. Fractures implicating joints are the most dangerous.

The usual symptoms of all fractures are pain, swelling, alteration of shape, grating of the broken ends of the bone on movement, and more or less inability to move the limb, but increased mobility in the hands of the examiner. But sometimes, in children, bones are bent or split, not broken, when, although there will be no grating, the deformity or bent shape of the limb will sufficiently indicate the injury. The latter condition is known as a green-stick fracture. For the signs distinguishing fracture from dislocation, *see* Dislocation. Fractures near the joints are distinguished from simple sprains (*see* p. 316) principally by the presence of grating. One end of the broken bone may be forced into the other, causing an *impacted fracture*. There will be no grating (*crepitus*), and the less it is interfered with the better for the patient.

Treatment. The *immediate* treatment after any accident is given at p. 254; of fractures, below. *The principles of after-treatment of all fractures* are to place and retain the fragments in perfect rest in their natural position until they have united. Modern methods of *massage* and passive movements in fractures had better be left to a surgeon.

The surface on which the patient with a fractured limb has to lie should be firm and level, and therefore no feather or very soft bed should be allowed. If a firm bed is not at hand place a board under the mattress. The lighter and cooler the method of fixing the limb the less unpleasant it will be. The irritation when the part is thickly covered and there is no escape for the perspiration is often intolerable. It is also of importance to be able to undo the apparatus easily, to see the state of the limb and to keep it clean with soap and water.

In the treatment of fractured bones the following articles are required: Splints, bandages, pads, tapes, sometimes oiled silk, and simple ointment or olive oil. Splints may be made of wood, or, except for the thigh, of gutta-percha, of telegraph wire, of thick pasteboard, of newspapers, of bandboxes, or even strong straw (bottle-covers) tied into a bundle. Bandages should be made of linen or calico,

or of old sheeting. Pads may be formed of pieces of blanket cut into the shape of the splints, or of cotton-wool or tow, or of cocoa-nut fibre, chaff, or husks of grain in bags. Before attempting to treat a fracture everything required should be made ready. When adjusting splints, much care must be taken than no unnecessary force is applied, or a *simple* may be converted into a *compound fracture*. See that there is no great pressure on the prominent parts, such as the bones of the ankle or elbow or thigh ; otherwise blisters and sores will form. This is to be avoided by making the pads fit the limb, or they may be fitted to the limb of another person or on the sound limb. Before applying splints the limb should be washed, dried, and dusted with violet powder or starch. Although frequent moving of splints when once applied is not desirable, it is still necessary to secure cleanliness, and to ascertain whether any wound is forming from pressure or whether blisters have formed from the violence of the injury. It will therefore be necessary to move the splints with great care about the third day, when the limb will be probably found showing the discoloration described under Bruises, and also presenting various blisters. These should be snipped at the most dependent part : the limb should be gently sponged and cleansed with warm water and carbolic soap ; a little simple ointment (Prescription No. 77 or 88) or vaseline spread on lint or soft rag should be laid over the blistered part ; and if pressure has occurred, the pads and splints should be carefully readjusted so as to avoid it. Similar attention will be required in another day or two, and afterwards the limb should be gently sponged every few days. If all this is done with care, no motion of the fractured parts need be entailed.

If there is great swelling of the parts or much bruising or escape of blood into the tissues apparent at first, broken limbs should not be bound on splints for the first three or four days. If limbs in such a condition are bandaged up tightly much pain results, and if the bandages are not slackened serious injury or mortification may follow. It is best at first, if there is much swelling, to lay the broken limb in as comfortable a posture as possible and as nearly as can be in its natural direction. It may be lightly bound to a single splint merely for the purpose of keeping it steady, or kept in place by heavy sandbags placed along it. The arm, whether broken above or below the elbow, will lie most comfortably half bent on a pillow. The thigh or leg will be rested most easily on

the outer side, with the knee bent. It will always be proper to apply fomentation or lotion, or to use irrigation, while swelling continues (*see* Chap. XX, Application of Cold), and, as a rule, it will be best to cool during the first two days and then to foment.

In treating fractures of the lower limbs, and also sometimes for the arm, the use of a "cradle" is necessary to keep the bed-clothes from pressing on the injured parts. A "cradle" may be constructed of some curved iron wires passed through three slim pieces of wood, as in Fig. 30, A. Or one may be made as Fig. 30, B, by cutting a barrel-hoop in two or three pieces and nailing them to

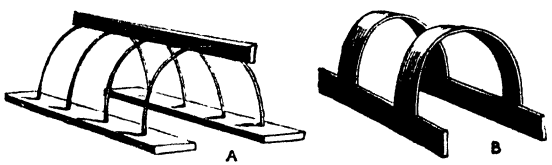


FIG. 30

two pieces of wood. As a temporary arrangement a cradle can be formed by knocking the ends out of a box.

Fracture of the Skull. If it be a simple fracture or crack in the bones of the skull, nothing more will be required beyond attention to any external wound, as mentioned under *Wounds of the Scalp*. Such injuries are, however, generally attended by *concussion* (*see* p. 274), and this state, if present, must be treated as there mentioned. If any portion of the bones of the skull is broken and *depressed* below the other part, the symptoms described under *Compression of the Brain* (*see* p. 276) will be present, and the operation of trephining may be required. For distinction between bruise and fracture, *see* p. 270. When, after an injury to the head, there is bleeding or escape of watery fluid from the ears or from the nose, in addition to insensibility and laboured breathing, *fracture of the base of the skull* has probably taken place, and the case generally ends fatally.

In a case where fluid is escaping from the ear or ears these should not be syringed. The ear-hole should be wiped clean twice a day with antiseptic lotion and covered, but not plugged, with cotton-wool squeezed out in an antiseptic solution.

In all injuries of the head there is special danger of inflammation of the brain, and therefore perfect rest from the first should be

insisted upon, with a darkened room, low diet, cold applications to the head (*see* Chap. XX), purgative medicines (calomel 5 grains), and *abstinence from all stimulants.*

Fracture of the Spine. The fracture is usually partial, and frequently associated with dislocation of one bone or of part of one bone. The symptoms are partly *local* and partly *nervous*, depending on the nature and amount of injury which the spinal marrow has sustained. The *local* symptoms are: pain, loss of power, and irregularity in the course of the spine at the seat of injury. Sometimes the bones of the spine, ordinarily felt as a succession of regular hard prominences in the back, are found to be unnaturally separated at the injured place, or one or more of the bones may be felt to be depressed *beneath the level* of those above and below. If the spinal marrow is so far injured that its functions are interfered with, there will be either partial or entire loss of both motion and sensation *below* the point of injury.

If the fracture is situated about the loins, the lower part of the body, the bladder, the rectum, and the lower limbs will be paralysed, the person being unable to move or to make water or to pass motions at will, both being retained or coming away involuntarily. The arms and upper part of the body remain unaffected. The patient may live for months or years, death eventually taking place from exhaustion, caused possibly by bed-sores (*see* p. 329), or from disease of the bladder (*see* p. 331).

If the injury is higher up, about the shoulder-blades, the muscles of the chest will be also paralysed, and breathing will be carried on with difficulty. Under such circumstances the patient may live a few days, but the lungs soon become digested, and the person dies suffocated.

If the injury is still higher, or at the lower part of the neck, the arms are also paralysed.

If the injury is still higher up, about the upper part of the neck (above the origin of a nerve called the *phrenic*), death takes place instantly from cessation of respiration. Such cases are popularly talked of as 'broken neck.' Hanging frequently produces death in this way.

Treatment. When the injury is in the lowest part of the back much may be done to make the person more comfortable and to prolong life. The sufferer should be placed, if possible, on a water-bed, and kept perfectly clean. The tendency to bed-sores about

the buttocks and back from pressure, and about the privates from irritation by urine or by fæces dribbling away, should be held in mind, and the parts should be protected by variously shaped pillows and by suitable coverings of oiled silk. As the person cannot make water, the urine accumulates in the bladder until, that organ being filled to distension, it dribbles away ; but the bladder remaining always full, the urine contained therein becomes offensive, ammoniacal, and doubly irritant to the inside of the bladder and to the skin, which it may run over outside. From the first, therefore, the urine should be drawn off with the catheter twice a day, and if a surgeon and the necessary instruments are at hand the bladder will probably be washed out daily : a patent urinal may be worn, and a temporary one is easily made with a wide-necked bottle, which can be emptied by the nurse from time to time. No medicine, except an occasional purgative, such as castor oil, will be required. But the rectum should be washed out every two or three days by an enema of soap and water. When the injury is higher than the loins very little can be done to alleviate the sufferings of the patient, and no medicine is of any use.

Fracture of the Bones of the Nose. This is known by the nose being flattened and by the grating of the broken bones when the nose is raised to its natural position. A fracture of these bones if there is any displacement requires careful treatment, and medical assistance should be obtained ; if there is no displacement the treatment of the bleeding is all that is required. The patient must be especially cautioned against touching the nose or attempting to blow it. If there is any displacement an attempt, by careful manipulation over the bridge, may be made to get the bones into their position. The patient should be on the opposite side to that in which the displacement has occurred, and a cold application (ice) shall be placed on the nose. Plugs should not be placed in the nostril with the idea of keeping the bones in position, as these get rapidly fouled and require frequent renewal, and with each renewal displacement is apt to recur and in any case is very painful. If air escapes into the tissues around, which is shown by crackling on touch, this need cause no alarm and disappears of itself.

Fracture of the Lower Jaw. This usually occurs at about the middle of one side of the part in which the teeth are placed, and is known by pain, swelling, inability to move the jaw properly, and irregularity of the teeth—the front teeth being drawn down

and the back teeth up by the action of the muscles. The point of fracture may be easily felt, and the saliva dribbles from the mouth. On moving the jaw grating will be felt. If the fracture is compound there will also be bleeding from laceration of the gums, and probably one or more teeth may be knocked out or loosened.

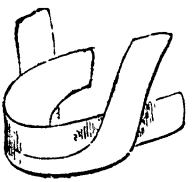


FIG. 31

Treatment. If teeth are only loosened they should be left. Teeth, or fragments of bone wholly detached, should be removed. The teeth should be brought into a natural line. A piece of gutta-percha, or thick pasteboard softened by hot water, should be accurately fitted to the jaw (previously shaved, if necessary), and extending from ear to ear. The gutta-percha should be about 8 inches long, and should be split up in middle from each end to within an inch of the centre. When applied, the lower portion should be doubled on the upper, Fig. 31, by which means there is a double support at the part most requiring it. The gutta-percha must be secured by a four-tailed bandage, made by taking 1½ yards of calico 'roller,' about 4 inches wide, tearing each end longitudinally so as to leave about 8 inches in the middle, in which should be a slit for the reception of the chin. This slit should be about an inch from the anterior margin, so that the latter may not rise so high as to cover the lower lip or get into the mouth. Two of the tails are then tied over the crown of the head and two at back of the neck; or the latter may be crossed and brought round and tied in front. The bandage may be rendered more secure by a circular one round the head above the ears, the two being secured by pins or stitches where they cross. The mouth is thus closed, and the patient must be fed for the first fortnight entirely on fluids by means of a tube with a funnel attached or put on to the spout of a feeding cup, passed along the cheek to the back of the mouth. At the



FIG. 32. Four-tailed Bandage

end of three weeks the splint and bandage may be discontinued and soft food taken. No solid food requiring mastication should be taken till the end of the fifth week. Dribbling of saliva and fœtid taste in the mouth are a great nuisance to the patient: owing to the dribbling, the bandages and splints get soiled very rapidly, so that they require frequent changing On this account the splint may often be omitted, as also in cases where it causes the patient much annoyance. Washing the mouth with weak Condy's Fluid or chlorate of potash mouth-wash (Prescription No. 21) is very comforting, and should be done if there is sufficient interval between the teeth or if a tooth is wanting.

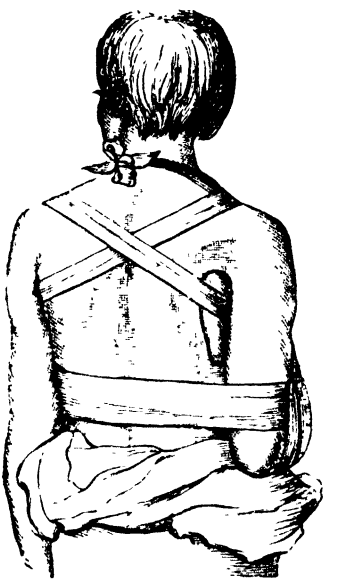


FIG. 33. Broken Collar-bone Bandaged

Fracture of the Collar-bone. The person cannot raise the arms upwards towards the head; the broken part of the bone may be seen and felt prominent; grating of the broken ends occurs on movement of the shoulder; the shoulder is flatter than the other and falls forwards and inwards; the person supports his elbow and forearm with the opposite hand and forearm. The accident frequently occurs to children.

Treatment. Place a big cone-shaped pad in the armpit, after thoroughly drying and powdering the skin, then bandage the shoulders so as to draw them well backwards. This is effected by a 'figure-of-eight' bandage, passing several times round each shoulder and crossing behind. Take care that the bandage turns do not press on the broken part. Cotton-wool as padding shall be placed under the bandage where it most presses. The arm must be then bound to the side by another bandage, with the elbow well back; and, lastly, the elbow must be supported by a handkerchief used as a sling round the neck. Thus the shoulder is kept up by the sling, out by the pad, and back by the bandage, bringing the broken ends of the collar-bone into position. When the bandages are adjusted they should be stitched in several places, as they are

liable to slip. They should be tightened when they grow loose. They should be worn a month, and the arm carried in a large sling for a week or ten days. The diagram, Fig. 33, represents a broken collar-bone bandaged.

It is difficult to keep this bone, when broken, at rest and in exact position, unless the patient lies on his back, with his arms confined to the side of the body, and keeps his head quite still, For ladies, when it is a matter of much importance to prevent deformity, the recumbent posture in bed should be maintained for three weeks on a hard mattress with a small hard pad between the shoulders. A small pad should also be placed in the armpit and the elbow raised and fastened to the side. When both collar-bones are fractured such a method of getting union is imperative. The position is very irksome, and few patients will submit to it. With the bandages as above described, a broken collar-bone unites speedily and strongly, although some little deformity must be expected.

Fracture of the Upper Part of the Arm-bone (Humerus). There are various kinds of fracture of this part, but the one now described is the most common. The arm is slightly shortened, and the broken end of the bone may be felt in the front of the armpit, while the round head of the bone is felt in its right place and does not move when the elbow is turned. The shoulder, when compared with the other, will be seen to have lost its rounded form, with a depression about 2 inches below the point of the shoulder. Grating will also be felt when the elbow is pulled downwards so as to restore the broken parts to their natural position. There is severe pain from pressure on the nerves. The following features distinguish this accident from dislocation: although the shoulder loses its rounded form, it does not present the sharp angle of dislocation; the head of the bone is felt in its natural position; there is grating; the broken end is felt in the armpit; and the parts return to their unnatural position after being placed right by extension, only to slip away when released—none of which signs are present in dislocation.

Various other injuries affecting the shoulder-joint occur, presenting symptoms very similar to fracture of the head of the upper arm-bone, or to some forms of dislocation. In any case of doubt, it will be well to apply the crossed bandage as for fractured clavicle and to keep the arm to the side until the advice of a surgeon can be obtained.

Treatment. If there is no reasonable doubt that the head of the bone is fractured it should be treated as follows: If, as is often the case, there is great swelling, it will be advisable to put the patient to bed and to use evaporating lotion for a few days until the swelling subsides before applying splints. Then, or at first, if there is no swelling, the broken bone must be reduced to its natural position by raising the arm and then pulling on the bent elbow. While the extension is kept up, a pad, dusted with boracic acid, should be placed in the cleansed armpit and kept in position by a broad bandage crossed over the shoulder of the injured side and with its ends fastened in the opposite armpit. The elbow is then to be allowed to hang by the side with the wrist and hand comfortably supported by a sling. The weight of the elbow hanging down tends to prevent and overcome the lower part of the bone being dragged upwards by muscular exertion. For greater safety a shoulder-cap may be applied. This is made out of gutta-percha or strong leather moulded by immersion in hot water. This must be cut so that the upper part must reach to the root of the neck above and should extend well over the chest and back; at the lower end it should reach to just above the elbow and should encircle half the circumference of the arms. A pattern should be first cut out of brown paper: *see* Fig. 34. The splint should be moulded on to the arm, taking care not to do so when it is too hot. After it is set, remove and punch holes from within outwards, pad it inside, and fix on to the shoulder by means of tapes or a bandage. The apparatus ought to be worn for five weeks, after which the joint may be gently moved.

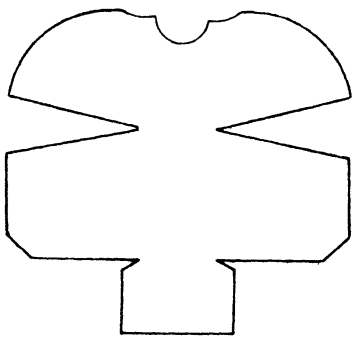


Fig. 34 Shoulder-cap

Fracture of the Middle of the Humerus is easily detected from the deformity, the grating, the bone being movable at the broken point where it should be firm, the local pain, and the inability to use the arm.

Treatment. The parts should be restored to their natural position by raising the arm parallel with the shoulder, and then

by pulling or extension of the bent elbow. Then four carefully padded splints should be placed, one in front, one behind, and one at each side. These splints must be long enough to reach from the top to the bottom of the arm, and the *outside* one should be the longest, as it should rest above on the shoulder and below on the outside of the elbow. Great care must be taken that this splint does not press too much on the prominence of the elbow—to be avoided by well padding opposite the hollow of the arm *above* the elbow. The skin of the armpit and that of the inside of the elbow are also liable to be frayed by the inside splint, which must be avoided by care and padding. Similarly the skin of the forearm may be blistered by the lower end of the front splint. The splints, when properly adjusted, must be secured by tapes tied round at the top and the bottom. Then a bandage should be applied from the hand upwards. The arm thus treated is here sketched, Fig. 35. The wrist and hand should be *supported by a sling, and the elbow allowed to hang down vertically.*

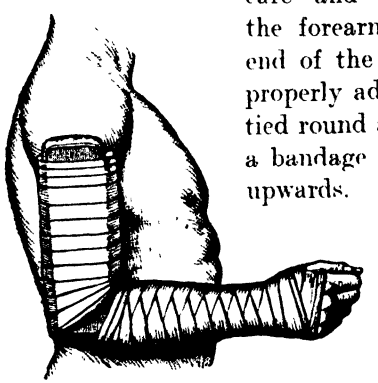


Fig. 35. Splints and Bandages applied to Broken Arm

If the means are at hand it is more advisable to apply a shoulder-cap, as in fractures about the shoulder, instead of the fourth outside splint. This shoulder-cap should in this case have its lower end so prolonged that it is bent at a right angle at the elbow and reaches more than half-way down the forearm, to which and the elbow it is bandaged. It is probable that the great frequency of fractures to remain ununited in the arm is due to the non-fixation of the elbow-joint. The splints should remain on some five weeks, after which movements of the shoulder and elbow-joints must be made.

Fracture of the lower part of the arm will be known by the elbow being drawn backwards, by its being restored to the natural position by pulling the hand, by its returning to the unnatural position if the hand is not pulled, and by the grating.

Treatment. Reduction should be effected by pulling on the wrist with the elbow bent at a right angle. With the other hand the broken part should be manipulated into position. The forearm should be flexed as far as possible on the arm; that is, the elbow

should be still more bent. A pad will then be placed in the bend of the elbow and a second pad behind the elbow; these will be secured in position with a bandage. Moulded leather or gutta-percha splints should then be placed both in front and behind the bent arm, reaching high up on the arm to low down on the forearm, and then be secured in position by bandages. The elbow and forearm should be then supported by a handkerchief-sling from the neck. Splints should be worn for a month, after which the joint should be gently moved.

Some fractures near the elbow-joint extend right into the joint, and the results, even with the most careful treatment, are very unsatisfactory. In such cases operative treatment by a surgeon produces the best results.

Fracture of the Prominences of the Arm-bone. The prominences (*condyles*) of the arm-bone on either side, just above the elbow, may be split off. The broken piece of bone forms a swelling towards the back of the joint, and there is difficulty in the motion of the joint. When these prominences are broken there may be much pain from injury of nerves. The injury should be treated as advised for fracture of the lower part of the arm, with a pad over the fracture.

Fracture of the Prominence (Olecranon Process of the Ulnar) of the Elbow. There is a depression at the back of the joint, above which the broken end of the bone will be felt detached from the body of the bone, and the person is unable to straighten the arm. This injury should be treated by placing the arm almost straight. A well-padded splint reaching two-thirds way along the arm and forearm, and with a pad in the bend of the elbow, should be fastened along the front of the arm. Narrow strips of strapping should be applied with their centre above the detached bone and the ends brought with a slant to the sides of the splint below the elbow and fastened there. The strapping should be removed when it gets at all loose. The splint will be on for about six weeks. Towards the end of the time the splint should be taken off temporarily while the elbow is gently bent; while this is being done the top of the olecranon must be kept firmly pressed down by the hand. The best treatment is by operation, as the injury but very rarely unites by bone but by ligament, so that there may always remain imperfection of movements.

There are other injuries of the elbow-joint presenting symptoms

of fracture or of dislocation. The precise nature is difficult of detection; but in case of doubt, keeping the arm bent at right angles, resting on an angular splint, will be the best plan until the arrival of skilled aid.

Fracture of the Bones of the Forearm. The two bones of the forearm (ulna and radius) may both be fractured in any part, or only one may be broken. There will be pain, loss of power of turning the hand, grating on movement, and the arm will be misshapen—the more so if both bones are broken.

Treatment. One person should hold the elbow and another pull the hand, keeping the thumb of the injured limb upwards. Then well-padded splints, a little broader than the arm, must be applied from the level of the crease in the palm to, on the outer side, the elbow, and on the inner side to the middle part of the upper arm. This latter splint has a right-angle bend at the elbow. The fingers must be left free so that the patient can practise movements of them daily from the first. A sling from round the neck must support both forearm and hand. The splints should be undisturbed for three weeks, after which they may be temporarily taken off to practise movements of the elbow and wrist joints, but they should not be discarded for five weeks at least as there is risk of non-union, especially in cases where both bones are broken.

In Children the Forearm is often Bent, rather than quite broken. The bones split as does a stick, and in such cases must be forcibly straightened, during which grating may be felt, and then splints are to be applied and worn for three weeks. This injury, as previously noted, is called 'greenstick' fracture.

Fracture of the Forearm close to the Wrist. This is an injury chiefly occurring to elderly persons and from it recovery is tedious. The limb is peculiarly bent, as in the accompanying sketch, Fig. 36, and there is generally much swelling, while grating is felt on extension of the hand. The lower fragment of the broken bone forms a marked projection at the back of the limb, and leaves in front, just above the line of the wrist-joint, a corresponding depression. It is distinguished from dislocation by grating being felt when the hand is extended and slightly moved.

Treatment. The proper reduction of this fracture is of the first importance, and often calls for considerable force. The reduction is easy under an anæsthetic, but without this it may be effected by grasping the limb and placing it palm downwards across the front

of the knee with the point of the inner (ulna) bone against the knee-cap. The hand is then pulled on and, at the same time, the wrist is made to bend partly forwards and to the inner side. Splints should then be applied to the back and front of the forearm, reaching to the level of the knuckles, and the front splint should be cut away so as to let the ball of the thumb be free. The fingers should be moved daily both by the patient and his attendant and the forearm carried in a sling. After ten days the splints may be carefully opened and, with the wrist held, the attendant will gently move the joint forwards and backwards and side to side and then replace the splint; at the end of three weeks the splints may be



FIG. 36. Fracture of the Lower End of the Radius

discarded and the patient encouraged to move the wrist in all directions. Rubbing (or massage) should also be done daily.

Other injuries about the wrist-joint occur, difficult of detection, involving often both the small bones of the joint and the ends of the bones of the forearm. In the absence of surgical skill, when there is doubt, it is best to treat the case as for fracture of the middle of the forearm.

Fracture of the Bones of the Hand and of the Fingers. These injuries are known by the attendant swelling, pain, and grating. The best method of treating fractures of the bones of the hand is to lay the extended hand on a wooden or gutta-percha splint, cut to the shape of the part. The inner or palmar surfaces of the bones of the hands are concave, and the splint should therefore be well padded so that it may adapt itself to their form. Sometimes, in order to maintain the broken parts in better contact, a small splint is desirable on the back of the hand. Then a bandage should be so applied as to keep the hand and fingers immovable. In some instances the broken bones are brought into more natural position when the hand is closed. If this is the case, the injury may be treated by causing the patient to grasp a ball of tow or other

substance about half the size of a cricket-ball, or so large as to permit the thumb and fingers meeting to within an inch. The closed hand, with the ball of tow inside, should then be secured in position by a bandage. The hand should be kept bound for about three weeks and supported by a sling, as noted below.

When a bone of the finger is broken it may be treated by binding the finger to a narrow splint of wood or gutta-percha or, best of all, perforated zinc, which should reach to the wrist. If the injury is very severe or if several fingers are involved, it will be needful to lay the whole hand on a wooden splint cut to the shape of the hand, thumb, and fingers. The inner surfaces of the bones of the fingers are concave, and the splints should therefore be well padded. *In all cases of fracture of the bones of the hands or fingers* the limb should be supported by a sling, so disposed as to raise the hand a little above the level of the elbow.

Fracture of the Ribs. The ribs are liable to be broken by falls or blows or by a crushing weight, as from a wheel passing over the chest. When the injury results from direct violence the rib is generally broken at the seat of injury; when from crushing or squeezing it breaks at the bend, or middle, of the bone. The patient complains of severe pain on drawing a deep breath, and there is a grating sensation in the side evident to the patient, and which may be felt on applying the hand flat over the part unless the patient is very stout. Grating is also felt it the person coughs, and there is generally a short, hacking, frequent, but suppressed cough. If the fracture is near the spine or the patient corpulent, detection will be more difficult. But if, after an injury to the chest, cutting pain is complained of, the treatment for fractured rib should be pursued. The principal danger from fractured rib is that the lung or its covering (the *pleura*) may be injured, when there may be spitting of blood, or *emphysema*, or pleurisy, or pneumonia.

Treatment. Diminish the motion of the chest by passing a broad 'roller,' 8 inches in width and about 12 feet long, tightly round the body from the pit of the stomach to the armpit. The bandage will require shoulder-straps to maintain it in position. The patient should be kept in bed on spare diet. The bowels must also be kept open. The bandage should be worn for three weeks, after which diachylon plaster may be applied over the seat of injury. Pleurisy, or inflamed lung, caused by fractured ribs, should be treated as advised for such ailments. Broad strips of plaster drawn

tightly from the spine over the damaged side to the centre of the breast-bone will serve the same purpose.

Traumatic Emphysema, or Air entering beneath the Skin. This sometimes results from the fractured ends of the ribs wounding the lungs. The emphysema forms a soft, puffy swelling of the skin, sometimes extending to the neck, which crackles when pressed. For this complication a pad of lint should be placed over the seat of injury, and a bandage should be tightly applied over the pad. The necessity for perfect rest must be more especially enjoined, for the occurrence of pleurisy or of inflammation of the lungs is more likely as the result of such injury.

Fractures of the Upper Part of the Thigh are of various kinds, but the one described is the most common. It is marked by inability to stand, shortening of the leg, and turning out of the toes, the heel of the injured limb pointing to the instep of the sound member. If the foot is drawn down to its proper length and turned about, while a hand is placed on the hip, grating will probably be felt. This accident frequently happens to old people, in whom it may occur from a comparatively slight injury.

Treatment. Unless the person is old and feeble the limb should be bandaged, as detailed below, for fracture of the middle of the thigh. If the patient is old and feeble, health would be sacrificed and probably bed-sores formed by long confinement in bed under the treatment by splints. The patient should be kept in bed for a fortnight with one pillow under the whole length of the limb and another rolled up under the knee. The more feeble should be propped up after a week in almost a sitting posture day and night, as the aged after a severe accident are liable to develop congestion of the lungs if made to lie down for any length of time on their backs. When pain and tenderness abate, which will be ordinarily in about a fortnight, the patient may be allowed to sit in a chair and to use crutches. What is called 'ligamentous union' will take place, and although the leg will be shorter than before, it will be fairly useful: the shortening can be remedied by a thick-soled shoe.

Fracture of the Middle of the Thigh. This accident is readily distinguished by shortening of the limb, by great swelling, and by grating when the ends of the bones are placed in contact by extension or pulling from the foot; which also restores the natural shape of the limb.

In young children this fracture is often incomplete, the bone being only bent. In such cases there is no grating, and pulling the foot does not restore the natural shape of the thigh, which must be bent back with the hands into position, much in the same way as a stick would be bent.

Treatment. For all cases of this kind and for fractures of the upper part of the bone, up to fifty years of age the long thigh-splint must be used. This is a narrow board of a hand's-breadth for an adult, but narrower and slighter for a younger person. It must be long enough to reach from just below the armpit to 4 inches below the sole of the foot. At the upper end must be a hole, at the lower end two deep notches with a hollow, or hole, just above for the reception of the ankle-bone. First, the splint must be thoroughly padded, with layers of blanket or otherwise. Then the limb should



be evenly bandaged from the toes up the knee, and gently extended to its proper length and shape by pulling the foot. Next, the lower end of the splint is to be fixed to the ankle by passing a bandage round the foot and through the notches of the board. Next, the splint is secured to the limb by a bandage passing upwards. During all this time an assistant must keep the limb in proper position by pulling the foot. Lastly, this extension must be maintained by 'the perinæal band.' This band is formed of a large handkerchief or piece of silk, doubled cornerwise and rolled round a long thin pad. This is placed between the legs, one end passing over the groin, the other under the buttock, and the ends are tied through the holes at the top of the splint. This mechanically pushes the foot down, and so keeps up the extension. A roll of broad bandage should also be passed round the body and upper part of the splint, to keep the latter close to the person. The perinæal band is likely to gall, and constant attention must therefore be directed to this part; particular care being taken that it does not press on the 'privates,' or become wet with urine. And as considerable pressure is exerted on the ankle, padding and manipulation are necessary at this part to prevent blisters or sores forming. It is also sometimes necessary to apply short splints both on the inner side and on the front of the thigh, when the bones have a tendency to project

in either direction. Figure 37 shows a thigh thus bandaged to the long splint.

It often happens that the bandage round the foot, notwithstanding careful padding, causes pain or blisters from the pressure, which, when the band between the legs is drawn tight, is considerable; or the band may cause soreness between the legs. Under such circumstances it may be necessary to continue the treatment without these aids, and this may be effected in the following manner. A fixed point, in the shape of a foot-piece, must be attached firmly to the foot of the bed, so that the sole of the foot of the injured limb may rest against it as the patient lies on his back. Then a long broad strip of plaster must be carried down the leg from just below the seat of fracture on the one side, round

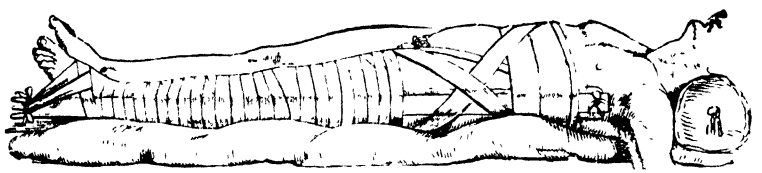


FIG. 37. Fractured Thigh

the foot-piece, and up the leg to the same point on the opposite side. By this means the pressure and extending force will be so diffused that the person will be scarcely sensible of it. But something is still wanting as the extending force, in place of the perinæal band. And this difficulty is to be overcome by tilting up the lower end of the bed, about 12 inches from the floor, and placing blocks of wood below the feet of the bed. The patient then lies on an inclined plane, and the body having a tendency to slip towards the head of the bed, while the foot is fixed by the plaster to the immovable foot-board, the desired extension is thus maintained at the seat of the fracture, the body itself being the counter-extending force. A well-padded band passing between the legs and fastened to the head of the bed may be adjusted so as to increase the extending force if the weight of the body is not sufficient. As a further precaution, small splints should be applied round the thigh at the point of the fracture. The best method of applying the foot-board is to procure a piece of wood about ½ inch thick, as broad as sole of the foot, and in length sufficient to reach from the floor when the bed is tilted to the extremities of the toes of the patient

as he lies with the heel downwards. The upper portion should be cut into the shape of a foot-piece, and the board should then be firmly screwed to the cross-piece of the bed. A little adjustment by cutting the latter or the foot-piece, or by inserting a wedge between the two where they meet, will be necessary in order that the upper part of the board to which the sole of the foot is bound may be perpendicular, and not participate in the tilt of the bed. To render it still more firm, a nail may be driven in the floor, in front of the lower end of the foot-board. If a pulley wheel can be got, this may be secured to the foot of the bed. To the long strip of plaster fastened as above a cord is to be attached below the foot. The cord is then passed over the pulley and a weight (a heavy book or bag of stones) attached. This will be about 7 or 8 lb. in the case of an adult, but what is necessary is that the weight be sufficient to extend and keep extended the limb to its proper length as measured by the sound limb. If the patient is likely to be restless the long splint from the armpit to below the foot should then be applied, but in other cases is not necessary.

Whatever method is employed, care must be taken that the foot is kept at right angles to the leg and that the turning out of the foot is corrected by due support and padding.

In children under five the most convenient treatment is to suspend the broken limb in a vertical position in the following way: On the middle of the head and foot of the bed two upright poles are fastened, and these are joined by a horizontal pole about 2 feet above the mattress. The child is laid on the bed and a strip of plaster fastened to the leg on each side from just below the fracture to above the ankle; the leg is then raised to a vertical position and fastened by means of a cord, tied to the ends of the plaster, to the horizontal pole with just so much pull that the buttocks are free of the bed. The sound limb is then too, but loosely, fastened to the pole. No splints are necessary and the child can be kept easily clean.

After any variety of fracture of the thigh it often occurs that the bladder is temporarily paralysed and the person cannot make water. The passage of water should therefore always be inquired about a few hours after an injury of the kind. If no water has been passed the belly should be fomented, and if this does not succeed the catheter must be used.

The patient must remain in bed for five or six weeks and must

then go about on crutches, not putting his foot to the ground for another two or three weeks. In almost all cases some shortening of the limb occurs, and occasionally this is not apparent until the patient begins to walk.

When a fracture of the thigh happens away from home, a gun, a rifle, a broom-handle, or any long stick, wrapped in clothing, may be used as a temporary splint. Or, failing all else, bind the legs together from hips to heels, making a splint of the sound leg.

Fracture of the Knee-cap. This generally results from spasmodic muscular action, as occurs from missing a step in coming downstairs. A sharp pain is experienced, accompanied by an often audible crack or snap. The person falls and cannot stand. The knee cannot be straightened, and a hollow, or chink, is found between the broken parts of the *patella*, a little above the knee.

Treatment. The patient must be put to bed and the limb extended on a light, well-padded wooden splint or board reaching from the buttock to the heel, and having a hole at the end to receive the latter part, and a small piece, projecting at right angles from the end, to receive the sole of the foot. The heel end of the splint should then be raised about 1½ feet, which has the effect of relaxing the muscles, and so allows the broken parts to come into contact. The foot and leg must be lightly bandaged to the splint; or the leg may be laid flat, the body of the patient being propped by a slanting board or bed-rest in the semi-recumbent posture, which has a similar effect on the muscles. Or, when one position becomes irksome, it may be exchanged for the other; or one may be maintained during the day and the other at night, care being taken not to *lessen the angle* at the hip when changing the posture, so that the muscles may be constantly relaxed. This may be readily accomplished by raising the body before lowering the foot, or by raising the foot before lowering the body. In some cases the broken parts of the knee-cap cannot be brought into satisfactory contact until both the heel is raised as above and also the body propped in the semi-recumbent posture. Whatever position is chosen, if there is much swelling and bruising, cooling lotions or ice should be used. When the swelling has subsided the lower fragment must be pushed upwards and fixed by a piece of strapping with the centre over the lower fragment and the ends brought obliquely upwards, to be fixed to the sides of the splint higher up. With the lower fragment thus fixed, 1½-inch-wide strips of bandage

must be applied across the front of the thigh. The ends of each strip are to be fastened to the side of the splint at a lower level than which they cross the thigh. The highest strip should be 6 to 8 inches above the upper fragment of the bone, the lowest overlapping its upper edge. The two fragments of bone should thus be drawn together. The apparatus should be kept on for eight weeks and the plaster readjusted if it gets loose during this time. After this a laced-up knee-cap should be tightly fitted, the muscles of the limb rubbed daily, and the patient may walk with crutches. In another six weeks the foot may be put to the ground and weight may be borne on the foot, but still crutches used. After another two months two sticks may be substituted for crutches and used till nine or ten months have passed since the accident. Even then the result is often disappointing and a limp remains. Operation at the beginning gives good and rapid results.

Fracture of the Leg. As in the forearm, so in the leg there are two bones: the outer thin, the fibula; the inner strong and supporting the body weight, the tibia. Fracture may occur in any part of the leg, and one or both bones may be broken. When both bones are broken the fracture may be generally easily detected by running the fingers down the shin, when an irregularity or prominence will be felt at the fractured part. There is also swelling, grating when the limb is moved, deformity, and inability to stand. Sometimes the displacement of the bones may be masked, and the presence of fracture rendered doubtful, by great swelling of the soft parts. It must be borne in mind that there is a special liability for fractures of the leg to become compound, even if not so at first, owing to a tendency of a broken end of the bone to break through the skin if the bones are not brought into good position. Again, there is special tendency to shortening owing to the frequent obliquity of the fracture; also, the foot tends to turn outwards.

Treatment. When there is great swelling and the existence of fracture is not to be ascertained without subjecting the patient to great suffering, the limb should be, as nearly as possible, brought into a natural position and then gently placed on a well-padded splint or on a pillow, to which it may be lightly tied by broad tapes. The person should lie on the side so that the leg may be placed, with the knee bent, on its outer side. Then the limb should be treated with cold lotions for several days, or until the swelling subsides, when the broken bones, if not already in place, may

be properly adjusted or 'set,' and splints applied as advised below.

If there is much bruising of the skin the leg should be washed with antiseptic lotion (1 in 40 carbolic acid lotion).

There are two positions in which a person with fracture of the leg may be placed, viz. on the side, as previously described, or on the

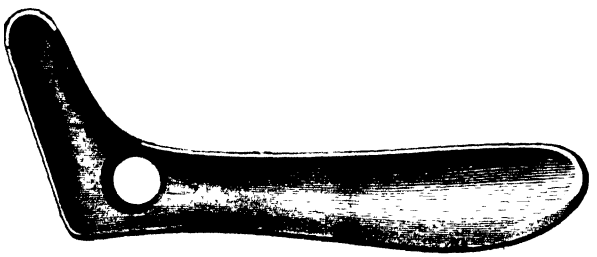


FIG. 38. Splint for Application to outer side of Leg

back. Sometimes the nature of the fracture decides this point, the bones coming into better contact in one position than in the other. The position, however, may be ordinarily determined by the wish of the patient, some persons lying and sleeping more comfortably on the side, others on the back. If it be determined to place the patient on the side, splints should be first prepared wide enough slightly to overlap the leg, long enough to reach from the

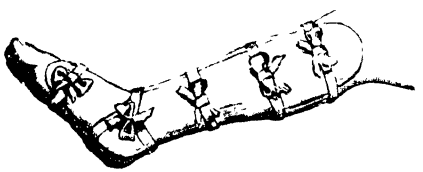


FIG. 39

knee to the foot, and provided with foot-pieces. If wooden splints in the shape of the diagram, Fig. 38, are not available, they may be made of thick pasteboard or of gutta-percha, or they may be cut out of tin. The two first-named materials should be soaked in nearly boiling water and, when cooled, moulded to the shape of the leg by placing them for a short time on the corresponding leg of another person of about the same height. Then the splints should be well padded with cotton-wool, sewed in calico bags of the same shape as the splints. When all is ready, the knee of the patient should

be fixed by an assistant, holding it firmly with both hands, and the broken ends of the bone should be brought into position by steadily but gently pulling the foot. When under this operation the leg assumes the natural shape, the outer side should be gently laid upon one splint, and the other splint should be placed on the inner side; the whole to be secured by tapes as shown in Fig. 39. The leg being laid on its *outer* side, the knots must be tied on the *inner* side, and care must be taken that they are not, especially at first, drawn too tight, as the injured part will probably swell for a few days, and the pressure of the tapes, especially on the shin-bone, may produce blisters. To avoid this, the splints should be rather wider than shown in the sketch. Knots are more easily loosened and tightened than a bandage, and, further, allow of the splint, on the inner or upper side, being lifted off and the leg examined without disturbing the whole limb. After four weeks' confinement to bed the patient may be allowed to get about on crutches, still wearing the splints, the limb being supported by means of a long sling passing round the neck and beneath the sole. In another two to three weeks the splints may be left off and massage be done, with gradual use of the limb.

When the patient is to be placed on the back a 'box-splint' is the most convenient form of apparatus. Two pieces of wood, as long as from the knee to 3 inches below the sole, are rolled up in opposite ends of a sheet as broad as the splints are long, until they almost meet. The leg is placed on the interval thus left, the splints turned up on each side, and all hollows between the limb and splints filled with cotton-wool and pads. The splints are then fastened to the limb with tapes. The leg thus rests on the sheet. The whole is then slung up to a cradle so that the knee is well bent. Before fastening the tapes the foot must be pulled upon to get the broken bones into position and to hold them there till the tapes are pulled tight. The splint will be worn for six weeks.



FIG. 40. Pott's Fracture

Fracture of the Leg immediately above the Ankle. One or both bones may be broken. In the second case the position of

the foot is as in Fig. 40. The most common accident is where the small bone (fibula) is broken, and this is accompanied by the tearing of the ligaments at the inner sides of the ankle (Pott's



FIG. 41

fracture). This fracture is of great importance, as if not properly treated marked lameness will result, or the patient may be hardly able to walk at all. The foot is displaced outwards and also often backwards: marked deformity requires an anæsthetic for its reduction. The reduction may be attempted by flexing the knee and fixing, by the hands, the upper part of the leg: the other helper will then grasp the foot with one hand and the leg with the other and will endeavour to reduce the deformity and hold it in position till the splint is fixed. The splint, with breadth equal to the depth of the leg, has two holes at the upper end and three prongs below (*see* Fig. 41). Its length should be from the knee to 3 inches below the sole of the foot. The splint is placed against the inner side of the leg and its upper end fastened by a handkerchief round the knee with its two ends passed through the splint and knotted. A 2-inch-thick pad is placed between the leg and the splint above the fracture, and the splint fastened to the leg above the fracture. A third folded handkerchief is then passed round the ankle with its centre over the inner ankle-bone, and the ends pass under the foot from the outer to the inner side and are fastened through the prongs of the splint as in Fig. 42.

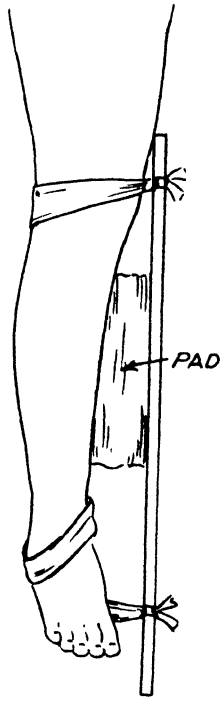


FIG. 42

The foot may be turned into the desired extent by tightening the third handkerchief, the thick pad above the fracture acting as a pivot. Backward displacement of the foot, if present, is corrected by tying this lowest handkerchief round the front prong only. The leg

must be then hung in a cradle with a support beneath the heel. After four weeks the patient should get about on crutches with the foot supported on a long sling from the neck, and the lowest handkerchief loosened daily to allow passive movements. No weight should be made on the foot for at least eight or nine weeks.

Fractures of the Foot. These injuries are difficult to detect and generally occur from great violence; the soft parts are frequently also much injured, and such cases necessitate surgical advice. Usually they do not require splints, placing the part as nearly as possible in the natural *position*—rest, fomentations, and lotions being the proper remedies.

Fracture, Complications of. 1. *From rupture of blood-vessels a quantity of blood may escape into the tissues of the limb.* If small it constitutes a bruise; but it may be so large as to cause the limb to swell and eventually result in an abscess. In the absence of surgical advice, the injured limb should be kept at rest in an elevated position, and ice or cold lotions should be applied over a firm bandage.

2. *Comminuted fracture.* This is when the bone is broken into several small pieces. It is generally the result of direct violence, and the soft parts are usually a good deal bruised. The treatment is the same as for simple fracture, although there will be more trouble in keeping the parts in apposition, and much care must be taken to avoid pressure on the bruised parts lest a wound result.

3. *Compound fractures.* When there is an external wound communicating with the fracture it is called *compound.* Compound fractures are more dangerous than simple fractures and are also more troublesome, as, in addition to treating the *fracture* in the manner described, the wound is liable to invasion of *bacteria*, and must be cleansed and dressed daily should suppuration occur (*see* Wounds), involving in every case different adjustment of splints and bandages in order to get at the wound easily without moving the fractured bone. When it is necessary to fix a limb with *compound fracture* on a splint, the seat of the injury should, as far as possible, be left uncovered by the bandage and the continuity of the splint interrupted by firm wire, arching over the wound. If requisite, a second bandage may be applied over the first one, to retain poultices, 'dressings,' etc. In this way local treatment may be used without disturbing the position of the limb, and the progress of the wound can be watched without causing unnecessary pain to the patient.

4. *Fractures implicating joints* are most dangerous, owing to the greater shock with which they are attended and the risk of inflammation of the joint. They are also liable to be followed by some stiffness of the joint. Such cases require very careful treatment, at *first* absolute immobility of the injured bone and joint being the essential point, while inflammation is combated by fomentations, or ice applied over a bandage. The *second* point is early *passive* motion of the joint, which should be gently moved by another

person after the lapse of four weeks, in order that any adhesions which may have formed may be broken down, or earlier, to prevent their formation.

5. Other dangers from bad, or compound, fractures are inflammation of the veins, tetanus, and blood-poisoning.

Fractured, Torn, or Cut 'Tendo Achillis.' The large thick tendon, thus called, which connects the heel with the great muscles forming the calf of the leg (which are the main instruments in keeping the lower limbs erect and straight when we stand, and in throwing the body forward when we walk) is liable to be torn or cut. It may be torn in making a false step in walking or running or in coming downstairs or when dancing. The tendon tears without warning, and the person drops to the ground with the sensation of a smart blow on the part. On attempting to rise he finds himself unable to rest the least weight on the foot, and a gap will be distinguished where the tendon is separated, into which the finger drops in passing it from the heel up the leg towards the calf.

Treatment. This consists in putting the patient to bed and laying the leg on the outside with the knee much bent and the toes much pointed, by which position the torn ends of the tendon are brought as nearly as possible together. To extend the foot use a foot-piece, which can be adjusted after the foot is fixed to it by a bandage. This posture must be preserved for a fortnight, to give time for the production of the new substance by which the tendon is repaired. To secure this position it will be necessary to bind a piece of thin board, about four fingers wide, extending from below the knee-cap to beyond the toes, upon the front of the leg, taking care to have the board well padded so that it may not rub. The board must be confined, by a bandage, to the foot, and above to the calf. Or the same position may be secured by the patient wearing a slipper attached, by a band fixed to the slipper heel, to a buckle and strap fixed round the thigh, high up. The knee should be well bent. Cold lotion may be applied. No bandage must be put on where the tendon is torn. After a fortnight, or a little longer, the gap mentioned above may be filled up with a firm substance. The apparatus may be taken off in about three weeks, but the patient should not stand on the foot for another two weeks; during this last two weeks he should practise moving the foot while still lying down. He then may be allowed to walk about, at first with a crutch or stick.

When the Achilles tendon is cut, which may happen from

the blow of a scythe or sickle or sword, the case is more serious. The person is in the same condition as a beast which is 'houghed,' and cannot stand. After cleansing the wound, it should be brought together by placing the limb in the position above described; the edges of the loose skin tend to drop into the wound so as to interfere with union. It is therefore necessary to pick up both edges of the cut skin, so as to make their *under* surfaces touch, then passing a needle and suture to keep them in such position. The limb must then be 'put up' as described for simple rupture, and the stitches may be taken out on the third or fourth day.

Crutches. Crutches should be just long enough to enable the person to raise the injured leg off the ground while he stands firmly on the other. The cross-bar should be oval-shaped and well padded, otherwise the pressure may strain the nerves of the arm. The ends of the crutches should be tipped with leather to prevent them slipping. If the state of the injured limb is such that the patient ought not to use it at all, support it with a bandage passed under the foot, the ends being brought up evenly in front and tied behind the neck. In this way a sort of sling is made, which assists the patient in keeping his foot from the ground.

Ganglion. This is the term applied to a swelling of the membrane or sheath enclosing the tendons of the wrist. It may appear gradually, and it may arise suddenly, after a strain or twist of the part, and may attain the size of a marble or a small egg. Similar swellings also sometimes appear from blows or other injury, on the back of the hand, on the tip of the elbow-joint, on the side of the knee, and on the knee-cap. If the swelling is on the wrist or back of the hand, and free from tenderness, it may burst by pressure with the thumbs, or by a blow with an unbound book. Then a pad made of a coin, or piece of lead wrapped in lint, should be bandaged on the part and worn for some weeks, to prevent re-formation. If there is any tenderness, the swelling should be first fomented and the part rested, in order to prevent inflammation. If on other parts of the body, blisters and other surgical treatment will probably be required.

Hanging. Life may be destroyed at once, if the body falls any considerable distance, by dislocation of the neck. If the force of the fall does not cause this, pressure of the rope on the blood-vessels of the neck, preventing the flow of blood, may cause rupture of some vessel in the brain, when the person dies from apoplexy. Such cases, especially the first, are generally immediately fatal.

Thirdly, the hanging person may die slowly from pressure of the cord on the windpipe, causing suffocation. If this occurs (and it depends on the position of the cord whether death takes place in this manner or by apoplexy) and the body be soon cut down, the person may possibly be revived by artificial respiration. In the presence of a body hanging the following directions are to be followed (*see* St. John first-aid book). Do not wait for a policeman; grasp the lower limbs and raise the body to take the tension off the rope; cut the rope, free the neck; apply artificial respiration. In these cases Laborde's method has been found specially successful (*see* p. 284).

Lightning Stroke. A person struck by lightning is suddenly, more or less completely, deprived of consciousness. But this may be either from fright or from the electric fluid. If from fright the condition quickly passes off, the person recovering as if from collapse or shock. Lightning may cause burns, sometimes of a deep and obstinate character, sometimes merely blistering or redness of the surface. Similar shocks and burns may result from contact with insufficiently protected wires used for any modern applications of electricity for lighting, traction, etc. Occasionally arborescent marks are discovered, appearing as if trees or other objects had been photographed on the skin. Other affections caused by lightning are: fractured bones, wounds like stabs, partial loss of sight, smell, speech, hearing or taste, and paralysis, which may or may not be permanent. Usually, however, persons not killed on the spot recover. The immediate treatment of persons struck by lightning should be by artificial respiration together with that recommended for collapse (*see* p. 273). Burns, or other injuries inflicted, must be treated as recommended under the respective heads. When the stroke is from a wire carrying electricity and the patient is still touching the wire, care must be taken before rendering assistance; thus the helper should stand on dry bricks, dry straw, dry wood, or india-rubber. His hands must be protected by a piece of folded newspaper, a tobacco-pouch, or cloth cap; or by a wooden stick or loop of dry rope attempts may be made to drag the patient away from the wire.

The following are useful rules concerning danger from lightning:

1. Lightning always chooses the best conductors on its descent to the earth; consequently we should know what things are better conductors than man, and what are not such good conductors as man. Near the former

we are safe; the latter should be carefully avoided. The current really passes up from the earth.

2. It is dangerous to stand near any high object such as a tree, spire, or large building because its height is likely to discharge the electric fluid passing overhead, and it is not as good a conductor as a man would be; consequently the lightning, having been discharged by it, would pass through the man's body, which offers a better passage to the earth.

3. It is dangerous to stand near running water if no higher object than yourself be near, as water is an excellent conductor and a man's height may be sufficient to discharge the lightning, in which case it would choose him as its conductor to the water.

4. It is dangerous to be in a crowd, as the vapour rising from a mass of people affords great attraction to the lightning.

5. It is very dangerous to carry jewellery or pieces of metal about the person—rings, brooches, keys, or watches—as they offer strong attraction to the lightning to take them on its downward course but are not sufficient to carry it to the earth.

6. If you are driving on a carriage during a storm, do not lean back but sit upright, as the lightning might run down the sides of the carriage.

7. Indoors the safest place is the middle of the room, as, if the house were struck, the lightning would run down the walls.

8. Mattresses and hearthrugs, etc., are non-conductors, and sitting on these you are comparatively safe.

9. A person lying on an iron bedstead is comparatively safe, as it is a better conductor than the human body

10. If you are out walking during a storm and your clothes become wet through with the rain, you are free from danger, as wet clothes will conduct the electric fluid harmlessly over the body.

11. During a storm a person is safer in the open, although a wetting may be experienced, than under trees or in sheds, which may attract the lightning.

The use of 'conductors' is to allow the earth's electricity to pass upwards and neutralise that of the clouds from which comes the 'lightning.'

Private Parts, Injuries of the. In the male, the testicles are liable to be injured by blows, or by the patient being thrown forward on to the pommel of the saddle. The effect is swelling of the parts, accompanied by great pain and tenderness, with faintness immediately after the injury. At first a stimulant, as wine or brandy-and-water, will probably be required. Afterwards fomentations and rest will in the great majority of cases effect a cure. As these injuries may have complications do not treat them lightly, but get medical advice as soon as convenient.

Rupture of Muscles. Rupture of muscles generally results from some violent exertion, such as of the muscle in the front of the thigh in recovering the balance. A small muscle in the calf

is sometimes ruptured by tennis-players. Violent efforts to grip the horse at a jump also may rupture the muscles inside the thigh. A snap is felt, or the sufferer may think he has received a blow; there is loss of power. On examination there is a depression at the seat of injury, immediately above which is a swelling. Great care must be exercised in the treatment, as unless care be taken the join will be one of fibrous tissue only, which will gradually stretch and the muscle never be of full use again. The treatment, other than by operation, is to put the part at rest and in such a position that the torn muscle is relaxed fully: for example, if the rupture be in the calf, the heel of the shoe should be fastened to a strap round the thigh with the knee well bent; this should be kept up for three weeks and then gradual use be made of the limb and the part rubbed. If the injury is at the front of the thigh, a long straight back splint reaching high up behind the thigh, and with a right-angled foot-piece, should be applied and the whole leg raised at the foot. This should be kept up for three weeks, then the limb may be gradually lowered till in two weeks more it lies flat. No use must be made of the limb till some eight weeks after the injury. After the limb is first fixed to the splint strips of plaster should be laid over the swollen muscle above the depression and fastened obliquely to the splint lower down, as is described in the treatment of fractured knee-cap. Subsequently careful massage and movements must be employed.

Spleen, Rupture of the. When the spleen is diseased or enlarged a very slight injury will rupture it, sometimes without any external mark. Occasionally the spleen ruptures from a fall, a blow with the fist or naked foot, or even from muscular exertion. When the covering or *capsule* of the organ is ruptured, blood escapes into the cavity of the bowels, and the symptoms are those of collapse (*see* p. 273), the person becoming faint, complaining of great pain, and the pulse rapidly growing imperceptible. Such injuries are nearly always quickly fatal, and no medical treatment is of much utility, surgical only if at once available. Perfect rest and the administration of stimulants are indicated; but stimulants must be given with caution, and only when the pulse can scarcely be felt, otherwise the excitement of blood-circulation they cause will add to internal bleeding (*see* p. 268).

Though death from ruptured spleen nearly always takes place in a few hours, rare cases occur in which life is prolonged for several days. In these

cases blood is not poured out into the abdomen immediately, the injured person appears to be in no danger, and the spleen is thought not to be injured. After an interval of some days, however, sudden symptoms of syncope are manifested, the abdomen becomes distended with blood, and death occurs within a very short time. The reason for such delay in the occurrence of death after a rupture of the spleen, is that although the spleen is ruptured at the time of injury, the *capsule* or covering of the organ does not give way till some time afterwards.

Sprains. The term signifies a violent stretching of the tendons, ligaments, or muscles of the part. But some of the fibres of the tendons about the injured part are often ruptured or torn. The symptoms of a bad sprain are: severe pain and often faintness, followed by swelling and discoloration, with subsequent weakness and stiffness of the joint. How sprains are distinguished from dislocations and from fractures near joints is mentioned at pp. 278, 287. A minor degree of sprain, arising from continued slight concussions rather than from one violent wrench, is known as the 'lawn-tennis arm,' and may occur in the shoulder, elbow, or wrist.

A sprain of a joint is a serious matter and must not be lightly treated or else persistent trouble may follow.

Treatment should commence by the attendant gently moving the joint freely in all directions and then, for slight sprains, proceed as follows: Put the joint absolutely at rest in the easiest position on a splint and apply cold. If in the lower limb, the patient must be put to bed, the joint fixed on a suitable splint, raised on a pillow, and evaporating lotion (Prescription No. 17) or cold water applied. After twenty-four hours gently stroke the joint in an upward direction for a few minutes. On the next day after the stroking, apply cotton-wool thickly round the joint and bandage tightly. On the third day leave off the splint altogether, stroke and gently rub the joint, and then gently move it and again bandage. Daily the length of time and the strength of the massage can be increased and the movements made more freely.

In a severe sprain the limb must remain longer (up to two or three weeks) on the splint. Massage and pressure should be performed as before, but with even greater care. The joint should be gently moved from the fourth day. In all cases treatment should be continued for three or four weeks, and a bandage, elastic if available, should be worn in the intervals between the daily massage and movement. After really severe sprains the bandage should be worn for six or seven weeks. If any feeling of weakness persists,

douching the joint with cold water is to be recommended. In delicate children sprains are sometimes the forerunners of disease in the joint.

Teeth, Injuries of the. When a tooth is broken, any sharp point should be smoothed with a fine, sharp file, which will prevent injury to the mouth or tongue and render the tooth less liable to decay, commencing from the seat of injury. The part should be afterwards touched, several times daily for a week, with spirits of wine, which renders the tooth hard and insensitive. If a tooth is loosened so much as to shake about, it should not, unless much decayed, be removed, as with care it will probably again unite to the socket. It should be replaced in its natural position, and the person should be instructed to avoid moving it with the tongue. If it will not remain *in situ*, a fine piece of wire or silk, or a horse-hair, should be passed round it and the adjacent tooth, so as to prevent motion. Teeth knocked out of the mouth or drawn by mistake, being immediately returned to the socket, have 'taken root.' These facts led to the replanting and transplanting of teeth as operations of dental surgery.

Urine, Retention of. Retention of urine signifies an inability to pass water, *not a stoppage* of the formation of urine. Urine still flows from the kidneys where it is secreted, into the bladder, but cannot escape from the latter organ. Retention of urine may arise from stricture (*see* p. 366); from an enlarged prostate gland (p. 358); from a small stone lodging in the urethral passage (p. 332); from paralysis of the bladder; from hysteria (p. 183); from fracture of the thigh or spine (pp. 301, 290). It may also arise from injury, such as falling cross-legged on a gate or wooden bar, which may cause bruise, swelling, or worse injury of the parts, such as rupture of the urethra. It may follow confinements and operations on the private parts, but in these cases is only temporary and soon passes away. The symptoms and treatment of retention from the different maladies named are given under the respective 'headings.' When retention occurs from injury, fomenting between the legs and over the bowels will generally afford relief. Otherwise the catheter must be used (*see* p. 253). *See also* p. 367.

Wounds and Cuts. Wounds may be *clean cut* with any sharp instrument and from blows with a smooth, round club where the skin is stretched over bone; or made jagged and ragged by a blunt instrument as a saw, or bruised as by a rough club or stick,

or punctured by a sharp-pointed instrument. In clean-cut or incised wounds bleeding must first be checked, and then all dirt and debris removed.

The arrest of bleeding has already been dealt with (*see* Bleeding). Before proceeding to treat a wound, and in order that no other germs may be added to those already present, the hands of the helper should be thoroughly washed in soap and water with the aid of a nail-brush and then rinsed in carbolic lotion (½ ounce in 20 ounces) or in iodine lotion (1 drachm to the pint). Anything that it is intended to touch the wound with or to dress it must likewise be cleansed from germs. Thus, forceps will be boiled, as also pieces of cotton-wool for sponges (swabs), and the needle and ligatures. The boiled water is then poured away and one of the above lotions added instead. Dressings sold as being antiseptic should not be accepted at their value, but should be placed for a few minutes in antiseptic lotion. When all this has been done the wound must be cleansed, and this is done by picking out any large foreign body with the forceps and then washing the wound well with lotion (say carbolic lotion 1 in 20) by squeezing this out on to the wound from the prepared swabs. After the wound is well washed, the edges of the skin around the wound to a distance of 2 inches should be painted with tincture of iodine. If it is decided to stitch the wound, the stitches should now be inserted and the wound dressed. As a rule one stitch at every three-quarters of an inch will suffice, and should penetrate just deep enough to get a firm hold. They should never be used to drag the edges together, but these should be pushed together while the stitches are fastened. After tying the stitches note if the cut edges of the skin turn in, and if so, lift them up with the forceps. The dressing should be made by the gauze or lint rung out in the lotion and smoothly applied over the wound and the area around. More gauze or wool should cover this and a bandage be applied. On the fourth day, with all the above precautions for cleanliness, the dressing may be carefully lifted and the wound looked at.

In the absence of redness and pain the dressing may be reapplied, and this may be repeated on alternate days. If all is well, on the eighth or ninth day the stitches may be cut with cleansed scissors and pulled out, and a lighter dressing applied till the fourteenth day. If at any inspection of the wound there is redness, together with pain or throbbing, the stitches should be cut and the wound

washed with lotion and then dressed daily without restitching. If there is much discharge and the wound deep, a narrow piece of india-rubber tubing previously boiled should be placed in the wound to act as a drain: the outer end of the tube should be pierced by a safety-pin well boiled, and this will prevent the tube sinking right into the wounds. Where there is much matter being discharged from the wound, fomentations should be applied and frequently changed. If a wound is over twenty-four hours old when first seen, no prolonged attempt at cleansing should be made nor stitches applied. The wound should be washed with weak lotion (say carbolic lotion ½ ounce in 20 ounces of water) and dressings or fomentations applied—the latter if the wound is very dirty or is two or three days old. It must be seen that in such wounds the matter is able to escape easily and is not pent up. Clean incised wounds of small size and of recent date may often be sufficiently treated by the application of flexile collodion without any further dressings.

Punctured Wounds, with which may be classed gunshot wounds and wounds of joints, are the most dangerous, because deep-seated blood-vessels or nerves are often implicated, because the parts punctured must be also stretched and torn, and because foreign bodies (as dirt, bullets, pieces of clothing—are often carried very deeply into the body. There is often no free exit for 'matter' formed; punctured and gunshot wounds are attended with great shock to the system. If the foreign body—a bullet, a piece of cloth, etc.—can be felt, it should be gently removed with the fingers or forceps. If faintness or loss of blood indicates a wound of some important internal organ or of a large artery, the case assumes a most serious aspect. But in all instances it will be best to apply an antiseptic dressing, to keep the patient lying on the wounded side so as to favour escape of blood or discharges, to enforce perfect rest, and to give low diet. If the wound throbs and the sufferer becomes feverish, apply poultices, and give purgatives, such as Prescription No. 61, followed by No. 27.

Wounds of the Brain. These injuries will be accompanied by concussion (*see* p. 274) or compression (*see* p. 276). Treatment accordingly, and antiseptic dressing to any wound.

Wounds of the Lungs. There is difficulty of breathing and a sense of suffocation; the countenance is pallid and anxious, and fluid blood mixed with clots is coughed up. These symptoms

may subside, or the patient may die from immediate loss of blood, or, at a later period, from inflammation. In all such cases the only means to be adopted are to keep the person quiet and give small doses of laudanum, to be discontinued if the pulse becomes stronger. Under such measures, if the internal wound is small, the flow of blood may cease and the patient recover. For the external wounds little more can be done than applying antiseptic dressings.

Wounds and Injuries of the Bowels and other Abdominal Organs. Injuries of the muscles of the belly, the bowels, liver, spleen, kidneys, or other abdominal organs, are marked by a fixed pain at the seat of injury, faintness and feeble pulse, or collapse (*see* p. 273), from which death may result immediately. There are also symptoms enumerated below, characterising injury of different organs.

Bowels. The muscles of the abdominal wall may be injured, but the *intestines* inside may not be touched. In cases of stabs or gores, the question is whether or not the intestines are injured. If the intestines appear through the wound, it may be seen whether or not they are injured. If they do not appear, the escape of fæces through the wound, the passage of bloody 'stools,' and the vomiting of bile or blood is evidence that the intestines are injured, and in such cases the collapse will be greater. If there is *no* reason to suppose the bowels are wounded, and they do not protrude, dirt and blood should be washed away with weak antiseptics, and as soon as bleeding has ceased (which, probably, will not be great) the edges of the wound should be brought together with long strips of plaster, and only fluid diet should be allowed. If there is reason to fear the bowels *are* wounded, or in all cases of punctured wounds such as by the horns of animals, a simple dressing should be applied. Also, in all cases it will be desirable to give a full dose of opium. Remember that a surgeon should be sent for as urgently as possible.

If from a wound the bowel protrudes it must be carefully washed with weak antiseptics, cleansed from all impurity, and returned by pressure with the fingers. If the bowel itself is torn, the wound must be closed; if very small, by stitching it up. The edges of the wound should be *turned in*, so that the *outer* surfaces come into contact. Fine silk, well boiled, should be used, and small stitches taken. The ends of the thread should be cut close off and the bowel then returned, as if it were uninjured. If the patient recover, the ligatures will drop into the cavity of the gut and no ill consequences result. The external wound should be closed up by stitches and plaster. *No solid* food for three weeks and no food of any kind for twenty-four hours should be given.

Liver. If the liver is injured, in addition to the general symptoms enumerated above, there will probably be vomiting; later, if the patient lives, white 'stools' and jaundice. *Treatment* as for wounds of the lungs

Kidney. There will probably be blood in the urine, frequent calls to make water, the testicle will be drawn up, and the person will be unable to stand erect. *Treatment.*—Both loins and bowels should be alternately fomented with hot water. The bowels should be kept moderately open. Give as little fluid as possible and promote the action of the skin. Thirst may be allayed by iced milk-and-water; beef tea, arrowroot, tea, and barley-water may also be given. When the urine assumes a lighter colour it shows that less blood is being passed and that improvement is taking place; and this may occur at the end of a few days or be delayed for weeks.

Spleen. *See* p. 315.

Bladder. There is a feeling as if something had given way, with violent burning pain. There is desire to make water but inability to do so. The person is unable to stand or walk. Soon the symptoms are those of extravasation of urine (*see* p. 367), and the *treatment* should be the same. A catheter passed will not draw off urine unless it find its way through the wound.

Wounds of the Tongue are liable to occur, in connection with epileptic fits or other accidents, when the organ gets accidentally thrust between the teeth. As a rule it is best to leave wounds of the tongue entirely to nature, as it is difficult to introduce ligatures. But sometimes wounds of the tongue bleed very freely, and may require twisting or ligature of an artery (*see* p. 266); or the actual cautery (a red-hot iron wire) may be necessary to arrest the bleeding. The mouth must be kept clean by repeated rinsing with weak Condy's (potassium-permanganate lotion) and water or boric-acid lotion (Prescription No. 14 or 21).

Wounds of the Throat. These wounds are generally made with the intention of suicide, and are dangerous, both from the importance of the parts injured and from the despondent condition of the patient. They may be clean-cut or lacerated; they may be superficial or deep; they may implicate arteries, veins, windpipe, or the gullet. If the air-passage only is cut, recovery often takes place; but if large blood-vessels are cut, death occurs rapidly from profuse bleeding.

Treatment. Any arteries wounded must be twisted or tied (*see* p. 266), and bleeding from veins, known by the blacker colour of the blood (*see* p. 261), must be restrained by pressure with the fingers unless they are visible and can be tied. The patient should be put to bed in rather a warm room, and as soon as all bleeding has ceased, *but not before*, the shoulders should be raised on pillows, with the head bent forward. The head should be retained in this position by tapes passing from each side of a cap, or of a bandage round the head, to another bandage placed round the chest. *No*

plasters or sutures should be used. A piece of well-boiled cotton wool powdered with boracic-acid powder makes a capital dressing. If the wound penetrates the windpipe, it should be covered with a loose woollen comforter or cotton-wool. If the gullet is wounded the patient will probably require to be fed with a tube. Thirst may be relieved by sucking a wet rag or ice. As these injuries are generally inflicted with a suicidal intent, it will be needful to have the patient watched, or he may repeat the attempt. If the patient is unruly and tries to tear open the wound, he may be confined by a strait waistcoat (*see* p. 142).

Wounds of the Scalp. These as a rule heal readily. Any portion of scalp detached from the bone should be replaced in position after cleansing. The hair should be shaved for 2 or 3 inches around the wound. Stitches are absolutely necessary. However slight it may appear to be, no scalp-wound should be neglected, but thorough cleansing must be carried out.

WOUNDS CAUSED BY THE BITES OF ANIMALS

Camel and Horse Bites are attended with much bruising of the parts, and a sharp tooth may wound an artery, as, for instance, the artery of the wrist. If this occurs, the flow of blood must first be stopped, as directed under *Bleeding* (p. 262). Afterwards the wounds require washing with 1 in 20 carbolic lotion, poulticing, and rest. At a later period simple dressing.

Dog and Cat Bites are difficult to heal, from the wounds being punctured, contused, or lacerated. Such injuries should either be touched all over with pure carbolic acid or else swabbed with tincture of iodine, whichever is first to hand. A 1 in 20 carbolic fomentation may then be applied ; and later, if the wound be clean, a simple dressing. For the treatment of the bite of a mad dog *see* Hydrophobia, on p. 178.

Tiger or Bear Bites. These injuries may involve deep-seated parts. The hand may be bitten to pieces ; the chest may be seized, when the teeth or claws will probably penetrate the lungs. Or the thigh may be seized, and the large artery wounded. When such accidents occur, measures to arrest bleeding should be taken (*see Bleeding or Hæmorrhage*, p. 261), after which the wounds should be thoroughly cleansed by touching each part with pure carbolic acid ; if this is not available, paint every part of the wound

with tincture of iodine. If that is not available either, use whatever antiseptic is at hand in a strong form; strong potassium permanganate solution will do. But whatever is to be used must be applied at once; after twenty-four hours it will not be much use. After that, dress the wounds with some antiseptic lotion, make the patient comfortable, and send him into hospital.

Wounds from Wasps or Bees (*stings*). When a swarm of wasps attacks a person, the number of stings inflicted may induce serious illness. Or in delicate persons, or children, several stings may cause faintness, nausea, vomiting, and purging. Under such circumstances a stimulant will be first required. Then the stings should be extracted by pressing the tube of a small key over the part, when the sting, if left in the wound, will probably start out, or a watery fluid will escape, carrying with it some of the venom. Then the best application is sal volatile or ammonia and water.

In cases of stings inside the mouth or in the throat, the sting should be sought for, and extracted if possible. Ice should be kept in the mouth, and leeches should be applied outside. If danger of suffocation appears urgent, opening the windpipe may be required (*Tracheotomy*).

CHAPTER IX

SURGICAL DISEASES

Abscess : Appendicitis : Bed-sores : Bladder, Inflammation of the : Bladder, Chronic Inflammation of the : Bladder, Stone in the : Bladder, Irritability of the : Blood-poisoning : Bones, Disease of the : Bowels, Obstruction of the : Bowels, Protrusion of the : Bubo : Bunion : Cancer : Cancrum Oris : Cellulitis : Club Foot : Elephantiasis : Feet, Tenderness of the : Filarial Disease : Fissure or Ulcer of the Anus : Fistula : Foreskin, Diseases of the : Glands, Enlarged : Gonorrhœa : Granulations : Guinea Worm : Gumboil : Gums, Spongy : Housemaid's Knee : Hydrocele : Joints, Inflammation of : Knock-Knee : Mortification or Gangrene : Peritonitis . Piles or Hæmorrhoids : Private Parts, Male, Discharge from the : Prostate Gland, Enlargement of the : Rider's Bone or Sprain : Rupture : Spermatorrhœa : Spine, Curvature of the : Stone in the Kidney : Stricture : Syphilis : Testicle, Inflammation of the : Tetanus : Tongue and Mouth, Ulcers of the : Toothache : Tooth Extraction : Tumours : Varicocele : Veins, Varicose : Venereal Disease : Whitlow.

Abscess. Any collection of pus or matter is called an abscess. The pus is the result of liquefaction of the surrounding tissues which are inflamed, and the inflammatory process is due to the action of micro-organisms. These microbes are present in all acute abscesses. Sometimes injury, such as a wound or blow, is a predisposing cause of an abscess; but the action of micro-organisms in addition is essential. The appearance of an abscess is that of a painful swelling which, after a certain course, terminates in a discharge of yellowish thick fluid called pus. Abscess may be present in any part of the body : a gumboil, a whitlow, and the painful swelling sometimes formed in the female breast during suckling are all instances of abscess. Abscess may also attack some internal organ, as the brain or liver. An abscess differs from a boil in *not* containing dead flesh, or a central hard part called the 'core.'

It is necessary to distinguish those swellings which are much inflamed, very painful, and rapid in their course from those which

grow slowly, and with little, if any, redness of the skin. The symptoms of the first variety, or of an *acute abscess*, are these: A swelling, becoming, in the course of two or three days, or often in a few hours, very hot, painful, and tender, the skin assuming a stretched appearance, with a bright red hue, most intense at the centre. As the swelling increases the pain becomes more severe, and has a characteristic throbbing peculiarity, which is worse if the part affected is allowed to hang down. The skin and subjacent soft parts become puffy, and retain for a short time the mark made by pressure with the finger. As the centre of the abscess becomes more painful and inflamed it softens and gradually ripens, or turns into matter. The skin at this part becomes thinner, more prominent, and loses its bright red colour, pointing, as it is termed, in the shape of a light yellow or bluish spot. The whole swelling is now soft, and by making gentle pressure, alternately with the fingers of each hand, the sensation may be generally felt of fluid moved from side to side (*Fluctuation*). The abscess finally bursts, and discharges the contained matter through one or more small apertures formed in the thinnest and most distended portion of the skin. The discharge, at first, is profuse, and consists of a thick yellowish fluid; as the cavity of the abscess contracts and closes, it diminishes and becomes blood-stained, then clear and thin. During the progress of healing, the superficial layers of skin about the seat of the abscess peel off. The progress of an abscess towards ripening is usually accompanied by constitutional symptoms, proportional in severity to the size of the swelling and the amount of inflammation. These symptoms are shivering, feverishness, headache, and often pains in the back and joints. Shivering, particularly, is regarded as indicating the commencement of the formation of matter. When abscesses form deep below the surface of the skin, especially where the skin is hard, as on the heel; or when they form beneath tendons and ligaments, as in one form of whitlow, the suffering is more intense, the matter longer in coming to the surface, the parts implicated more important, and professional assistance oftener required.

The symptoms of the *second* variety of abscess, called *chronic* or *cold* abscess, are much less severe. Feverishness and headache are slight, and the sign of matter forming, viz. shivering, may not occur, or be so trivial as to escape notice. The swelling increases very slowly, and with little pain or tenderness. The skin remains

for a long time free from puffiness or inflammation. At length there is a slight blush or redness, and the matter is discharged through a small opening, as in acute abscess. Although the commencement of this form of abscess is attended with less fever, the termination of the malady may not be so characterised. *Chronic abscesses* are generally large, and are nearly always due to tuberculosis (*see* p. 212). Usually tuberculous disease of a joint, bone, or gland is the cause of chronic abscess.

Treatment. A. *Of an acute abscess.* The inflammation is to be encouraged because it is Nature's method of dealing with the invading organisms. Therefore do not use cold applications; but hot applications such as the fomentations and poultices described in Chapter XX. If the abscess is near bursting, the fomentation applied must be made with some antiseptic such as boric or carbolic lotion, so that other infection may not be conveyed to the open wound resulting from the bursting. The fomentations or poultices should be changed frequently, every two to four hours. Other assistance to the inflammatory process may be given by using the hyperæmic treatment (*see* Chapter XX), producing congestion in the part by means of a firm bandage applied above the abscess for a time.

If medical aid is at hand it should be obtained, as it is always best to open an abscess at the earliest opportunity, and to open it in such a way that the pus will freely drain away. If the abscess is not to be opened early, the patient can wait, though with some suffering and loss to his general health, until the abscess points.

After a variable time, generally two or three days in acute abscess, the abscess becomes prominent or pointed; then the skin, at the thinnest or most prominent part, should be punctured with a clean, sharp lancet, when the matter will usually flow out, often with a spurt. The part should never be roughly squeezed in order to get the matter out quickly. Having allowed as much matter to flow as will easily escape, put, with the blunt end of a probe, a very thin strip of antiseptic carbolic gauze into the aperture, to prevent closure, and apply a fomentation. The fomentation and gauze should be removed after two or three hours. Then with a pledget of absorbent cotton-wool and antiseptic lotion as much more matter as can be expelled without pain should be pressed away. The poulticing (but not the plugging) and gentle pressure should be repeated at longer intervals, until all discharge ceases. If at any time there is a tendency to closure of the opening, the blunt end

of a probe should be gently passed from one end of the opening to the other. So long as discharge continues, the parts should be kept in that position which will best favour the outward flow of the matter. When discharge ceases, if the edges of the wound appear to gape and require support, plaster should be applied to keep them together. In any case a simple antiseptic dressing should be in contact with the wound. As the wound heals this dressing may be discarded and the part dressed with boric ointment on lint. Healing may be accelerated by the use of the suction cups mentioned under Hyperæmic Treatment (p. 607). For a large abscess drainage by means of a rubber tube is necessary for some time ; but this can hardly be done, except by a doctor.

When opening an abscess no plunge should be made, for this causes unnecessary alarm. Neither should the lancet be used slowly, which causes prolonged pain. The puncture should be made with confidence, decision, and a moderate degree of rapidity ; and if an aperture is required larger than the shoulder of the lancet used, it should be made the necessary length by cutting *outwards*, when withdrawing the instrument. The blade should not be passed further into the abscess than is necessary to reach the pus, lest an artery be wounded.

When abscess occurs in the neck it is important to open it early, and the puncture should be made longitudinally (or in a direction with the lines or folds of the skin), and not horizontally, in order to avoid a large scar. In the female breast it prevents much suffering to make a puncture as soon as the presence of matter is ascertained ; and to avoid a scar the puncture should be made from the nipple towards the circumference and not across the breast.

Abscesses are liable, if not quickly and carefully treated, to terminate in sinus or fistula, which means an unsound condition of the parts beneath the skin. Sinus may result from the abscess not being opened sufficiently early, or from the opening being too small for the exit of the matter, which becomes pent up, and burrows under the skin. Or it may arise from want of care in dressing the part, or from lack of rest of the part. Sinus is to be prevented by making the opening sufficiently early, and by making the opening large enough ; by keeping the opening in such a dependent position that the matter may easily flow out ; by care in dressing the part, when it is often necessary to place and secure a small pad of lint over any position where there is any tendency of the matter to

gravitate or bag; and by not allowing the opening to close up too soon, which is to be effected by the insertion of a thin strip of gauze into the wound at first (*see* p. 326), and afterwards by the daily insertion of the blunt end of a probe (*see* p. 326) to the depth of less than a quarter of an inch between the lips of the wound, and carrying it through the whole length of the orifice, so as to separate the parts.

A most important essential is to immobilise the diseased part thoroughly; often occasional movement is sufficient to keep a sinus open for months.

Besides the local treatment of acute abscess, the bowels in the inflammatory stage must be opened, either by 5 grains of calomel or two pills of Prescription No. 61. When the pus has been allowed to escape a tonic should be given, such as Prescription No. 51, thrice daily.

B. *Treatment of Chronic Abscess.* The treatment of a chronic abscess should be undertaken only by a doctor. The abscess should certainly not be opened by one who does not thoroughly understand the use and discipline of asepsis, or the patient will be anything but benefited. Besides this there is also the consideration that there is usually some condition behind the abscess and causing that which requires treatment, and this can only be done by a medical man.

Appendicitis. Appendicitis is inflammation of the *vermiform appendix*, which is a short blind tube attached to the *cæcum*, or commencement of the large bowel. The disease in its acute form is very dangerous and not amenable to treatment by domestic medicine.

The danger is due to the rapidity with which perforation of the appendix occurs, thus allowing its contents to escape and cause acute general inflammation of the peritoneum or peritonitis. In very severe cases the disease may, if not treated surgically, lead to death within forty-eight hours. The symptoms begin with very acute pain in the abdomen, which is soon most intense low down on the right side, where there is an acutely tender spot which the patient will point out with his finger (*see* p. 32). Vomiting occurs and the patient is pale, with a cold, clammy skin and weak, rapid pulse. The right leg is usually kept drawn up to relieve the pain, and the right side of the abdomen is kept stiff and hard so as to alleviate the pain caused by breathing movements. Complete constipation is usually present.

Treatment. No time should be lost before sending for a doctor. The only treatment permissible before his arrival is the application of fomentations, as hot as the patient can bear them, to the painful part. He should be put to bed with his head, shoulders, and bent knees supported on pillows. His position in bed should be rather sitting than lying down. No food of any sort should be given and no medicines. Purgatives and opium particularly are to be avoided. Thirst may be relieved by the administration in small amounts of hot water or hot weak tea without milk.

This starvation treatment may be kept up for forty-eight hours or more. It will be very helpful to the doctor if the pulse is counted and the temperature taken at regular intervals of four hours and the figures and time noted on paper.

In many cases immediate operation will be required. In the less severe cases improvement in the patient's condition will be noticeable within forty-eight hours of the onset of the symptoms. This improvement is shown by

(1) The patient looks less ill and distressed.
(2) The pain is less.
(3) Vomiting stops.
(4) The pulse rate per minute will decrease.
(5) The temperature will tend to fall.

Bed-sores. When patients, whether from disease or from injury, have to lie long in bed, and especially when they are obliged to lie long in one position, sores are apt to form on those parts of the body subjected to the greatest pressure. It is really the death of the part from long-continued pressure. Thus the back, hips, buttocks, heels, and elbows are liable to suffer, and when a patient is likely to lie long in bed, the commencement of bed-sores should be guarded against from the first. The pressure producing the sore diminishes the sensibility of the part affected, so that the patient himself may be unaware of the formation of the sore. It is therefore necessary that his word should not be accepted on the point, and that examination should be frequently instituted. Want of cleanliness, and moisture, especially moisture from urine or fæces, irritate the skin, and render bed-sores much more likely, and therefore, as preventive measures, great care must be given to cleanliness in these respects. Bed-sores are especially liable to form in paralysed patients owing to affection of the nerves

going to the skin. When a bed-sore is about to form, the skin becomes reddened. If the pressure is not relieved, the part assumes a dusky appearance, and may become blistered. Then a grey or blackish slough forms, with discharge of thin matter.

Prevention consists chiefly in (1) relieving pressure, and (2) keeping the patient as dry as possible.

The skin of the part pressed upon should be washed night and morning, and in many cases oftener, with soap and water, followed by brisk circular rubbing with methylated spirits, brandy, or eau-de-Cologne, to harden the skin and stimulate circulation; then dusted with starch, zinc, and boracic powder, Prescription No. 66.

The sheets should be kept perfectly smooth and free from bread-crumbs, and care should be taken, when giving or taking a bed-pan to and from a patient, not to irritate the skin by undue dragging.

The posture must be changed as much as possible, and pressure relieved by means of air cushions, or rugs, and when necessary, as in paralytic cases, by air or water-mattresses.

When the heels, ankles, and knees are liable to become sore, the pressure may be lessened by ring cushions of wool with a bandage wound round them, or the parts themselves may be bandaged round with wool.

In cases of incontinence the skin, after being washed and rubbed, should be treated with ointment such as boracic or zinc, as the ointment protects it from the irritating effects of the discharges and prevents the absorption of moisture.

Treatment. The spirits should be discontinued when once the skin is broken, though they may be still rubbed over the surrounding part.

Flexible collodion painted over the part is of use in the first stages of a bed-sore, as it excludes the air, allowing any slight sore to heal under it; or a piece of lint dipped in friar's balsam, covered with three thicknesses of gauze cut a little larger and dipped in collodion, may be applied.

When a slough has formed, antiseptic fomentations (*see* Chapter XX) should be applied to hasten the separation of the dead tissue. When this is successful the cavity, if large, must, after being sprinkled with iodoform, be packed with strips of gauze, the whole kept in place by strapping. If shallow, a bed-sore, when clean, may be dressed with boracic ointment on a piece of lint. It should be dressed at least twice daily.

The best way of preventing chafing of the skin and possible bed-sores in infants and young children suffering from diarrhœa is by always keeping a piece of cotton-wool moistened with olive oil against the buttocks inside the napkin. The olive oil should also be well rubbed over the buttocks, hips, and into the folds of the groin each time the napkin has to be changed.

Bladder, Inflammation of the. Inflammation of the bladder may be caused by injuries, by exposure to cold, by irritation from a stone, or it may be connected with stricture, or arise from the extension of a gonorrhœal attack. It may be excited by an over-dose of copaiba or of cantharides. It may result from the unskilful use of instruments. It may be a consequence of prolonged labour, or arise from neglecting to empty the bladder after confinement. Shivering often occurs at first, followed by mental depression, fever, thirst, and pain, with tenderness on pressure over the bladder. Pressure in the fork between the legs is also very painful, where there is generally a sense of weight or burning. The urine is voided frequently and in small quantities, often with great straining, followed by aggravation of the pain and burning. The urine also contains a mucous deposit, and sometimes blood. Women often void flakes of mucus much larger than can pass from males. In exceptional cases the inflammation may pass to the kidneys, causing interference with the secretion of urine, when the patient may become delirious and sink into a typhoid condition.

Treatment. A hot bath will generally be advisable, and fomentations (*see* Chapter XX) should be afterwards applied over the lower part of the bowels. Barley-water should be prescribed *ad libitum* as a drink, and for thirst and feverishness Imperial Drink (Chapter XX) should be taken. The bowels must be kept well open (Prescription No. 27). The patient should be kept in bed, and be restricted to low diet, such as milk, broths, and light puddings. Avoid alcohol in any form.

Bladder, Chronic Inflammation of the. Acute inflammation of the bladder sometimes subsides, leaving a condition which may be long continued, becoming, as it is called, *chronic*. Or the cystitis may arise very gradually without the more marked symptoms referred to above. This condition mostly occurs as a result of gonorrhœa or of gravel; or in elderly persons in connection with enlargement of the prostate, a gland situated round the neck of the bladder. It may also be a sequence of stone or of stricture, or of

disease of the rectum or kidneys, or it may follow accidents to the spine. It also occurs when the bladder participates in attacks of paralysis (*see* p. 202). It may result from atony of the bladder in old people who are unable to expel their urine. In chronic inflammation of the bladder the symptoms are those of the acute form, but in a minor degree; and there is, in addition, a discharge of thick, ropy mucus with the urine, which adheres to the side of the vessel, smells ammoniacal, and often presents whitish-looking lines or streaks, which are caused by the *phosphate of lime* formed from the urine within the bladder.

Treatment. Medical aid should be obtained as soon as possible, in order to ascertain if there is stricture (*see* p. 366), or enlarged prostate (*see* p. 358), or stone, or tumour in the bladder (*see* pp. 332, 381), or any affection of the kidneys (*see* p. 186) or of the rectum. In the meantime, the patient should keep himself in the recumbent posture as much as possible. Pain and irritation may be allayed by warm hip baths, or by enemata of warm water (Chapter XX). The bowels should be kept open. The diet should be nourishing but plain, with plenty of barley-water, and Imperial Drink. Prescription No. 45 should be given thrice daily; and, if the urine is acid in reaction, 5 grains of hexamine twice daily.

Bladder, Stone in the. Stone in the bladder is a consequence of a diseased condition of the urine. It is often one of the results of *gravel* (*see* p. 167). When stone is present there is acute pain, aggravated by motion, and worse after making water. There is also frequent desire to make water, with itching and smarting at the end of the penis. This induces children to pull the foreskin continually, which becomes elongated, and often red and inflamed. There is also frequently sudden stoppage of the stream of urine, owing to the stone rolling in front of the passage, and the fluid passed is sometimes bloody. In children especially there is much straining at stool, and usually protrusion of the lower bowel (*see* p. 335). The early symptoms of stone often resemble those of enlargement of the prostate (*see* p. 358), or of stricture (*see* p. 366), or of tumour (*see* p. 381), and instrumental examination is necessary to decide the point. There are various kinds of stone, and the only remedy is surgical operation. Sometimes a small stone passing out of the bladder lodges in the urethra, or urinary passage, requiring a surgical operation.

Bladder, Irritability of the, is marked by frequent desire to make water without evident cause. This may depend in elderly persons on incipient disease of the prostate gland (*see* p. 358); or at any age on stone; or on gravel (*see* p. 167); or on fissure of the anus (*see* p. 344). It may arise from constipation, when hard fæcal matter in the lower bowel presses against the bladder. The irritation caused by worms is also a cause (*see* p. 230). It sometimes occurs to children who are overworked. But irritability of the bladder may arise *temporarily* from cold as experienced at the commencement of the cold season, or on change to a colder climate. It may also follow various drinks, or it may be due altogether to nervousness. When inability to hold the urine occurs to adults, and there is no evident disease, or cause, explaining the disability, a physician should be consulted.

Blood-poisoning. Blood-poisoning may occur under a number of varying circumstances. The blood is more or less poisoned in many diseases of which typhus and typhoid fevers are the types. But the term 'blood-poisoning' is more conveniently applied to conditions in which a diseased or injured part, owing to the presence of certain bacteria, secretes an unhealthy material, which may be absorbed into the system, causing what is called septic intoxication; or minute portions (called emboli) of thrombi, or clots, formed in the neighbouring veins may be transferred to different parts. These contain the bacteria which caused the original evil, and secondary abscesses form (*pyæmia*). The term is still more popularly applied to cases in which a sore surface on one person has come into contact with the diseased discharges of another person, or with those of some animal or insect.

Thus when poisonous matter enters the system it may cause a condition known as *sapræmia*, which occurs from the absorption of chemical products resulting from the decomposition of the putrid material by bacteria. Or, in the second case, it may cause a condition known as *septicæmia*, which occurs from the circulation of the bacteria themselves in the blood.

Thus blood-poisoning may result from putrid matter from the womb during 'puerperal fever'; or from unclean and lacerated wounds, especially from burns and scalds (*see* p. 271); or from bad or compound fractures (*see* p. 310); or from wounds inflicted by wild animals (*see* p. 322); or especially from *post-mortem* wounds received during the manipulation of diseased bodies, or from

foul wounds of living or dead men or animals. Blood-poisoning is attended from the first with great depression ; there are repeated shiverings, quick pulse, hot skin, dry tongue, sallowness of the surface, peculiar odour of the breath, thick ammoniacal urine, profuse perspirations, marked rise of body temperature, and temporary cessation of discharge from any wound. If *pyæmia* results, soon after the first symptoms, sometimes in twenty-four hours, throbbing pain, or swelling in different parts, points to the localisation of the mischief by *abscess* which may form in the liver, lungs, skin, joints, or other parts.

In the presence of blood-poisoning the source of the mischief must be sought for and removed if possible. Thus unclean wounds must be looked at to see that the discharge is able to escape freely and all parts of the wound should be frequently washed with weak lotion (for example, tincture iodine 1 drachm in 1 pint of water) and frequent fomentations applied. The general treatment is to support the strength by stimulants and nourishing fluid diet. Where ' matter ' appears to be forming, this will be encouraged by fomentations and the abscess opened as soon as possible (*see* Abscess).

Bones, Disease of the. The bones are subject to numerous diseases, the principal of which are tuberculous or syphilitic affections. References should be made to the headings ' Tuberculosis of Bones ' on p. 222 and to ' Syphilis ' for further information.

Bowels, Obstruction of the. This affection is characterised by the patient being unable to pass a stool or wind. If he is able to pass wind the condition is more one of chronic constipation than of obstruction. The affection is caused by some condition which blocks the passage of the contents of the intestine. It may occur suddenly in an otherwise apparently healthy person, when it is called acute obstruction, or gradually in a person who has been the subject of indigestion and constipation, when it is called chronic obstruction.

Chronic Obstruction. A person who has long been liable to attacks of constipation with distension of the abdomen from wind, which are generally relieved by purgatives or enemas, one day finds himself unrelieved by his usual medicines and that he is unable to pass any wind. The abdomen becomes more and more ' blown up ' and after a day or perhaps two he begins to vomit and continues vomiting at intervals.

Treatment. In such a case enemas given repeatedly, six or eight, one after the other, may produce the desired evacuation and

relief of all symptoms. The enemas should consist of warm water in which soap is dissolved and to which two tablespoons of castor oil are added (*see* Chapter XX). They should be repeated at intervals of half an hour, or as soon as each one has come away another should be given until relief is obtained.

If the abdomen is not tender it may be kneaded with the hands, beginning from low down on the right side; the kneading is continued upwards to the ribs then across and down the other side. This should be stopped if any pain is felt. The patient must be kept quiet in bed and a minimum of easily digested fluid food only allowed.

If pain is present hot fomentations should be applied and changed frequently. Purgatives should be avoided. If these measures are not successful, further treatment should be undertaken by a medical man, as probably an operation will be required to relieve the obstruction.

Acute Obstruction. This condition is characterised by its sudden onset. The patient is seized with severe pain in the abdomen and soon begins to vomit. The vomit consists first of the contents of the stomach, then of green bile, and then of evil-smelling dark fluid. In a few hours the patient is obviously very seriously ill. The passage of motions and wind entirely cease and the secretion of urine may be suppressed.

Later, after twelve to twenty-four hours the abdomen becomes distended, hard, tender, and rigid, but by the time this happens the patient is practically beyond human aid.

Treatment. The only remedy for this condition is operation, and this must be done promptly and skilfully by a surgeon.

Until his arrival all that can be done is to apply hot fomentations to the abdomen and treat the patient as described under Appendicitis. In this case also opium must be strictly avoided.

A mustard plaster (Chapter XX) may be applied to the front of the abdomen below the breastbone in the intervals of fomentations, and an enema, not to be repeated, of soap and water with 2 ounces of turpentine should be given. Purgatives must on no account be administered.

Bowels, Protrusion of the. This affection, a prolapse of the rectal mucous membrane, which occurs principally in children, but sometimes in old people, is met with in every degree from the mere protrusion of a ring, to the protrusion of half a foot or more.

At first the tumour is bright red, and mothers, seeing this for the first time, are often much alarmed without due cause, as it is not a dangerous affection. If the bowel often comes down, it gradually becomes thickened and more like skin. Children who have been much relaxed, as from dysentery or diarrhœa, or from the too frequent use of purgatives, are very subject to the affection. Or it may be a consequence of the irritation excited by stone in the bladder (*see* p. 332), or by thread-worms (*see* p. 230), or by phimosis (*see* p. 345). Or the malady may arise from nurses allowing children to sit on the stool too long. Often it occurs from debility; a cough, even in feeble children, being sufficient to bring the gut down. The gut, when it at first presents, returns by its own elasticity. Afterwards, although thus returning, it comes down again immediately. In old cases, the tumour requires to be replaced.

Treatment. To find out the cause of the affection is the first aim, as on removal of the cause the effect will generally cease. The presence or absence of worms, or of stone, must be assured. Constipation or diarrhœa, if present, must be first treated (*see* pp. 514, 520). The child should not be allowed to sit on the stool for more than two or three minutes, and if the bowels are unrelieved, the patient should be placed on it again after some little interval. The protrusion of the bowel may often be thus prevented. When the child is about to have a stool, let the nurse with her fingers draw the skin of the buttocks outwards, so as to render it quite tight over the fundament, and hold it in this position till the motion is finished. If the bowel comes down, the child should be laid on its face, the legs should be widely separated, and the protrusion should be lubricated with vaseline or salad oil. Then it should be gently grasped with the points of the fingers enveloped in a damp, soft, oiled cloth or handkerchief, and steadily but gently squeezed for about half a minute to empty it of blood. Then it should be gently pushed up. The utmost gentleness must be observed; for, with pain from rough handling, resistance is produced, and with it increased difficulty of replacement. In cases of *recurring* protrusion, before applying oil as above described the part should be sopped with alum water (Prescription No. 20). In all cases when much of the bowel has descended the child should be kept in the horizontal posture after replacement. Rest of the parts leads to recovery of strength and elasticity to retain their natural place.

If the protrusion cannot be easily returned, it will be best to apply a cold lotion, or ice, for a few hours, after which the gut will probably return, or may be replaced by pressure with the damped, oiled cloth. If the protrusion will not remain up, a band should be put round the waist, and another band dividing into two past the anus (*vide* sketch) should be brought from this band between the legs, and the ends should be separately fastened in front. This is called a **T**-bandage. Where the descending band passes over the anal orifice, a large cork or bung rounded at the end should be sewn into the cloth. The pressure of this pad, if rightly adjusted, will prevent the descent of the bowel. Various belts are sold for the purpose, but the home-made belt, as figured here, is efficacious. In bad cases the sitting posture at stool should be wholly prohibited, and motions should be passed while the child is lying down. Children subject to this affection generally require tonics, and salt-water bathing is often advantageous. Whatever improves the general health will also give increased strength to the parts which naturally support and retain the bowel in its position. The motions must be kept soft by some mild aperient such as manna, or a teaspoonful of confection of senna given every morning.

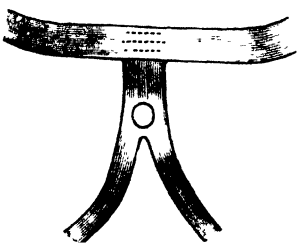


FIG 43. T-bandage

Bubo. The term 'bubo' is applied to inflammation of the glands in the groin. This is often the result of some venereal disease, especially of gonorrhœa. But the glands of the groin may swell and inflame from other causes, especially from the irritation of a sore on the foot, leg or scrotum, or even from a strain of the parts experienced perhaps when riding a restive horse. And sometimes in the tropics it appears to come on without any apparent cause. The possibility that a bubo may be due to a mild attack of plague (*see* p. 76) must always be borne in mind.

However bubo arises, the symptoms are a greater or less degree of heat and swelling of the affected part, with severe throbbing pain, aggravated by pressure or by attempts to walk. Often a bubo results in the formation of matter; but sometimes, after considerable pain and swelling, it gradually subsides. Rest in the horizontal position is essential, and hot poultices (*see* Chapter XX)

should be applied. If the swelling and tenderness increase, and throbbing is felt, and a soft spot becomes evident in the hard swelling, then pus has formed and the bubo must be treated as an abscess (*see* p. 326), and opened. The incision in a bubo should always be vertical and never oblique or horizontal, whatever the shape of the swelling.

[For keeping dressings on the groin the figure of ∞ bandage should be employed. The end of a bandage should be laid on the front of the thigh of the affected side, and the roller should then be carried round the body and fixed by a pin where it meets the end. Then it should be carried round the thigh, passing first outside and then inwards, between the legs, across the groin, and so round the body again. If both groins are affected, a double figure of ∞ bandage may be used. Better even than a bandage is a modified form of bathing-drawers with a long band to fasten round the body.]

Bunion. This term is applied to a swelling appearing over the joint of the great toe between the foot and the digits. It arises from irritation of the part from the pressure of a tight or ill-fitting shoe, and is, in the first instance, an effort of nature to afford protection to the part pressed upon. It consists in the enlargement of a little sac (*bursa*), containing watery fluid (*synovia*), which acts as a pad. Irregular pressure soon inflames this bursa, so that bunions, even when recently formed, are often tender and inflamed, requiring rest and fomentations. When old, the swelling becomes hard, with occasional periods of tenderness. Removal of all pressure in the early stage is the only certain means of relief. This should be effected by having the boots made straight along the inner side, with square toes. Plaster spread on soft leather may be applied over the part as a further protection. If a bunion gathers, which it sometimes does from irritation and neglect, it must be treated as an ordinary abscess (*see* p. 326).

If relief is not obtained by the above methods, a surgeon should be consulted with a view to an operation.

Cancer. Cancer may occur in any part of the body, but is most common in the breasts of women, the lips, the skin, the stomach, the testicle, the tongue, and the womb. The cause of cancer is not known, but it is believed to be at first a local malady (thought by some to be due to a *parasite*) which afterwards spreads. A cancer is what is known as a malignant tumour (*see* p. 381). When a doctor uses the word 'cancer' he means what is scientifically called a *carcinoma;* but the popular term cancer includes any sort of malignant tumour, the other chief kind of which is

pathologically known as a *sarcoma*. Usually, but there are many exceptions, sarcomata grow more rapidly than carcinomata and infect younger people. The subjects of carcinoma have usually reached middle life.

Cancer of the Breast. *See* p. 460.

Cancer of the Lip (*Epithelioma*). Commences as a slight sore or scab which will not heal, but grows rapidly as a hard tumour. Such a sore may also be syphilitic, and the diagnosis requires medical advice.

Cancer of the Skin (*Carcinoma* or *Sarcoma*). Usually commences as a small, hard, and nearly insensible swelling. It may remain in this state for weeks or months, or even longer, but at length it passes into a more active condition.

Cancer of the Stomach. When cancer affects the stomach it causes great pain, vomiting of bloody mucus, emaciation of the body, and a hard tumour, which may be usually felt on examination of the left side below the ribs. Surgery alone can give relief, and the earlier the operation the better the chance of cure.

Cancer of the Testicle. Commences as a hard swelling with a sense of weight and dragging, and eventually acute lancinating pain, and enlargement of the glands of the groin. The testicle is also subject to a soft variety of cancer. Tuberculous and syphilitic deposits also occur in these organs, and medical aid is necessary to decide as to the nature of the tumour.

Cancer of the Tongue. Commences as a small sore or ulcer, generally near the side and behind the middle of the tongue, which will not heal, eventually becoming the seat of lancinating pain. But an obstinate sore on the tongue may be syphilitic, or innocent, disappearing on the removal of decaying or jagged teeth.

Cancer of the Womb. Causes much pain, and is accompanied by bleeding at non-menstrual times and a badly smelling sanious, or watery discharge, with great weakness and emaciation. It generally occurs after middle life. The skin of the face is frequently leaden colour.

Treatment. There is no known cure for most cancers except removal by the knife. In a few cases who have come very early for treatment an apparent cure has been effected by the use of radium at the Radium Institute in London. The X-rays have benefited a few cases.

Cancrum Oris. This is the name given to a very destructive ulcer which attacks the cheeks, lips, gums, or external genitals, usually of children. It is attributable to debility after smallpox, with kala-azar, or other exhausting febrile diseases, especially when combined with improper and deficient food, dirt, neglect, and living under insanitary conditions. Or it may arise under such circumstances of life without prior illness. The disease commences as a dark, hard swelling of the cheek, or lips, which soon ulcerate and slough away. In this manner portions of the genitals, cheek, lips, gums, or jaw-bone may be destroyed. There is profuse discharge of both saliva and badly smelling fluid. It may terminate fatally from exhaustion, or from bleeding from some artery opened during the sloughing process; or the patient may gradually recover, with the loss of some portion of the affected tissue. The *treatment* must be prompt and heroic, for unless the spread of the ulceration is checked death will ensue in feeble patients. First wash the place with swabs of cotton-wool dipped in potassium permanganate solution or in some other antiseptic lotion. Then with a small bit of cotton-wool twisted tightly round the end of a match swab the parts deeply and freely with pure carbolic acid. Rub a little vaseline on the healthy skin, or mucous membrane, if the ulcer is on a mucous surface. Dry the ulcer with pledgets of cotton-wool, which should be burned at once, and powder the surface with iodoform, covering this with a pad of boracic lint. If medical aid cannot be obtained, repeat this treatment twice a day for two days; then use the solution and iodoform only, if the ulcer is not spreading. Nitric acid (strong) may be used instead of carbolic acid, and one or two applications with an interval of twelve hours should destroy the slough. Remove sloughs with the forceps, cutting them away as near the healthy tissue as is possible, swabbing freely the adherent portions. If the ulcer opens into the mouth it must be frequently cleansed by the nurse with swabs of absorbent cotton-wool.

The allied malady, called *noma*, which attacks the private parts of female children, is due to similar causes and requires similar treatment. The diet must be liberal and nourishing; eggs, milk alone, or beaten up with port wine; strong beef tea, meat juice, or jellies. When the disease affects the lips and cheek swallowing will be painful, and the child will refuse nourishment to escape pain. Feed with a medium-sized india-rubber tube

passed well to the back of the mouth. If this is resisted a longer tube may be passed by a skilled nurse through the nose into the gullet, and liquid food thus administered. Give Prescription No. 51 internally in dose proportionate to the age of the patient.

Cellulitis. Cellulitis means spreading inflammation of the subcutaneous or loose cellular tissues due to the activity of micro-organisms. Such inflammation may go on to suppuration and sloughing or even to general gangrene. The second variety of whitlow described on p. 384 is an example of cellulitis.

The harmful organism may enter from a small wound and, if it attacks the subcutaneous tissues, may produce cellulitis in three or four days. The patient feels ill and there is fever. The affected part is hot, tender, swollen, and often brawny. If pressed it will often 'pit.' The condition may spread rapidly and involve the whole limb, producing then high fever and delirium. Suppuration will then occur under the skin, undermining the skin in such a way that a probe or one's finger can be passed freely under it from the wound, if there is one.

The *treatment* of cellulitis must be prompt and the patient should be taken as soon as possible to a doctor. Meanwhile give him 5 grains of calomel or two pills of Prescription No. 61 : and foment the affected part. If there is any tendency for the inflammation to spread, the swollen part must be freely incised. It may be necessary to make several incisions in the skin to relieve the tension. The whole limb, if a limb is affected, should be fomented or placed in a separate hot antiseptic bath. The earlier the incisions are made the better, as by this means sloughing may be prevented. If suppuration has occurred, the tissues under the skin should be freely exposed and the local hot antiseptic bath employed.

Club Foot. Club foot is scientifically known as *talipes*. The deformity has several varieties. The most common are : when the heel is drawn upwards, or the foot is turned inwards ; or, as often happens, when both such conditions prevail. When the heel is drawn upwards, the person walks on the front part of the sole of the foot, and on the toes ; or, in bad cases, on the toes only. When the foot is turned inwards, he walks on the outside. Sometimes the foot is turned outwards, and the person walks on the inner edge. Sometimes the toes and front part of the sole are drawn upwards, and he walks on the heel. Club foot may be either *congenital*, the child being born so ; or *acquired* as a result of some

disease or injury after birth. In the latter variety the deformity arises from contraction of some muscle or muscles acting on the foot, or from paralysis of some muscle or muscles, in consequence of which the opposing muscle or muscles act uncontrolled. Thus one of the commonest causes of club foot is infantile paralysis (*see* p. 528), where one set of muscles being paralysed is unable to oppose the action of its normal opponents and so the foot is pulled out of shape.

Treatment. A child with club foot of any variety should be taken early to an orthopædic surgeon. Much can be done for the condition by massage and manipulation if seen early. Especially if seen when the tissues are still soft, and before the deformity has become great. Each case requires to be treated on its own merits; no general rule of treatment can be laid down. Sometimes the wearing of a fixed apparatus is necessary for a time. Sometimes minor opertions, such as the cutting of tendons, are necessary. Persistence in treatment under the constant eye of the surgeon is the important factor in success.

Elephantiasis. Elephantiasis is a disease common in some parts of India, in Ceylon and in other tropical areas. In the West Indies it is known as 'Barbados leg': the name elephantiasis is due to the resemblance of an affected extremity to an elephant's foot. Elephantiasis is a chronic overgrowth of the skin and tissues underneath it, produced by blocking of the lymphatic vessels in the legs, arms, labia, or scrotum. The injury to the lymphatics and the subsequent swelling of the part, with oozing of lymph and thickened, wrinkled, sometimes warty, skin, is caused by a small worm (*Filaria sanguinis hominis*). An account of this worm is given under the heading 'Filarial Disease' on p. 343, to which the reader should refer. As there explained the adult worm occupies and obstructs lymph vessels, while the embryos come out into the blood, usually at night only.

These two factors cause a febrile attack with slight, or rarely, severe pain in a limb, and a thickening of some of the lymph vessels. The acute stage soon subsides, to be repeated at intervals with the same symptoms, and a gradual increase in the size of the limb or other part affected. During some of the attacks the fever may be high, and the skin of the limb red and inflamed. The increased size and weight of the affected part become a source of great annoyance to the patient. Walking becomes difficult, and

frequently enormous tumours of the scrotum have to be carried by the patient.

In many cases of elephantiasis no worm embryos are found in the blood at any time of the day or night. It is possible the parent worms in these cases are dead, but their remains still block the lymph vessels, which latter after being subject to the irritation so long, become permanently closed.

Treatment. Medicine by the mouth has no effect on elephantiasis. When the disease affects the scrotum or labia the overgrown tissues can be removed by operation. Any swollen or tender lymphatic glands should also be excised, as the parent worm is possibly in that situation. For elephantiasis of the leg relief may be obtained when the disease is slight by wearing an elastic stocking or by rubber bandages; and also, even when the swelling is great, by complete rest in bed combined with intra-muscular injections of thiosinamin given by a doctor. This treatment lasts several months. Certain surgical measures also, not amputation, have been employed successfully in the treatment of elephantiasis.

Feet, Tenderness of the. Some persons suffer much from tenderness of the feet. For the relief of this annoying condition nothing is better than bathing the feet daily in strong salt and water. Tender feet are often found perspiring and smelling offensively. Salt and water bathing will also tend to correct this, especially when aided by perfect cleanliness, the use of the dusting powder of Prescription No. 66, and clean socks twice daily. Wool socks, free from dyes, with divisions for the toes, are made for this complaint. Wool, being a slow conductor of heat, maintains the feet warm and of equable temperature, while it permits the perspiration to evaporate. Cold feet may be relieved by immersing them for two or three minutes every night in cold water, rubbing all the time, and then putting warm socks on.

Filarial Disease. This is a condition where the embryos of certain worms are found in the blood, the parent worms being present elsewhere in the body. The presence of the parent worms in lymphatic vessels often obstructs these vessels and so causes 'elephantiasis,' to which disease the reader is referred.

The embryo filaria worms are conveyed to man by certain varieties of mosquito. When the mosquito bites, the embryo works its way through the human skin and develops into the adult worm. Lying in the lymphatic vessels the adult female produces embryos

which find their way into the blood, in which they can be seen by the microscope. They retire usually by day to the vessels of the lungs. Another mosquito may bite an infected human and so the cycle of development goes on.

Besides being the cause of elephantiasis, filarial infection is also usually the cause of chyluria (*see* p. 133), and of the disease known as 'lymph scrotum.' Also of certain varieties of hydrocele and ascites.

There is no known means of expelling the worms that give this trouble. The sufferer should however put himself in the hands of a physician as, with the rapid advances now being made in Tropical Medicine, it is quite possible that by the time he reads this an efficient means of treatment will have been discovered.

Fissure or Ulcer of the Anus. This consists of a crack or ulcer of variable extent, situated at the junction of the skin with the gut, and extending inwards. The causes are habitual constipation, and the passage of large hard stools. Scratching the part in consequence of some local irritation sometimes originates fissure. It is very frequently associated with piles. The chief symptom is pain on going to stool, of a very acute character, often continuing for hours after the stool. Often the fæces are streaked with blood; and if the fissure is deep and large, there may be bleeding each time the bowel acts. There is usually frequent spasm of the muscle round the orifice of the anus, accompanied by intense pain. The spasmodic pressure thus exerted by the muscle gives the stools a flattened or ribbon-like appearance. It may cause reflex irritability of the bladder, and in women symptoms referable to the womb. When the above symptoms present, fissure or ulcer may be suspected; but the fact cannot be ascertained without examination. The treatment requires laxatives (Prescription No. 60) to soften the fæces and prevent straining at stool. Or injections of warm water may be administered for the same purpose. The parts should be kept very clean with soap and water.

Caustic (nitrate of silver) is the best local application; and in simple cases, if applied early to the bottom of the fissure, previously well washed, often effects a cure.

But as a rule, and always when the fissure is a large one, the condition can only be cured by surgical operation.

A fissure may be suspected of accompanying piles when the pain after defæcation lasts for a long time.

Fistula. This term is applied to any sinus which burrows under the skin or mucous membrane and has an opening at either end. One of these opens through the skin, the other into a viscus such as the bladder, stomach, etc., or into one of the cavities of the body. Other forms of fistula connect two organs, as in recto-vesical or recto-vaginal cases. Fistula in ano results usually from the formation of an abscess. Such an abscess is often due to tuberculosis (*see* p. 212). When matter forms near the anus it is characterised by throbbing pain and fever, and the parts should be fomented and treated as advised for abscess (*see* p. 326). A swelling becomes apparent, and it usually points close to the orifice of the anus, and should be opened early. Then the abscess may gradually heal, or a fistula remains which communicates internally with the gut. The treatment of nearly all kinds of fistula requires a surgical operation.

Foreskin, Diseases of the. There are two conditions of the foreskin, called phimosis and paraphimosis, which require description.

Phimosis consists in an unnaturally long foreskin, with a small opening, so that it cannot be drawn back to expose the head of the penis. This condition is often congenital; but it may result from the contraction of healed sores, or ulcers. It often causes much local irritation from retention of secretions between the head of the penis and the foreskin. It may cause difficulty of micturition, the urine sometimes distending the foreskin like a bladder. From the straining efforts required in passing water, rupture or protrusion of the bowels may be produced. A surgeon should be consulted as soon as possible as to the propriety of operation; circumcision is generally advisable. When it occurs in connection with sores and ulcers, rest, fomentations, and thorough cleansing are required.

Paraphimosis consists in the foreskin being drawn back from the end of the penis, where it remains and cannot be returned. This is not uncommon in children, and also occurs when the parts are swollen as an accompaniment of venereal disease. The result is swelling and redness of the parts, attended with much pain and sometimes by difficulty in making water, or even complete inability to do so. The parts should be returned to their natural positions

as soon as possible. They should be first bathed with ice-cold water. Then the glans, or head of the penis, should be compressed with the fingers and thumb, so as to squeeze the blood out of it; at the same time it should be pressed backwards while the foreskin is drawn forwards. If this does not succeed after several trials, a slight cut will probably be necessary, for which the child should be taken to a surgeon. If neglected, ulceration of the parts will follow. After reduction, the question of circumcision will arise.

Glands, Enlarged. In Chapter II mention has been made of the lymphatics, which are a system of minute vessels throughout the body containing lymph. On the course of the lymphatics are little collections of lymphoid tissue called glands. In health these glands are scarcely perceptible; but when enlarged they attract notice. These glands constitute the second line of defence that the body presents to invasion from outside. They are, as it were, little forts full of ready mobilised troops that are dispatched to meet the hostile organisms when they enter through a wound. If the enemy is at all powerful, further reinforcements have to be called up, and those forts (glands) nearest the enemy become more than usually full of troops (white cells) and so they are enlarged. Sometimes the enemy succeeds in overcoming not only the first line of defence at the wound itself, but the second line at the glands; that is to say, the glands may suppurate. Pus consists of the bodies of the dead white cells; who have, as it were, died in defence of their country. Glands may be enlarged *acutely*, as after a septic wound. The *treatment* then should be to apply hot fomentations over the glands, but more especially to treat the wound on the lines laid down in Chapter VIII. If the gland suppurates, it must be treated as an abscess and opened (*see* p. 328). Glands are also acutely enlarged in plague, scarlatina and some other diseases.

Glands become chronically enlarged in certain diseases, of which the principal are tuberculosis, syphilis and lymphadenoma. Skilled medical knowledge is required to distinguish between these causes. The commonest, especially amongst children, is tuberculosis.

The commonest places for the glands to be enlarged are the neck, the armpit and the groin. They are also sometimes enlarged within the abdomen (*see* p. 221).

Glands in the neck. The lymphatic glands of the neck are

arranged in several groups, and it will make for lucidity if we take them in detail :

Occipital glands, at the back of the neck on either side. These may be acutely enlarged from several forms of irritation of the skin of the back of the neck or back of the scalp. The bites of vermin, wounds, boils at the roots of the hair, or any of the skin diseases which attack the head. The glands may be chronically enlarged in the diseases above mentioned, of which tuberculosis is the commonest.

The first group of causes being in the main inflammatory will give rise to swelling, pain, and tenderness of the glands in sympathy with, and receiving lymphatic vessels from, the regions named. In bad cases an abscess may form in one or more of the glands. The conditions in the second group of cases are more chronic as a rule, and painless. Tuberculous glands may soften and break down (*see* p. 217).

Posterior auricular glands, behind the ear and the angle of the jaw. May be enlarged from constitutional causes as above, or from irritation, etc., at the side of the head, also from wounds or diseases of the outer ear (for example eczema). Inflammation of the ear passages (otitis) is the most common cause of disease of these glands ; they may also be enlarged in mumps and various forms of sore-throat.

Submaxillary glands under the jaw on either side. Enlarged in constitutional diseases and in cancer, wounds, or diseases of the mouth, tongue, teeth, lower jaw, throat, or salivary glands in the floor of the mouth.

Superficial cervical glands, extending along the line of a vein called the external jugular, easily seen in the skin of thin and delicate persons. Enlarged in tuberculosis, syphilis, etc. ; cancer of the breast, windpipe, or gullet ; and in injuries, etc., of these parts ; also in diseases of the skin over them or muscles and tissues beneath them.

Deep cervical glands, except where enlarged are not very noticeable. They lie deep along the line of the carotid artery and internal jugular vein. Receiving lymphatics from the mouth, throat gullet, windpipe, and tissues adjacent, they may be enlarged in injuries or diseases of those parts, and are frequently enlarged from tuberculosis.

Glands in the armpit may become enlarged from similar acute

and chronic causes to those in the neck. The commonest of the acute enlargements is due to a septic wound of the hand: often the first gland to enlarge then is one just above the elbow on the inner side. The commonest causes of the chronic enlargements are cancer of the breast and tuberculosis.

The Glands of the Groin may swell and gather from similar causes, or from venereal disease, forming bubo (p. 337); from boils, or disease of the external genitals or anus.

The *treatment* of the latter descriptions of enlarged glands is the same locally as that given above. But general treatment must depend upon the disease causing the enlargement. When the foot or leg is affected the glands likely to be painful run down the thigh in the direction of the femoral artery. When there is pain in the glands of the groin or thigh, rest is essential.

Enlargement of the Glands of the Bowels is referred to at p. 221.

When the enlargement of any glands is thought to be tuberculous reference for treatment should be made to p. 218.

Gonorrhœa. Gonorrhœa arises from contagion; and is due to a microbe, the *gonococcus*. It may occur in either the male or female. It commences, usually from the third to the sixth day after exposure, with itching and redness of the opening of the urinary passage (the *meatus*), accompanied by a thin whitish discharge. In two or three days there is swelling of the private parts, severe scalding pain in making water, and a copious discharge of thick, yellowish-coloured matter. The duration of gonorrhœa is from ten to twenty days; much longer if neglected.

Gonorrhœa frequently causes one or other of the affections enumerated below. The inflammation may extend to the *testicle* (*see* p. 370). The *bladder* may become inflamed (*see* p. 331). *Bubo* may form (*see* p. 337). *Phimosis* or *paraphimosis* may be excited (*see* p. 345). *Gonorrhœal rheumatism* is another sequel (*see* p. 206). *Gonorrhœal warts* may grow (*see* p. 349). *Retention of urine* may result (*see* p. 367). *Ophthalmia* may result (*see* p. 416). *Lastly, gleet* may remain, and ultimately cause *stricture* (*see* p. 366). In bad cases the disease has spread from the bladder to the kidneys, or in women it may reach the womb (*uterus*) and its appendages.

Treatment. The patient with gonorrhœa must not imagine that he is suffering from a trivial disease and on this account neglect it or attempt to treat it himself. He should consult a doctor. He

may be well in ten days; but he may equally not be well, and his disease may become a chronic discharge (gleet), rendering him perhaps sterile, or involving him in any one or more of the complications mentioned above. It is common to find that a patient who has thought himself well is in reality not so, and years after apparent recovery he may unknowingly infect others: sometimes with terrible consequences. He should therefore place himself in the hands of a doctor at once. Until that can be done, he should meanwhile avoid all alcoholic drinks, tea and coffee: nor should he take any spices or stimulating food. He should rest as much as possible, wear a suspensory bandage and a little bag to catch discharge, and apply hot fomentations to the perineum. He should take Prescription No. 60 thrice daily until all scalding on passing water has ceased; thereafter he should take Prescription No. 47 thrice daily.

Much benefit may be obtained from urethral injections, the method of giving which is described in Chapter XX. These must be done with the greatest care and cleanliness or not at all. Protargol 5 grains to 3 ounces of water may be injected every half-hour. Or zinc permanganate, ¼ grain to the ounce of water, makes a suitable injection. But they are best done at first under medical supervision.

The *treatment* of the affections mentioned as sometimes resulting from gonorrhœa is as below:

When the *testicle* becomes affected, injections, if being used, should be discontinued; and the treatment indicated at p. 370 should be adopted. When the *bladder* is inflamed the treatment should be that mentioned for inflammation of the bladder (p. 331), and injections, if being used, should be discontinued. The treatment of *bubo*, *phimosis*, and *paraphimosis* is given at pp. 337, and 345. *Gonorrhœal rheumatism* presents similar symptoms to acute rheumatism (*see* p. 88), and requires medical advice. *Gonorrhœal warts* arise from the irritation caused by the discharge between the prepuce and the penis, aided by uncleanliness. Warts should be washed twice daily with salt and water, and then sprinkled with calomel, which generally cures without pain; but warts may require to be cut off by a surgeon. The treatment of retention of urine is indicated at p. 368, of ophthalmia at p. 416. *Gleet*, the last stage of *gonorrhœa*, signifies a watery discharge. It is often tedious, requiring lengthened treatment and *very*

temperate living. The daily use of a permanganate of zinc injection and attention to the general health, with iron and quinine, will generally prove successful. *Stricture* may arise from neglected gleet, when the discharge will not cease until the stricture is treated (*see* p. 367).

Granulations are little red portions of flesh which grow in and fill up wounds. When more than ordinarily luxuriant they are commonly called 'proud flesh.' Granulations are the consequence of the natural healing process; but when high, pale, and spongy, they require touching with alum or caustic, which reduces their growth and allows the wound from which they come to heal.

Guinea-worm. Unlike the worms described from p. 227 onwards, the guinea-worm is not a parasite of the intestine of man. She, for the male is never seen, is found lying in the tissues under the skin. The disease is common in some parts of India, as Rajputana: it is unknown in some other parts. It occurs in tropical Africa, Brazil, and other tropical places.

A full-grown guinea-worm may be three feet long. It is slender, about the thickness of pack-thread except at the extremity, where it is attenuated to the calibre of a hair. It is opaque, of a milk-white colour. The interior of the worm contains a vast number of young worms rolled up in coils. The young of the guinea-worm exist in the water of dirty tanks and wells. They are taken into the stomach with drinking-water, in the body of a minute *crustacean*, making their way thence into various parts of the body. The young worm slowly grows until it attains several inches in length, giving during this period little or no indication of its presence. The period which elapses from the reception of the embryo into the system till the appearance of the worm is just over a year.

The usual positions in which it appears are the lower extremities, but it may present in almost any part of the body. Attention is generally first attacted by the feeling of a thin cord beneath the skin, or by the formation of the characteristic blister always attending the presentation of the end of the worm on the surface of the skin. The blister so forming assumes the size of half a pigeon's egg, and is frequently accompanied by itching of the body, or by an eruption like nettle-rash. When the blister breaks or is opened, it is found to contain a glairy whitish fluid, in which

the end of the worm may be found, thin and fragile. The whitish fluid is full of worm embryos.

Treatment. It is a good thing to massage gently the area above the blister and try to get the worm out whole, or, if it is visible under the skin, make an incision and remove it. This will save a lot of trouble. Failing this the native plan of winding the worm out on a thin piece of stick may be tried. But care must be taken lest the worm break, or lest the part of the worm round the quill becoming dry breaks, even without the application of force. An alum lotion, applied with lint over the part, hardens the worm, and so tends to prevent breakage. Extraction should only be attempted once in twenty-four hours, when perhaps an inch, and perhaps a foot, may be gained. Slight friction with oil along the line of the worm tends to loosen it. Also a stream of water over the part will often assist extraction. If the worm breaks, abscess and fever are the general results. This is an extremely troublesome thing to happen and may give rise to a chronic sore, disabling the patient for months. That is why the twisting out method is not a very good one, as the worm is so liable to break. A better plan is to douche frequently with water the part occupied by the worm until she gets emptied of all embryos, *i.e.* of all the white fluid : this generally takes two or three weeks. Then the worm no longer resists and may be extracted.

The prevention of guinea-worm disease consists in drinking only boiled water.

Gumboil is a small abscess, generally commencing in the socket of a carious tooth, and bursting through the gum ; or, if neglected, through the cheek. There is great tenderness of the tooth, especially on pressure, severe throbbing and aching pain, and a feverish condition.

Treatment. Fomentations and hot water taken into the mouth are useful at first ; but as soon as matter can be detected it should be liberated by a prick with a lancet. If the tooth causing the gumboil is much decayed, or there is only a fang, it should be removed ; otherwise there will be a succession of gumboils. A dentist should be consulted if possible.

Gums, Spongy. Tender gums, gums that bleed on pressure or that ooze matter from in between the gum and the tooth are extremely common amongst natives of India, and common also,

though to a less extent, amongst Europeans resident in India. It is popularly thought that such spongy gums are an indication of scurvy (*see* p. 208). This is not so; the affection is entirely a local one; but is of considerable importance, not only for its effect on the gums and teeth, but also for its effect on the general health of the patient, since this suppuration, though so slight as sometimes to be unnoticed, is constantly going on, and that means that every day a considerable quantity of foul pus is swallowed with evil results that we shall note later. The medical name of the disease is *Pyorrhœa Alveolaris*. When it has been existing for some time the chronically inflamed gums shrink and recede from the teeth, leaving them protruding from their sockets apparently further than normal. At last the teeth begin to rock, there is absorption of the long sockets of the teeth as well, and they gradually drop out. That is the way in which so many elderly Indians lose their teeth: not as is usually the case with Europeans by caries of the teeth, that is to say, by the formation of a little hole that extends. The tooth that drops out as a result of pyorrhœa is usually a sound tooth.

The effects of the constant pus absorption may produce low fever, and not infrequently chronic joint pains, which are often wrongly thought to be rheumatic; neuralgic pains, especially about the face, also occur; and the general health of the patient is much upset. Anyone suffering from soft or suppurating gums should consult a dentist. The *treatment* and *prevention* consist primarily in close attention to the hygiene of the teeth (*see* the section on Dentition in Chapter XVII). The teeth must be scrupulously cleaned immediately *after* each meal, and on retiring at night. Dental floss silk may be necessary to secure efficient removal of particles of food from in between the teeth. The use of the tooth powder of Prescription No. 69, or of one of the good dental creams now on the market, is recommended. The kinds that are squeezed out of a tube are recommended, not the liquid dentifrices. When there is much pus coming from the gums the use of Prescription No. 21 as a mouth wash six times a day is advisable. If the pus is less, or if there is bleeding, or to harden the gums use Prescription No. 20 for this purpose.

In many cases however, the gums will require active treatment by a dentist at frequent intervals. When the general health is being affected it may be advisable to have some, even all, of

the teeth extracted. Sometimes benefit may be obtained from injection of a vaccine made from the pus.

Housemaid's Knee. This term is applied to inflammation of the bursa, or little 'water-bag' situated over the knee-cap. The front of the knee-joint is swollen and tender, with a feeling of crackling if touched, and there is considerable pain. It results from injury or from constant kneeling; hence the term 'housemaid's knee.' Hot fomentations should be applied, and perfect rest enjoined. After recovery a firm bandage (elastic, if available) should be worn for some weeks. In neglected cases pus may form, and must be let out by incision.

Hydrocele signifies a collection of water in the serous covering, or bag, enveloping the testicle, which comes on gradually. It begins from the bottom of the scrotum, and forms a pear-shaped swelling, smooth on its surface, soft to the feel, free from pain and tenderness, but causing uneasiness from its weight. It may originate from injuries, it may occur without assignable cause, and it may be congenital. It may be mistaken for *rupture* or *varicocele*, and the distinctions are given at p. 362. The only cure is by surgical operation. Temporary relief only will be obtained from tapping.

Joints, Inflammation of (Arthritis). A joint may be acutely or chronically inflamed. The former is frequently the result of injury, and the reader is referred to the sections on Dislocations and Sprains. Rheumatism, acute (rheumatic fever) and chronic, and gout are also dealt with under those headings. The most important cause of chronic inflammation of joints is tuberculosis, and a fuller account of joint tuberculosis is given on p. 222.

Knock-knee. Knock-knee comes on about the age children begin to walk. It is also found in growing boys and girls who stand too much, or who carry heavy weights, especially if of delicate constitution. Usually one knee is more affected than its fellow. There is a sensation of weakness, and aching pain. It is often due to mechanical yielding of the parts concerned. But it may also be associated with rickets (*see* p. 529). The weakened ligaments must have time, and rest, given them to contract and grow strong. Exercise should be abridged, and supports of the lightest description should be procured. Diet must be nutritious, and cold bathing and massage are useful.

Mortification, or Gangrene. This signifies the death of any part of the body. There are two varieties, dry (including senile gangrene) and moist. Dry gangrene is marked by the part affected assuming a pale, white appearance, here and there mottled with brown. The part is cold, and there is loss of motion and sensation. Soon the skin shrivels and is converted into a black mass, which separates itself from the healthy tissues by ulceration.

Moist gangrene is characterised by a swelling, at first red, then becoming purple or black, on which blisters form. The part is cold, with much pain. In old people with diseased blood-vessels and weak circulation, gangrene is often preceded by very cold feet, and commences as a blackish spot at the inner side of the great toe, or on the smaller toes, surrounded by an inflamed area which extends up the limb. Mortification of various parts may occur from old age ; from debility, starvation, excessive cold, disease of the arteries of the part ; or from injury to the nerves, or arteries. A part with moist gangrene stinks. Sometimes gangrene occurs in diabetes. Surgical advice and treatment is essential ; the condition is serious. Until a doctor can come, raise the limb and keep it warm with cotton-wool, after sterilising the skin, especially of the part of the limb above the limit of the gangrene, as well as possible. It will be well to paint the healthy skin above the gangrene with tincture of iodine daily.

Peritonitis. Peritonitis is inflammation of the peritoneum or membrane surrounding the bowels. Peritonitis may be acute or chronic. The cause of chronic peritonitis is usually either inflammation round the womb (*see* Chapter XIII) or tuberculosis (*see* p. 221).

The cause of acute peritonitis is usually appendicitis (*see* p. 328). It may also be caused by injuries over the bowels or wounds of the bowel, by perforation of a typhoid or dysenteric ulcer, or by extension of inflammation from the womb.

Acute peritonitis is marked by fever, and severe continuous burning pain in the belly, increased by pressure. The patient lies on his back in bed, with the knees drawn up, afraid to increase the pain by movement. If the breathing is watched it will be seen that the belly is nearly motionless, whereas in health it rises and falls. But when inflammation is present, movement of the part is so painful that breathing is performed altogether by the muscles of the chest. There is generally costiveness, nausea, or vomiting, great

prostration of strength, and an anxious expression of countenance. The pulse is frequent, and wiry to the touch, and the urine is highly coloured. In fatal cases pain increases, the bowels become swollen and tympanitic, or drum-like, from accumulation of gas within; the extremities grow cold, the skin is bathed in cold perspiration, the features are sharpened, pain suddenly ceases, and the patient dies. Peritonitis must be carefully distinguished from *colic*, in which there is intermitting twisting pain, *relieved* by pressure, the patient often rolling about to obtain ease (*see* Colic, p. 135). The thermometer will show rise of temperature.

Treatment. A surgeon must be sent for at once; the condition is dangerous. Until his arrival make the patient as comfortable as possible; put a pillow or two under his knees and a cradle or some substitute for it to support the weight of the bedclothes off his belly. Give no food; and only teaspoons of water. Give no medicines; certainly no purgatives or opium without medical advice.

Piles, or Hæmorrhoids. To understand piles it must be recollected that the blood is carried by the arteries from the heart to all parts of the body, and that it returns by the veins from all parts to the heart. The rectum or lower gut is a terminal point surrounded by a large amount of loose tissue in which a number of arteries and veins meet. It is also a dependent part, from which the blood must rise against the force of gravity. Hence it is a locality in which blood is liable to stagnate, especially if any obstruction occurs above, as so frequently offered by liver affection, or by obstinate constipation.

Piles may be either *external* or *internal*; or partly internal and partly external. *External piles* consist at first of an enlarged vein, which appears at the verge of the anal orifice in the shape of a dark-coloured tender swelling, usually about the size of a hazel-nut. In a little time the watery part of the tumour is absorbed and the swelling disappears, leaving some thickening where the skin joins the gut. External piles are often very tender and painful, causing much heat and pain about the fundament, especially when calls to stool occur; but they seldom bleed.

Internal piles are composed of an enlarged vein in the mucous lining of the rectum, pushing the membrane of the gut before it, and to such an extent that they often assume a pear shape. Internal piles are very insidious in their growth, and sometimes it is bleeding which first attracts notice. When piles increase in size they

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cause a feeling of weight and burning in the gut, straining at stool, frequent desire to make water, sometimes inability to make water, pain in the loins and down the thighs, and whites in women. Internal piles may also ulcerate, giving rise to dysenteric symptoms. Or they may protrude externally, when, if not returned, they may be constricted by the muscle (*sphincter*) round the orifice of the gut, when they first swell and afterwards mortify. Internal piles frequently bleed more or less, sometimes profusely. Bleeding from piles takes place as a rule after the action of the bowels, and the blood sprinkles the pan; more rarely it precedes the stool; in exceptionally severe cases it occurs independently of the action of the bowels, on the person suddenly standing up, or without assignable cause. If the loss of blood is not excessive, it appears at first to have a salutary effect on stout and robust persons, not, as popularly supposed, by the discharge with the blood of some deleterious matters from the system, but by relieving other organs, especially the liver, of fulness and congestion. In time, however, the loss of blood being repeated, perhaps even daily, the debilitating effect far counterbalances any healthy tendency, rendering the person weak and anæmic, exciting many of the symptoms detailed under Neurasthenia (p. 196) and Anæmia (p. 117), and also rendering the person more liable to various diseases.

Both external and internal piles may appear at the same time. At first they are present during a short period, and then, becoming smaller, cease to give trouble probably for months. At length, if not properly treated, they become permanent, and if not always bleeding or inflamed, they are the source of continual discomfort. Both varieties are also liable to become inflamed and ulcerated. When piles become inflamed, there is much pain, pain, and swelling, which last result may be seen in the case of external piles. There will also be an aggravation of all the symptoms previously enumerated.

The causes of piles are numerous. Constipation and the consequent straining at stool, sedentary pursuits, and too long sitting on soft seats have a tendency to excite them. Too much horse exercise or camel-riding, riding in a jolting vehicle the immoderate use of strong purgatives, especially aloes, are all exciting causes. Warm, moist climates, by inducing relaxation generally, and of the veins in particular, are also causes. Congestion of the liver is a fertile source of piles; also the frequent occurrence of bowel complaints.

Piles are often associated with, or cause, fissure or ulcer of the anus (*see* p. 344). Less frequently they are accompanied by polypus and cancer.

Treatment. The treatment of piles must be divided into that proper during the painful or inflammatory stage and that necessary when the parts are quiescent. When *external* piles are inflamed, fomentations or poultices should be applied and the bowels should be maintained open by Prescription No. 27 or No. 60, which produces watery stools. The patient should be kept at rest in bed. After the sore or inflammatory condition has passed away the parts should be bathed frequently with cold water, or cold alum water, while tolerably active exercise must be taken, and the bowels prevented becoming costive by laxative medicines, or perhaps by brown bread. The utmost cleanliness is necessary, as dirt may cause the piles to ulcerate, from the irritation it excites. A slight operation will often be required.

In the treatment of inflamed internal piles, or those not protruding outside the verge, the bowels should be at once thoroughly moved by castor oil, after which, as poultices or fomentations cannot be applied to the part, injections of warm water may be used. The patient should be kept quiet in bed. When piles are inflamed, whether internal or external, the diet should consist chiefly of broth, toast, eggs, or milk, and no stimulants should be allowed. Every effort must be made to remove the cause.

When internal piles protrude after stool, they should be sponged with cold water or with alum water (Prescription No. 20) before being returned. When they do not return, the person should lie down for a time, when perhaps the protruded substance will be drawn back by the action of the bowels. If not, they must be returned by gentle pressure, otherwise they may become constricted and inflamed by the pressure of the verge of the anus. Persons subject to internal piles should acquire the habit of visiting the closet at night instead of the morning, that the piles, if protruding, may be returned when the recumbent posture is about to be assumed, rather than previous to the active business of the day. Excessive bleeding may be stopped by injections of cold, or iced, alum water (Prescription No. 20); or hazeline and water in equal parts.

A host of medicines have been lauded as beneficial for piles; but the cure of piles consists more in hygienic measures, and in attention to diet, than in medicines. The patient should restrict

himself to a carefully regulated and temperate diet, with plenty of vegetable food and little meat, abstaining from highly seasoned dishes, pastry, and spirits. He should also take care that his bowels are kept open, best by an aperient mineral water. After each motion the parts should be well bathed with cold water. Paper should not be used and straining at stool must be absolutely avoided. Regular exercise is desirable. Change of climate to Europe will often relieve piles when other means fail. But frequently a surgical operation is required. When piles have existed for any length of time medicine will have no beneficial or curative effect.

Of local applications for external piles, the best is, probably, compound gall ointment. Or a preparation from the American witch hazel, known as 'hazeline,' may be used, being a more cleanly application than ointment. The piles should be bathed with hazeline three or four times a day, and a piece of linen or absorbent cotton dipped in it should be kept applied during the intervals. The best applications for internal piles, when not inflamed, is injection of alum and water, Prescription No. 20, cold, night and morning; or 1 ounce of hazeline with a similar quantity of water, or hazeline ointment.

Private Parts, Male, Discharge from the. Generally occurs from gonorrhœa or gleet (*see* p. 348). But a glairy, clear, ropy discharge may present when there has been neither gonorrhœa nor gleet; it is probably of no importance. A discharge of semen sometimes occurs: this is called spermatorrhœa (*see* p. 364).

Prostate Gland, Enlargement of the. The prostate gland surrounds the *urethra*, or urinary passage at the neck of the bladder, and is liable to several diseases. The most important disease of the gland is slow enlargement. This is rare before middle age, most common in old men; and is characterised by frequent calls to make water, especially during the night, increasing slowness and difficulty in making water, and straining. But straining does not much increase the flow of urine, which falls directly forward and is not ejected in a stream. There is a sense of weight in the fork, so that the patient often imagines he has piles. The enlarged gland mechanically prevents the bladder being perfectly emptied, and the urine remaining decomposes and becomes ammoniacal, setting up chronic inflammation of the bladder (*see* p. 331). Then the urine is loaded with sticky, tenacious mucus, or purulent matter, which adheres to the bottom of the utensil, and is frequently tinged with

blood. There may also be fits of complete retention of urine (*see* p. 367). Bleeding, sometimes copious and sudden, may also occur from the rupture of a vein. The early symptoms of enlargement of the prostate are sometimes very like those arising from other causes, as *stone in the bladder* (p. 332) and *stricture* (p. 366), so that physical examination is usually necessary to decide the point.

Treatment. The only cure lies in surgical operation, by which the gland can be removed. A surgeon should be consulted in any case, even if an operation is not performed, as in that event the patient will require instruction what to do in the occurrence of retention of urine. Catheters will then often have to be passed by the patient himself, who may never be able to pass urine naturally, and leads what is called a 'catheter life.'

Rider's Bone or Sprain. This consists of thickening and even ossification within the tendons of the adductor longus, the innermost muscle in the thigh. It may occur to those riding a great deal, without any extraordinary exertion, due to repeated slight strains. The only cure is by operation.

Rupture. Technically spoken of as hernia. There are several varieties, but the most common (inguinal) appears in the male as a tumour in the groin; in the female as a tumour a little lower than the groin. This tumour is caused by the muscles over the bowel giving way, and letting some portion of the intestines escape outwards beneath the skin, or more often by the bowels being forced along a track of the lining tissue of the abdomen which should have closed up or been absorbed. The affection may come on gradually from natural weakness of the parts, but it more often happens suddenly during extraordinary exertion. A sudden sensation of something giving way is felt, and a soft elastic swelling appears. In the male, this rupture eventually makes its way into the scrotum. In the female it generally remains as a smaller tumour in the groin. When a rupture has occurred, the bowel may return or be returned into the cavity of the abdomen, when it is said to be reducible. Or it may remain down and cannot be returned, when it is said to be irreducible. Again, in addition to being irreducible, the passage of the bowel contents may be interrupted and the blood running through the vessels to the bowel stopped; this condition is called one of strangulation.

In the first result no symptoms present: but a rupture having once occurred, the tumour is liable to come down when the person

stands or walks about; and although it may return when he lies down, or when pressure is made, there is always danger that *it may remain down and become strangulated.* A person with *reducible* rupture should avoid excessive exertion, and wear a truss, or, better still, submit to an operation for radical cure of the condition.

A truss is composed of a pad connected with a circular metallic spring, and so arranged that the pad keeps the bowel from descending, the spring maintaining the pad in position, and allowing free movement of the body. A truss should be fitted to the person by the instrument-maker, under the supervision of a surgeon. But if obliged to send for a truss, the measurement of the body, one inch below the hip, should be given, and the side affected should be mentioned. Care should be taken that the spring is strong enough to control the rupture, and to ascertain this, after adjusting the truss, the patient should stand up, with his legs apart, and cough strongly. If the truss is not suitable the rupture will come down. The truss and pad should be covered with leather, from which the skin is less likely to chafe.

If the truss chafes at first, the skin should be bathed with methylated spirit, which will harden it. Wrapping a narrow thin calico bandage round the truss, which may be taken off and washed, is desirable for cleanliness, or a washable truss may be obtained. The truss should be put on before rising in the morning, and be taken off after lying down at night. The person should have two trusses, one for wearing when bathing, so that he may never be without the protection, and thus to retain his truss in ordinary wear dry. It is generally desirable for a person, although only ruptured on one side, to wear a double truss, for there is often a weakness of the corresponding region on the opposite side, and with a truss upon one groin, a greater strain is thrown upon the other, which is therefore apt to give way. Unless a truss fulfils all the requirements as above, and unless it is used in the manner directed, it may do injury. Without a truss, a person with reducible rupture is in constant danger of life; with a good truss, properly used, he is safe. If, when a rupture first appears, a truss cannot be procured at once, a 'figure-of-eight' bandage with a pad over the rupture should be used.

When the tumour remains down and cannot be returned, although not strangulated, there is a colourless elastic tumour, often penetrating to the scrotum, which may be the cause of dragging pains. In all cases of irreducible hernia (or rupture) it is advisable to have

an operation. A truss is useless and may make matters worse. The only kind of truss that is ever advisable is a hollow or bag-truss. An irreducible rupture may readily become obstructed, that is, there will be interference with the passage of the bowel contents, as shown by constipation, flatulence, and colicky pains. In these cases the patient should be put to bed on his back with the knees bent over a pillow : cold water or ice put on the rupture, only fluid diet given in small quantities, and repeated enemas of soap and water in each of which should be put 1 drachm of turpentine. The rupture should be supported on a pillow between the legs. If the symptoms instead of being relieved tend to increase, strangulation is probably present. In strangulation the patient first complains of flatulence, colicky pains, a sense of tightness across the belly, desire to go to stool, and inability to evacuate. Some fæcal matter may, however, be passed if any happens to be present below that part of the intestines which has become strangulated. To these symptoms succeeds vomiting of the contents of the stomach, then of sour bilious fluid, then of material like coffee-grounds, and lastly of matters having the odour, and often the appearances, of fæces. The swelling becomes tense and incompressible and does not move when the person coughs. If this state continues the inflammatory stage sets in. The tumour, and eventually the whole surface of the belly, become swollen and painful. The countenance denotes anxiety, the vomiting is constant, the patient restless and desponding, the pulse is small, quick, and wiry, and there is constant hiccough. After a variable time the parts mortify, the tumour becomes dusky red, the pain ceases, and the patient, having probably expressed himself relieved, soon after dies.

Treatment. *Purgatives* given by the mouth *will do harm.* Therefore the feeling of a desire to stool, causing entreaty on the part of the patient for something to open the bowels, should not be complied with, except by a rectal injection of warm water. The great point is to return the protruding intestine into the cavity of the abdomen. Immediate operation by a surgeon is the ONLY safe method of doing this. Only when a surgeon's help is absolutely not available the following measures may, and must, be tried, since an unrelieved strangulated rupture practically means death in two or three days. The bladder having been emptied, the patient should lie down with his shoulders raised and with both thighs bent towards

his belly and placed close together. This relaxes all the muscles. An anæsthetic, if available, should be administered, and 'taxis' as described below performed. If the anæsthetic is not available, and if the patient's condition is not very critical, the foot of the bed should be raised two feet, crushed ice or cold water placed on the rupture and two hours allowed to elapse in the hope that the bowel may go back. If not, 'taxis' must be tried. If a hot bath be available, this may be substituted for the raised bed position, and cold applications and taxis tried while the person is still in the hot water. Taxis is performed as follows: The operator grasps the swelling with the fingers if small, with the palm of the hands if large, and *gently* compresses it. This will drive wind, and other contents of the swelling, into the belly. Then the swelling may be raised by its neck, gently pulled forward, and again compressed. This should be continued for ten minutes if the swelling is not tender and there is no hiccough; but for a shorter period if the reverse conditions present. Much force must NOT be used, as the tumour may be injured or pushed between the muscles, instead of back into its proper place. When successful, the tumour usually disappears with a gurgling, the pain is relieved, and the vomiting stops. The tumour should not return in one lump, so to speak, but gradually. A pad should be carefully placed over the part, and the figure-of-eight bandage applied (*see* p. 338). The diet should be fluid until the bowels have acted naturally, and no aperient medicine should be given; but if the bowels do not act in twelve hours, an injection of warm water and soap should be used (*see* p. 603).

Rupture is liable to be mistaken for hydrocele or for varicocele, or *vice versa*. The distinctive features are therefore contrasted here:

RUPTURE	HYDROCELE	VARICOCELE
Usually comes on suddenly.	Comes on gradually.	Comes on gradually.
Disappears when the person lies down, and reappears when he stands up.	Does not, as a rule, disappear when the person lies down.	Disappears when the person lies down.

RUPTURE	HYDROCELE	VARICOCELE
If the fingers are pressed on the *external ring* when the patient is lying down, and he rises with the fingers still pressed on the part, a rupture does not return. The *external ring* is the part through which the rupture passes, and is about an inch above, but to the side of, the root of the penis.	Pressure with the fingers makes no difference. The swelling remains as before.	Pressure with the fingers does not prevent the reappearance of the swelling, which gradually returns when the person stands up.
The tumour commences above, or in the groin.	The tumour commences below, or in the purse.	Commences from below or in the scrotum.
Tumour tense, or elastic; or 'gurgling' may be felt or heard inside.	Tumour smooth, affording a fluctuating feeling, like water in a bladder.	Feels like a bag of worms.
When the person coughs the impulse communicated by the cough is felt in the tumour and the size is often increased.	No impulse or shake from coughing felt in the tumour.	No impulse or shake from coughing felt in the tumour.
The tumour is opaque.	Tumour is translucent; that is, light may be seen through it.	The tumour is opaque.
No pain or tenderness in the tumour, unless *strangulated*.	No pain or tenderness in the tumour.	Dull aching of the part, especially after long standing.
The tumour does not obscure the testicle, which may be felt below and behind it.	The tumour obscures the testicle, which is behind it.	The tumour does not obscure the testicle, which is below it.
No distinct separation between the tumour and the bowels.	Distinct separation between the tumour and the bowels.	Distinct separation between the tumour and the bowels.
Dangerous to life.	Not dangerous to life.	Not dangerous to life.

Rupture at the navel also occurs, caused by violent exertion or straining, and is especially liable to happen through an old scar at this place, due to a previous operation. The rupture may

attain a large size and is liable to accidents, already described, of becoming irreducible and strangulated. In such cases the treatment is as in the other variety. An adult with a rupture at the navel should always wear a properly fitting pad and belt.

For Rupture in Children (*see* p. 531).

Spermatorrhœa. Spermatorrhœa consists of involuntary discharge either of semen with the secretion of the prostate gland, or of the latter alone. The fluid has a milky appearance. Occasional nocturnal discharges of this description *are of no consequence*. In severe cases similar discharges may occur during the day. Often this depends on certain bad habits, and the result will cease when such practices are discontinued. Such discharges are often associated with dyspeptic symptoms, and the patient is frequently out of health, and tends to become depressed. The recurrence of the symptoms tends to exaggerate the depressed condition, the mind of the patient dwells needlessly upon it, and he erroneously supposes the malady to be of great importance, and is often led astray by unscrupulous advertising harpies, who make their living by preying upon the fears and anxieties of their timid fellow-creatures. If the spirits are depressed, change of employment, or relief from mental occupation, and change of locality are indicated. In the meantime the bowels should be kept open, and the closet should be visited in the evening, so that the lower bowel may be emptied before the person retires to rest. Late suppers should be avoided, and no spirits should be taken. The patient should sleep on a hard bed, and be lightly covered, and he should not lie on his back. As medicine, if there are no prominent dyspeptic symptoms requiring treatment, and if the bowels are sufficiently open, quinine and iron (Prescription No. 51), with double doses of bromide of potassium (Prescription No. 55) at night and a cold bath in the morning.

Spine, Curvature of the. There are three principal varieties of spine-curvature, viz. : to either side, forwards, and backwards : of these the *lateral curvature* is most common. It occurs chiefly to young females, and the first sign is probably one shoulder being observed higher than the other. Preventive measures are : care against constrained positions, as during writing, for instance, so frequently fallen into by children. Also against the practice of raising children by placing the hands under their armpits, and letting the whole weight of the child's body drag on the shoulders. Children should be raised ordinarily by placing one arm under the buttocks ;

and they should never be hauled about by one arm. In all instances of threatening spine-curvature, exercise short of fatigue, avoidance of strained positions, much rest in the recumbent posture, attention to the general health, with liberal diet and tonic medicines, are the requirements. In mild cases a cure may often be obtained by means of massage and by prescribed exercises and movements taken regularly under supervision.

A sharp backwards curve of the spine is often the result of tuberculosis of the vertebræ (*see* p. 222). Any curvature of the spine is most important, and the subject should be taken immediately to a surgeon.

Stone in the Kidney. Stone in the kidney may result from the collection of pieces of gravel (p. 167) in the kidney.

When large pieces of gravel are passed there are shooting pains in the loins, running towards the groin, scrotum, and thigh, often numbness of the leg, with desire to make water, and pain at time of doing so. In the male the testicles are often spasmodically drawn up. These symptoms are accompanied by feverishness, constituting what is popularly termed 'a fit of the gravel.' When the piece is larger still it becomes worthy the name of a stone, or as it is termed by doctors a 'renal calculus.' The passage of a stone is attended by violent pain called 'renal colic,' in the area shown on the diagram on p. 33 In some instances, without warning, the patient is seized with a most acute pain in the back of the loins, accompanied by violent sickness and vomiting. There is frequent tendency to pass urine, which is scanty, high-coloured, or bloody. At length, during a violent retching, the patient experiences a sudden sensation as if he were stabbed, and from that time his acute pain gradually ceases. When these symptoms happen to a person passing red gravel, a small gravel-stone, formed in the kidneys, has passed through the *ureter* (a small tube connecting the kidney and the bladder) into the bladder, where it may remain, increase in size, and become stone in the bladder, or from which, if small enough, it may pass out with the urine. For the distinctions between renal colic and gall-stones, *see* p. 162. Renal colic has also to be diagnosed from ordinary or intestinal colic (*see* p. 135). If a stone is too large to pass from the kidney to the bladder, it may remain in the kidney and excite inflammation or abscess. When there is doubt as to the existence of a stone, the aid of the X-rays may be called in.

Treatment. In the case of a fit of the gravel or of the more severe renal colic, the first thing is to give a hot bath (*see* Chapter XX), which will often relax the spasm of the ureter. When the pain is very intense morphia, $\frac{1}{3}$ grain, should be injected (*see* Chapter XX). Sometimes hot poultices will give relief also. Hot barley-water, water and Imperial Drink (Chapter XXI) should be given freely. A surgeon should always be consulted early, because very often operation becomes absolutely necessary. In the intervals between attacks the patient should lead a quiet life, avoiding sudden exertion. He should drink water freely, and may take Prescription No. 45 at intervals.

Stricture. Stricture, or contraction of any of the natural passages of the body, may occur as the result of disease or of injury.

Stricture of the Gullet. This prevents the passage of food into the stomach, and is characterised principally by gradually increasing difficulty of swallowing, noticed probably during years, and occasionally aggravated by fits of spasm. There is also pain in the chest and between the shoulders, and if an instrument is passed into the gullet it meets with an obstruction. Hysterical women may also suffer from symptoms of stricture of the gullet, but in such cases the difficulty of swallowing often appears suddenly and vanishes as quickly. When symptoms as above occur, general and surgical treatment under professional superintendence is required.

Stricture of the Rectum. The symptoms are pain, straining, and difficulty in passing the fæces, which are voided in small narrow flattened pieces. There are also cramps and pains in the thighs, frequent desire to make water, and dyspeptic symptoms. A medical man should be consulted as soon as possible. It is well to keep the motions soft by using small doses of confection of senna in the early morning every alternate day.

Stricture of the Urethra. The urethra, or channel by which the urine passes, is subject to both *permanent* and *spasmodic* stricture.

Permanent stricture signifies a contraction of the canal of the urethra in one or more places, owing generally to attacks of gonorrhœa, but caused sometimes by injury. The symptoms of stricture of the urethra are: frequent desire to pass water, especially at night, a little urine dribbling out after micturition and wetting

the clothes, increasing difficulty in making water, a small, forked or twisted stream diminished in bulk. There is often itching at the end of the penis, and a gleety discharge. As symptoms partly resembling those of stricture occur from stone in the bladder (*see* p. 332), or enlarged prostate gland (*see* p. 358), examination by passing an instrument is the only certain test.

Treatment. Any stomach disorders, or acidity of the urine, must be removed by aperients and antacids, and temperance, rest, and early hours must be adopted. But mechanical treatment is of most importance, and consists in the periodical passing of an instrument, only to be performed by a surgeon. When the stricture has been dilated, the passage may be kept open by the patient, if instructed how to use a bougie of the proper kind.

Spasmodic stricture usually occurs to persons who have some slight permanent stricture or small gonorrhœal ulcer in the passage. The exciting causes of spasm of the part are : indulgence in drink, retaining the urine too long, exposure to wet, horse or bicycle exercise, irritation from piles, or some unnatural condition of urine. The symptoms are now those of *Retention of Urine.* The patient has a great desire to pass water, and on straining finds himself unable to do so ; the bladder becomes distended, and appears as a globular tumour in the lower part of the abdomen. The suffering is great, and, if not relieved, the continued efforts at evacuation may terminate in rupture of the bladder or urethra, and in *extravasation*, or escape of the urine into the surrounding tissues. When this serious complication results, the patient, during a violent effort of straining, feels something give way ; his painful sense of distension becomes immediately less, and he thinks himself getting well. He probably now makes a little water, as the stricture relaxes when the pressure behind is removed, and this further adds to his satisfaction. But in a very short time smarting pain occurs about the anus, in the fork, and in the privates ; for the irritating urine has penetrated into all these parts, which rapidly become red, much swollen, and inflamed. Blackish spots and blisters, significant of *mortification*, soon appear, the tongue becomes black, the pulse feeble, and muttering delirium and hiccough precede a fatal termination.

When the escape of urine is not great, as occurs if the patient is relieved at the critical period, an abscess forms in the fork, behind the scrotum. Or, sometimes, an abscess forms without any escape

of urine, simply as the result of irritation. This, called *perinæal abscess*, is known by throbbing pain, tenderness, hardness, and a globular swelling, with hot skin and feverishness. Frequently a *perinæal* abscess results in *fistula* (*see* p. 345), through which urine often finds its way from the bladder.

Treatment of retention of urine. The sufferer should sit in a hip bath or tub containing water, as hot as he can bear it, deep enough to cover the whole of the low abdomen as high as the navel.

While thus sitting he should endeavour to pass water. The bath should be continued if necessary for two hours and its effects may be assisted by a full dose—12 or 15 grains—of Dover's powder. An ounce of castor oil should also be taken.

If these measures do not enable the patient to pass urine, operation measures will be required. These measures would be the passage of a catheter or else the withdrawal of urine by puncture of the bladder.

Extravasation of urine should never occur if proper treatment is undertaken, and retention of urine due to spasmodic stricture, unrelieved in three hours by the measures I have described, must be treated by a competent surgeon. Domestic medicine is useless in such an emergency.

After an attack of retention of urine, even if relieved by treatment, a surgeon should be consulted regarding the treatment of the stricture.

Syphilis. Syphilis is due to a minute organism, *treponema pallidum*. The infection of syphilis is commonly venereal, though it not infrequently is conveyed by other methods of contact. The sore commonly appears about a month after infection, and when arising in the usual way it first shows, on some part of the genitals, in the shape of a small red pimple, which, about the fourth day, becomes a watery vesicle with an inflamed base. Then a little 'matter' forms, and, discharging, leaves a painless sore or ulcer, with a hard margin, elevated edges, and depressed centre. This is called *primary* syphilis. About this time the glands in the groin will be felt hard and slightly enlarged; but not tender and swollen like a bubo (p. 337). The sore usually soon disappears with treatment.

But the person affected is not free from disease. Weeks, or months, afterwards, *secondary* symptoms may occur. On an average, the period of their appearance is in about six weeks, and in

the majority of cases the sequence is much as follows. The person grows dispirited, is probably troubled with rheumatic pains, particularly in the shin-bones and heels, and complains of loss of appetite, and want of sleep. Then either skin diseases, sore-throat, ulcers of the tongue or mouth, or all these affections, appear. The mildest variety of sore throat is simple redness, or soreness; but very often there are ulcerations. The patient has a hoarse, guttural way of speaking, and may complain of pain in the ears. Next, or at the same time as the sore throat, appear eruptions of the skin, of various descriptions.

Later than the above signs, perhaps many years after, especially if the disease has not been well treated, there may appears signs of *tertiary* syphilis. This not infrequently attacks the internal nostrils, producing a foul discharge, and it may ultimately destroy the bones of the nose. Or it may attack the shin-bones, the surfaces of which swell, become very painful (*Periostitis*), and form what are termed *nodes*. These *nodes* sometimes gather, burst, and leave deep, foul ulcers, at the bottom of which is diseased bone. The windpipe may also be implicated, producing huskiness, or loss of voice, which may become permanent. Internal organs, as the brain, spinal cord, or liver, may also become diseased, giving rise to various anomalous symptoms, only to be recognised by the experienced practitioner.

But even this is not the end of syphilis. Women frequently miscarry as a result of syphilitic poison in the system. Children of diseased parents are often born diseased. When a child is born syphilitic, it is weakly and shrivelled, with a hoarse cry, snuffling respiration, discharge from the nostrils, and copper-coloured blotches on the skin. A syphilitic child in its infancy is liable to wasting (p. 539) and as it grows up to many other troubles.

Treatment. No one except a doctor should attempt to treat syphilis. The patient should be put in the hands of a medical man with all dispatch. If one is not immediately available, until one can be seen the sore should be kept clean and washed with one part of Prescription No. 18 to five parts of water. Mercury and chalk (grey powder) pills of two grains each may be taken thrice daily, if the teeth and gums are kept clean; but this should not be continued more than three days without close medical supervision. An injection or two injections of Salvarsan, followed by a course of mercury, is much to be recommended if it can be obtained.

For tertiary syphilis potassium iodide is the most useful drug, usually in double doses of Prescription No. 56 thrice daily; but this also must not be taken without medical supervision, or symptoms of *iodism* will be produced.

Testicle, Inflammation of the. May arise from various causes, as injury, mumps, gonorrhœa or Malta fever. The whole organ may be affected, or the posterior part may be chiefly implicated. The symptoms are heat, swelling, redness, great tenderness, pain between the legs, aching and dragging sensation in the loins, feverishness, nausea, and sometimes vomiting. If discharge has been coming from the penis, it sometimes ceases temporarily when the testicle inflames. Both testicles may be affected. The inflammation may be general (*Orchitis*), or confined to the upper tubular part (*Epididymitis*).

Treatment. If an injection is being used for gonorrhœa it should be stopped. Perfect rest in bed is desirable, and the inflamed part should be raised on a small pillow. It should be assiduously fomented (*see* Chapter XX).

But if the pain is very great, it is probable that fomentation might make it feel worse. In this case more temporary relief will be obtained by putting an ice-bag on the part. The attack runs its course in about ten days, after which the testicle will require to be supported until all remaining hardness and swelling subsides, which may not be for some weeks. If a person with swelled testicle is unable to keep at rest, as advised above, the great thing is to support the parts well by a suspensory bandage, or with the handkerchief as described below. In severe cases the person is totally unable to move about, however much he may wish to do so, and in all cases the less he does so the more quickly will a cure be brought about.

When swelled testicle occurs to boys with mumps, the pain and swelling are usually moderate, and beyond raising the organ and applying fomentations, no treatment will be required. This form of swelled testicle subsides rapidly, without leaving any permanent swelling.

A chronic form of inflammation of the testicle is sometimes due to tuberculosis (p. 212), and should be treated on the lines of that disease.

If a suspensory bandage is not obtainable, a substitute may be formed by a broad bandage and a handerkchief. The bandage

should be passed round the waist like a belt, and fastened. Then the handkerchief should be folded into a triangular form. The centre of the base of the triangle is to be passed under and behind the testicles, as far as possible. Then the two lateral ends of the handkerchief are to be drawn up, and passed (on each side) first in front, and then over and behind the waist-belt, each end being then brought in front of that part of the handkerchief passing over the bandage. The two ends are then tied together. The front end of the handkerchief is then brought up, passed under the bandage, carried over it, and attached to the knot formed by the other two ends. In this manner a bag may be formed.

Tetanus. The disease usually commences with stiffness of the neck and about the jaws, which are opened and closed with difficulty. The person frequently regards this as due to cold, or thinks it is rheumatism. There is often difficulty of swallowing, leading to violent ejection of fluids from the mouth or through the nose. In some instances the malady does not proceed further, and the patient may recover. But in other cases, in the course of a few hours, or days, the jaws become firmly closed, constituting 'lock-jaw.' Spasms of the limbs and body also supervene, by which the patient may be bent like a bow, resting on his heels and the back of the head; or the body may be bent to either side. Sometimes the hands and forearms to the elbows escape these spasms. The face is contorted into a frightful grin, known as the *risus sardonicus*. There is agonising pain in the limbs during the spasms, and also at the pit of the stomach, shooting through to the back. The spasms recur at intervals varying from a few minutes to hours; but during these intervals the muscles remain hard, and do not thoroughly relax unless the patient sleeps. During the spasms the breathing is laborious, the skin is hot, and drenched with perspiration. The patient may die from suffocation, in consequence of spasm of the top of the windpipe, or from spasms fixing the muscles of the chest and preventing breathing; or he may die from exhaustion. The immediate cause of tetanus is a microbe, the bacillus of tetanus. It flourishes in the soil, especially in the neighbourhood of dirty stables, cab ranks, etc. A cut, scratch, or wound if contaminated becomes inhabited by the bacillus. The poison formed by this microbe passing into the blood acts most readily on the central nervous system, brain and spinal cord, causing, through the nerves, the spasmodic muscular contractions

above mentioned. In some cases no history of a wound or scratch can be obtained; but the bacillus must have got access to the nervous system somehow. Such cases are called *idiopathic* tetanus.

Diagnosis. Stiffness of the jaws may be caused by the inflammation attending cutting a wisdom tooth, so that when symptoms of the kind are present in young people, it will be well to ascertain if this is the case.

Tetanus may be mistaken for hydrophobia (*see* p. 178), and *vice versa*. But in hydrophobia there is generally fear of water, in tetanus there is no such fear. In hydrophobia there is no lock-jaw. In hydrophobia there is constant 'hawking' and spitting, in tetanus none. In hydrophobia there is complete relaxation of the muscles after any convulsive seizure, in tetanus the muscles remain more or less hard between the struggles. There is generally the history or mark of a dog-bite in the one case, and not in the other; but probably the mark of some other injury.

Tetanus may also be mistaken for poisoning by strychnine (*see* p. 245). In tetanus some exciting cause, as a wound, is nearly always present. In tetanus the muscles of the jaws are first affected, which is rarely the case in poisoning by strychnine. In poisoning the spasms chiefly affect the extremities, and in tetanus the hands and forearms often escape. In poisoning, although the jaws may be firmly closed, the mouth can be opened during the intervals between the spasms, and there is no real 'lock-jaw' as in tetanus. Tetanus comes on more gradually than the effects of strychnine, which are present in a few minutes after a poisonous quantity has been taken. In tetanus the spasms do not thoroughly relax even between the paroxysms; in poisoning the periodical relaxation is complete.

Hysterical convulsions have been sometimes mistaken for tetanus; but a reference to the description of hysteria (*vide* p. 183) will at once show the difference.

Treatment. It is much easier to prevent tetanus than to treat it successfully when once established. Every wound, especially if at all contaminated with earth, should be scrupulously cleaned as soon as possible. The most dangerous are punctured wounds, and the most dangerous contamination is garden soil which contains manure. The tetanus bacillus is very prevalent in the damp climate of Bengal, and especially so during the rains. The outlook in tetanus depends principally on the length of time that has

elapsed between the infliction of the wound, at which time infection as a rule also occurs, and the onset of symptoms, that is to say on the length of the incubation period. If that is less than ten days the outlook is bad. Even if the tetanus is established the wound must be attended to and freely opened up.

Clean away all blood and foreign bodies which may be in the wound. If there is only an abrasion it may be painted with pure carbolic acid and covered with a dressing of boracic lint with vaseline, iodoform, etc. If the tissues around the seat of injury are swollen and pit on pressure, dressings of very hot antiseptic lotion will relieve pain and reduce the swelling. Success has been recorded as following amputation of fingers, etc., and removal of tissue in which the wound is situated. But treatment must chiefly rely on the injection of tetanus antitoxin in large doses as early as possible. This acts best when used as a prophylactic when the wound is first seen. Many lives have been saved during the war in France by injecting all cases of severe wounds with tetanus antitoxin. So that in India any case of suspicious wound should be similarly dealt with, using the antitoxin to *prevent* tetanus. As a means of treatment after tetanus is established tetanus antitoxin, although theoretically valuable, has not until quite lately given satisfactory results. Once tetanus has begun, in order to give this treatment the best chance of success the antitoxin must be injected into the brain or spinal cord. In such a serious disease as tetanus success with the antitoxin would mean a considerable saving of life, especially in India, where the disease is common. Large doses must be fearlessly used. The disease varies in virulence, and the more chronic it is the better the chance of life. Mild cases have recovered under sedative treatment only. Acute cases are very serious and give a high mortality. There are other methods of injection treatment, by magnesium sulphate into the spinal membranes, which are useful; but can only be done by a doctor. In addition to the above, Prescription No. 29 may be given to calm the spasms: it may be repeated in three hours' time.

Infantile Tetanus. Lock-jaw, or even complete tetanus, sometimes occurs to infants, generally between the third and tenth day after birth. It is usually preceded by symptoms, such as restlessness, whimpering, broken sleep, yawning, and hasty snatches at the mother's breasts, which are soon relinquished; but often such symptoms are not noticed, or are referred to some other cause.

Probably the first thing that attracts attention is inability of the infant to take the breast properly, which may be attributed to some fault of the mother's nipple, or to 'tongue-tie' of the infant, until at length the infant's jaws are noticed to be stiff. When an infant has taken the breast properly and then does not do so, suspicion of lock-jaw should arise, and the jaws should be examined for stiffness. If the disease goes on, the symptoms as detailed at p. 371 present. The cause of the tetanus of infants is exposure to infection through the navel or umbilical cord when not protected by proper dressings. The jaws must be gently separated by the end of a spoon protected by a little linen rolled round it; and then milk, diluted with one-third the quantity of lime water (Chapter XXIII) should be given cautiously. If there is difficulty in swallowing, not more than half a teaspoonful, or even less, should be given at one time, but the attempt should be hourly repeated. A warm bath (Chapter XX) should be given twice daily. As medicine half a grain of chloral, and 1 grain of bromide of potassium dissolved in half a teaspoonful of water, every five or six hours. The antitoxin should be tried.

Tongue and Mouth, Ulcers of the. May arise from hot or caustic fluids; salivation, thrush, scurvy, venereal disease, cancer, debility, or from dyspepsia. When ulcers arise without any evident cause they are usually dyspeptic, and the best application is solid nitrate of silver: or pure carbolic acid applied accurately to the ulcer alone by means of a match whittled to a point. Also, readily obtainable is a concentrated solution of alum (powdered alum 3 drachms, water 1 ounce), applied several times daily with a feather or brush. Probably the best application of all, though it is not always available, is chromic acid, as given in Prescription No. 7. One application a day should be sufficient.

The accompanying dyspepsia or other ailment must be treated at the same time.

Toothache. A tooth consists of four chief parts, as shown in Fig. 44.

(*a*) *Enamel*, which is very hard and covers the visible portion.

(*b*) *Dentine* or ivory also hard, but not so hard or resistant as enamel.

(*c*) *Nerve* or pulp consisting of nerves and blood-vessels.

(*d*) *Cementum*, the material covering the "root" or portion embedded in the gum.

Toothache is caused by irritation or inflammation of the nerve or surroundings of the tooth. Decay until the nerve is exposed is the most frequent cause. The decay commences on the outside of the tooth and spreads inwards, hollowing out the inside so that the tooth becomes a mere shell and pieces break off. Food undergoing decomposition between the teeth, or in the natural depressions of them, chemically affects and destroys the enamel, or hard outer coat, acting in the same manner as acids.

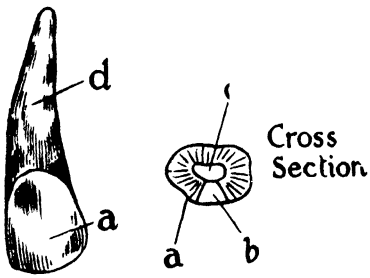


FIG. 44. Diagram of a Tooth

Decay is often very insidious and the fact of its being present is frequently only known by the occurrence of pain. It would be well if the teeth were systematically examined several times a year. A warning of pain, however slight, should never be neglected, and should lead to investigation and to such measures, stopping or otherwise, as may be required.

The teeth of women during the period of pregnancy are apt to decay rapidly, and are peculiarly sensitive; a good reason for having them put in order previous to that event.

In young people decay runs a more rapid course in consequence of the structures being softer, the shell thinner and the pulp larger than in the teeth of older people: an additional reason why the teeth of young people should be specially attended to.

The great preventive of decay is keeping the surfaces of the teeth free from all particles of food, 'tartar' and mucus that lodge between and about them, and the use of the tooth-brush should be taught as soon as there are teeth.

As a rule, and especially where there is a thick, sticky saliva, a saponaceous tooth-powder or soap should be used. Many tooth-powders are not only useless but actually injurious, being gritty and injuring both the teeth and gums. Clean the teeth after each meal when possible, and always the very last thing at night, taking no food at all afterwards.

Not only should the teeth be cleaned, but the gums also should be well rubbed or massaged, using the tooth-brush with a circular motion in order to stimulate them.

The tooth-brush should not be soft, a fairly hard brush being the best to use. Pure castile soap by itself makes an excellent tooth soap: the taste is objectionable at first, but is soon got used to. An efficient tooth-powder will be found in Prescription No. 69. Never use pumice powder, as this is too gritty.

Toothache may be felt in a sound tooth, the pain being due to exposure of a nerve in another tooth on the same side of the jaw either upper or lower; this pain, however, never crosses over the middle line of the jaw. Pain felt in a lower tooth from an exposed nerve in an upper one is called referred pain. Besides pain from an exposed nerve, pain may also be felt from an abscess on the root of the tooth, the tooth then being very tender and feeling higher than the rest of the teeth. An abscess may cause a great swelling of the face, those from upper front teeth pushing out the upper lip, from the side teeth in the upper the whole cheek up as far as the eyelid may become swollen, whilst from lower back teeth the swelling appears in front of the angle of the jaw.

Pain caused by an exposed nerve generally comes on as soon as one lies down as night or when eating hot or cold things. Pain from an abscessed tooth is more of a tenderness in the tooth.

Exposed nerve pain may be relieved by applying to the hollow tooth on cotton-wool a little oil of cloves, or half a drop of pure carbolic acid or creosote; whilst pain from an abscessed tooth may be relieved temporarily by painting a little tincture of iodine or chloroform on the gum, or splitting a raisin and toasting it, then applying this hot to the gum over the tooth. Capsicum may also be applied to the gum. Most cases, however, will swell up and then burst, when the pain will be relieved; but the tooth should be extracted as soon as possible when once swelling has begun.

Tooth Extraction.* Tooth extraction may be an easy or a very difficult operation. This depends upon the tooth to be extracted, the implements at hand for the purpose, and the skill, or otherwise, of the operator. When possible a dentist should be consulted. When the skilled aid of a dentist or doctor is not available, it is justifiable for a person of ordinary strength and ability to attempt extraction of a tooth when necessity, such as constant

* For Figs. 47 and 48 in this section and for much of the letterpress we are indebted to Mr. Coleman's book on "Extraction of Teeth," published by H. K. Lewis.

pain in a decayed tooth, demands that it should be done. The different sorts of teeth in the upper and lower jaws have different shaped forceps designed for their extraction. These forceps usually have stamped on them what teeth they are intended for. If such are available so much the better : if not, the operator must do his best with the forceps at his disposal.

The operation of tooth extraction may be described in three stages :

(1) The application of the forceps to the tooth. (2) The destruction of the membranous connexions of the tooth with its socket. (3) The removal of the tooth.

The instructions here given first are applicable to all teeth. After that description a separate short account will be given for the different kinds of teeth in the two jaws.

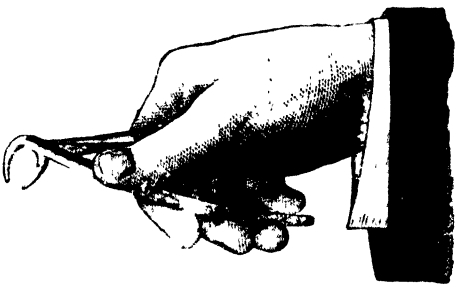


FIG. 45. Showing Method of Holding Lower Forceps



FIG. 46. Showing Method of Holding Upper Forceps

(J. F. Colyer's "Extraction of Teeth.")

(1) In the first stage, the forceps should be taken in the palm of the hand, the blades pointing upwards or downwards, according to the jaw operated on, the thumb being employed as a stop or regulator to govern the amount of separation of the handles, and consequently of the blades, as shown in Figs. 45 and 46.

The blade should be first adapted to the most obscured side of the neck of the tooth, and then lightly closed upon the opposite side. This being done, the thumb is gradually withdrawn, and steady, but forcible pressure made in the direction of the root of the tooth. The force employed should be *regulated* by the amount

of resistance experienced, it being applied gently and increased as the case demands, and often accompanied to advantage by a very slight rotatory movement.

The tendency is to force the blades insufficiently up the socket of a tooth, and so to obtain only an edge grasp on the neck of the tooth, with the probable result of fracture at this point. If the tooth be already loose, and especially if it be one with a single root, there is no need to push the blades up the socket to any extent, and doing so only causes unnecessary pain.

In any case one should commence gently and gradually increase the force until a *firm grasp* of the tooth is obtained.

(2) The second stage of the operation, the separation of the tooth from its socket, is now begun. This will consist in a slight rotatory movement, if the tooth has a conical root, or an inward and outward movement, if the root be flattened, or if there are two or more roots. The hand is able to perceive when the membranous attachments of the tooth to its socket have yielded, and then the operator begins continuously with this stage the movements of

(3) The third stage or stage of extraction. Care should be taken not to apply this force too soon, *i.e.*, until the last stage is complete, or great resistance will be experienced, and fracture of the tooth may occur.

One can tell, as a rule, in what direction the loosened tooth is coming most readily and the traction should be exerted in the direction of least resistance. It should be understood that all the time the forceps must be held tightly, grasping the neck of the tooth ; no movement between the forceps and the tooth itself is allowable once they have been applied.

In all extracting, the left hand must be used to support and steady the jaw as shown in Figs. 47 and 48.

Upper Front Teeth. The forceps, held as before directed, should be applied to the neck of the tooth, to its posterior surface first, and then closed gently upon it by the thumb being withdrawn. The instrument is now forced upwards in the direction of the long axis of the tooth until the edge of the jaw, or, if the tooth be much decayed, a point beyond, is reached. As a rule at least *a third of the root* should be in the grasp of the forceps.

The tooth being firmly grasped, slight rotation in one direction is attempted ; but if much resistance be encountered the rotatory

movement is reversed, and if still resisted, it may be exchanged for an inward or outward one—*i.e.*, to and from the centre of the palate—coupled with a return to the rotatory movement. An inward movement often immediately loosens the tooth.

Upper Side Teeth or Bicuspids. As already described the instrument is applied to the tooth, and the blades forced upward into the socket. The tooth is to be separated by movements to



FIG. 47. Showing position of fingers of left hand for removal of a right upper bicuspid or molar

and from the palate, first inwards towards the palate, then more forcibly outwards. Rotation is not to be performed on side teeth.

Upper Molars. These teeth have three roots. In removing a tooth of such dimensions and resisting power as a molar, we must exert a larger amount of force than upon smaller and less firmly implanted teeth, and this especially in grasping them, when a very slight rotatory movement accompanying the forcing upwards of the instrument will often prove advantageous. From the direction of the roots, it is apparent that only an inward and outward movement is feasible, commencing with the former.

The lateral movements have generally to be repeated before

the truly extractive ones can be attempted. A slight rotatory movement when the tooth is fully brought outwards will frequently readily disengage it from its socket. This slight rotatory movement has the effect of dilating a tooth socket and unlocking a curved root.

Lower Front Teeth. The operator should stand on the right and slightly in front of the patient; the jaw is grasped on the outer



FIG. 48. Showing position of fingers of left hand for the removal of a front left lower tooth

and inner aspects by the thumb and first finger respectively, whilst the remaining fingers support the lower jaw. A clear view of the tooth operated upon is by this means obtained, as the thumb likewise depresses the lip and the first finger pushes aside the tongue (Fig. 48).

The instrument is pressed well down into the tooth socket, and the severing or detaching movements, which should be inward and outward, are cautiously performed. These teeth yield most readily in the outward direction, in which, combined with an upward direction, the final extractive force should be exerted.

Lower Side Teeth or Bicuspids. The operator stands behind and slightly to the right of the patient in removing a right lower bicuspid.

His left arm passes round the patient's head, and his thumb and first finger embrace the inner and outer sides of the jaw respectively, the remaining fingers supporting the jaw. If detachment be felt after the first movements, the rotatory can be combined with slight lateral movements.

Lower Molars. These teeth have two roots, flattened and curved slightly backwards. The operater should stand in the same position as that recommended for lower bicuspids, employing the left hand in the same manner (*see* Fig. 48). Slight inward movement may first be attempted, but the tooth will generally more readily yield in the outer direction.

The pain produced by extraction will be reduced if the gums are painted with a 10 per cent. solution of cocaine, or one if its allied substances.

The tooth forceps should always be scrupulously clean and should be sterilised by boiling before each operaton. After extraction the mouth may be washed out with Prescription No. 20 or glycothymoline and water. Should bleeding continue for long from the socket, a doctor should be consulted.

Tumours. The term is applied to almost any swelling, and does not, as popularly supposed, signify any particular disease. There are therefore many kinds of tumours, some of which are mentioned under the maladies of which they form part. A tumour may be benign, which means that it does not affect the patient's constitution and is strictly local; or it may be malignant, which means that it tends to spread and to kill the patient. An example of the former is a fatty tumour, a lump composed of nothing but fat: an example of the latter is a cancer.

An *aneurism* is a pulsating tumour resulting from disease of an artery.

Tumours may be either solid, or liquid, in which case they are called 'cysts.'

The only cure of most tumours is by surgical operation.

Varicocele. An enlarged condition of the veins within the *scrotum*, which feel soft like a bag of worms. The swelling is irregularly pyramidal, the base resting on the testicle, and the apex pointing upwards. It is most common on the left side, and it is accompanied by a dull aching pain, by a sensation of weight, and by a dragging pain in the back and loins. If the person lies down the swelling *gradually* subsides, with relief of the

painful feelings. It is worse if the bowels are constipated, and is thought in some cases to be caused by constipation. Often no particular cause is evident, but bicycle-riding tends to induce it in those constitutionally predisposed. After it has existed some time, it is apt to cause neuralgia of and wasting of the testicle. Varicocele may be mistaken for rupture or for hydrocele, and the distinguishing features are given at p. 362. The disease may be palliated by wearing a suspensory bandage, by bathing the scrotum daily with cold water, and by regulating the bowels to avoid constipation. Such measures are rarely sufficient, and a surgical operation is necessary for a radical cure.

Veins, Varicose. This term is applied to an enlarged, dilated and tortuous condition of the veins. Varicose veins of the leg are noticed at p. 479 as a result of pregnancy. Varicocele (*see* p. 381) is also a form of varicose veins. Piles (*see* p. 355) is a similar condition of the vessels of the rectum. The cause of varicose veins is some sluggishness of, or impediment to, the circulation of the blood through the veins which return the blood from the extremities of the body to the heart. Hence the veins of the legs, which have the largest columns of blood to support, are most likely to become varicose. Sluggishness or feebleness of the circulation may depend on debility from many causes. Impediments to the circulation, particularly of the legs, are various ; such as pregnancy or constipation. Occasionally varicose veins are found in other parts of the body. The part affected is attacked by dull aching pain, and the varicose veins may be seen, and may be felt, like soft, prominent cords, ramifying under the skin in different directions, or clustered in raised knots. The leg swells, particularly in the evening or after exertion. Often the veins appear at the point of bursting, and, if the disease is neglected, the skin may give way, and a copious bleeding may take place, which continues until it is stopped by pressure, or until the person faints, after which an ulcer may form on the leg.

Treatment. The part affected should be frequently sponged with cold water ; if the leg, it should be kept raised, and friction with soap liniment should be used for ten minutes three times daily, the leg being rubbed gently upwards, from the ankle towards the knee, so as to assist the venous circulation. Moderate walking exercise may be taken, but only after the precaution of a well-applied bandage, which should be put on when the limb is elevated

and not swollen, over a thin lisle thread, or silk stocking. If there is debility, generous diet and tonics, of which iron is the best, should be given. If the varicose veins appear connected with constipation, this condition must be treated (*see* p. 137). Varicose veins from pregnancy usually disappear after the birth of the child ; but varicose veins from other causes may increase to such an extent as to require surgical treatment. Surgical treatment is in fact the only satisfactory treatment for varicose veins : the operation is simple. If a vein should burst see p. 267 for treatment. It is one of the advantages of early surgical treatment that it will avoid this danger of bursting veins.

Venereal Disease. There are several forms of venereal disease : they are all the result of direct contagion. One is gonorrhœa (*see* p. 348), another is syphilis (*see* p. 368). A bubo (p. 337) may result from gonorrhœa or from the variety of disease now to be described. This disease is called a ' soft sore ' or ' soft chancre ' to distinguish it from the hard sore which commonly results from syphilitic infection. A soft sore, of which there may be more than one at a time, usually appears within four days after infection. Some days after its appearance, even after it has healed, it may be followed by a ' bubo ' that is likely to suppurate. The proper *treatment* of a soft sore is cleanliness and dusting it with iodoform : it should be well in a fortnight. There are other distinctions between a soft sore and a syphilitic one, more important than their respective hardness ; but as no sensible man would for a moment attempt to diagnose or treat himself for any venereal disease he may have contracted, it is unnecessary to say more here. The patient should in every case go straight to a doctor.

Whitlow. There are several kinds of whitlow. The slightest form occurs on one side of the root of the nail, beginning with a little inflammation and throbbing. By degrees a whitish, semi-transparent bleb is formed, extending more or less round the nail. If not opened the fluid separates the scarf-skin from the true skin underneath, through which it bursts, discharging watery matter, when the finger may get well. But if the matter has been pent up for some days it frequently ulcerates the true skin, and a little red granulation sprouts up through the opening in the scarf-skin, which is excessively tender, and is vulgarly called ' proud flesh.' If this increases the nail may be destroyed. The blister should be snipped with scissors, and an antiseptic dressing applied. If red ' proud

flesh' forms, the dead scarf-skin should be removed, and alum or caustic should be lightly applied to the part.

The Second Form of Whitlow occurs in the bulbous ends of the fingers. This is much more severe, and the matter is deeper, seated beneath the true skin. This is a form of cellulitis (*see* p. **341**). No blister forms, but the fingers swells and is red, afterwards becoming white as the matter approaches the surface. The pain extends into the hand and arm, and the nail is usually destroyed. The finger should be deeply lanced—the sooner the better—where the swelling is greatest, and in the direction of its length, and a carbolic fomentation applied. When matter ceases to flow, the part should be dressed with a simple antiseptic dressing.

The Third Form of Whitlow, called *thecal abscess*, is the most severe. The sheath containing the tendons of the finger inflames, becoming hot, red, and terribly painful; the finger swells, and unless quickly attended to, the inflammation spreads into the hand and arm, and the tendons, or one or more bones of the finger, are injured, and may slough out. Bathing the part in hot water, and hot poulticing should be used. The inflamed part should be lanced *early*, using proper antiseptic precautions, within twenty or thirty hours from the beginning of the attack; and the wound kept open with a piece of lint. To secure perfect rest the finger should be placed on a splint, which may be cut out of any soft piece of wood or made from a piece of perforated zinc. The splint should extend from the end of the finger to the wrist, and under the finger should be the breadth of the finger, but it will be more comfortable if made wider under the palm. It should be wrapped in cotton cloth, to be changed daily, when the splint should also be well washed. After the lancing, carbolic poultices should be applied till the matter ceases to flow, and afterwards use any simple dressing kept in place by a bandage. Sometimes the suppuration is next to the bone, in which case the lancing has to be carried right to the bone. Four grains of calomel should be taken internally in case of any whitlow. In all cases of whitlow the hand should be kept in a sling, with the fingers pointing to the opposite shoulder.

An excellent plan, to secure the advantages of position and immobility in such cases, is to bend the elbow at an acute angle and raise the hand towards the opposite shoulder. Then, pinching up the top of the coat-sleeve at the wrist, fix it to the coat with

a strong safety-pin. The sleeve then acts as a sling. If greater immobility is required attach a fold of the sleeve to the coat, just under the elbow, with another safety-pin, and attach the inside of the sleeve to the body of the coat with a third safety-pin (*see* Fig. 49).



FIG. 49

CHAPTER X

DISEASES OF THE SKIN

Introductory : Acne : Birth-marks : Boils : Carbuncle : Chaps : Chilblains : Eczema : Erysipelas : Erythema : Frost-bite : Hair, Falling of the : Herpes : Impetigo : Leucoderma : Lice : Lupus : Moles : Nails, Diseases of the : Oriental Sore : Pemphigus : Prickly Heat : Prurigo and Itching : Psoriasis : Ringworms : Scabies or Itch : Seborrhœa : Sudamina or Miliaria : Ulcers : Urticaria, or Nettle-rash : Warts.

THE following terms are used in describing eruptions of the skin :

Macule. A macule is a part of the skin of changed colour and definite outline which is not raised above the surface of the surrounding skin.

Papule. A papule is a solid elevation of the skin not bigger than a pea.

Vesicle. A vesicle is an elevation of the skin of the same size as a papule, but containing some clear fluid.

Bleb. A bleb is elevation, larger than a pea, that is full of liquid.

Pustule. A pustule is an elevation of the skin containing pus : it always develops from a vesicle.

Acne. Acne is an inflammatory process occurring in and around the sebaceous glands and due to a special organism. It consists of isolated pimples, or pustules, forming on a hard red base in the sebaceous glands of the skin, sometimes very long in coming to a head, and most frequently seen on the nose, but sometimes on the back, cheeks, forehead, or chest. Acne pustules are sometimes preceded by ' blackheads,' which are due to stoppage in the sebaceous glands by dirt and scales and secretion accumulating there. One variety of acne is associated with dyspepsia and excessive consumption of alcohol ; but common acne is essentially a disease of the age of puberty. It usually occurs between the ages of twelve and twenty-five years.

The *treatment* of acne is preventive and curative. For the former frequent and vigorous washing with soap and water and friction with a rough towel; while the rubbing in of sulphur ointment, 10 grains to the ounce, is also useful. To be avoided are alcohol, tea, and coffee. For curative treatment the blackheads should be squeezed out, and the affected area washed with a mixture of spirit and soap. If very obstinate, a vaccine may be injected to cure this condition.

Birth-marks. The ordinary birth-mark or 'port-wine mark' is scientifically called a nævus or a cutaneous angioma.

These marks occur most frequently on the face, head, and neck; but are met with in other parts.

For the very large nævi there is, as a rule, nothing to be done, at any rate not when they affect a large area of the face; because the scars left by treatment might appear worse than the original port-wine stain.

But a nævus of moderate dimensions may be successfully treated in several ways, of which the most popular now is by means of carbon-dioxide snow (*see* p. 599). Next to that electrolysis has given the best results; or a small nævus may be altogether excised. The patient should put himself in the hands of a surgeon; he should never himself attempt any treatment of a birth-mark.

Boils. A boil is due to the destruction of a small portion of skin and subcutaneous tissue by the action of micro-organisms. The dead tissue is usually round the root of a hair; and this central slough is called the 'core.' Boils are common in India, especially during the latter part of the hot weather or during the rains. They may occur singly, or several at once, or in successive crops; and they may vary in size from a pea to a hen's egg. Large boils most frequently occur on the limbs, on the back of the neck, in the armpit, or about the buttocks, and are often long before coming to a head. In some instances after pain and swelling have occurred they gradually subside without the formation of matter, and are then popularly termed blind boils. There are two factors in the causation of boils: one lies in the general health, the other in local infection. As regards the former, poorness of blood, heat, overwork, and attacks of fever are predisposing causes. There appears to be something in the popular idea that excessive mango eating may cause boils, though the saying is probably equally applicable to other fruits and to the taking of much lime juice. These fruit

juices appear to reduce the amount of calcium in the blood and so predispose apparently to boils. At any rate if one is subject to boils one should stop taking lime juice and take fruits only in moderation. As regards the local infection, one boil often infects the adjacent skin and causes another. A similar occurrence is seen in styes of the eyelids, which will sometimes alternate from one lid to the other as each one becomes infected.

Treatment. If the boil is a big one, it should be treated, both as regards fomenting and lancing, as described under 'abscess' on p. 324. Afterwards it should be dressed as there described. If the boil or boils be small, they should be covered with 25 per cent. ichthyol ointment spread on lint. If that is not available use the iodine paint of Prescription No. 9, applying it for an inch or two round the boil as well, two or three times daily. Any discharge should be carefully wiped away with woollen swabs dipped in 1 in 20 carbolic lotion. Care must be taken to prevent local infection, which may easily be caused by a little of the discharge touching or being wiped on healthy skin. If a boil is seen early it may sometimes be 'aborted' by sharply pulling out the central hair. This should always be done at any stage if a hair can be seen.

In addition to this local treatment the bowels should be kept open and tablets of calcium sulphide, ½ grain, should be taken four times daily. This will often prevent the onset of other boils. If a crop of boils is at all persistent there are, besides the above treatment, three things that must be done. First, the urine should be examined to see if it contains sugar, as diabetics are especially liable to such crops of boils (*Furunculosis*). Secondly, the injection of a vaccine by a medical man should be undertaken. Thirdly, the patient must get away from his work and from the plains of India and either go home on leave or immediately to the hills.

There is a special form of sore sometimes called a *Delhi* boil or a *Baghdad* boil: this will be found described on p. 398 under the name 'Oriental Sore.'

Carbuncles. A carbuncle resembles a boil (*see* p. 387) except that it is more extensive and involves deeper tissues than a boil. Carbuncles are most frequently situated where the tissues underlying the skin are of a dense fibrous character, as the nape of the neck, the back, or buttocks. A serious form may appear on the face. Carbuncles are usually seen in debilitated people over forty-five years of age, especially if suffering from diabetes. They result

from an impure and debilitated condition of the blood; but their appearance at any particular part of the body may be determined by an accidental injury. Carbuncles vary in size, sometimes being as large as an orange. They are at first very hard, painful, and cause the skin above to become of a dusky red colour, which gradually fades off into the surrounding skin without any defined border. As the carbuncle forms, matter and sloughs are discharged from several small openings. The progress of the disease is slow; but after a time, generally two or three weeks, the whole of the affected skin and tissues underneath slough away, leaving a deep, irregular cavity, which burrows under the neighbouring skin. Carbuncles are commonly attended with much constitutional disturbance, such as fever, perspiration, and debility. The strength must be kept up by nourishing diet and iron. The local treatment consists of hot fomentations and free incision, in order to let the *core* or decayed tissue, and matter, escape. When the discharge ceases, the part may be dressed with simple dressing or plaster, as an ordinary sore. The sooner a free, crucial incision is made the better, and the cavity should be swabbed with carbolic acid 1 part, and glycerine 5 parts.

Internally calcium sulphide should be taken, in tablets of $\frac{1}{4}$ or $\frac{1}{2}$ grain every four hours. In every case of carbuncle the urine should be examined. If sugar is present the medicines and limitation of diet prescribed for diabetes (*see* p. 144) must be adopted.

Chaps. 'Chaps,' and roughness of the skin of the hands, chiefly occur from the cold of Northern India, which is sometimes intense, particularly during nights of the winter season. Washing in hard water is also bad for the skin. When the skin cracks over the knuckles, or elsewhere, the part is popularly said to be 'chapped.' Protection from the cold winds should be secured by gloves, and cold cream or glycerine may be applied. Many of the patent ointments are useful for keeping the skin soft and for curing cracks and sores, but vaseline or lanoline is usually sufficient.

Chilblains. Chilblains are seldom seen in India except in the cold weather of the northern districts, when they not infrequently occur to children. 'Chilblain' is the term commonly applied to erythema (*see* p. 392) of the skin over the toes, or some portion of the feet, the hands, or ears. Chilblains are caused by sudden alternations of temperature, such as warming the feet and

hands, when cold and damp, by the fire. The skin becomes red in patches, slightly swollen, and there is much irritation and itching, especially in the evening. Sometimes, owing to irritation, the parts blister, or even become a sore. Chilblains are most common in delicate women and weakly children, or in persons whose circulation is very languid.

Treatment. The parts should be kept warm, and therefore, unless the feet are disabled, brisk walking exercise should be taken. The part should be also painted with tincture of iodine. After washing the part take care to dry it thoroughly and, if it can be borne, vigorous friction with a towel is useful. Blisters and ulcers should be treated on general principles, and if the general health requires attention, Prescription No. 51 should be taken as a tonic.

Eczema. The term 'eczema' is too loosely used, and several skin conditions have been called 'eczema' that should not strictly be classified as such. Eczema is a catarrh of the skin, not due to external irritation, and characterised at some stage of its course by serous exudation or 'weeping.' Eczema is not always weeping, it may be quite dry, but at some stage there has been exudation. Usually eczema begins with mere redness of the surface (erythema), then this begins to weep a clear fluid, then the discharge sets into crusts; then after a time there are no more crusts and the skin appears red, shiny and dry, and lastly the epidermis on this part is shed in scales. So that any or all of these appearances at once may be seen in a case of eczema. The typical appearance of eczema is that of a red and weeping patch of skin accompanied by much itching, tingling, and smarting, and usually presenting in the flexures of the limbs, as the groins or armpits. The fluid in the vesicles soon becomes milky and turbid, and in four or five days the vesicles burst, when the fluid is discharged and rises into thin, yellowish-green scabs. Sometimes the 'weeping' is very considerable and difficult to check. Fresh vesicles form on the surrounding skin, while the parts already affected remain sore. The duration of this malady may be from a week to months, or more (especially in *gouty eczema*), and in prolonged cases the scabs become detached, leaving a sore raw surface, or they crack, exuding a clear watery fluid. In children eczema may be connected with teething, and may appear behind the ears; in women it may occur with irregular and painful monthly courses; and it sometimes

appears near the nipples of suckling women. In many cases it is thought to be caused by indigestion.

Eczema often recurs in different parts of the body at certain seasons, as the spring and fall.

Eczema in children and eczema of the scalp is usually of the seborrhœic or scaly form (*see* p. 406).

Treatment. Eczema should always be treated under medical advice; it is often not an easy disease to treat and the amateur may only waste time and lose heart if he attempts it himself. Local treatment is much more important than internal. First all crusts must be removed by softening them in oil on strips of lint, then the medicaments may be applied. In the acute stage the part is not to be washed with water, nor is soap to be applied. The powder of Prescription No. 66 will be found a very useful application; but if there is much weeping, it may get caked up. In which case wash the part first with calamine lotion, Prescription No. 15, and do this three or four times a day.

Where the pouring out of serous fluid from the eczematous surface is excessive the first dressing may soon be soaked. Remove the soiled materials and apply a fresh dressing. When you find that your dressing remains dry the chief difficulty is conquered: the part may then be treated with zinc ointment on lint.

Internally, in acute cases with much itching, small doses of antimony wine for two or three days will do good. Apart from that, and if the bowels are kept open, no other internal medicine is required, except that if the dry eczema becomes chronic, small doses, 3 minims, of liquor arsenicalis should be taken thrice daily after meals.

Erysipelas. Erysipelas is an infective inflammation of a portion of the skin and underlying tissue, due to the operations of a microbe. It usually attacks those who are out of health from constitutional debility, abuse of alcohol, bad food, neglect of cleanliness and sanitation. Erysipelas is most common on the face, which becomes shining, red, burning, and much swollen, the redness disappearing for a few seconds on pressure. Sometimes the swelling is so great that all distinctive features are quite lost. With the commencement of the redness, or previous to its appearance, there is chilliness or shivering, headache and nausea, followed by vomiting and high fever, with constipation. The redness of

the skin has a raised margin more or less defined, with severe burning of the part, on which small blisters may form. Simple erysipelas as here described generally runs its course in from ten to fourteen days, the inflammation increasing for four days, after which it declines as the blisters mentioned above form, and the skin wrinkles, and peels off.

In more severe cases there is much fever, 102°-104° F. as shown by the clinical thermometer, and perhaps delirium. The tissues underneath the skin are also affected, there is intense throbbing pain, and matter may form; the resulting abscesses and sinuses adding much to the danger, and indefinitely prolonging the disease. If the inflammation extends to the brain, the case may prove rapidly fatal.

Erysipelas frequently attacks wounded parts, or parts which have been subjected to surgical operation, or sometimes vaccinated arms, when the surface of the surrounding skin, or even of the whole limb, becomes red and swollen as above described. When it attacks a wound the discharge almost ceases, and if nearly healed the wound reopens. An unhealed condition of the navel renders uncared-for infants very subject to erysipelas, which spreads from the navel.

Treatment. The part affected should be covered with lint, after having been dusted over with starch or with the powder of Prescription No. 66. Or it may be painted over with tincture of iodine. The bowels must be opened either by 5 grains of calomel or by two pills of Prescription No. 61. Also Prescription No. 51 should be taken thrice daily. Benefit may also be obtained from the injection of specific sera under medical advice.

It must be remembered that this disease is infectious, and the patient must be isolated and his clothes disinfected.

Erythema. Erythema means only a superficial redness, a blushing, in fact, of the skin. Such is seen in the eruptions of some fevers, or as an effect of some drugs. There are several varieties of erythema described. Thus *erythema simplex* is one, and when that condition is more transient the name *erythema fugax* is given to it. Erythema simplex or fugax consists of light red patches of various size and form, appearing in different parts of the body and generally passing away in three days or a week. There is considerable itching or tingling. It frequently occurs on the legs of girls previous to the monthly flow. It may follow drinking cold water,

when the body is heated. It may accompany teething, and in infants generally attacks the thighs and genitals. It is not dangerous and is rarely attended with fever. The bowels should be acted upon by a gentle purgative.

Another variety of erythema is *erythema solare*, or sunburn from exposure to the sun, especially when reflected from water. The X-rays may produce a similar erythema. No treatment as a rule is necessary; though if the swelling and tenderness are great the evaporating lotion of Prescription No. 17 may be applied to the part by means of soaking a piece of lint in it.

In fat people and infants, opposing surfaces of skin sometimes chafe one another, such as the skin under pendulous breasts. This is known as *erythema intertrigo*. It is distinguished from eczema by the absence of weeping. The opposing surfaces should be separated and dusted with the powder of Prescription No. 66: if necessary the surfaces should be kept apart by means of a muslin bag filled with this powder.

There are other varieties of erythema which it is unnecessary to describe here: chilblain, whose scientific name is *erythema pernio*, is described on p. 389.

Frost-bite. Severe frost-bite leads to mortification or gangrene of the part, usually the toes. But mild frost-bite is a more advanced stage of chilblain (*see* p. 389).

The first effect of the cold is to blanch the part, then dilatation of the vessels follows and the part becomes congested and looks violet. In serious cases vesicles form. In the milder cases of frost-bite care should be taken not to warm the parts too quickly. Rubbing with snow is recommended, and this must be continued till the circulation is restored. Warm socks and gloves must be worn and the skin should be painted with tincture of iodine.

Hair, Falling of the. Loss of hair may be (1) generally distributed over the scalp, or (2) in patches.

1. *General baldness* is usually a senile change, and there is nothing to be done for it. The change may occur early in life, especially in men, and a tendency to this earliness may be hereditary. Early baldness may also be a consequence of any fever or other general disease that interferes with nutrition. Apart from these causes the commonest cause of baldness is seborrhœa of the scalp (*see* p. 406); and this is evidenced as a rule by scurfiness of the head. When baldness follows a long fever, such as enteric,

the hair will usually grow again, and nothing is required but cleanliness and the use of the brush, and friction of the scalp with a rough towel.

If the hair seems to be falling earlier in life than it should, without evident cause, the following lotion will be found useful: perchloride of mercury 12 grains, glycerine 3 drachms, rectified spirit 3 ounces, oil of roses 2 minims, and distilled water to 6 ounces. Rub this well into the scalp night and morning. If there is scurfiness of the head, treat as for seborrhœa on p. 406. But the treatment of general loss of hair is not encouraging, except when a definite cause, such as seborrhœa, can be found. In most cases it is a senile change, even if setting in early.

2. *Falling off of the Hair in Patches.* If the patches are circular, and pimples are seen on the denuded part, or at the roots of the hair round it, or if hairs are seen broken, or running in an unnatural direction, *Ringworm* is present (*see* p. 401). When no pimples are seen, and the skin of the denuded portion is quite white, it is usually the affection known as *Alopecia*. *Alopecia* may occur either on the scalp or on the face. The patches are generally small and round. The skin is white, often shiny. The hair generally falls out rapidly, but sometimes it turns grey before falling off. There is no itching as in the parasitic diseases; indeed, the bald patches are often less sensitive than the rest of the skin. The cause is not fully known, but is probably some disease affecting the nerves, or blood-supply, to the hair. So long as the roots of the hairs do not die, attention to the general health and a stimulating lotion applied locally may cure the disease. When the roots of the hairs are dead, no lotion, even the most vaunted, will produce a new crop.

Herpes. Herpes consists of a crop of vesicles along the line of one of the nerves of the skin. There are a few special forms of this eruption. It often occurs on the lips during febrile diseases, or accompanying a common cold, in the shape of five or six little vesicles on an inflamed base, which burst and form a scab. The foreskin is another part not uncommonly attacked. The number of vesicles, sometimes ten or a dozen, and the attendant itching, which is often very troublesome, serve to distinguish *herpes labialis* and *herpes* of the prepuce, etc., from more important affections. Less frequently, *herpes* occurs on the forehead, when there is much stinging pain and numerous rings of vesicles, which, unless care-

fully treated, may leave a mark for life. The most serious variety is that called *Herpes Zoster*, or 'Shingles.' In this form of herpes a line of vesicles rises, reaching from the spine round the lower part of the chest or abdomen to the middle line, usually on one side. There is a popular but erroneous idea that if it occurs on both sides it terminates fatally. The eruption follows the line of the nerves in the skin. *Herpes* also occurs on the head, the nose, or over the brow. The eruption is often preceded, and always accompanied, by severe shooting pain, and feverishness. The vesicles burst about the fourth day, when scabbing takes place; the whole process lasting about a fortnight.

For the *treatment* of herpes as a rule nothing is required, except perhaps a little dusting powder over it, Prescription No. 66. Where the pain and itching of herpes zoster are severe, then lint soaked in lead lotion should be placed over the affected side exposed to the air so that evaporation may ensue. The lint should be frequently wetted in the lotion. Or evaporating lotion, Prescription No. 17, may be used instead of lead lotion. A patient with herpes zoster should be in bed.

Impetigo. Impetigo is a contagious disease, caused by pus microbes. It first causes slight itching and a red-coloured eruption, palpable also to the touch. As the eruption spreads it is not circular in shape like ringworm, but of irregular and undecided form. In about twelve hours each little red point of which the eruption is composed contains a small globule of yellowish, watery fluid. This and the subsequent thicker secretion drying on the surface of the skin assume a honeycombed appearance, some part of the scab being depressed or cup-shaped, and some elevated, or presenting the appearance of concentric rings. The crust is often perforated by hairs, which do not break off so readily as in ringworm, and are consequently more easily extracted by the roots. As the disease advances the secretion becomes more thick and copious, until there may be a layer of yellowish-looking scab or crust over the whole head. When the malady has been neglected, sores and ulcers form on the scalp, underneath its scabby covering.

Treatment. The head should be poulticed and bathed with carbolic lotion (1 in 100) and olive oil, until the whole of the scabby matter is removed, and the surface is quite clean. The hair must be cut close. Then olive oil or glycerine should be applied, and the scalp should be covered with a close-fitting cap. White precipitate

ointment should be rubbed in when all the scabs have been removed. The child will usually require some tonic medicine, such as cod-liver oil.

Leucoderma or 'White Skin.' This consists of white patches on any part of the body, giving, when numerous, a piebald appearance to the skin of the native. It depends on deficiency of colouring matter. When general it constitutes the condition known as *albinism*, the eyes being devoid of pigment, and the body becoming a tawny pink. There is no known cure. It is mentioned here because it is often mistaken for *leprosy*, to which it has no relation. It is not contagious, and a good servant need not be discharged because he develops white skin patches.

When small and of short duration, a patch of leucoderma may sometimes be cured by the application of strong counter-irritation, such as the regular application of iodine paint, Prescription No. 9; or the daily use of a poultice made from the native 'babchi' seeds.

Lice. There are three kinds of louse or pediculus that infest man: the head louse, the body louse, and the crab louse. The first two resemble one another in appearance and size and are easily visible to the naked eye. The crab louse, who infests the pubic hairs, is smaller and is seen with more difficulty.

A. *The head louse* is very common in India, especially amongst children and native women of the lower classes. It affects especially the back part of the head, where the 'nits' or eggs of the insect may be seen in large numbers closely adherent to the hairs. The presence of the louse gives rise to itching, and that to scratching, and that to excoriation of the skin and infection of the region by pus organisms. As a result sores sometimes form and very often the glands at the back of the neck becomes enlarged.

The *treatment* is to destroy the lice. In a child cut the hair very short or shave the head and apply white precipitate ointment (Prescription No. 80). In a woman the hair may be saved and the ointment thoroughly applied to the scalp after washing the hair. The nits are difficult to remove as they are so adherent to the hairs; but the hair should be washed thoroughly in vinegar and then carefully combed out. This will assist their removal. (*See also* Chapter XIX, p. 570.)

B. *The body louse* is not to be found so much on the body as on the underclothes, where she breeds. Hence the importance of frequent changes of clothing, taking care to disinfect the garments

before putting them on again (*see* Chapter XXII). The dangers of these lice will be better understood if the articles on Typhus and Relapsing Fever are read.

C. *The crab louse* lives among the pubic hairs; but occasionally wanders elsewhere. Like the other lice his presence gives rise to much itching.

The *treatment* for the crab louse is similar to that for the head louce, white precipitate ointment well rubbed over the area being sufficient to kill the lice. It is not necessary to shave the pubic region.

Lupus. There are two different skin diseases called lupus, of which the common variety is a tuberculosis of the skin. The tubercles ulcerate the skin and gradually spread, sometimes into the deeper tissues, so that they may appear to be eating away the face or whatever else the lupus has attacked. There is no object in describing the disease here, because its diagnosis requires a high degree of medical skill and its treatment necessitates constant medical supervision as well. In the *treatment* of lupus the X-rays, Finsen light, tuberculin and other highly specialised forms of treatment may be employed.

Moles. Moles are commonest on the face, neck and trunk; but are also met with on the limbs. They are either congenital or develop soon after birth. If they cause disfigurement or give rise to irritation, they may be removed with the knife. They should never be irritated with caustics or similar applications.

Nails, Diseases of the.—Sores near the toe-nails are often very troublesome, especially when accompanied by what is termed 'ingrowing toe-nail,' when the nail grows into the flesh. It does not, however, arise from any alteration in the nail, but from the soft parts being pushed up against the edge of the nail by tight, or ill-fitting, boots. If this continues, an ulcer is formed at the root, or side, of the nail.

Treatment. The object is to remove the irritation caused by the nail. In many cases, after soaking and softening the nail in hot water, it may be filed or scraped so thin, and so much of the corner may be cut away, that the soft parts are no longer irritated. Or, by filing the nail thin in the middle, growth in that part is stimulated and the offending edge may be caused to rise from its situation. To aid this, the soft parts should also be carefully pressed away from the sharp edge of the nail, by introducing beneath the

overhanging skin a small piece of lint or lead foil, and pressing it well down towards the bottom of the sore. Persons disposed to this affection should wear their shoes loose, square at the tips, and keep their nails scraped thin and cut short. A surgical operation is necessary to cure this affection if it is at all pronounced.

An ulceration, technically termed *Onychia*, sometimes forms about the finger-nails of unhealthy children. It commences as a deep red swelling, in which matter forms, succeeded by an ulcerated condition. Poulticing and letting the matter out by means of a lancet are the remedies. But every such case should be shown to a surgeon, as there may be other constitutional causes at the root of this affection.

Oriental Sore. In Upper India and in Persia and in other places occurs a form of sore due to a special parasite. At first the disease is evident as a swelling; but in its later stages it appears as a chronic ulcer with thickened edges. The disease has in different parts the names Baghdad boil, Delhi boil, Frontier sore and many others; but these conditions are all identical and may be included under the heading here given.

The sores may be on any part of the body, and are to be recognised from their obstinacy to heal and their thickened edges.

One of the most efficient means of *treatment* of Oriental sore is by means of carbonic-oxide snow; but this can only be applied by a doctor. Sometimes surgically scraping the ulcer will accelerate its healing. Or painting it with tincture of iodine and applying pressure, such as by means of a pice just over the immediate dressing. A piece of zinc foil placed in contact with the ulcer also seems to accelerate healing.

Pemphigus, or Blebs. These names have been given to peculiar blisters, or *blebs*, which form on different parts of the body, especially in children. The first change consists in the appearance on the back, belly, buttocks, or limbs, of red circular spots, which itch and burn. In a few hours, at the middle of the spots, small transparent vesicles arise, which enlarge, and soon cover the whole of the red patch, excepting a narrow margin. The blebs appear in crops and are round or oval in shape, and may attain the size of a two-anna piece, or even, occasionally, of a hen's egg. The contents, at first transparent, gradually become turbid, and in two or three days the blebs burst; the place then becoming covered with a scab, under which the skin heals. Before the first blebs heal, new ones

form, and the disease may continue in this manner for days or weeks.

There are various varieties of pemphigus; but the common form in India is that sometimes known as *Pemphigus contagiosus*, which at times assumes a mild epidemic character. These epidemics are usually in the hot weather, and attack the young more commonly, sometimes running through a school. It should be remembered that the blebs are contagious, as those attending to them in others may become infected. In adults pemphigus may be preceded by dyspepsia, or debility from various causes; but sometimes the patient looks and feels well throughout the attack, until exhausted by the loss of sleep caused by the itching.

The treatment consists in attention to the general health, and in the remedy of any digestive disorders. The diet should be liberal, but meat is not to be given in large amount, and alcohol must be avoided. Local treatment consists in puncturing the blebs with a fine needle, and in protecting the parts from injury from the clothing sticking to them, by simple dry dressing. For some time afterwards a stain remains on the skin, but there is no permanent scar in ordinary cases. Of drugs arsenic is the most useful.

Prickly Heat. This is probably the first complaint a newcomer to India suffers from, and, although unattended with danger, it is very annoying. The symptoms are itching, tingling, pricking, and sweating, while the skin is covered with a bright red eruption, eventually presenting little watery heads or vesicles, some of which may afterwards contain a little white matter. The eruption is deepened in colour by exercise, or by hot drinks.

Prickly heat is much more liable to occur in a damp climate like that of Bengal than in Upper India; it is also much commoner during the rains than at any other time.

The *treatment* should be both preventive and curative. It is a good thing to have some antiseptic in one's bath at such times; a little phenyl will serve the purpose. Some ammonia in one's bath will help to allay itching. One should limit the amount of fluid one takes when thirsty, if subject to prickly heat. Light clothing, temperate diet and free action of the bowels are necessary. Avoid all flannel in direct contact with the skin. Should prickly heat occur, dry the part after washing, and freely dust it with the powder of Prescription No. 66. This will be found very efficacious.

If the condition is severe enough to give loss of sleep and irritability of temper, ten days in the hills are advisable. If this is impracticable, try taking tablets of calcium lactate internally, 5 grains four times a day, as well as using the dusting powder.

Prurigo and Itching. Intense itching, always worse at night, is the prominent symptom. It generally attacks the posterior parts or the 'privates,' but sometimes occurs in the flexures of the limbs, or on the shoulders, and back. At first the parts implicated are covered with pimples, raised above the surface of, and redder than, the skin. But afterwards there is no evident deviation from the natural state, except redness or scabs produced by scratching. It is common among old people, it occurs in *diabetes* (irritation from the sugar), and in other feeble conditions. It is also a frequent complaint of pregnant women. Sores may be produced by scratching. Adults can exercise some self-control; children should be provided with loose, soft gloves, certainly at night.

The word '*Pruritus*' is used to express itching without any visible cause to account for it. The irritation may be extreme. It should be treated in the same way as prurigo, as given below.

Treatment. When local itching occurs, stimulating drinks should be forbidden, and only easily digested food allowed. Internal remedies are seldom of much use. Silk underclothing is sometimes a help. Any evident cause such as diabetes, lice, or thread worms for itching round the anus must, of course, be excluded. Sometimes a bran bath is useful, or one containing equal quantities of ammonia and eau-de-Cologne. Or a lotion of weak liquor potassæ is sometimes efficacious; or sometimes the frequent application of 1 in 20 carbolic lotion to the part is sufficient for a cure. If that fails, procure some liquor picis carbonis and dilute it with spirit to 1 in 4 and apply locally. Or a tar ointment may be necessary, and often gives relief. For intense itching of the anus due to no apparent cause a suppository containing half a grain of cocaine is useful.

Psoriasis. Psoriasis is a chronic scaly eruption of the skin. It is found especially on the extensor surfaces of the limbs, on the back, or on the scalp. It occurs more in cold weather than in hot, and in India more on the hills than on the plains.

Psoriasis begins with little scaly raised spots. On lifting up the scale the skin is seen to be red underneath. As the disease spreads the spot grows bigger, and then the centre begins to look normal

again, leaving a circular or oval margin with healthy skin inside. The margin may spread further, and the edges of contiguous patches may unite. The scales may become very thick over the patch, looking white in colour. The affected skin may itch, especially when the disease is spreading, but usually does not itch much, sometimes not at all.

Medical skill is usually necessary to diagnose this disease from others like it.

Treatment should be both general and local: and in every case should be conducted under the advice of a doctor. If the disease is not spreading, then 2 minims of liquor arsenicalis in 1 ounce of Prescription No. 35, three times a day, after meals, should be taken.

For the disease on the head and face, salicylic acid ½ drachm, with white precipitate ointment and vaseline, ½ ounce of each, make a suitable ointment. For the rest of the body Ointment No. 78 should be applied night and morning. This ointment permanently discolours clothes. For a tender skin, Ointment No. 78 may be diluted with equal or less quantities of vaseline.

Psorasis does not affect the general health.

Ringworms. The ringworms, scientifically called 'Tinea,' form a group of diseases due to the growth of fungi on the skin. There are several varieties of these fungi. For our present purposes it is sufficient to describe four of their varieties under the headings:

I. Ringworm of the head.
II. Ringworm of the body.
III. Favus.
IV. Tinea Versicolor.

I. *Ringworm of the head.* The earliest symptoms are a little redness or scurfiness on some part of the scalp with itching; but these symptoms most usually escape notice. Then in two or three days there are circles of minute pimples, which also may not be recognised until they, in the course of a few hours, turn into minute vesicles. These break and discharge their contents, producing a thin scab, which may be mistaken for scurf. Fresh circles of pimples and vesicles quickly form on the outside of the first crop, the disease spreading in more or less circular-shaped patches. As the malady goes on, from the discharge consequent on the eruption, and induced by scratching, larger and thicker scabs form. Neglected 'ringworm' may thus involve nearly the whole of the scalp, these

later stages being very similar to favus (p. 404). There is, however, a peculiar condition of the hairs, in the part affected, which distinguishes ringworm from any other head affection. Seen with a good magnifying-glass the hairs over the affected spot appear as if rubbed or broken off close to the scalp; the short portions remaining looking dry, lustreless, bent or twisted, split, and running in a line different from that of the healthy hairs, affording a fancied resemblance to a stubble-field. The hairs thus affected are dead; and when attempts are made to extract them they often break. When the root comes away, and is placed under the microscope, the distinctive fungus may be recognised in the shape of bright, round, cellular bodies, about $\frac{1}{700}$ to $\frac{1}{500}$ of an inch in diameter, collected in chains or groups. The most minute redness or scurfiness on the head of a child with itching should always be regarded with suspicion, as the possible commencement of 'ringworm.' When there is a scurfy spot although the place is *not* red, or when there is a red spot although the place is *not* scurfy, examination with a strong glass will often show either minute vesicles, or, if at a later stage, lighter-looking portions of hair-shafts, which have escaped observation by the naked eye. If redness or scurfiness is seen on the heads of children who have been exposed to infection, the safest plan is to conclude that ringworm may be present, and to use appropriate remedies.

Treatment. The great difficulty in treatment is to reach the fungus which is deep down in the hair roots. By far the most efficient means of treatment is by the X-rays: this should be adopted if available. If not, then the means described below may be undertaken. In a case of ringworm the child should wear a skull-cap, and the head for one inch round the spot should be thoroughly shaved, not shaving the part affected. After which the great object is the removal of diseased hairs, which should be carefully extracted, one by one, with a pair of broad-nibbed forceps. Unless this is done very gently, but at the same time firmly, the hairs will break, and the roots remain. The hairs removed should be burnt. Then the area should be cleaned; but never wash it with water, as that tends to spread the disease. Wash with spirit or spirit and ether lotion. If very scurfy, wash with a lotion of 10 grains of salicylic acid dissolved in 1 ounce of chloroform. Then the strong tincture of iodine may be applied once daily by means of a small brush. Or what is often better, chrysarobin

ointment, as given in Prescription No. 78, should be rubbed in with the finger. If chrysarobin is not obtainable, then Goa powder may be used. Goa powder may be obtained in most Indian bazaars. A few grains of the powder should be mixed with vinegar or lime-juice to form a paste of the consistency of cream, which should be rubbed on with the fingers night and morning for eight or ten days. Under the action of the Goa powder the part affected becomes whitish, while the surrounding skin is stained brown. A preparation of Goa powder known as *chrysarobin* is made, an ointment, or solution, of which may be applied with a brush. Goa powder is often adulterated. It is a fine, yellowish powder without smell or taste, and it is well to see the powder, and not trust to a prepared solution. Care should be taken that neither the powder nor the solution touches the eyes, as it may cause much irritation. Goa powder is reputed an infallible remedy for Indian parasitic ringworm, but it sometimes fails, and causes considerable pain if applied to thin skin. If the ointment of Prescription No. 78 gives pain, it may be made only one-half or one-quarter this strength. If these measures are not successful use an ointment of equal parts of simple ointment, Prescription No. 88, and of unguentum hydrargyri nitratis.

Ringworm is *highly contagious*. Other children must be kept as much as possible away from the patient, and separate combs, brushes, towels, soap, and washing utensils must be provided. Clothing and bedding used by the patient should be disinfected (*see* Chapter XXII), and the soiled things should be washed separately. If ringworm occurs in a school, or large family, the first thing is to institute a regular and periodical search on all heads, and the next thing is to isolate those affected. If this is impossible the healthy should have their heads washed daily with carbolic acid solution (1 in 40), and the hair should afterwards be anointed with some kind of greasy pomade. Plenty of brushing is also a precautionary measure of value; and extraordinary attention should be given to ventilation of both living- and sleeping-rooms.

II. ***Ringworm of the body*** is known in the vernaculars as ***dad***, ***dadru***, ***majees dad***, and among Europeans as 'Dhobi's itch.' It commences as a small, itching, scurfy spot, and, enlarging at the circumference, shows a line of minute vesicles. As this advances in semicircular patches, the skin over which the disease has passed gets well. It frequently develops round the 'fork' and

waist, being determined to the latter part in natives by the irritation of the clothing worn round the body. It is from native servants that the disease is often communicated through towels or clothing. Also, no doubt, the mixing up of clothing at the 'wash' is sometimes responsible. But it may appear on the face, or in the roots of the nails, or in the beard. Ringworm of the body causes much itching, especially at night, which keeps the person awake and tends to destroy the general health, while the scratching induced causes a scaly or cracked condition of the skin, when it has been mistaken for eczema.

Treatment depends considerably on the extent of the disease. When, at first, the parts affected are small, the remedies mentioned for ringworm of the head should be used. But if early treatment has been neglected, and the disease is extensive, or the skin inflamed, the part should be sponged four or five times daily with a mixture of ½ ounce of sal volatile in 6 ounces of water, until the remedies mentioned below can be procured. Then wash twice daily with carbolic acid soap. Then sponge with a solution of 2 drachms of bicarbonate of soda in 8 ounces of water. Afterwards rub the following ointment well in: sulphate of zinc 60 grains, lanoline 1 ounce. If this is not successful after six or eight days, use iodide of lead 1 drachm, lanoline 1 ounce. In proportion as the general health is improved, the more readily is the parasite destroyed by local measures. In chronic cases the remedies often fail to reach the actual growing fungi owing to the layer of scales, etc., over them. In such cases the skin must be well washed with hot water, soap, and a scrubbing-brush. But Prescription No. 78 ointment will usually be found the most efficient remedy. The fungus may also be killed by means of the X-rays.

III. *Favus* is a disease caused by a fungus; it is common in India amongst the poorer classes, but rare in England. It usually occurs on the scalp, appearing first as a tiny sulphur-yellow disc, depressed in the centre like a cup and pierced by a hair. This disc increases in size and becomes crusted over. In the course of months if the disease is untreated the scab will come away, leaving a shiny pit permanently devoid of hair. It is not uncommon to see an Indian bald from the effect of favus. When the dry crusts are present the patient's head has a peculiar musty, mousy odour. The *treatment* must be conducted on the same lines as for ringworm of the head. The crusts must be removed by soaking them with

oil, and the affected hairs pulled out: and then medicines as above recommended applied.

IV. *Tinea Versicolor* is caused by a special fungus. It produces slightly raised scaly patches, which more or less fuse together. The disease is usually on the trunk only, but may be on the limbs or face. It gives a peculiar change of colour to the subject and may make an Indian appear fairer and an European darker. On an Indian the colour usually appears grey. It is quite superficial and may be scraped away to some extent. It does not affect the general health. It is contagious.

The *treatment* consists in thorough washing with soap and water and after drying, painting tincture of iodine over the part. The cure is rapid.

Scabies, or Itch. Itch commences as small vesicles less than the size of a pin's head, generally between the fingers, afterwards spreading to other parts. It is caused by an insect, which burrows under the skin. This creature is called *Acarus scabiei*, and is round in shape, varying from one-seventh to one-quarter of a line in length and breadth. The female, being larger than the male, is sometimes visible to the naked eye as a greyish-white, moving atom. Under the microscope it presents a tortoise-like shape, and is found to be studded with hairs and bristles, the head terminating with strong jaws. With these the female insect burrows through the thinnest part of the upper layer of the skin, selecting such spots as the space between the fingers, or the inner aspect of the wrist and arm, where the skin is thinnest and softest. Once buried it does not come out again, but burrows within the skin, where young *acari* are produced, which in their turn burrow and reproduce their kind. These burrows may usually be seen in the shape of dotted or zigzag marks on the skin, looking like faint needle-scratches. The itching produced is often intolerable, especially at night. After itch has continued some time, and been neglected, and irritated by scratching, matter may form and the burrows become open sores. A person with itch should be isolated. The parts affected should be first *well* washed with ordinary soap and water, which opens the burrows, and then *well* rubbed twice daily with sulphur ointment, Prescription No. 89. This is best done first at bedtime, holding the hands in front of a fire the while.

When the hands are affected, they should be well washed and rubbed with the ointment, and then inclosed in gloves or a bag of

oiled silk all night, and the rubbing repeated in the morning, after a good washing with soap and water. Beyond opening the bowels if confined, no internal treatment is necessary. The clothing of persons with itch should be burnt, or disinfected, by baking in an oven at a temperature of 140° Fahr., or by the fumes from burning sulphur (*see* Chapter XXII). Scabies in small children is often on the legs : they are to be treated similarly.

Success in the treatment of itch depends on the care and thoroughness with which the measures are carried out. If the rubbing in is done morning and evening, and the parts not cleaned meanwhile, all the insects should be killed in three days. But half-measures are no good, and will allow the disease to go on for weeks.

Seborrhœa. Seborrhœa is a condition of over-activity of the sebaceous glands, leading to alteration as well as increase of their secretion. It is most commonly seen on the scalp. On the heads of infants seborrhœa may give rise to dirty-yellow greasy masses of epithelium. In adults such an appearance is rare ; here the disease is shown by dry powdery scales. It is, in fact, the condition that is responsible for the shower of scales (dandruff) from the head when the subject brushes his hair. There is sometimes itching accompanying it. Seborrhœa is responsible for a good deal of baldness.

Seborrhœa may also occur on the face and body, and is indeed not uncommon there in India, but usually the disease begins on the scalp. On the face and body there are commonly seen cakes of greasy scales with a reddish base on the skin and a fringe of papules about the edge. On the body, the patches often form ring shapes. There is also a disease called seborrhœic eczema, which is only eczema attacking skin that has long been the seat of seborrhœa. This disease begins also as a rule in seborrhœa of the scalp.

Seborrhœa in no way affects the general health, and local measures alone are required for its treatment.

Treatment. The scaly masses must first be removed by washing with soap and water. Then gently rub in with a little brush, a lotion composed of half an ounce to an ounce of precipitated sulphur, in 8 ounces of distilled water, care being taken to touch the hair as little as possible. Bedtime is the most convenient hour for this ; but in severe cases it should be done twice daily.

Precipitated sulphur in cold cream in the proportion of 1 to 10 makes a good pomade, and if the hair is falling the addition of a drachm of tincture of cantharides to each ounce of the pomade is useful. On the body a stronger application is required, and the ointment of Prescription No. 89 may be applied.

Perseverance is often necessary for success in the treatment of seborrhœa of the scalp; but, if neglected, the subject will tend to lose his or her hair sooner than without treatment.

Sudamina, or Miliaria. An eruption of numerous minute watery vesicles, seldom larger than a pin's head. *Miliaria* is the term generally given to this affection when the skin appears also reddened. It affects the sweat glands and occurs during most diseases which are accompanied by much perspiration, as fevers, acute rheumatism, and inflammation of the lungs. This condition is caused by the little ducts from which the perspiration oozes becoming clogged by dirt or the secretions of the skin, and it is usually seen on the bodies of patients who have been kept too warm, or whose skins have not been sufficiently cleansed. The eruption presents principally about the neck, chest and armpits. It is of little consequence, but indicates that the patient requires a cooler regimen and greater cleanliness of the skin. It is important that it should not be mistaken for the specific eruptions of certain fevers.

Any toilet powder, or the dusting powder of Prescription No. 66, will form a suitable application.

Ulcers. Ulcers are raw open sores, generally hollowed out lower than the surrounding skin, which may result from any inflammation of the surface of the body, as, for instance, from boils, or from injuries. Ulcers of a peculiar kind are caused by tuberculosis, syphilis, cancer, and certain parasites.

Chronic ulcers of the legs are common in elderly people, and are frequently caused in the first instance by varicose veins (*see* p. 382). Ulcers require different treatment according to their cause, or condition. The most universally suitable application is boric ointment, Prescription No. 77, spread on lint. Any ulcer that does not show signs of healing as soon as treatment is undertaken should be shown to a doctor.

A special form of ulcer, liable to occur on the nose or near the eye, is called a *Rodent ulcer*. It has malignant characteristics, and for its treatment either removal by the knife, X-rays or radium is necessary.

Another special form of ulcer is described under the name 'Oriental Sore' on page 398.

Urticaria, or 'Nettle Rash.' An eruption resembling in appearance, and in the accompanying stinging pain, the condition of the skin produced by nettles. But sometimes the rash commences as long white wheals, surrounded by a red band or margin, as if the part had been struck by a cane. The rash frequently appears suddenly; may last only a few minutes, or for a day or two, and may disappear as suddenly; or it may vanish in the daytime, returning at night. There is severe itching, or tingling, which may be alleviated by applying sal volatile 1 part, water 2 parts, or by applying weak ammonia. From the sudden manner in which it occurs, sometimes attended with vomiting and feverishness, it often excites alarm; but it is not dangerous, and often depends on improper diet. In some persons it follows eating shell-fish (mussels), strawberries, cucumbers, or mushrooms. In India it is not uncommon to find it resulting from a meal of tinned fish, particularly tinned salmon. Sometimes nettle rash follows drinking cold water when the body is heated. If the attack follows soon after a meal and is accompanied by nausea or vomiting, it is best to give an emetic, Prescription No. 30. In other instances give Prescription No. 60, 1 ounce thrice daily. If the rash is at all persistent, take 5 grain tablets of calcium lactate thrice daily. Some cases are chronic and some frequently recur; this is especially the case in neurotic women. Such should avoid all stimulating food and alcohol, and keep the bowels freely open. Many such are benefited by a course of the sour milk (lactic acid bacillus) treatment. A sea voyage is sometimes efficacious when other means fail.

Warts. Warts are of various kinds, though their nature is the same. Warts give rise to no symptoms, except such as may arise from their size or situation, such as difficulty in holding a pen, etc.

Ordinary warts may be successfully treated by applying salicylic acid in the form of a plaster or dissolved in collodion, 1 drachm to 1 ounce, and then applying chromic acid, Prescription No. 7, to the base of the growth.

If this fails, then surround the skin round the wart with a thin layer of vaseline and apply by means of a probe, first pure carbolic acid, and then strong nitric acid to the wart. It will then fizzle away.

A larger wart may be snipped off by the scissors and after a little pressure to stop immediate bleeding its base may be treated as described above.

Warts may be very efficiently treated also by means of carbon-dioxide snow (*see* Chapter XX).

CHAPTER XI

AFFECTIONS OF THE EYE AND EYELIDS

Foreign Bodies in the Eye. These can often be removed by means of the corner of a handkerchief, a camel's-hair brush, or a feather. In cases where removal is difficult, if the lower lid be drawn down, the foreign body may often be gently stroked down on to it from the eyeball and then along the inner surface of the lid to the inner angle of the eye, and there removed. These parts are less sensitive than the eyeball and so less discomfort is caused.

It is often possible to remove a foreign body from one's own eye by the aid of a mirror or polished surface such as the inner case of a silver watch.

By raising the upper lid and drawing it down over the lower lid, and allowing the lids to separate themselves, a foreign body may be dislodged and removed. Opening and shutting the eyes under water is often effective also. Blowing the nose vigorously often sometimes assists removal.

Frequently the foreign body is lodged under the upper lid, where it can be felt by patient. To remove it the eyelid must be turned inside out. This is done by placing a blunt knitting-needle or a match on the middle of the eyelid horizontally, seizing the lashes with the fingers, telling the patient to look towards his feet, and then turning the lid back over the probe. This will expose the inner surface of the lid, when the foreign body will be seen and can be removed. No harm can be done by this proceeding with ordinary care, and it may save patient hours of suffering.

Foreign Bodies in the Cornea. Sometimes sharp particles, such as chips of iron from the bar of a tonga in India, become embedded in the clear central part of the eye (cornea). At first the discomfort is felt chiefly on opening or shutting the eyes. On careful examination in a good light, a small particle may be seen lying in the clear substance of the cornea. The use of a magnifying-

glass makes the examination easier. Such cases should wherever possible be treated by a surgeon. It is not advisable for lay persons to attempt removal of the foreign body, as they may damage permanently the delicate cornea by so doing.

Where no surgeon is available, put one drop of cocaine lotion (Prescription No. 102) into the eye. Wait two minutes and then touch the body with a piece of clean blotting-paper. This may effect removal if, as is sometimes the case, it is only very lightly embedded in the cornea. The touching must be done very gently to avoid damaging the cornea. Relief from the discomfort will be afforded by the cocaine, but it must not be repeated for this purpose, as it damages the cornea.

If removal is not effected by this simple proceeding, nothing further should be attempted. After a day or two the particle will become loose and probably come out of itself.

Meanwhile the eye should be bathed with boracic lotion (Prescription No. 95) twice a day and the eye kept closed with a pad, secured by a bandage. This should be continued for a day or two after the foreign body has come out or been removed.

Injuries to the Eyeball. The eye may be damaged by a blow. This frequently happens during games in which a ball is used. A wound may be caused requiring, obviously, immediate surgical attention, but more commonly little or nothing wrong with the eye is seen. The sight may appear blurred. In many cases the eye is simply suffering from concussion due to the force of the blow, and in a few days or less will recover perfectly. It must always be remembered, however, that if the blow has been a severe one some damage may have been done to the delicate structures in the interior of the eyeball. This is especially liable to be the case if the sight is very blurred and there is pain in the eye. In all such cases, therefore, it is advisable that the patient should lie down for the rest of the day and apply a handkerchief dipped from time to time in cold water, to the eye. If there is any tendency to bleeding inside the eye this will arrest it. If the sight is dim the next day, the eyes should not be used, and protected from light. If the dimness of vision does not clear up in a few days some damage has probably been done to the interior of the eye. In such cases of injury it is always advisable, therefore, to seek medical advice early, to ascertain the extent of the injury. If none is obtainable, the eyes should be rested and the sound eye not used for fine work

or reading till a month has passed; if then it causes pain in the other eye, reading must be discontinued for a further period.

Affections of the Eyelids. *Stye* (*hordeolum*). A stye is caused by inflammation occurring in one of the small glands of the eyelids. A red spot appears on the margin of the lid; at first it may only irritate a little, but later becomes painful. In severe cases the whole lid becomes swollen. It should be frequently fomented with hot water, permitted to come to a 'head,' and then pricked with a sterile lancet or needle. The 'matter' it contains should then be squeezed out. If an eyelash grows from the centre of the stye, the hair should be pulled out with pincers. This may evacuate the matter and save pricking the stye. After the matter has been squeezed out hot fomentations should again be applied. If the patient has several styes in succession, especially if they are associated with pimples or boils, it indicates a poor state of health. The general health in such cases requires attention. Constipation, if it exists, must be counteracted. A tonic containing iron is often useful (Prescription No. 51).

Sore Eyelids or Blepharitis. Acute inflammation of the eyelids may be caused by any of the causes which lead to inflammation elsewhere in the body, such as erysipelas, and should be treated according to the cause. Bites of insects such as the mosquito frequently cause a great swelling of the lids, so that the patient cannot open his eye. This usually clears up in a day or two without any treatment. An application on a piece of lint of Prescription No. 96 will assist in reducing the swelling and discomfort. The lint should be again dipped into the lotion when it ceases to be moist and should not be covered, except by a single turn of bandage to secure it, as constant evaporation of the lotion is beneficial.

Chronic Inflammation of the Lid. Various forms are met with, the simplest of which is simple redness of the lid margin due to exposure to heat, as in the case of cooks, or due to excessive smoking, bad atmosphere, etc. It is often due to defective eyesight, especially in children of school age. It may be due to parasites such as the 'crab' louse, which on close examination may be seen, or its eggs may be detected attached to the roots of the lashes. Chronic ophthalmia (*see* p. 414) and defective general health may also cause this condition.

Apart from simple redness of the lid margins mentioned, two chief forms are common. In one of these, the 'scaly' form, small

white scales like dandruff accumulate among the lashes; in the other, the 'ulcerative' form, yellow crusts glue the lashes together. On removing the crusts, small ulcers which bleed easily are seen around the roots of the lashes. The lashes in both forms become loose and fall out. In the 'ulcerative' form they are often not replaced, causing disfigurement.

Treatment. The same treatment is required in both forms, but must be more thoroughly and energetically carried out in the ulcerative form.

The scales or crusts must first be removed by washing with soap and warm water, followed by thorough bathing with borax or carbonate of soda lotion (strength 14 grains to the ounce of water in both cases). The crusts, being softened by the washing and lotion, can now be gently rubbed off by means of a small piece of cotton-wool. Yellow ointment (Prescription No. 97 or 98) should be now well rubbed into the surface previously covered by scales or crusts, for several minutes. The weakest ointment may be tried first (Prescription No. 97), and if not effective the stronger one (Prescription No. 98) should be used. In more severe cases, or if above treatment does not suffice, the raw surfaces left after removing the crusts (ulcers) should be well painted with a solution of protargol, the strength of which should be 10 to 15 per cent.

The general health should be attended to in all cases. The sight should be examined by an oculist if possible. If lice are the cause of the condition, rub blue ointment (unguentum hydrargyri dilutum) or sulphur ointment into the lid margins twice a day.

Watery Eye, or Overflow of Tears (Epiphora). There is a communication between the eyes and the interior of the nose by what is known as the lachrymal sac and duct, the minute entrance to which (puncta lachrymalia) may be seen at the inner corners of the eyelids. The duct conveys the tears from the surface of the eye to the interior of the nose, and if the passage be blocked, watery eye results. Blocking of the duct is frequently caused by an eyelash, but may be due to dirt, small chalky concretions, or masses of fungi. The opening may be closed by the contraction of a wound. Watery eye may also be caused by displacement of the punctum lachrymale, owing to facial paralysis or blepharitis. In old age the lower lid becomes flabby and by falling down exposes the orifice of the duct to cold, which produces congestion and also, by altering its position, prevents its receiving the tears.

Very rarely the punctum lachrymale is absent at birth. Newly born children occasionally have watery eye owing to blocking of the tear passages by epithelial cells, which should have melted away at birth.

Watery eye must be treated with reference to the cause. If a hair can be seen with a magnifying-glass in the inner corner of the eye in one of the puncta lachrymalia, it must be picked out with a forceps. The other conditions require surgical treatment, but astringent drops (Prescriptions No. 91 or 92) will afford temporary relief.

In cases where the 'watery eye' is caused by a permanent blocking of the duct into the nose, inflammation sometimes takes place inside the lachrymal sac, and a painful swelling forms just below the inner corner of the eye. This may subside, or matter may form, giving rise to an abscess. Fomentation with hot water may relieve the inflammation and avert an abscess. If it does not, surgical treatment is required.

If, therefore, there is reason to suspect blocking of the duct, medical advice should be sought.

Ophthalmia (Conjunctivitis). This term implies inflammation of the membrane (conjunctiva) covering the eye or lining the eyelids. There are several varieties. In mild cases the inflammation may not extend beyond the surface of the white of the eye, which is injected with red vessels, running in different directions and not straight from the centre towards the circumference as described under Iritis. There is a smarting feeling as if sand or grit were in the eye. There is intolerance of light, and the eye is watery and weak. In the case of children, if the attack is moderately severe it is kept obstinately shut. There is also pain in the forehead or head generally. There is a 'discharge' from the eye, at first clear and thin, but afterwards thicker and of a yellowish-white colour. During sleep this discharge collects at the edges of the lids and dries there, gluing together the eyelashes. One or both eyes may be affected; one eye is often affected first and the other afterwards if proper care is not taken to protect the healthy eye.

In all cases, but especially if there is a discharge from the affected eye, the healthy eye should never be touched with anything that has been in contact with the affected eye, in order to avoid spreading the infection if the disease is due to micro-organisms. After touching the affected eye, patient should cleanse his hands

and dip them in an antiseptic lotion (Prescription No. 18 diluted with four parts of water).

The severer forms of this disease are caused by micro-organisms which get into the eye. It is very common in children, and is often brought about by contact with older children suffering from the disease or by children using a common towel. Foreign bodies, burning acid, ammonia, cold, straining at fine work, stings, exposure to irritant smoke or gas, and alcoholic excess also cause it.

In the East it must always be remembered that granular ophthalmia, which is described later in this chapter, often commences as simple ophthalmia. It is particularly necessary, therefore, in all cases of ophthalmia in the East to guard against spreading the disease to others. Each person affected with ophthalmia, therefore, should have a separate towel, soap, water, and washing-basin.

The severer forms of the disease at first sight may appear like the purulent form to be described later, but may be distinguished from it often by the fact that in the simple form the yellow ' matter ' collects chiefly in the eyelashes and in the corners of the eyes, but when the eye is opened yellow matter does not pour out from the eye, as is the case in the true purulent form.

Treatment. Patient should wear a shade of dark-tinted glass if there is intolerance of light, but should not be kept shut up in a dark room, as is often done. Light is unfavourable to the growth of micro-organisms, which cause many forms of eye disease, and tends to help the healing process. If the light is not too powerful, as in the East at certain times in the day, patient should be allowed to go out of doors as soon as he can comfortably do so. It should be particularly noted that neither in this or in any kind of ophthalmia (conjunctivitis) should the affected eye be closed with a pad and bandage. This stops the discharge from coming out, and by doing so may cause serious damage.

In the mild forms where there is not much discharge and the eyes are not very painful, bathing the eye with equal parts of boracic lotion (Prescription No. 95) and water three or four times a day will usually be sufficient to remove the trouble. It may be noted here that in the absence of distilled water, which is preferable on account of its freedom from dissolved impurities which may irritate the eye, rain-water, if clean, is preferable to sap or well-water. It should be filtered and boiled before use.

If there is much discharge, especially if it is yellow in colour,

the eye should be well washed out twice a day with mercurial lotion (Prescription No. 18 diluted with twenty times its bulk of water) morning and evening. This washing out is best done by means of an irrigator, procurable from a chemist, or a large glass syringe may be used. Plenty of fluid should be used, as the mechanical cleansing by the fluid is of great importance. The eyes may be washed out in the intervals between the irrigations with the boracic lotion, as described previously.

If the eyelids are swollen, red and painful, they should be fomented as well, twice or thrice a day, before washing out the eye.

The lids should be anointed each night with vaseline to prevent their sticking together; if they adhere, they should not be forced apart but should be bathed till they separate.

A purgative should be given (Prescription No. 61) if the bowels are confined.

A chronic form of ophthalmia is often kept up, especially in those who use their eyes for much reading or fine work, by eye-strain, due to defective sight (*see* p. 426). The provision of suitable glasses will remedy this.

Purulent Ophthalmia (Conjunctivitis). This is a condition which demands immediate and careful treatment. It results from the introduction of virulent micro-organisms into the eye. A very dangerous form of this disease results from the discharge passed in gonorrhœa being introduced into the eye. A gonorrhœa patient may infect his own eye, or infection may be caused by using a towel which has been previously used by such a patient. It may be contracted by infants from the mother during labour. It is highly contagious, and the nurse should always thoroughly cleanse her hands and disinfect them in antiseptic lotion (Prescription No. 18 diluted with five times its bulk of water) after handling the case. The inflammation is very severe; the 'whites' of the eye may become so swollen that the middle, clear part of the eye (cornea) is almost hidden (chemosis). The discharge contains a great deal of yellow 'matter' (pus). In some cases the inflammation may spread to the deep parts of the eye and the eye may be lost (pan-ophthalmitis).

Treatment. To prevent this disease the eyes of infants should be well washed with boracic lotion (Prescription No. 95), and if there is the slightest suspicion that the mother may have had a

vaginal discharge at the time of birth one drop of nitrate of silver lotion (Prescription No. 100) should be dropped into each eye. This disease accounts for a very large proportion of all blind people in Europe. The use of the above remedies will prevent it and cannot in any way injure the eyes. If only one eye is affected, the other eye should be protected by being covered with a watch-glass fixed between two pieces of sticking-plaster and stuck over the eye. A small piece of rubber tubing should be fixed beneath the watch-glass at the lower and outer part. This is to allow of ventilation, and is particularly necessary in a hot climate. If not done the eye cannot be properly observed and the glass becomes hazy, and the eye also becomes irritated. Except at this part the eye should be completely sealed off. The plaster must be constantly looked at to see that it does not get loose, to avoid any discharge getting under it. Persons looking after the patient must be very careful to avoid any of the discharge getting into the eye, and should wear special large glasses to prevent this. It is essential to wash away the discharge from the interior of the eye. Potassium permanganate lotion (Prescription No. 19 diluted with ten times its bulk of boiled water) and weak mercurial lotion (Prescription No. 18 diluted with thirty-two times its bulk of water) should be used for this purpose. The washing is best done by means of an irrigator. If not available a syringe may be used. The syringing must be done very gently to avoid damaging the front of the eye (cornea), which may be very much softened. The irrigation must be done every two hours by day and every four hours by night. The lids should be held open so that the fluid can get into the eye, but in doing so the greatest care must be taken to avoid force, as the cornea may thereby be damaged. If this happens serious damage to the sight or loss of the eye may result. After each irrigation the lids should be well anointed with vaseline to prevent their sticking together. In addition to the above, one drop of silver solution (Prescription No. 100) should be dropped into the eye once a day. In applying any form of lotion to the eye, the lower lid should be drawn down and the lotion dropped into the eye, by means of a glass medicine-dropper preferably. If not obtainable, a fountain-pen filler or a quill may be used. They should be placed for a short time in boiling water before use. A clean piece of cotton-wool also may be used; it should be soaked in the lotion and then the lotion may be squeezed out, a drop at a time. For the relief

of pain apply hot fomentations frequently. If they do not give relief, a piece of lint dipped in ice-water may be used. The dressing should be laid over the eye and secured by a very loose bandage, so as to allow the discharge to pass out of the eye. Hot applications are preferable to cold, as cold tends to devitalise the tissues and interfere with nature's process of healing. Patient should be kept in bed. Head of bed should be away from the light. Eyes should be protected from light by a shade over both eyes. The bowels should be kept open (Prescription No. 27 or 61). It may be necessary to give a sleeping draught if patient is very restless (Prescription No. 29).

The strength should be maintained by plenty of good and easily digested food and by tonics if required (Prescription No. 51).

When the acute stage has passed off a few drops of a 15 per cent. solution of protargol should be dropped into the eye twice daily till the discharge ceases. After that astringent drops (Prescription No. 93) should be used.

This being a very dangerous disease, a doctor must always be called in early if possible.

Granular Ophthalmia or Trachoma. This is often called 'granular lids' in the East, but all cases popularly called granular lids are not true trachoma. Many are only chronic ophthalmia of a simple nature, whereas trachoma is a very serious disease, on account of the difficulty in curing it and the loss of sight which often follows it. True trachoma is characterised by the formation of granular bodies, resembling minute sago grains, in the inner surface of the eyelids. After a time the disease may spread to the front of the eye (cornea). The sight of the eye is then affected owing to the formation of blood-vessels and opacities in the clear substance of the cornea. Ulcers frequently form (*see* p. 419) and the sight of the eye is frequently permanently damaged, or the eye may be lost. This disease is very common in the East, and is the chief cause of blindness there. It is contagious and runs through whole families. If a person in the East has a discharge from the eye which does not yield to the treatment described under Simple Ophthalmia, he should be suspicious of its being trachoma and consult a surgeon. The treatment of trachoma consists in destroying the granules by the application of caustics and other means, which cannot be carried out by the patient himself, or a lay person, without special instruction.

Phlyctenular Ophthalmia (Phlyctenular Conjunctivitis). In this form of ophthalmia one or more small, round, grey or yellow nodules are seen in the conjunctiva just outside the clear margin of the cornea. They are raised above the level of the rest of the conjunctiva, or what is commonly called the 'white' of the eye. This disease is most common in young children, especially in delicate children. It is frequently associated with tubercular enlargement of the glands of the neck. If the condition has lasted some time there is great intolerance of light and the eyes are kept tightly closed. This renders treatment difficult at home, and therefore medical advice should be sought. If medical treatment be not obtainable the eye should be bathed frequently with warm boracic lotion (Prescription No. 95). A small piece of yellow oxide of mercury ointment (Prescription No. 97) as large as a hemp-seed should be taken up on the tip of a clean finger and placed on the inner surface of the lower lid, which should be drawn down and turned out by the other hand. The upper lid should then be gently rubbed over the eyeball with the tip of a finger for two or three minutes. This should be done twice or thrice a day. To carry out the application of the ointment, it may be necessary to sit down and fix the child's head firmly between the knees, while a second person, sitting opposite, supports the child's body on his lap and holds the hands.

The general health of the child must at the same time be attended to.

Angular Ophthalmia (Angular Conjunctivitis). In this disease the margins of the lids, especially at the inner and outer angles of the eye, are reddened, and may appear scurfy if the disease has lasted some time. If not treated the disease may last for months or years. It is due to a special micro-organism, and can be cured by bathing the eyes first with boracic lotion (Prescription No. 95) and then dropping in zinc lotion (Prescription No. 93) four or five drops twice daily.

Ulcers of the Cornea, or clear central part of Eye. These may result from an injury, neglected ophthalmia, and other causes. They are especially common in granular ophthalmia. The 'white' of the eye presents more or less the injected appearance described in simple ophthalmia (*see* p. 414), but in addition, if the ulcer has lasted some time, one or more red vessels may be seen stretching from the margin towards the centre of the cornea, in

some part of which a small, rough-looking, white spot (an ulcer) will be discovered. This spot will contrast markedly with the clear polished glass-like surface of the cornea round it. The patient often feels a pricking sensation as though there were a piece of grit in the eye. There is also much intolerance of light (photophobia) and watering of the eye. In bad cases several of these spots may form. If the case proceeds favourably, the white of the eye loses its injected appearance, the red vessel or vessels in the cornea disappear, and the ulcer heals, often leaving a white film, which may or may not disappear in time. When the disease does not progress favourably it may lead to further damage to the eye; a large film is left in the cornea (opacity), interfering very much with the sight. In still more severe cases the cornea is converted into a white mass and the person cannot see at all. In some cases the ulcer may make its way through the cornea, and a hole is made through which the iris protrudes. As a further result, cataract, or inflammation, leading to a loss of the whole eye, may result. It is necessary, therefore, that ulcers of the cornea should be treated with great care.

If the ulcer is the result of ophthalmia, in the granular variety of which it is particularly common, the above treatment must be carried out, and in addition the ophthalmia must be treated.

Atropine is used to put the internal muscles of the eye at rest and also, by dilating the pupil, to prevent the iris forming adhesions to neighbouring parts, as the occurrence of these may cause damage to the sight or more serious trouble, such as glaucoma.

The patient in all cases of ulcer may be kept in a slightly darkened but well-ventilated room till the acute symptoms have passed off. He should then wear a shade over both eyes or dark glasses till recovery is complete. In cases where a film (opacity) remains in the cornea after an ulcer has healed, yellow oxide of mercury ointment (Prescription No. 97) introduced into the eye twice a day and well rubbed into the spot by means of a finger placed over the upper eyelid is very useful in clearing up the film. The rubbing should continue for five minutes. If the ointment irritates the eye it should be diluted with an equal part of vaseline for the first few days. Later, when the eye has got used to the ointment, the strength of it may be increased to 9 grains of yellow oxide of mercury to an ounce of soft paraffin.

Treatment. The eye should be gently irrigated with equal parts

of warm water and boracic lotion (Prescription No. 95) four times a day. One drop of atropine lotion (Prescription No. 94) or atropine ointment (Prescription 101), a small piece as large as a split pea, should be introduced between the lids after each irrigation. The application of ointment is best done by means of a glass ointment-introducer, procurable from a chemist. A little vaseline, which should have been previously boiled to sterilise it, is then applied to the lids to prevent their sticking together. A pad of cotton-wool, covered by a piece of antiseptic gauze or muslin, sterilised by heating in a hot oven, is then applied to the eye. The pad should be kept in position by a bandage, which must be firmly but not too tightly applied. It must be specially noted that a pad and bandage must not be used if the ulcer is the result of an ophthalmia, such as granular ophthalmia. The use of the pad in these cases causes the discharges to be retained and does harm. Both eyes should be protected by a shade, and the patient may be kept in a slightly darkened but well-ventilated room till the intolerance of light diminishes. The windows should be shaded with green curtains.

If the case is a very severe one hot fomentations should be applied to the eye in addition to the above treatment. This should be done in the intervals between the irrigations.

Iritis. This term signifies inflammation of the iris, or that part of the internal eye in which the round ring of the pupil is situated. Its colour determines the colour of the eye. In this disease, while the white of the eye is injected, minute red blood-vessels being seen running from the middle towards the circumference, the cornea, or centre of the eye, is clear. Through the cornea can be seen the iris, which after a time tends to become discoloured, turning greyish if naturally dark, greenish if naturally blue. It loses its natural shiny surface, which becomes dull. This will be better seen on comparing it with the affected eye. After a time, if disease continues, a whitish deposit often takes place, and the pupil thereby may be blocked up. In some cases a yellow deposit forms and collects in the lower and front part of the eye behind the cornea (hypopyon). The symptoms of iritis are pain, often of a neuralgic character, both in the eye and in the forehead above the eye, intolerance of light, and dimness of vision. The causes of iritis are: injuries, gonorrhœa, syphilis, tuberculosis, gout, and rheumatism. Iritis also occurs without obvious cause in people who are in a poor state of health. A special, chronic

form has been found to be associated with an unhealthy condition of the teeth and gums.

The chief danger of iritis is the liability to fixation of the pupil by adhesions. This may cause serious permanent damage to the eye. Dilatation of the pupil with atropine will prevent this.

Treatment. The eye should be protected from light by a green shade or dark glasses. If pain is severe the room should be moderately darkened. Hot fomentations should be applied frequently. Atropine lotion should be dropped into the eye three or four times a day till the pupil is dilated, after that once a day (Prescription No. 94). Sometimes these drops, if used for some time, cause dryness of the throat, and in some cases delirium may result. This is caused by the lotion passing into the nose through the lachrymal passages and being absorbed. Atropine ointment (Prescription No. 101) is far less likely to cause these symptoms, as the soft paraffin of which it is made does not readily pass into the lachrymal passages. It is also more efficient in bringing about dilatation of the pupil, as it is retained better in the eye. Should dryness of the throat or delirium occur, the use of atropine should be temporarily discontinued and resumed later if required. The fear of these symptoms should on no account prevent the use of atropine, as its use does not endanger the life of the patient even if such symptoms occur. Atropine not only prevents adhesions, but it also puts the internal muscles of the eye at rest and relieves pain. In cases with adhesions in which the pupil does not dilate properly but is seen to be irregular, mercury may be given internally (hydrargyrum cum creta, 2 grains, twice a day as a powder) in addition to the local treatment. This is often very efficacious in softening the adhesions and allowing the pupil to dilate. If it causes a metallic taste in the mouth or the gums become tender, it should be left off for a time and resumed later.

Iritis being a serious disease, medical advice should always be sought early. It is very important to determine the cause in each case. It medical advice cannot be obtained and there is reason to believe the disease is caused by gonorrhœa, syphilis, tuberculosis, or any of the causes mentioned it is absolutely necessary that the general treatment of these conditions (q.v.) should be carried out at the same time as the local treatment described.

Glaucoma. This is a disease in which the pressure inside the eyeball becomes higher than normal. This tends, if not relieved,

to destroy the nerve of sight and cause incurable blindness. The symptoms are attacks of dimness of vision. The patient sees things but dimly as through a mist. This may last from a few hours to a day or two. The sight may then become all right again and remain so for some days or months, but another attack sooner or later will occur. Sometimes the patient sees bright flashes of light, or coloured halos round lights. After one or two attacks of dimness of vision the sight is usually found to be more or less damaged. There is a diminution of the field of vision as if a cloud obscured some portion of it. In some cases, after the above-described symptoms have lasted for a time, the patient may be seized with severe pain in the eye or with neuralgic headache, usually worse on one side than the other. The eye will usually appear 'red,' the redness being especially marked in the zone immediately outside the margin of the clear central part of the eye, the cornea.

These symptoms may also come on at once without any of the symptoms first mentioned. The cases in which there is no pain may be called the 'simple' form, those in which there is severe pain the 'acute' form.

Treatment. It cannot be too strongly emphasised that glaucoma is a most dangerous disease, and that if medical advice is not sought at once in the acute form, the sight of the eye may be permanently lost in a single day. If, therefore, there is a suspicion of acute glaucoma, seek medical advice instantly. The quiet form is equally deadly as regards its power of destroying the sight, and advice must always be sought early, though there is not the same vital necessity of seeking it at once as in acute glaucoma. If no medical advice is available, or pending its arrival, in the simple form two drops of eserine lotion (Prescription No. 99) should be dropped into the eye twice a day till the symptoms are relieved, and once a day afterwards till medical advice can be obtained. The instillation of the lotion may cause an uncomfortable feeling in the eye for a time, but this must be expected. It can never do any harm in a doubtful case and should be used. It will keep the eye in a safe condition till advice can be obtained. In the acute form three drops of eserine lotion (Prescription No. 99) should be dropped into the eye every half an hour, and the eye bathed with hot water till the pain is relieved. After that eserine lotion can be used every four hours till the eye quiets down and loses its redness. Eserine lotion should then be used once a day to prevent a recurrence of

the disease, till medical advice can be obtained. In the acute form the patient must be kept absolutely at rest in bed till the acute symptoms pass off. A purge (Prescription No. 53) should be given. In the simple form the patient should keep quiet and avoid exposure to sun or wind till the symptoms pass off. He need not remain in bed, but should not read or do any fine work.

Cataract. This condition is caused by the lens of the eye becoming more or less opaque, so that light can no longer pass through it normally into the eye. This causes interference with vision, the amount of which varies according to the degree of opacity of the lens. The lens is a clear structure resembling glass, situated behind the central circular opening of the eye, called the pupil. In the healthy eye it cannot be seen and the pupil looks black. When the cataract is fairly advanced it can usually be seen through the pupil, looking white or bluish-white in colour. It must not be confused with the white scar left by a corneal ulcer (*see* p. 419). This is situated in the clear glass-like cornea, whereas the cataract lies deeper behind the pupil. Cataract may be present at birth or may develop later in life. It is most common in old people. Occasionally it is caused by an injury to the eye.

In the early stages of the disease nothing wrong can be seen on looking at the eye. If, however, an elderly person whose glasses previously suited him finds he cannot get a pair which suit him and that he sees best in twilight or with his back to the light, cataract should be suspected. Cataract is considered by the general public as a very terrible disease, but as a matter of fact glaucoma and other diseases are far more dangerous. Cataract can be cured in almost every case by an operation, whereas glaucoma and other diseases, if neglected, destroy the sight entirely. Many surgeons allow the cataract to ripen before operating. This means the patient must wait a varying time, from six months to in some cases several years. A warning here is necessary. The process of ripening of the cataract is entirely free from pain or discomfort of any kind in the eye. If any pain or discomfort arises the patient should at once seek medical advice, as in some cases glaucoma (*see* p. 422) supervenes in a ripening cataract. If this should happen and not be recognised, the optic nerve will be damaged and the operation for cataract will fail to restore the sight. Further, a quiet, insidious form of glaucoma is often thought by a patient who has not sought advice to be cataract, and he waits, hoping to have

it removed when ripe. When he seeks advice it is only to be told it is too late and that the sight is lost. This is exceedingly common among the natives of India. To avoid this, in all cases of failing sight medical advice should be sought early to determine the cause.

Spots before the Eyes (Muscæ Volitantes). People of sedentary habits or in poor health who do a great deal of reading or fine work sometimes see black specks before the eyes. The specks often appear to move, passing usually from above downwards. They are especially visible when looking at a white surface or the sky. They often cause considerable anxiety, as the patient thinks they indicate serious eye disease. They are more frequent in persons whose digestion or liver is out of order. In the East the latter is frequently the cause, and a purge (Prescription No. 61) occasionally and a reduction of the amount of meat in the diet, together with regular exercise, especially on horseback, will usually remove the trouble. Grey-tinted glasses should be worn in the bright sunshine. Occasionally such spots are associated with actual disease of the eye. In this case the spots will be more constantly seen, whereas the others vary very much from time to time. A single spot may also appear, which is always seen in a certain position. This may indicate breaking of a small blood-vessel in the eye or some local disease of the retina. In all these conditions, if the sight is any way diminished it increases the probability of there being some actual disease of the eye. In such cases medical advice should be sought.

Balls of light, zigzag lines, and other appearances commonly precede an attack of 'sick headache' or migraine. Occasionally flashes of light are a symptom of early glaucoma (*see* p. 423).

Affections of the Nerve of the Eye (Optic Nerve). The optic nerve and its expansion in the retina are subject to various maladies. The ophthalmoscope has enabled surgeons to differentiate the nervous affections of the eye, which are now variously designated in accordance with the appearances discovered by ophthalmoscopic examination.

Affections of the nerve of the eye may be caused by syphilis, diabetes, albuminuria, tubercle, severe hæmorrhages, malaria, and tumours of the brain. The nerve may also be implicated in inflammation starting in the eye, or in the nerve or its covering behind the eye. Exposure to bright light, such as looking at an eclipse of

the sun with the naked eye, may also cause damage to the nerve of the eye.

Symptoms which may be expected are: dimness of vision, distorted vision, sparks or flashes of light, narrowing of the field of vision, perhaps loss of portions of the field as if by a cloud in front, and sometimes night-blindness. Any such symptoms demand early professional advice. In the meantime the eyes should be rested as much as possible; they should be protected from bright light, and any general malady should be treated.

There is a special form of affection of the optic nerve caused by the excessive use of tobacco. The patient notices that his sight is getting worse, and this is more marked in the daytime or in a bright light. He finds that, though glasses may help a little in some cases, he cannot find a glass with which he can see as well as he did before. If the patient looks straight at a small red or green patch it may appear to him colourless, whereas if he moves it about before his eye it may appear coloured. The size of the patch should be not larger than a pin's head. This condition is called tobacco amblyopia. Individuals vary very much in their susceptibility to tobacco. The presence of diabetes or the use of alcohol predisposes to this condition. Usually it is met with only in fairly heavy smokers or people who chew tobacco a good deal.

The only remedy is to give up at once the use of tobacco. It must be absolutely given up. The use of even what is to the patient a ridiculously small amount is enough to keep up the condition. Alcohol, if taken, should be given up also. It must be noted that the disuse of tobacco will almost invariably effect a cure if the disease occurs for the first time. Patients, when they are cured, should never return again to the use of tobacco, as they are very liable to get another attack. A second attack may cause serious permanent damage to the sight.

Poisons such as lead and carbon disulphide, used in india-rubber works, may also cause disease of the optic nerve.

Defective Eyesight. It has been pointed out in the course of this chapter that defective vision is a symptom of many eye diseases. Apart from these, there are several conditions in which the sight of the eye is not normal. Normally the eyeball is of a certain length, and the different parts of the eye—the cornea, lens, etc.—so act on the light entering the eye as to focus the rays correctly on the retina. This focussing apparatus is a necessity for the

production of distinct vision. Under certain conditions the structure of the eye may be so altered that light is not under all conditions accurately focussed on the retina. This gives rise to defective sight. Four chief varieties are common.

Short Sight (Myopia). In this condition a person can see objects near to the eyes, but distant objects are seen indistinctly or not seen at all, according to the degree of short sight. It is caused by excessive use of the eyes by children or young people for reading or fine work. If a child says he cannot read the writing on the blackboard at school, and if he holds his book closer than is usual to the eyes whilst reading, he probably has short sight. The condition if neglected gets worse, and the sight is permanently damaged. Liability to short sight is often hereditary, and parents who are short-sighted should be on the look-out for it in their children.

Treatment. Proper glasses of the concave variety are required. In cases of short sight in young people an oculist should always be consulted, as it is usually necessary to examine the eye under the influence of atropine. By this means the tendency of the patient to choose glasses which are too strong, and which therefore injure the sight, can be eliminated. A short-sighted child should only be allowed to read in a good light and not allowed to hold the book too close to the eye. If the short sight can be prevented, as it can be, from increasing till the child is grown up, there is then no danger of its getting worse, as after the age of twenty-five years it will not increase. If the condition is not treated the short sight will get steadily worse and permanent damage to the eye may also result.

Hypermetropia. This is often wrongly called 'long sight' by the laity. The error arose because in this disease there is trouble in reading or in doing fine work, whereas the patient sees distant objects quite well. He does not, however, in the most favourable case see them better than a person with normal sight, but usually sees them less distinctly.

In slight cases the only complaint often is that the eyes get tired after reading for some time, or that after reading for a time the print becomes blurred. Headache also may be caused by much reading or close work. In worse cases the patient will not be able to see very fine print, and his distance vision may be affected. A patient may have had hypermetropia for years and not be

aware of it. This is because under favourable conditions the internal muscle of the eye is able to counteract it, but if the conditions are unfavourable it can no longer do so and the defect becomes apparent. Hypermetropia, therefore, may only be noticed when a patient passes the age of thirty to thirty-five, or if he has much work to do, as in studying for an examination, or after an illness.

Treatment. The remedy is the use of suitable glasses of the convex variety. In slight cases it is sufficient to wear them only for reading, in other cases it may be necessary to wear them constantly.

Astigmatism. This condition often causes great discomfort. The symptoms are the same as those of hypermetropia, just described, but pain in the eyes and headache are more frequent in this condition.

Treatment. The use of proper glasses of the cylindrical variety will give relief.

Presbyopia. When a person whose sight has been normal all his life passes the age of forty-five years, he usually notices a tendency to hold his book further away whilst reading, and difficulty in seeing small print, especially by artificial light. This is due to a loss of elasticity in the lens of the eye. It is a natural occurrence, just as it is for the hair to turn grey, and need cause no alarm. It is remedied by using glasses of the convex variety for reading only. As age advances stronger glasses will be required. A change once in five years till the age of sixty is reached is the rule. After sixty there is only a slight change in the sight. It must be emphasised that patients who are suffering from chronic glaucoma (*see* p. 422) often notice a more rapid failure of their sight and buy stronger and stronger glasses, with the result that when they come to an oculist the sight has been permanently damaged. Any rapid weakening of the sight for near vision in a person over the age of forty-five should lead him to consult an oculist. If ordinary presbyopia is present a change of glasses once in five years is sufficient, but if people have much reading to do a lesser change may often be made with advantage every two years. If the glasses need to be changed oftener than this, provided correct glasses were last prescribed, the patient should be on his guard against the occurrence of some other disease in his eye.

In all cases of defective eyesight patients are warned against

purchasing glasses in a shop that seem to suit them. They are very apt to buy unsuitable ones, which may injure their eyes. They should consult an oculist and get a prescription for the glasses best suited to their particular case.

Squinting. A squint may be either single, double, or may alternate. It depends upon want of equilibrium between the muscles which move the eyes, or on paralysis, injury, or diseases of the nerves.

Squint in Children. There is a widespread belief among the laity that squint may be caused by improper placing of the cradle with regard to the light, or from a child constantly looking at an object to one side of its cradle. It is also commonly attributed to imitation of a person who squints. It must be clearly understood that these and all similar explanations are erroneous. Children below the age of two years often squint when looking at near objects, because they have not learned to use both eyes together. In such cases the squint will not be constantly present, but only when a child is looking at a near object, and will affect either eye. This will pass off as the child gets older. It must be realised, however, that very young children of six months and upwards do develop squint, which if neglected may become permanent. If, therefore, an infant squints constantly, it is well to seek medical advice. A child may squint only when it is not well or in the course of a severe illness. This is due to nervous irritation, and will be remedied by attending to the general health.

Too much stress, however, cannot be laid on the fact that the chief cause of squint in children is defective eyesight, and that if taken in hand at once it can be cured. If neglected it will become permanent. The child's eyes should be examined by an oculist. If glasses are prescribed, it must be clearly understood they must be always worn from the minute the child gets up in the morning till it goes to bed at night. A second pair of glasses should always be kept ready in case the child breaks the first pair, as leaving off the glasses for a day or two will undo the good of months of constant wearing of them. If the case is taken in hand early and these precautions are taken there is every chance of the child being permanently cured, though glasses may have to be worn till it is grown up or always.

In a case which has not been so treated it is possible in many cases to very much improve the condition by an operation, or to

permanently cure it if it has not lasted too long. No greater mistake, however, can be made, as is so often the case, than that of 'waiting till the child is older and then getting the eyes put straight,' a remark which parents often make! The eyes can be 'put straight,' but if the squint has lasted a long time the sight of the squinting eye, from want of proper use, becomes weaker than that of the other. The sight of the eyes being unequal, they cannot be used together properly. The better eye only is chiefly used, and the result as regards the improvement of sight is nil. If this is the case the squint may recur, owing to disuse of the weaker eye.

In adults squint is usually due to affections of the nerves of the eye, or damage to the eye. The treatment depends upon the cause.

CHAPTER XII

DISEASES OF THE EAR, NOSE, AND THROAT

DISEASES OF THE EAR

Eruptions on the Ear : Deafness : Earache : Wax in the Ear : Boil in the Ear : Foreign Body in the Ear : Inflammation of External Ear : Acute Inflammation of Middle Ear : Chronic Discharge from the Ear

1. Eruptions on the Skin of the Ear, or behind the Ear. These 'breakings-out' usually occur to children during teething, and the peculiar form of skin disease thus attacking the ears is generally eczema. In such cases cleanliness must be particularly attended to, otherwise the skin affection may run into sores. Glycerine soap and water should be used daily, so that all discharge may be gently washed away. Then the treatment should be conducted as given at p. 391. But often these affections of the skin about the ears remain more or less prevalent, in spite of any treatment, until the period of teething has passed. Without treatment, and specially without attention to cleanliness, they assume a more prolonged and inveterate form.

2. Deafness. Deafness occurs in every degree, from mere dulness of perception of sound to absolute insensibility. It is not itself a disease but a symptom of some disease of the ear. It may depend on obstruction to the outer passage of the ear, to injury or disease of the drum, to disease of the middle ear, to disease of the nerve of hearing, or to obstruction to the passage leading from the ear to the throat.

If it comes on without any obvious cause in an otherwise healthy child or adult, the presence of a mass of wax in the external passage may be suspected. Quinine in the large doses necessary for cure of malarial fever may cause temporary deafness accompanied by noises in the head. Adenoids and enlarged tonsils, by causing blocking of the passage leading to the throat, are a fairly common

cause of deafness in children, and a cold in the head may produce the same effect.

In the absence of the simple causes I have mentioned, a medical man should be consulted before any treatment is undertaken.

3. Earache. Earache is also a symptom, and the common causes in India in otherwise healthy people are : (1) boil in external passage ; (2) inflammation occurring as the result of accumulated wax. In children earache may be the first indication of an attack of mumps or of a sore throat. Again, a decayed tooth or the cutting of a wisdom tooth may cause earache. The pain may also be an indication of inflammation of the external passage or of the middle ear—always a serious affection. The situation of the pain is a good indication of whether the cause is likely to be a serious condition or not.

The pain of ordinary earache is located in the ear itself, below it, and in front of it ; it is frequently made worse by moving the jaw. In serious middle-ear inflammation, on the other hand, the pain is felt behind the ear and on the side of the head ; moreover, if the bone immediately behind the ear is lightly tapped with the finger, pain is felt in the bone. When this symptom is present no time should be lost before seeking medical advice. In the slighter forms of earache the dropping in the ear of a few drops of olive or other sweet oil warmed in a teaspoon can do no harm and is generally very soothing. Gentle syringing with warm water in a cup of which half a teaspoonful of bicarbonate of soda has been dissolved cleanses the passage, and hot fomentations, either wet or dry, may be applied.

4. Accumulation of Wax in the Ear. When such an accumulation has grown large enough to block the passage and cause deafness or earache it can be seen as a black mass if a good light is directed into the ear. To remove it a drop or two of glycerine or oil should be placed in the ear at night, which will soften the wax, and the following morning the wax can be washed out with hot soda lotion mentioned above. No attempt should be made to extract the wax with an instrument of any sort, as such an attempt is likely to cause serious harm to the drum besides producing severe pain.

In syringing an ear the stream of water should never be directed straight into the passage, but against the top or bottom or one or other side, and in removing wax the direction of the jet should

be changed from one side to another. After the wax has been washed out a piece of clean cotton-wool should be placed in the ear for twelve hours or so.

5. Boil in the Ear. This occurs in the external passage, and when near its opening can be seen a raised, red, pointed projection. It causes great pain and tenderness of the ear. Sometimes the gland behind the angle of the jaw becomes enlarged from the effect of the boil.

The pain is often accompanied by a slight watery discharge. It usually lasts three or four days, after which time the boil bursts, there is a slight discharge of pus or matter, and the pain ceases. The discharge continues for a few days longer and then stops.

Treatment. A purgative dose and the application of hot fomentations to the ear will assist in rapidly bringing the boil to a head. When the boil has burst the ear should be gently syringed daily to clear out the discharge and a piece of clean cotton-wool placed loosely in the opening. This treatment should be continued until all discharge has stopped.

6. Foreign Body in the Ear. Children sometimes thrust small bodies such as beads or seeds into the ear, and such foreign bodies may perhaps not be discovered until they have set up inflammation, shown by redness, pain, heat, and swelling in the passage and discharge from it.

No attempt should be made to extract the intruder with a hairpin or any other instrument. The ear should be syringed. The stream of water will wash out the foreign body. The syringing may have to be persevered with until ten or twelve syringefuls of lotion or warm water have been used. If it is not then effective skilled aid must be called in.

7. Inflammation of the External Ear occurs in children or adults as the result of some irritation. This irritation may be dirt, wax, foreign bodies, or caused by too forcible cleansing of the ear passage by the corner of a towel or other such means adopted by unwise nurses.

The symptoms are pain in the ear itself, in front of it, below it, pain on moving the jaw. The lobe of the ear may be red-hot, swollen and tender, but is not always so. In a day or two a discharge occurs, which, however, does not relieve the pain.

The disease is a serious one unless treated early because it may lead to inflammation and perforation of the drum.

In young children the discharge may be the first recognisable sign of the disease. Infants who have pain in the ear only show it by crying and putting the hand to the ear and by refusing to lie on the side.

Treatment. Pain may be relieved by hot boric fomentations (Prescription No. 6), and a poultice of absorbent cotton-wool soaked in the same water should be applied between whiles. To an adult 10 grains, and to a child 2 to 4 grains, of bromide of potassium may be given.

Discharge should be washed away twice or thrice daily with warm boric-acid lotion (Prescription No. 14) from a syringe, the passage then gently and carefully dried with a twist of absorbent cotton, and the astringent lotion (Prescription No. 20 mixed with an equal quantity of water), *first made warm*, may be dropped in the ear from a spoon. A small piece of cotton-wool should be placed loosely in the opening of the ear.

If improvement, shown by a lessening of the pain and discharge, does not occur after two or three days of this treatment, skilled advice should be sought.

8. Acute Inflammation of the Middle Ear is a very serious disorder, and its treatment outside the scope of domestic medicine. The illness begins with very acute throbbing pain in the ear and side of the head behind and above the ear, accompanied by high fever, which perhaps follows on a shivering attack. Deafness is also a marked symptom. After twenty-four to seventy-two hours the drum of the ear may burst and the pent-up matter escape. This escape of the matter relieves the pain but the internal structure of the ear may be destroyed. If the matter does not escape externally the inflammation may extend into the bone of the head or into the brain.

Treatment before the case is seen by a doctor should be limited to application of leeches behind the ear, the administration of a purgative, and to hot fomentations.

9. Chronic Discharge from the Ear may result from acute inflammation of either the external or middle ear. It leads to many complications which it would be out of place to describe in a work of this kind. In all such cases a medical man, and preferably one who has made a special study of ear diseases, should be consulted.

The *treatment* necessary is generally long and tedious, but if

patiently and conscientiously carried out will in any but very severe cases lead to eventual cure.

DISEASES OF THE NOSE

Adenoids : Bleeding from the Nose : Foreign Bodies in Nose : Hay Asthma : Polypus of the Nose : Worms in the Nose

Adenoids. Adenoids consists in the overgrowth of the lymphoid tissue, such as the tonsil is formed of, that normally exists at the back of the nose above and behind the palate. As this tissue is of similar nature and function to the tonsils, enlargement of the latter commonly accompanies the growth of adenoids and both are liable to occur, especially in children. The symptoms produced by adenoids are mainly those of obstruction to nasal breathing. The mouth is generally held half open to allow the patient to breathe through it, and for a similar reason he snores during sleep. The nostrils become drawn in and the nose thin and pinched, and the general picture of the child is typical and easily recognisable as 'adenoids' by those who have once seen it. The children often look stupid, and may in fact be backward at school. This is partly because they cannot hear a good deal that goes on, since deafness often results from spread of a chronic catarrh from nose to ear. Similarly also taste and smell may be affected. In bad cases that have persisted for long there may arise much deformity of the chest owing to the child's being unable to take a really deep breath, the ribs in consequence being drawn in.

The adenoids may be felt by passing the finger up and behind the palate.

In any case where a child habitually wears its mouth open or snores at night, or seems to have its nose stopped up, a doctor should be consulted. If the child be seen to early the condition may be remedied by tonics, fresh air in the hills or at the seaside, and respiratory exercises; but very often by the time the doctor sees the case the time has passed for such measures, and surgical removal of the adenoids, together usually with the tonsils, is necessary. The condition should certainly not be neglected, as the child may become permanently affected not only in his respiratory organs, but mentally as well. (*See also* 'Chronic tonsillitis' on p. 445.)

Bleeding from the Nose. This may result from injury, or it may occur from a plethoric or too full condition of system, or, on the other hand, from a thin, poor state of the blood, as happens in scurvy or as the result of venereal disease, fevers, malaria, and kidney or liver disease. It may also occur as a consequence of polypus (*see* p. 438). If the bleeding arises from a blow it will probably stop after a few minutes on the application of cold water to the face and back. If it continue from any cause, a pinch of powdered alum dissolved in a couple of tablespoonfuls of cold salt and water may be sniffed up the nostrils; or powdered alum may be snuffed up. In all cases of obstinate bleeding from the nose the body should be kept in the upright posture, and the hands should be raised and held by other persons above the head. The patient should breathe through the mouth. A bladder of ice or a cold wet cloth may be applied to the forehead and back of the neck, a piece of cold metal, as a door-key, to the back; and pressure should be made over the facial artery by pressing the finger in the angle formed by the side of the nose and cheek. The nostrils should be pressed together with the thumb and fingers for half an hour. The feet and legs may be placed in hot mustard and water. In some cases the blood may not pass from the nostrils, but, proceeding from the back of the nose, may trickle into the throat and be swallowed or spat out. If faint the patient must lie down.

If bleeding from the nose depends on too full a condition of system, recurring perhaps periodically, low diet, purgatives (Prescription No. 27), especially if costiveness is present, are the proper remedies. Moderate bleeding from the nose may be regarded as salutary when the person is red-faced, plethoric, and subject to headache or giddiness. It is then an effort of Nature to relieve herself, and, unless violent, should not be suddenly restrained. Bleeding from the nose frequently occurs to children, and in some cases a thin condition of blood is the cause, and the complaint must be treated accordingly. If bleeding depends on a polypus the growth should be removed (*see* p. 438). Syringing of the nose is to be avoided, as is also plugging of the nose with lint or cotton-wool. In obstinate cases of bleeding the nose may be irrigated by means of a large-sized catheter, one end of which is placed in one nostril and to the other end fitted a glass or tin funnel. With the head slightly bent forward and the mouth open, a solution of cold salt and water or Hazeline may be poured into

the funnel; the water will then pour out of the other nostril and the mouth. Or the nasal douche may be employed as described on p. 612.

Cold in the Head. *See* p. 133.

Foreign Bodies in the Nose. Peas, beans, seeds, small stones, slate-pencil, insects, etc., may be thrust into the nostrils by children or may be accidentally inserted. Attention is generally drawn to these cases by a discharge from one nostril, which makes the upper lip sore and has a bad smell. They may be frequently discharged by compressing the clear nostril with the fingers and then blowing forcibly through the obstructed nostril. If this does not succeed, snuff may be given to excite sneezing.

These measures failing, a mustard-and-water emetic may be given, and when vomiting occurs the mouth should be stopped by the hand. A rush of fluid will then take place through the nose, and probably dislodge the foreign substance. If no effect is thus produced, a probe or piece of wire, bent into the form of a loop or hook, may perhaps be passed above the substance so as to hook it down; or it may sometimes be seized with a pair of forceps. Care must be taken not to push the foreign body backwards, and digging attempts upwards towards the head should be avoided. When a foreign body cannot be extracted, it will frequently work out if left alone. If a leech gets into the nose, a solution of 2 drachms of salt in 2 ounces of water should be snuffed up or the douche employed (*see* Bleeding from the Nose and p. 612). No attempt should be made by syringing down the opposite nostril to force a foreign body out by a stream of water coming from behind.

Hay Asthma. This disease is often called hay fever and pollen fever; but it is not a true fever, and hay asthma is a better name, because the condition in the nose has resemblances to that in the bronchial tubes in true asthma. Like asthma, hay asthma often runs in families.

Some persons possess a peculiar, ill-understood, nervous irritability of constitution, with irritability of the nasal passages to particular atoms floating in the atmosphere. While some persons are affected when hay is ripening, others are not affected from hay, but suffer when certain other vegetable productions bloom. It is perhaps most frequently excited by hay pollen, and occurs, in England and India, more especially during the hay-harvest. The

symptoms are spasmodic sneezing (which is sometimes the chief or only symptom), watering of the eyes, feverishness, cough and expectoration, and sometimes spasmodic attacks of difficulty of breathing resembling true asthma.

The sufferer from hay asthma should take an early opportunity of consulting a rhinologist or nasal specialist, because in many cases a simple local treatment of the nasal mucous membrane may cure or relieve his symptoms. If this is not successful he should avoid agricultural districts where the pollen causing the disease is most prevalent; mountain air is usually the best. If the condition is troublesome the specific antitoxin treatment for hay asthma should certainly be tried and a doctor consulted for the purpose. During an attack the local application of adrenalin chloride, 1 in 1000 solution, to eye and nose will often give relief. So sometimes does the local application of cocaine in tablet form, a tablet containing $\frac{1}{6}$ grain being introduced into each nostril. Or the use of Ferrier's snuff, consisting of morphine hydrochloride 1 grain, powdered acacia 1 drachm, bismuth subnitrate 3 drachms, may give relief. But the last three remedies should not be used without medical advice, and certainly not persisted in until all the previously mentioned means have been tried.

Polypus of the Nose. A polypus is a pear-shaped tumour growing from a more or less marked pedicle or stem. The most usual positions are the ear, the nose, the lower gut, the female privates, and, less frequently, the throat. Polypi may be soft, gelatinous, and light in colour, or comparatively hard, fleshy, and red. Polypus of the nose causes a feeling of stuffing in one or both nostrils, sneezing and discharge, and snoring during sleep when the mouth is kept wide open. Taste and smell are impaired and the speech becomes thick and nasal, all the symptoms being aggravated by damp weather. When one nostril only is affected, on stopping it by pressure with the finger, the person breathes well through the other. As the polypus grows it may present as a more or less reddened tumour at the entrance of the nostril; or it may hang through the posterior nostrils into the throat, causing constant 'hawking' and spitting. Sometimes the patient feels the tumour flapping to and fro with the breathing, or it may be heard moving. It may cause bleeding from the nose. The *treatment* of a polypus consists in its surgical removal.

Worms in the Nose. The affection generally described as worm in the nose, or *Peenash*, is in reality maggots in the nose. It is a malady almost entirely confined to the lower class of dirty natives. A fly enters the nostrils and deposits larvæ or eggs, which eventually become maggots. If any disease causing discharge from the nostrils exists, the flies are attracted, and are most likely to effect entrance. Anyone may daily notice flies clustering about the eyes and nostrils of dirty natives, particularly children, the latter taking little trouble to rid themselves of the nuisance. At such times, or during sleep or weakness from disease, the flies enter the passage, and maggots in the nose is the result. Sometimes one or two maggots are passed daily, at others several dozens may be passed, or extracted. They sometimes consume not only the interior of the nostrils, but even eat their way through the skin of the nose and into the mouth. A good application is carbolic acid lotion (1 in 60) or a mixture of turpentine and water, injected by means of a syringe. When visible, the maggots should be extracted with forceps. Maggots may also be present in the ears, the symptoms and treatment being the same.

DISEASES OF THE THROAT

Foreign Bodies in Throat and Gullet : Sore Throat : Pharyngitis, Acute and Chronic : Laryngitis, Acute and Chronic : Tonsilitis, Acute and Chronic

Foreign Bodies in the Throat and Gullet. People are sometimes choked, and have been killed, by false teeth or portions of food sticking in the gullet and preventing the air passing into the windpipe. As in Fig. 50, showing a section of the parts, the windpipe (1) and the gullet (2) lie close together, the entrance to the former being protected by a little valve, A, the *epiglottis*. This remains open and upright except when the act of swallowing is performed, when it shuts down over the opening into the air-passage or *larynx*, B, allowing the food to glide over it. When a person eats quickly or carelessly, pieces of food may pass beneath the valve into the windpipe, a circumstance popularly spoken of as 'going the wrong way'; or a piece of food may lodge above the gullet and epiglottis, shutting the latter down, and thus producing suffocation. This may happen when masticating stringy meat. Two pieces may be attached like chain shot; one piece is

swallowed while the other remains entangled in the teeth, and the connecting string shuts down the little valve at the top of the windpipe and stops the breathing. The effects are spasmodic cough, protrusion of the eyes, blood or froth issuing from the mouth and nose, the person turning blue in the face and falling down insensible.

Treatment. Place the patient where the best light falls from a window or lamp into the mouth, and then boldly and quickly examine the back of the throat and the base of the tongue by

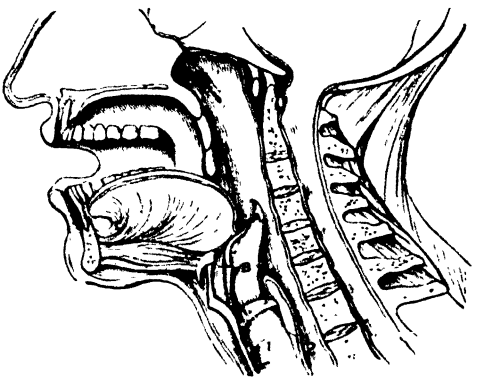


FIG. 50

passing the forefinger well down. If necessary the teeth must be forced and kept open by a piece of wood or handle of a knife. Probably the foreign mass may be touched and hooked up if a hard body, or pushed down if a soft one, with the finger. This will be facilitated by directing that the tongue be put forward, well out of the mouth, and there retained, being grasped by the patient's own fingers (if conscious) covered with a handkerchief. This procedure mechanically draws forward the arches of the palate and allows the operator to sweep his finger well across from one side to the other of the throat. If the finger does not reach the foreign body a sharp blow on the back should be given with the flat of the hand. If the patient is a child, it will add force to the blow if the child is taken between the knees, so as to compress the belly; otherwise much of the impetus of the blow is lost by transmission to the yielding walls of the abdomen. Or the child may be held up by the heels, and inversion sometimes succeeds in dislodging the offending body. Thus fish-bones or other bones or

various foreign bodies lodged high up in the gullet may often be removed by the fingers. They may be brought up by vomiting, occasioned by passing the fingers into the throat in their search, or they may sometimes be dislodged by pressure with the fingers outside. Hard angular, or pointed substances, such as false teeth and teeth-plates, should always, if possible, be got up, and in some instances they may be laid hold of with a long pair of curved forceps. But softer substances, when lodged low down, may sometimes be impelled onwards into the stomach by swallowing large pieces of food, or they may be ejected by an emetic (Prescription No. 30). If necessary, apply artificial respiration (*see* p. 284).

If these measures fail, a *probang* must be passed, to push the intruding substance into the stomach. This instrument is a long stick of whalebone, slightly bent, with a piece of sponge attached to one end and a small hook to the other, as below. If such an instrument is not available, a substitute may be extemporised as follows: Obtain a slip of whalebone or cane, and tie firmly to one end of it a knob of sponge about the size of a marble. Lubricate the sponge with a little butter. The patient is made to sit with the head well thrown back, and the tongue should be put out, when the operator introduces the probang, sponge end first, into the throat *so as to touch the*

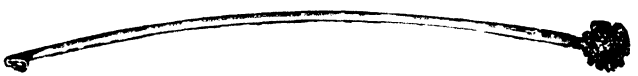


FIG. 51. Probang

back part, and then pushes it gently onwards and downwards towards the stomach, so as to displace and send before it the foreign mass into the stomach; or the hooked end may be passed, in the hope of bringing the foreign body upwards; or a number of loops of thread may be attached to the hook and passed down the throat, as foreign substances have sometimes been thus caught and brought up when other means have failed. But these operations can scarcely be performed except by a surgeon, although they should be tried rather than a sufferer be left without attempts at relief.

Foreign Bodies in the Windpipe cause sudden pain, violent, and a fit of choking, accompanied by intense pain. Should the body not be got rid of by the sufferer's own efforts a fatal result may ensue. If not immediately fatal, the spasm may subside and the body be retained in the windpipe and produce little or no symptoms; there may only be slight cough or slight pain. Notwithstanding this, the patient is in reality in danger, and the body should, if possible, be removed. For this purpose medical aid should be sought without delay. In children, even when no history

can be obtained, a sudden suffocation should raise the suspicion that a foreign body has got into the windpipe. In the presence of a sudden suffocative attack due to the entrance of a foreign body into the windpipe, the helper will act as for a foreign body in the throat and gullet.

Sore Throat. The term 'sore throat' is a popular one used to express any painful disease of the throat. It is necessary for us to be more explicit and to name the disease according to the part of the throat most affected. The disease may be

(*a*) in the pharynx, or upper part of the throat;

(*b*) in the larynx, or lower part of the throat, whence the voice is produced;

(*c*) in the tonsils, two lymph-glands which are situated one on either side of the pharynx.

Each of the above parts may be inflamed, and in any case the inflammation may be acute, that is to say, of short duration and rather severe, or chronic, which is of longer duration and tends to be less severe. The accounts of sore throat will be found, therefore, under the headings Pharyngitis, Laryngitis, and Tonsillitis.

Pharyngitis. *Acute pharyngitis* occurs in the course of many infectious diseases, though in some, such as scarlet fever, the inflammation is mostly confined to the tonsils. When acute pharyngitis occurs alone it is usually due to cold and part of a catarrh involving the nose, and often the larynx as well. There is usually slight fever, but the disease only lasts a few days; it tends to be more severe if the tonsils are affected, when the treatment should be as given for acute tonsillitis.

Chronic pharyngitis may follow repeated at[illegible] pharyngitis, and is common in heavy smokers, alcoholics who have to use their voice much, as clergymen. [illegible] it is a particularly unfortunate affection because it [illegible] the mucous membrane dry and so gives rise to a fee[illegible] of thirst, which the unfortunate man tries to relieve by more alcoholic drink. The voice is often hoarse, but this is when laryngitis exists as well.

In *treatment* the cause must be ascertained and managed accordingly. No tobacco can be allowed, and the food should not be spiced. The general health must be attended to; and relief can

be sometimes given by sucking potassium-chlorate lozenges or other simple or astringent pastilles, such as eucalyptus and red gum pastilles. The affection, however, is a very obstinate one.

Laryngitis. *Acute laryngitis* is usually due to catching cold or the inhalation of an irritating atmosphere. It often accompanies catarrh of other parts of the respiratory passages, such as coryza or bronchitis. First of all a feeling of tickling in the larynx is experienced, and then the voice becomes hoarse and there is a cough. Sometimes the voice may be completely lost. In children the symptoms may be severe, because the catarrhal swelling of the mucous membrane may cause almost complete stoppage of the air passage in their small larynges. There is usually not much fever except in a child.

There is as a rule not much difficulty in diagnosing acute laryngitis except in a child sometimes, where the symptoms will resemble those of laryngeal diphtheria. If there is a false membrane (*see* Diphtheria) to be seen elsewhere in the throat the diagnosis of diphtheria will be clear, but sometimes there is not, and diagnosis then may be difficult.

For *treatment* absolute rest of the voice must be enjoined: no talking, except in a mild whisper. If the disease is severe the patient should be in bed. A moist atmosphere is beneficial, and a bronchitis kettle will give much relief. If there is fever, then 2 minims of tincture of aconite in 1 ounce of Prescription No. 40 every four hours will assist. In the absence of a bronchitis kettle steam inhalations (*see* p. 609) in which some turpentine or eucalyptus oil may be employed are useful. Hot fomentations on the outside of the neck help to ease the pain; but if symptoms of obstruction to breathing occur they may be better eased by the application of cold externally in the form of finely chipped ice.

Chronic laryngitis. The commonest cause is over-use of the voice, especially shouting in the open air. Excessive smoking may also cause chronic laryngitis; chronic alcoholism also. There are other types of chronic laryngitis due to syphilis and tuberculosis, but we are dealing at present only with the simple forms.

Hoarseness of the voice is the principal feature of the disease, sometimes complete loss of voice.

In every case of chronic laryngitis a doctor should be consulted early, and an examination by the laryngoscope is advisable. It is necessary to make sure that the disease is not tuberculous and to

exclude other causes of laryngitis, and this can only be done by a doctor. If the laryngitis be of the simple type the voice must be rested absolutely. Clergymen must abstain from preaching for a lengthy period. Tobacco and alcohol must be avoided. Chronic pharyngitis often accompanies this condition, and the chlorate of potash lozenges and pastilles recommended for that should be used here also. If the services of a doctor are available he will also be able to apply medicaments locally to the larynx.

Tonsillitis. Tonsillitis may be acute or chronic.

Acute tonsillitis, apart from its occurrence in the course of one of the infectious fevers, may result from cold or be rheumatic in nature, or, most commonly of all, be due to infection by some micro-organism. In the latter case a predisposing cause is often a condition of generally lowered vitality resulting from fatigue—as, for instance, the overworked doctor or nurse is more likely to be infected from some patient than when in full vigour, and so gets the familiar 'hospital throat.' There are two varieties of acute tonsillitis:

(*a*) When the disease is superficial, either giving rise to mere redness or, with general enlargement of the organs, giving much suppurative exudation of yellow-white colour. This exudate is usually in tiny patches, but the patches may meet and cover the entire tonsil. The temperature is high, the glands in the neck are often enlarged, and the patient feels very ill. This is called follicular tonsillitis, and affects both sides.

(*b*) When the inflammation is more intense inside the tonsil and there suppurates forming an abscess inside accompanied with much swelling, usually much more on one side than the other. This is called a 'quinsy,' and cure is obtained when the abscess bursts or is opened.

The *treatment* of acute tonsillitis should commence by giving to an adult either two pills of Prescription No. 61 or 5 grains of calomel. If the tonsillitis be not severe, and especially if of the rheumatic type, relief may be obtained by taking 3 minims of tincture of aconite in 1 ounce of Prescription No. 58 every four hours till the temperature falls, or by 10 grains of acetyl-salicylic acid every three hours. Potassium-chlorate lozenges should also be freely sucked. In the severer and septic form of tonsillitis where there is much exudate over the tonsils, then 2 minims of tincture of aconite and 3 grains of potassium chlorate in 1 drachm of Prescription No. 54 every four hours should be taken, and in addition

the throat should be gargled every hour or so, either with the chlorate gargle Prescription No. 21, or with glycothymoline 1 part to 3 parts of warm water. Instead of gargling, and especially for children who cannot gargle, the application of this chlorate solution by means of the spray or the glycothymoline solution by means of the nebuliser (*see* p. 615) is indicated.

Where there is 'quinsy,' *i.e.* an abscess formation as described under (*b*), the abscess should be opened by means of a guarded knife; but if a doctor is not at hand this should not be attempted. Meanwhile the same treatment as for a septic tonsillitis should be adopted, both the medicine and the spray or gargle. In any form of acute tonsillitis relief will be obtained by frequent hot fomentations on the neck; but if the swelling of the tonsils is so great as to threaten suffocation, relief will be obtained rather by cold applications for the time, ice externally and ice to suck.

Acute tonsillitis may be a serious disease, and is often accompanied by high fever, pains in the joints, and other signs of severe illness, but the soreness of the throat is severe enough to direct attention to the tonsils and make the diagnosis. The exudate over the tonsils may be so great as to resemble the membrane of diphtheria (*see* p. 46), and some cases can only be diagnosed by a bacteriological examination.

Chronic tonsillitis. Chronic tonsillitis is a common affection, especially in children, and is often accompanied by adenoids (*see* p. 435). In this disease the tonsils are large and pale in colour. Attention is usually directed to the child's tonsils by the frequent recurrence of sore throats. During the sore throat the tonsils are large and red, and the condition is one of acute tonsillitis; when this acute inflammation has subsided the tonsils remain large and are liable to exacerbations of the acute attack. When very large the tonsils may meet in the middle line and so cause obstruction to swallowing and breathing.

Sometimes the enlargement of the tonsils is tuberculous in origin, and not infrequently the glands in the neck are felt to be enlarged as well.

In this condition local applications to the tonsils themselves are not of much use, and to the outside of the neck less use still. There is nothing so good for the child as fresh country air, especially the seaside or the hills in India. At the same time Prescription No. 71, 2 drachms or more, according to the age of the child, thrice

daily should be given; and cod-liver oil, either pure or with malt extract or in the emulsion, as in Prescription No. 46, is very useful.

But if the enlargement is great or persists for long the tonsils should be excised, and the consultation of a surgeon for this purpose should not be delayed too long or permanent harm may result to the child's respiratory organs.

Fortunately, in older children there is a tendency for them to grow out of this condition as they reach adolescence.

CHAPTER XIII

DISEASES OF WOMEN

MANY women on first coming to India find that they are subject to disorders from which they did not suffer in temperate climates; but care exercised during the first few months while the woman is becoming acclimatised will be repaid by a subsequent freedom from these minor maladies. It is a mistake to suppose that healthy Englishwomen living in India are necessarily subject to female maladies in a greater degree than their sisters in England, though irregularities in exercise, etc., are more liable to be followed by womb trouble in India than in England. The most common maladies affecting the womb are as follows:

Amenorrhœa: Scanty or Suspended Flow, or Failure of the Monthly Courses. The monthly affection of women begins about the age of fourteen and ceases between forty-five and fifty. In Indian women it usually begins a couple of years earlier. It may be suspended or fail under the following circumstances: First, it is not present, as a general rule, during pregnancy or suckling; secondly, instead of appearing at the usual age it may be delayed; thirdly, the monthly flow may cease for a time after an attack of fever, etc.; fourthly, the non-appearance of the discharge may depend on some mechanical obstruction or on disease of the womb; fifthly, it may be concomitant with "change of life," or the result of anæmia or other constitutional disease.

First: When the cause of failure of the monthly flow is pregnancy there are other symptoms of such condition.

When the flow is absent during suckling it is in accordance with nature, and no treatment is required.

If the flow occurs when a woman is suckling it is usually advisable to discontinue the suckling as the milk at that time is liable to upset the nursling's digestion.

Secondly: When the discharge is delayed the girl may be pale

and weakly and poorly developed. The non-appearance of the discharge at the usual age in a healthy girl need cause no anxiety, as in some cases development is late, the discharge does not begin till sixteen, but then is established and continues regularly.

However, should the girl be subject to periodical attacks of pain in the back and loins, irregular recurring headaches, white discharge, palpitation of the heart after slight exertion or mental agitation, or dropsical swelling of the legs, arms or face, she should be carefully treated, as these symptoms are indicative of anæmia and may be cured, and the monthly flow established regularly, if treatment is efficiently performed. Girls are especially liable to acne, characterised by the presence of 'blackheads' on the face and chest or back at the age of puberty, *i.e.* when the monthly flow begins to be established.

Exercise in the open air, especially on horseback, but without tiring the patient; a generous but wholesome diet; cheerful society, especially of healthy girls about her own age, without undue excitement or late hours; the avoidance of close rooms, especially of ill-ventilated sleeping apartments; and cold or tepid bathing, will do much good. Change of scene with unfatiguing travel, and salt-water bathing during the intervals between the monthly periods are also often beneficial. The bowels must act regularly, if necessary with aperients; but regular action of the bowels is best achieved by means of diet (*i.e.* by giving fruits, jams, marmalade, and brown bread or porridge) and exercise. It is better to use special abdominal exercises and massage of the abdomen than to permit the habitual use of aperient drugs to keep the bowels acting. Aperients, together with hot foot- or hip-baths to which a little mustard may be added with advantage, should be taken a day or two before the expected period if there is irregularity in the flow; and at such times cold baths should not be used, and over-exertion and excitement should be avoided. When a girl suffers from periodic pain in the back or loins unattended by the regular discharge, it is well to apply a mustard-and-linseed poultice over the abdomen below the navel, and on the loins at night when she goes to bed, and to make her sit, carefully wrapped up in a blanket, with her feet and legs in hot water with mustard (one tablespoonful to the gallon) for fifteen minutes before getting into bed. This treatment repeated two to three nights monthly for two or three months may establish the flow, especially when

accompanied by the general treatment above mentioned. After the foot-baths and poultices special care must be exercised to prevent chills.

If these means are insufficient to establish the flow, especially if any weight or fulness is felt in the pelvis, the girl should be examined medically to determine that there is no abnormality of the pelvic organs.

Thirdly, the menses have ceased for a time. It must be borne in mind that at first the monthly period usually does not appear regularly. The constitution seems to require the influence of habit, and for some time irregularity of flow may be the rule, not the exception. In the early months also slight causes may induce suppression of the periods. Damp feet, sitting on damp ground, cold bathing, fatigue, severe excitement or fright, or overwork will sometimes suddenly check the discharge if present, or may prevent its reappearance if any of these causes occur at about the time the period is expected. Sitting on damp ground or cold bathing at or immediately after the period may be followed by an acute attack of pelvic inflammation. When the discharge is suddenly checked or prevented there is usually headache, lassitude, and probably pains in the lower part of the abdomen. Interruption of the menses may be caused by the attack of fever. The periods are especially liable to be scanty or suppressed for a couple of months after an acute attack of malarial fever. Debilitating diseases such as consumption, Bright's disease, and diabetes may cause scanty menses or complete suppression of the flow. But such stoppages are gradual and are not followed by headaches, flushing of the face, pain in the back and loins; while there are the symptoms of the other diseases which may be present, which will serve to point out the cause of the suppression.

Treatment. When the stoppage of the monthly flow occurs as a consequence of some debilitating disease no special treatment directed to produce the flow is desirable, but when the stoppage occurs in otherwise healthy women the treatment with hot foot- or hip-baths and poultices detailed above will usually be successful. Delicate patients must be invigorated by means which improve the state of the blood (iron in some form, as Prescription No. 50 or 51) and give tone to the system. If sudden stoppage occurs after the menses have been established, a hot bath at 106° Fahr. is generally

successful if taken immediately after the exposure to cold or other cause of suppression.

When the suppression of the discharge is due to acute pelvic inflammation the pain is so great as to necessitate medical attention.

Fourthly: The non-appearance of the discharge may depend on some mechanical obstruction, or disease of the womb. Obstruction chiefly occurs among young girls; disease among older women. The means directed in the foregoing remarks having failed, after a fair trial, to produce the desired effect, a doctor should be allowed to examine the patient in order to ascertain if any anatomical obstruction or any disease exists. Such examination should on no account be delayed if the patient complains of much pain in the lower part of the abdomen, or of persistent white discharge.

Fifthly: Stoppage of menses from the '*change of life*' is considered under that heading.

Caution. In any kind of delayed or supressed discharge, medicines which excite the flow of the menses should not be used excepting under medical advice. These may prove dangerous and have often done much injury when administered by quacks or well-meaning but ignorant friends. Suspended flow may usually be overcome without such medicines, and if the individual is otherwise in good health, need not be the cause of much anxiety. If the patient is not in good health such self-drugging may be but wasting valuable time and allowing the disease which is the cause of suppression to become firmly rooted. The fear of 'decline' or other malady as the *consequence* of delayed menstruation is not well founded. The delay is the effect rather than the cause of such malady.

Dysmenorrhœa, or Painful Menstruation. This is fairly common, and is generally indicative of congestion about the womb or ovaries. In exceptional cases it is due to the womb being bent backward, or it may be due to inflammation about the womb and ovaries, or to neuralgia affecting the ovaries.

The symptoms are tenderness and pain in the lower part of the abdomen, especially just above the groin, and often most on the left side; pain in the back; a feeling of weight or bearing down in the pelvis, with extension of pain into the legs, and in most cases colicky pains in the region of the womb. If the pain is very severe there may be nausea, vomiting, diarrhœa, sudden desire to pass, and pain in passing, water. Such symptoms

may precede the monthly period by a few hours, or sometimes days.

The symptoms may disappear with the onset of the discharge, or they may continue with the passage of clots of blood or shreds of membranes until the discharge ceases. As a rule there is most pain when there is least discharge.

The treatment consists in maintaining the bowels moderately open, in avoiding all exposure to damp and chill for three to four days previous to the expected period, while at the same time guarding against idleness and want of occupation, which tend to constipation and a mental and nervous condition favourable to any malady. When pain occurs, a warm bath at the beginning of the attack seldom fails to give relief. After leaving the bath the patient should dry quickly and go to bed, wrapping up the abdomen in hot flannels or putting a rubber hot-water bottle on the loins and abdomen. If the bath is not available the patient may sit in a deep basin of hot water or fomentations may be applied over the loins and lower abdomen; phenacetin or acetanilid in 3-grain doses sometimes relieve the pain. Brandy, whisky, or wines should not be given; bromide of potassium, Prescription No 55, may be given and repeated three- to four-hourly If the pain assumes a neuralgic, periodic character, returning at regular intervals daily or twice daily, give Prescription No. 36 three times daily. During the intervals the patient should take regular moderate exercise in the open air. Late hours and irregular meals must be avoided.

When dysmenorrhœa is persistent and does not yield to the above-mentioned remedies it should be ascertained if any displacement or obstruction exists.

Menorrhagia: Excessive Menstruation. In the amount of the discharge, the attendant symptoms, the duration of the period and the interval between the periods, every woman is a law unto herself. But if a woman who has habitually had a period lasting three days at intervals of twenty-eight days begins to have periods lasting four to six days at intervals of twenty-one to twenty-five days, such a woman is suffering from menorrhagia and should not neglect to be properly treated.

Excessive menstruation is usually due to congestion or inflammation of the womb with displacement thereof, but it may be the result of general disease, such as the early stages of heart or kidney disease, or of inflammation of the liver. Excessive menstruation

is very likely to occur in women who have suffered much from over-nursing or from frequent pregnancy, and sometimes when a doubt of pregnancy exists it may be difficult to distinguish this condition from miscarriage; or it may be due to a tumour in the womb.

In all cases of profuse menstruation rest in the horizontal position is indispensable, with perfect quietness. The diet should be low, consisting of milk and light puddings, the drink being water, barley-water, or cold weak tea; wine or spirits should on no account be given. Everything should be given cold or very cool, since hot drinks may increase the discharge. Quinine must be avoided as it has an action on the womb stimulating the flow. If the liver is inactive and the bowels costive, calomel 3 grains, or Prescription No. 61, may be given.

During the intervals the patient should sleep on a hard bed, and the clothing should be light, the sleeping-room well ventilated, bowels moderately open.

Prescriptions for Menorrhagia. (1) To regulate the flow, viz.:

Extract Hamamelidis Liquidi	℥. x
Ammonii Chloridi	gr. ij
Peppermint water	oz. ½

Dose one tablespoonful, ½ ounce, to be taken three times daily during the month: this is very useful if the patient suffers from irregular and excessive periods on first living in a tropical climate.

(2) To check an excessive flow:

Extracti Ergotæ Liquidi	℥. x
Acid Gallic	gr. v
Water to	oz. ½

Dose ½ ounce, to be taken every four hours when the flow is profuse.

Inflammation of the Womb may be acute or chronic. It may occur in connection with disorders of menstruation, or without such prior ailment; when acute the malady begins with cold or shivering, followed by quick pulse and fever. There is pain, increased by pressure, over the lower abdomen, the patient lying in bed with her knees slightly drawn up. There is pain about the loins and thighs, difficulty and frequency in making water (which is hot and scalds, and becomes turbid as it grows cold), a sense of weight or 'bearing down,' swelling of the abdomen, fever, nausea,

and vomiting. After the first few days there is usually a light-coloured discharge, which may grow yellowish-red or dark red. There may be diarrhœa with pain on passing a stool, and if the woman is subject to piles these may become congested, increasing the distress. The causes of inflammation of the womb are: cold (especially cold after confinement, or during or immediately after the monthly period), the use of too strong drugs or injections, the use of dirty pessaries, too frequent sexual intercourse, injuries or infection during childbirth.

The *treatment* consists of rest in bed, with linseed poultices or poppy-head fomentations applied over the lower abdomen. Unless there is diarrhœa a purgative should always be given, as hardened fæces in the lower bowel may press against the womb and mechanically irritate that organ. The diet should be light and chiefly fluid; the drink, water or barley-water. Rest in bed in the horizontal posture is essential, as walking, standing, or even sitting is very injurious and may cause a relapse. If neglected, inflammation of the womb may terminate in the formation of an abscess somewhere in the neighbourhood of the organ. This may be suspected if a recurrence of shivering with rise of temperature, as shown by the clinical thermometer, takes place during the existence of pain and tenderness as above described. If these signs supervene the help of a doctor should be sought, as neglect of an abscess in the pelvis may cause a great deal of distress and in some cases almost permanent disablement.

Chronic Inflammation of Womb. This is a minor degree of the above condition. It may result from the acute form if the patient has not had a sufficiently prolonged course of treatment from the beginning of the acute stage. In chronic inflammation there is more or less pain and tenderness about the lower part of the abdomen, with "whites," a sense of bearing-down pain in the loins, and painful monthly periods. If long continued it may lead to structural alterations about the womb, such as enlargement and displacement. The best treatment is by means of douching with water as warm as can comfortably be borne. The patient should avoid standing about: with a little care a woman can manage many of the ordinary household tasks when sitting down as well as when standing. In very severe cases of chronic inflammation the patient should be put to bed and kept in bed lying down, with a good nurse in attendance. In the less severe cases she can get about her

occupations, taking care to rest in the recumbent position as much as possible and to guard against any tendency to constipation by taking fruit, vegetables, or occasional aperients. In this, as in all womb affections, horse exercise cannot be permitted. When the symptoms are persistent medical advice should be obtained.

Womb Displacement, or Falling of the Womb. This consists most usually of a falling of the womb below and behind its natural position. The womb, which is pear-shaped, may bend forward, backward, or to either side. In such cases the body inclines in one or other of the directions mentioned and the neck remains more or less in its normal position, the result of which is that the womb gets a sharp bend at the point where the body joins the neck.

Backward displacement of the womb is most frequent in women who have been neglected during the confinement or have got up too soon after child-birth. It may occur in the first instance suddenly after exertion, as in lifting heavy weights, or it may have come on gradually from local weakness of the ligaments of the womb, or from general muscular weakness. It happens in every degree, from very slight falling to protrusion of the womb externally, or from a slight inclination from the proper position, to injurious pressure on bladder, rectum, nerves, or blood-vessels. The symptoms are feelings of weight and bearing-down pains, with a sensation of fulness in the pelvis, tenderness and aching about the groins and thighs, and frequently "whites." The bearing-down feeling is relieved by lying down. There is often a frequent desire to pass water, with, in some cases, inability to do so, caused by pressure on the bladder when the body of the womb is displaced backwards so that the neck of the womb presses on the neck of the bladder. Constipation is a common symptom due to pressure of the womb on the rectum. There is usually congestion of the uterus from interference with the circulation of the blood therein. There is also frequently dyspepsia and flatulent distension of the bowels, which helps to produce the depression of spirits which is such a marked feature in these cases.

Displacement is sometimes associated with dysmenorrhœa, and may be complicated by 'ulceration' with a discharge from the vagina. Displacement when accompanied by ulceration is a frequent cause of sterility.

Treatment. This varies with the degree of displacement. In the mild cases measures which lessen the congestion are all that are required. A douche of Condy's Fluid, one teaspoonful to a pint of lukewarm water, or of washing soda, one teaspoonful in a quart of lukewarm water, should be injected into the vagina once daily. The patient should lie on her side, or face downwards, and should assume the knee-chest position for ten minutes two or three times daily. By means of this position the uterus falls back into its normal place and the congestion is lessened. To get into the knee-chest position the patient gets on her knees on the floor and then bends forwards till the chest rests on the floor; she keeps in this position for a few minutes at first, gradually increasing until she can remain in it for ten to fifteen minutes.

If the displacement is considerable it may require replacement at the hands of a gynæcologist. When displacement has occurred it is likely to return, and instruments called pessaries may be necessary to hold it up. If these fail it may be necessary to fix the womb in position by means of sutures. Pessaries may be the cause of ulceration, and need to be removed for cleaning at regular intervals.

Womb Ulceration. This is a sore at the mouth of the womb, which may be slight or severe, innocent or malignant. It arises from injury from ill-fitting or dirty pessaries, or from chronic inflammation and displacement of the womb. The symptoms are white discharge, sometimes unpleasant smelling, chronic backache, and increased loss of blood at the monthly periods. It cannot be positively stated that ulceration exists without examination, and when so found it requires careful medical treatment until it is healed. If a woman notices that there is a blood discharge after sexual connection it probably indicates ulceration which may be malignant.

Whites (Leucorrhœa). This means an increased secretion from the vagina. The discharge may be white like the white of an egg, or yellowish, and may be slight or amount to several ounces daily. The causes are anæmia, chronic inflammation or displacement of the womb, congestion due to excessive sexual intercourse, frequent child-bearing, and tumours in the womb or its neighbourhood, and ulceration of the mouth of the womb.

The *treatment* consists in careful attention to any womb affection which may be present. If there is no obvious cause the

general health is attended to, bowels are kept regular, proper exercise is taken, and the patient should be as much as possible in the open air. To arrest the discharge, alum lotion one teaspoonful to the pint, or bicarbonate of soda in the same strength, may be used. In children a white discharge may be due to thread-worms, which, escaping from the rectum, find their way into and irritate the vagina. In such a case the treatment would be to get rid of the worms with santonin powders or quassia injection and to keep the parts scrupulously clean.

Change of Life (Menopause). The monthly discharge in women begins about the fourteenth and ends about the forty-eighth year. It is to the period of cessation that the term 'change of life,' or menopause, has been applied. This period is popularly supposed to be fraught with danger to women, and there is often considerable suffering at the time, and in some women a more than ordinary liability to various ailments. The majority of women pass through this time without any great derangement of health, the monthly flow becoming more scanty until it ceases altogether. The most common symptoms associated with the menopause are flushing of the face, giddiness, sweating, throbbing of the blood-vessels in the head, headaches, nervousness, despondency, irritability of temper, palpitation of the heart, and gradual cessation of the monthly flow. Less common but well-known symptoms are digestive troubles, such as nausea, constipation, and bad taste in the mouth; pain in the neck, and numbness and tingling of hands and feet. The woman becomes less active and usually puts on flesh. Sometimes the monthly flow ceases for two, three, four, or even six months, and then reappears somewhat more profusely than normal, to cease again either temporarily or permanently. There should be no irregular discharge of blood at the menopause, and the periods should not be more profuse than normal at this time. If there is any marked increase in the monthly flow at this time the woman should not hesitate to be examined carefully. Cancer of the womb frequently occurs at the change of life, and makes much headway before examination, because the woman considers the profuse, and possibly irregular, discharge of blood which troubles her incidental to this change. If every woman who suffered from excessive and irregular monthly discharge from the age of thirty-seven years and upwards were examined early by a skilled doctor, the mortality of women from cancer would be

quickly diminished. At present the only means of curing a patient suffering from cancer is complete removal of the affected part: this is possible only in the early stage of the disease; and if the woman neglects for some months an irregular blood discharge she may find too late that a cancerous growth was the cause of the trouble. In many cases the patient has no pain in the early stage of the disease, and therefore no woman should neglect to be examined thoroughly because she has no pain.

While irregular and profuse menstrual discharge sometimes occur in healthy women at the change of life, such discharge should never occur after the change; consequently a woman should immediately be examined if she begins to suffer with any sort of discharge from the womb after the change of life has been established, as only too frequently cancer is the cause of this discharge.

While emphasising the importance of attending to such irregular hæmorrhages, we would not wish it to be thought that cancer is the only cause of such irregularity at the menopause, but it is only after thorough examination by a competent physician that a correct diagnosis can be established, and therefore we would advise every woman suffering from such irregularity to lose no time in submitting to a thorough examination.

Treatment. The bowels must be kept freely open; sweating should be promoted, as women who perspire freely have less trouble than others during this period of change; the woman should be careful not to over-exert herself, but at the same time she should not allow herself to sink into a condition of semi-invalidism; she should also try to occupy her mind with outside interests. Further, she should remember that the inconveniences and discomforts from which she is suffering are but a temporary phase, and if she lives a careful and well-regulated life during the time she will have many healthy and comfortable years afterwards.

For the headaches, flushing and giddiness, the best remedy is small doses of potassium bromide; Prescription No. 55 may be taken two or three times daily.

Breast Inflammation. This occurs most frequently in nursing women but may be present in others, especially in pregnant women. It may arise from injury or from suckling a child when the nipples are cracked and sore.

If the child dies or is weaned too suddenly, the breasts become engorged but not inflamed if the treatment noted below be followed.

When inflammation occurs towards the end of suckling it is the result of over-suckling and weakness.

Inflammation of the breast is most common after a first confinement, as the nipples are then most tender and liable to crack with suckling. Inflammation of the breast is accompanied by sharp shooting pain, fever, possibly with shiverings, hardness of the breast, and, later, heat and redness of some part of the breast is observed; there is generally considerable swelling of and great pain in the breast from the beginning of the inflammation. The secretion of milk may be stopped, but this does not always occur if the inflammation is partial. The pain and tenderness are increased by moving the arm.

Treatment (I) *of Engorged Breasts.* As above stated, if the child dies or is weaned too suddenly the breasts become engorged and painful, and there may be fever. In such a case the treatment of the breasts is: (1) Allow no one to touch the breast. (2) Restrict the amount of fluid very considerably; the less fluid the patient drinks for two or three days the more rapidly the engorgement will disappear. (3) Give the woman a large dose of Epsom salt daily to move the bowels very freely. Prescription No. 53 should be taken twice daily. (4) If the patient is in such severe pain that she cannot sleep. a Dover's powder, 7½ grains, may be given at night. If this regimen be carefully followed the woman will be perfectly well in four to five days. If, however, the breast-pump is used and belladonna plasters or other drugs be applied to the breasts the patient may get a breast-abscess, which may take a long time to heal.

(II) *Of Inflamed Breasts.* If the woman has a sore nipple and the breast become inflamed and hard in one part only, the best treatment is the application of lead-and-opium lotion constantly until the inflammation subsides.

(N.B.—The difference between engorged and inflamed breast is this: the engorged breast is uniformly enlarged and hard, but not red; the inflamed breast is hard and tender in one spot, which may be in any part of the breast, but is often above the nipple.)

If the inflammation is subsiding the pain and tenderness leaves the breast and the hard patch rapidly becomes smaller. If, however, the inflammation does not subside, 'matter' forms in the breast, constituting abscess of the breast. After feelings of feverishness and shooting pains the breast enlarges at one particular spot, with

throbbing pain; the skin becomes red and shiny. If not incised with a lancet this spot becomes very prominent and pointed and finally bursts, permitting pus or matter to escape. As soon as this pointing is perceived the matter should be let out by lancing, the incision made being large and in a direction from the nipple to the circumference and not across the breast, from which an unsightly scar results. An early use of the lancet in abscess of the breast will prevent much suffering which may arise from the burrowing of matter, unable to find an exit, in the substance of the breast. After incision the wound should be covered with lint or clean old linen, on which boric powder has been sprinkled. The patient must not be allowed to suckle the child from the opposite breast, as suckling will keep up the inflammation and discharge from the inflamed breast. If breast-abscess is neglected the matter burrows, the whole breast becomes diseased and even destroyed, and its surface is riddled with small holes—'sinuses'—from which matter is discharged on pressure; such a condition needs a surgical operation with skilled attention for some considerable time afterwards.

As breast-abscess is painful and exhausting, the patient must be put on to a generous diet and some tonic, such as Fellowe's syrup, one teaspoonful in water thrice daily after meals; or Prescription No. 50 three times daily after meals should be given.

Sore Nipples. Cracks about the nipples, occurring during suckling, not only give rise to great pain but may also cause inflammation and abscess of the breast. All nipples are liable to crack if not washed and dried after nursing, but the dark-coloured nipple is less liable to become sore than the pink one. The nipple should never be left in the child's mouth after the process of suckling is finished, as that makes the nipple sodden and more liable to crack. It should be remembered that sore nipples may arise from 'thrush' in the child's mouth, which must be cleaned as well as the mother's nipple.

When nipples are simply tender but not cracked, hazeline ointment is the best application, and care should be taken that the dress does not press upon the tender part. The nipple should be covered by a nipple-shield when the child is suckling. After suckling the nipple should be bathed with equal parts of brandy or eau-de-Cologne and water; or alum-water may be used, and a little hazeline ointment should be afterwards applied.

When cracks exist, if small they should be covered over with

Friar's-balsam or flexible collodion to seal them up. If there is a deep crack or fissure it should be washed with alum-water before and after suckling, and the nipple should in all cases be protected by a well-fitting nipple-shield through which the child sucks. If the crack is very large, suckling from that breast should be suspended for a short time to enable the crack to heal, as the child may get indigestion from the blood which comes from the crack, and the mother may get a breast-abscess if she persists in nursing the child.

Breast Pain. The breasts are likely to become enlarged and tender just before the monthly periods. This pain lasts a few days, but gives no great trouble if the breast has not at some time been actually inflamed. In women reaching the change of life the breasts may become enlarged and painful and the woman may feel a tender lump in some part of the breast. If there is any suspicion of a lump the patient should submit to a careful medical examination, as cancer of the breast is common in women.

Pain in the breast may be troublesome in girls about the period of the establishment of monthly courses, and occasionally in boys about the age of puberty. The pain may be due to neuralgia, and in this case it comes on periodically, at regular intervals of twelve to twenty-four hours. In women living in the tropics severe pain in the breast is sometimes cured by regular dosing with quinine, *e.g.* Prescription No. 51 three times daily.

Breast Cancer. Cancer of the breast mostly occurs in women past middle life. The more usual form of cancer begins as a small, hard swelling under the skin near the nipple, in which the patient often complains of sharp, stabbing pain. It gradually spreads, involving the substance of the breast and drawing down the skin of the nipple. So long as the mass is movable and the glands in the armpit are not enlarged there is hope of cure by excision, but if the mass is very large operation is not likely to prove successful, and when it becomes an open sore the possibility of complete removal is very slight. Women at the change of life often imagine that the tenderness which is likely to occur then in the breast is due to cancer, and in order to put their minds at ease they should have a careful examination as soon as possible. If the case is one of cancer, the earlier removal is effected the better are the chances of recovery; if it is not cancer, the sooner the woman is reassured on that head the better it will be for her nervous system.

Breast: Other Diseases. Other diseases which develop as tumours in the breast are principally:

(1) Adenoma or fibroma, generally met with in women between the ages of twenty and thirty. The growth begins as a hard nodule. When small it is freely movable. The veins under the skin become enlarged, but there is little or no pain. The skin is movable over the tumour and rarely ulcerates.

(2) Cysts. Cysts are composed of a bag containing fluid. They are most common in women between twenty to forty years of age. A cyst begins as a small round, hard lump, which may attain a large size, affording to the fingers the sensation of a fluid moving from side to side. All such maladies require surgical operation.

Pruritus. Irritation of the private parts often takes the shape of intense itching or smarting, which prevents sleep and so destroys the health. It may depend on personal uncleanliness, or be associated with bladder or bowel disturbance, or with diseases such as diabetes, in which an unusually large amount of urine is passed, so increasing the moisture of the parts, or with eczema extending from the groins to the private parts; or lice infesting the hairs about the parts may cause it; or it may result from irritation of the discharges in cancer of the womb, or in 'whites'; it often occurs in pregnancy as a result of the congestion of the privates. Finally, it may be due to an abnormal condition of the nerves ending in the skin. The itching skin may show no abnormality, or there may be an eruption of minute watery vesicles. The treatment must depend on the cause. If it be due to 'irritable bladder,' copious draughts of water or barley-water, with avoidance of all spices and made-up dishes and wines, spirit or beer, will soon relieve the irritability. If due to bowel trouble, thread-worms (q.v.) may be the cause, or diarrhœa or constipation may set up an irritation. As a local application for the intense itching, cold or iced water or carbolic lotion 1 ounce in 1 pint of water may be used. If the irritation is accompanied by the eruption of vesicles, lead lotion or alum lotion may be used. Bran baths, or baths of borax or washing soda 2 ounces in twenty-five to thirty gallons of hot water, are sometimes very beneficial. If the itching is due to lice the hair should be shaved off the parts, and mercury ointment or white precipitate ointment be applied. A thorough application of soap and water should always be used before other remedies are tried. If the itching is due to eczema the parts should be freely anointed

with olive oil or vaseline after cleansing with bran and water—in this condition soap should be avoided. Pruritus is nearly always worse at night than at other times.

Ovarian Dropsy. This may be a true dropsy due to irritation of the abdomen by a rapidly growing tumour of the ovary; or it may be a cystic tumour of the ovary. In the latter case it is due to the gradual distension of the parts called the ovaries by fluid. The ovaries being situated on each side of the womb in the pelvis, the tumour or swelling occurs on one or other side in that position. But the tumour may appear central in the later stages. The growth of the tumour is usually slow, and the health and strength of the patient may remain long unimpaired, until the bulk and pressure of the tumour on neighbouring parts brings on difficulty of breathing and swelling of the feet. As the only treatment is surgical, it is advisable for the patient to have the tumour removed early rather than wait for the unpleasant symptoms which occur as it grows.

CHAPTER XIV

PREGNANCY AND LABOUR

Pregnancy. The pregnant condition lasts from 273 to 280 days, or about 40 weeks. The following Table is for calculating the period of pregnancy.

Nine Calendar Months			Ten Lunar Months		
From	To	Days	From	To	Days
January 1	September 30	273	January 1	October 7	280
February 1	October 31	273	February 1	November 7	280
March 1	November 30	273	March 1	December 5	280
April 1	December 31	273	April 1	January 5	280
May 1	January 31	273	May 1	February 4	280
June 1	February 28	273	June 1	March 7	280
July 1	March 31	273	July 1	April 6	280
August 1	April 30	273	August 1	May 7	280
September 1	May 31	273	September 1	June 7	280
October 1	June 30	273	October 1	July 7	280
November 1	July 31	273	November 1	August 7	280
December 1	August 31	273	December 1	September 6	280

The above 'Ready Reckoner' is used as follows: A woman has ceased to be 'poorly' on July 1; her confinement will be at the soonest about March 31 (*the end of nine calendar months*); or, at the latest, on April 6 (*the*

end of ten lunar months). Another has ceased on January 20; her confinement will be on September 30, *plus* twenty days (*or October 20, the end of nine calendar months*), at the soonest; or on October 7, *plus* twenty days (*or October 27, the end of ten lunar months*), at the latest.

Signs of Pregnancy. (1) Cessation of the monthly flow—which, however, in exceptional cases may not occur. (2) Morning sickness: this usually begins six weeks after conception, but may be a little earlier; it usually lasts six weeks. (3) Enlargement of the breasts, generally after the first month, occasionally not till the third month. (4) Enlargement of the coloured ring of tissue which surrounds the nipple; this occurs in the third month, and at the same time the nipples and breasts may become tender; about the fifth month there may be oozing of fluid from the breast; in a first pregnancy this is clear and yellowish, in subsequent pregnancies it may be milky. (5) Enlargement of the abdomen: this does not take place till after the third month. (6) Quickening or movement of the child: these begin between four and a half to five months, and are sometimes accompanied at first by faint feelings. (7) Pulsation of the child's heart: this resembles the ticking of a watch under a pillow, can be heard from four and a half months onward, and is audible on putting the ear on the abdomen either in the midline below the navel, or in a line joining the hip-bone with the navel on the left side. (8) Movement of the child, which may be felt externally after the sixth month on placing the hands on the abdomen. (9) Variations in temper, disposition and appetite, the woman becoming capricious and showing desires for special and sometimes unusual articles of diet.

Treatment of Pregnancy. Pregnancy is a physiological state, and therefore the woman should continue to live a regular and healthy life. She should take exercise daily, some women playing tennis regularly for the first four months; this need not be discontinued if the woman is healthy and is accustomed to playing: the same may be said of horse-riding, but the woman should take care not to ride a too spirited animal. Walking exercise is the form which may be indulged in until the end of pregnancy, and if the woman is in a hilly district walking up and down the hills will strengthen the abdominal muscles and render labour easier. The woman should keep regular hours, should avoid hot and stuffy rooms, late nights and dancing. The diet should be generous and varied, and the capricious appetite may be indulged

unless the articles specially desired are definitely harmful to the woman. If the pregnant woman is exposed to sudden strains or to shaking, the womb may be excited to premature action and miscarriage is liable to occur. As the danger of any disease is increased if it occurs during pregnancy, any unhealthy pursuit should be discontinued. It is especially deleterious for a pregnant woman to sleep in a badly ventilated room, for as the child grows there is a great need for pure air. The clothing should be warm but easy. Stays may be enlarged by a gore of elastic on each side, or special maternity corsets may be worn. The breasts should have plenty of room; and if the nipples are tender or irritable they should be bathed daily with eau-de-Cologne or whisky-and-water or with alum-water. If the nipples are depressed they should be pinched and drawn up between the fingers regularly every day. In healthy pregnancies no medicine is needed, except possibly to overcome constipation; this is best done by taking Prescription No. 53 (half dose) or cascara pills. Castor oil should be avoided, as it tends to constipate afterwards; powerful purgatives and patent purgative pills should also be avoided, as these are deleterious in pregnancy.

Preparations previous to Labour. Bathrooms, water-closets and drains should be well cleansed. Proper disposal of refuse should be insisted upon. The best-ventilated room obtainable should be selected for the lying-in period, and it should not be kept too warm either before or after labour, as is generally the case in the cold season of northerly districts. The antecedents of the nurse should be inquired into. If within four weeks previous to the woman's confinement the nurse has been engaged with a scarlet fever or a blood-poisoning case, or with a woman suffering from puerperal fever, she should not be employed. If she has been attending any other diseases or burns or scalds, she should have a full bath and wash her hair with carbolic soap and wear a fresh dress. Arrangements should be made for a good supply of pure absorbent cotton-wool, to be used as sponges during labour. If practicable, artificial aseptic sanitary towels and sponges should be obtained. All these things, if used, should be burnt after the labour. Plenty of ordinary napkins should be boiled previously, then dried, well aired, and put ready to hand. Arrangements must be made for an ample supply of both hot and cold water. If it is a first labour, and therefore likely to be long, light nourishing

food should be prepared—*e.g.* egg-and-milk, lightly boiled egg with toast, hot milk, or beef-tea or other soup—and a feeding-cup should be obtained. A chamber utensil to receive the after-birth and a bed-pan and an enema syringe should be in readiness. Other things which should be ready beforehand are: a large square of flannel called the receiver or an old blanket or shawl for the child to be placed in at its birth; a waterproof sheet, or, failing this, a large piece of new American cloth to prevent the mattress from being soiled by the discharges; the bandage for the child; the child's clothing; large and small safety-pins; three or four ligatures to tie the navel-string, as below; blunt-pointed scissors to cut the string; soft linen for dressing the navel; some pieces of fine soft linen to wipe the baby's eyes, nose, and mouth at birth—these should be placed in boric-acid lotion; sweet oil to remove the cheesy material covering the baby; Wright's Coal-tar or Vinolia bath soap and a fine sponge for washing the child; 'blue-seal' vaseline in a wide-mouthed bottle.

The binder for the infant should be of thin flannel about 5 inches broad and 36 inches long, *i.e.* long enough to go twice round the body.

The ligatures for the navel-string should consist of silk or sewing-thread, as cotton is not strong enough and tape may slip. Each ligature should be composed of ten threads loosely rolled into a cord and tied in a knot at both ends so that they may lie evenly.

[The following layette will be found useful for babies in India: twelve day shirts; eight night-gowns; four monthly gowns; six day flannels; six night flannels; five flannel binders and five markeen many-tail binders to wear over the flannel; four robes; three dozen diapers; four long petticoats; six pairs wool boots; six flannel pilches; four cradle-sheets; four pillow-cases; two blankets and eighteen *gudris*, which are 30 inches square and made of garrah quilted with markeen.]

Labour. This is the common term for a confinement. If the birth takes place before three months it is called an abortion, before six months a miscarriage, and between six and nine months premature labour.

The signs of *approaching* labour are: a sinking downward and forward of the abdomen, a feeling of physical well-being, frequent desire to make water, perhaps griping and a sensation of squeezing, and a mucous discharge sometimes stained with blood and known

as 'the show': all or any of these signs may occur some hours, or even a day or two, before actual labour pains begin. With the symptoms of approaching labour the patient's bed should be prepared. A hard coir or horsehair mattress is preferable. Over this is the usual blanket and sheet, over which should be placed a long sheet of india-rubber or American cloth, which should be fixed to the bed at the four corners with safety-pins; then on this 'guard' a blanket folded four times, then a sheet doubled in a similar manner, which is called the 'draw-sheet.' All this is to absorb the discharges and to prevent the mattress on which the woman has to lie afterwards becoming soiled. After labour is over and the mackintosh-sheet and extra blanket and sheet are removed, the bed should be quite dry. A strong towel should be attached to the head of the bed for the purpose indicated after. The woman's dress should consist of a nightdress, petticoat, and dressing-gown. As labour progresses the nightdress is rolled up above the waist so that it may not be soiled, and the petticoat and dressing-gown are removed; she is then covered with a loose sheet, which is taken away later with the 'guard' and draw-sheet. If the bowels have not acted freely within six hours an enema of soap and water should be administered. (N.B.—Carbolic soap should never be used for enemata.) Emptying the bowels removes the mechanical obstruction to the progress of the baby's head offered by a hard mass of fæces in the bowel, ensures cleanliness, and prevents discomfort; for the contents of the lower bowel, if this be full, are forced into the bed towards the end of labour.

The beginning of labour is denoted by pains in the back and abdomen below the navel; these pains recur at regular intervals and gradually increase in strength. At first the pains resemble cramp and worry the woman a great deal; when these pains have lasted for some hours the waters generally break, and the woman then gets bearing-down pains, during which she shuts her mouth and bears down as if she were trying to relieve the bowels of a constipated stool. There may be slight shivering and vomiting during the first pains. The patient should be encouraged to walk about or to sit up, as this accelerates labour; she should relieve the bladder and bowels from time to time, and may sit in a bath of hot water before the waters break. The hot water relieves the first stage pains. After the waters break the pains recur every seven to ten minutes and get stronger. The patient should now

take to her bed and lie on her back with the knees drawn up. When the bearing-down pains occur the patient should hold her breath, place her feet flat on the bed, and pull hard on the towel attached to the head of the bed. This assists the expulsive efforts of the uterine and abdominal muscles. The time of labour varies from four to twenty-four hours, being generally longest in those having a first child. In ninety-five out of every hundred cases the head of the child first emerges, the rest of the body soon following.

The main points to care for during a normal labour are :

First. To support the perineum, *i.e.* that part of the mother's body between the back wall of the vagina and the opening of the bowel, the anus; this part is exposed to great pressure as the head passes, and is liable to be torn as there are no bones in the neighbourhood to take the pressure. Laceration of the perineum is most likely to occur in a first labour, and its occurrence is almost sure to follow a very rapid delivery. To prevent laceration of the perineum (*a*) the parts should be bathed frequently during labour with hot water to which lysol or saponified cresol has been added, as the soap in these two preparations acts as a lubricant and renders the passage of the head easier. (*b*) The head may be delivered in the intervals between two pains by pressing on it from behind the anus. (*c*) If the head is coming down very quickly the patient should be told to cry out, not to bear down with the pain, and the progress of the head should be retarded by pressure of the fingers on the visible part of the head.

Secondly. To free the child's eyes and mouth from discharge or mucus.

Thirdly. To see that the womb contracts as soon as the child is born. To secure this, when the head is born the hand of an attendant should be placed over the womb, making moderate pressure, which should be maintained until the after-birth comes away. After the birth of the child the womb shrinks down until it lies below the navel, where it can be felt as a hard mass. If it cannot be thus felt, bleeding into it is probably occurring.

Fourthly. To divide the navel-string (*see after*).

During the labour thirst may be relieved by cold water, cold tea, milk-and-water, or iced milk; the patient should be allowed to eat light nutritious food if she cares to do so. Sleep during the intervals between the pains is refreshing and restorative; the

face and hands may be sponged and the hair brushed if the patient expresses a wish for it.

One teaspoonful of liquid extract of ergot should be given after the delivery of the after-birth, as this helps the uterus to contract and so checks bleeding.

In from ten to twenty minutes after the birth of the child the after-birth comes away. Sometimes this does not leave the womb for thirty to forty-five minutes after the delivery of the child; in no case must the cord be pulled on to hasten its progress. The delivery of the after-birth (placenta) is attended by a renewal of the pains, and usually by a slight discharge of clotted blood. In other cases a more fluid, bloody discharge occurs, which is of no consequence if of a few ounces, but which if profuse amounts to hæmorrhage (*see below*). In some cases the after-birth presents at the orifice, and may be expelled by pressing on the womb through the abdominal wall.

The above refers to straightforward labour, but sometimes labour is preceded a few days or even one to two weeks by 'false pains': such pains are felt in the abdomen, not in the back; they are very irregular in force and frequency, one pain being strong and the next weak, one following another in ten minutes and a third occurring in twenty to thirty minutes, and are not accompanied by a show. False pains are usually caused by intestinal irritation, and are generally removed by a dose of castor oil.

Treatment after Labour. When the after-birth has been delivered the patient should be washed, the soiled sheets, etc., should be removed, a clean thick dry pad should be put on, the nightdress drawn down, and the patient should be allowed to sleep. She should be kept on her back for the first two hours, or longer if there be any bleeding.

After the birth of the child, if the mother is much exhausted, a cup of hot milk or an egg beaten up in milk is the best stimulant. After the woman has well rested and perhaps slept for a short time, the private parts should again be washed and another dry napkin put on. The discharge is usually rather free at first, but if the womb can be felt hard and firm through the abdominal wall there is usually no reason for uneasiness. If, however, the womb is felt soft and boggy, bleeding after delivery is going on and needs appropriate remedies. The washing of the private parts and the application of a clean napkin is necessary four to five times daily

for the first three days. It is a matter of convenience to the attendant and renders the required cleanliness easier if the hair on the private parts is shaved off before the labour begins. Excitement from visitors must be avoided. None but the husband and the necessary attendant should be admitted for the first five days, and special care must be taken to exclude from the lying-in room any one who has recently been in contact with any sort of infectious disease, as lying-in women are peculiarly liable to these diseases. The room must be kept well ventilated, but care must be taken that neither the mother nor the baby are exposed to cold.

The patient should pass urine within six hours after delivery, and this should be done on the bed-pan. If this cannot be used the patient may turn on hands and knees. If there still be difficulty the lower part of the abdomen and the private parts should be fomented with hot water. Owing to the distensible state of the bladder, the patient will often remain for very many hours before making water, and this may lead to inflammation or paralysis of the bladder.

The state of the bowels after delivery is of importance, as constipation sometimes causes fever during the lying-in period. On the morning of the third day after delivery, if the bowels have not been opened, a tablespoonful of castor oil should be given. If there is reason to suspect an accumulation in the lower bowel, as often occurs during the later days of pregnancy, and is known by passage of hard round lumps, an enema of soapy water should be given. If the patient does not suckle her child, purgatives will be the more necessary for the relief of the breasts. In this case saline aperients, Prescription No 53, or citrate of magnesia will be found most useful.

Diet. Until the bowels have acted the diet should be light but nutritious—*e.g.* custards, boiled fish, lightly boiled, poached or scrambled eggs once daily, milk, jellies, or junkets and soup; tea and toast may also be given. After the bowels have been moved the patient may have chicken, mutton, or fresh game. Vegetables such as onions, cauliflower, spinach, and vegetable marrow may be given, but potatoes and rice should be avoided, as the starch in these is likely to cause flatulent distension of the bowels. If there is a decided disinclination for food there is probably something amiss.

Attention must also be directed to the discharge called the

lochia, popularly 'the cleansings.' The passage of this is accompanied by more or less after-pains, generally first felt about half an hour after delivery. During the after-pain, which is simply a contraction of the uterus similar to that which occurred during the course of labour, the discharge increases and blood-clots may be expelled, especially when the patient rises in bed to make water. After-pains are salutary, as they diminish the size of the womb and expel its contents, *i.e.* blood and small clots. The application of the child to the breast often brings on or aggravates the after-pains. Unless very severe no medicine is needed, but if really troublesome, antipyrin powders (3 grains) should be administered every three hours until the pains cease to be troublesome. At first the discharge is bright red blood with possibly a few small clots; on the third day it becomes thin and watery and yellowish in colour, at last appearing like soiled water. It has a peculiar odour resembling that of the ordinary menstrual discharge. The quantity and duration vary considerably. In some patients it ceases with the after-pains a few days after delivery, but generally begins again when the patient exerts herself. Its continuance is a sign that the womb is not contracting properly. As long as it continues the parts should be frequently washed and the napkins changed. As this secretion is necessary its sudden interruption is generally a sign of ill-omen, such as puerperal fever. The vagina may with advantage be douched on the third day with boric-acid lotion, one teaspoonful in a pint of hot water, but no attempt should be made by amateurs to syringe out the womb.

In ordinary cases the breasts remain quiescent during the first thirty-six hours after the delivery; they then begin to enlarge, with slight pain, their substance becoming heavier and more tense. This depends on the activity of the breast-cells in secreting milk—this activity being preceded by an increased flow of blood to the breasts. There is no shivering or feverishness if the woman is progressing normally. If shivering and fever should occur the woman ought to be given a saline purgative (Prescription No. 53) and an enema to clear the bowels out quickly. If the breasts are very tense they may be fomented and gently massaged towards the nipple. If there is hæmorrhage after the delivery of the after-birth the child should immediately be put to the breast, as suckling promotes firm contraction of the uterus. If there is no hæmorrhage the babe should not be put to the breast until five to six hours

after the delivery. The child should be nursed three times during the first twenty-four hours, every four hours during the second twenty-four hours, and every two hours from the third day onward. Applying the child to the breasts at these intervals stimulates them to secrete, and the first watery milk contains a mild purgative called colostrum, which helps to rid the babe's bowels of their contents. On the third day the milk is opaque, white, and has a sweet taste. If the breasts do not secrete properly the patient should be given barley-water and milk to drink. The child should not be applied to the breast more often than indicated above, as frequent fruitless suckling renders the nipple hot, tender, and irritable. If the nipples are short and badly formed a nipple-shield consisting of glass with a rubber teat is used, and care is taken to fill the glass part with milk by gently massaging the breasts, before applying the baby to the shield, as if the child has difficulty in drawing up the milk through the shield it quickly becomes tired and will not make the necessary efforts to suck. Each time the child is about to suck the nipple should be cleaned with soft old linen and plain boiled water, and again when the child ceases suckling. The infant's mouth should be treated in like manner.

Scrupulous cleanliness is desirable, as even a little milk drying about the nipple may turn sour and irritate it, or it may be received into and disorder the infant's stomach. The nipples and breasts should be washed with warm water and soap night and morning. By such care the chance of sore nipple and bad breasts will be avoided. During the first week the mother should suckle while lying down. She can turn on one side or other and, supporting herself on her elbow, let the nipple fall into the child's mouth. Afterwards the semi-erect posture should be taken, from which the infant sucks more easily. Both breasts should be used alternately. The mother should remain recumbent for the first three days, after which, if there has been no tear of the perineum, she should begin exercises to strengthen the muscles of the abdominal wall. These exercises are done as follows: Lying on her back, the pillows having been temporarily removed from under the head, the woman crosses her arms on her chest and straightens out the legs. She then raises herself into a sitting posture, the attendant holding the legs below the knees to ensure that they are not lifted from the bed; from the sitting position the patient then lays herself down slowly. This should be done at first twice in the

morning and twice in the evening. Later, as it is done more easily, the patient may do it four to six times thrice daily. When this exercise is freely done the following should also be adopted: The patient, again lying flat on her back, draws up the knees until the soles of the feet rest on the bed; the thighs are then straightened until they are at right angles to the abdomen, and the knees being kept rigidly straight, the legs are laid slowly down on the bed: this exercise is harder than the foregoing one, and should not be begun until that is easily accomplished. These exercises increase the blood discharge at first, but they are very beneficial in restoring tone to the abdominal muscles, to the intestines, and to the uterus and its ligaments; they should not be done if the patient is suffering from fever. If the patient attempts to do the exercises too often at first she will suffer from pain in the abdominal muscles, but this is not serious.

The patient, if she has had a normal confinement, may be allowed to sit upon a chair on the eighth day and to begin to move about her room on the tenth day. A great part of her time should be spent in a recumbent position for the first month, but it is not desirable for a healthy woman to spend too long in bed.

When the mother resumes her dress, if she wears corsets these should be so arranged as not to press on but to support the breasts. She must remember that her milk is affected by any indiscretion in food or habits, and that unless her health be maintained her infant will certainly suffer. Fretting and irritability react very unfavourably on the milk, and therefore the woman should strive to maintain a calm and equable disposition. The diet should be nutritious and varied, and there is no objection to the patient eating anything which did not upset her digestion before the birth of the child. Fresh fruits and vegetables are especially desirable, and there is no valid reason why potatoes and peas should be debarred when the woman is able to move about. They tend to cause flatulence while the woman is lying-in, so may be avoided at that time. Barley-water is useful in increasing the quantity of milk. Drugs such as castor oil, rhubarb, mercury, arsenic, and opium affect the child when taken by the mother.

The foregoing relates to natural and straightforward confinements, but other circumstances may arise, which are now briefly noticed.

1. THE LABOUR MAY BE TEDIOUS AND LONG. This occurs in weakly women, the pains being feeble, or ceasing usually after the 'waters' break,

If four hours elapse without pains, assistance should be sought. In the meantime nourishing soup and chloral (Prescription No. 29) should be given, and after rest and sleep the pains may probably return.

2. CORD ROUND THE NECK occurs once in about twelve cases. Frequently it is not of much consequence, as when the cord is round the child's neck it is usually long. It should be loosened by gentle traction, and the shoulders should be allowed to slip through the loop. Or, if the cord is long, it may be slipped over the child's head. In some cases it has been necessary to *saw* the cord through, to prevent the child being strangled. When so necessary, the cord should be *sawn* through with the finger-nail, and *not cut*, or it will bleed profusely.

3. PRESENTATION OF THE BREECH. This occurs once in about sixty cases, and the labour is tedious, because the infant, being doubled at the haunches, requires a larger space. As a rule no interference is required until the breech and feet are born, when the case becomes converted into *presentation of the feet* (*see* No. 5).

4. TWIN BIRTHS. This occurs once in about seventy cases. The presentation generally varies, the first being the head and the second a foot case, or the reverse. After the birth of the first child, the presence of a second is known by the slight reduction in size of the womb. Sometimes the 'after-birth' of the first child comes away before the birth of the second, sometimes not till afterwards, and attempts should not be made to remove it, as there may be only one 'after-birth' for both infants. After the birth of the first, the womb should be stimulated to contract by keeping up a grasping movement of the fingers and thumb on the lower part of the abdomen. Sometimes the birth of the second child follows that of the first in ten minutes, but on other occasions not for some hours. Under such circumstances the woman should rest until pains return, and she may drink a little cool tea or arrow-root, the precaution being taken to examine the pulse frequently lest bleeding may be going on unsuspectedly. If bleeding is occurring the pulse becomes quick and feeble. The second labour is usually quicker than the first, the soft parts having been already dilated. After the birth of the second child and the passage of the 'after-birth' especial attention must be paid to the contraction of the womb. The womb should be pressed with the hand until it can be grasped as a firm hard ball.

5. PRESENTATION OF THE FEET. One or both feet may come first, which happens once in about 100 cases. The birth is generally safe for the mother but not for the child, which is apt to suffer from the circulation of the cord being obstructed by pressure. Footling cases should not be hastened in the early stage, as the longer the buttocks are detained the greater will be the dilatation of the parts, and the birth of the head will be more easy. When the breech is expelled, the cord should be examined, and, if the pulsation of the cord has ceased, the birth of the shoulders should be hastened by pulling the body steadily down during the next pain. The toes of the infant turned to the back of the mother is the most favourable position for the birth of the head; and when the breech is expelled, if the toes are turned forward, the assistant should seize the breech in both hands and during the next pain endeavour to turn the child round. If circulation is restored in the cord after the birth of the shoulders there is little cause for anxiety for

the safety of the child, but if there is no pulsation in the cord it is necessary to assist at every pain, and hasten the delivery of the head by pushing on the uterus through the abdomen. The head being born, the assistant should examine the cord, and if it pulsates, the child should not be separated for a few minutes until it begins to cry. If there is no circulation in the cord the infant should be treated as detailed for *stillbirth* (p. 486).

6. Presentation of the Face. Instead of the top of the head, the face may present, which happens once in about 230 cases. When it occurs the labour is protracted. The child is seldom in danger but the head and face are swollen and disfigured, and, unless the mother is prepared, the appearance may give a severe shock. In the absence of medical aid it will be best to wait patiently for the natural termination.

7. Presentation of the Hand, *or* '*Cross-birth.*' Presentation of the hand, or the elbow or shoulder, occurs once in about 230 instances. The assistance of a medical man is urgently required, as the operation of turning the child will probably be necessary.

8. Bleeding, or Hæmorrhage. Bleeding may occur either *before* or *after* the birth, but does not happen to an alarming extent more than once in about 300 cases. Bleeding occurring *before* the birth generally depends on the 'after-birth' being seated over the mouth of the womb, so that, as the latter dilates, the vessels of the 'after-birth' are torn. This kind of bleeding may occur at any time after the sixth month of pregnancy, but is more frequent between the eighth and ninth months. In every case of bleeding during pregnancy absolute rest is necessary; the patient's room should be well aired, her food should be farinaceous, her drink toast and water. When bleeding happens during the last months of pregnancy the person should obtain medical advice, and the presence of a surgeon during labour.

Bleeding *after* delivery may happen *immediately* before or after the expulsion of the 'after-birth, or it *may come on some hours, or even days*, after the confinement. *When bleeding occurs immediately after delivery* it depends on feeble contraction of the womb. When the 'after-birth' separates, loss of blood to some extent is the natural consequence; nor is the woman injured by a moderate loss, such as 8 to 10 ounces. But if the quantity exceeds such an amount it produces fainting, the woman being pale, cold, and gasping for breath. The womb will be found soft, and to induce it to contract firm pressure should be made over the lower part of the abdomen, and if possible the womb should be firmly grasped in the hand through the skin. Iced or cold water should be given to drink, and the child should be put to the breast. No stimulants should be given, and the person should not be raised into the upright posture, which might bring on fatal fainting. *Liquid extract of ergot* may be given in drachm doses every hour for three hours.

When bleeding occurs some hours or days after delivery it may depend on relaxation of the womb, or on the retention of some part of the after-birth, or of a clot of blood, preventing perfect contraction; or it may arise from fright or excitement. Massage of the uterus through the abdomen and drachm doses of liquid extract of ergot are the means of relief.

9. Convulsions may occur before, during, or after labour. All clothing should be loosened, the patient should be allowed plenty of fresh air, and the

face should be sprinkled with cold water. To prevent the tongue being bitten, a piece of soft wood should be held between the teeth. If the head is hot, cold applications should be used to the forehead.

10. Laceration of the Perineum. The necessity of supporting the *perineum*, or that portion of the person of the mother exposed to pressure, as the head passes, has been mentioned at p. 468. But in first labours, notwithstanding support, some amount of tearing often occurs. This is of little consequence as it quickly heals, and no treatment beyond cleanliness is required. But in exceptional cases the tearing may be greater; and if the wound exceeds an inch the patient should be kept in bed with her legs tied together, the wound being frequently cleansed until healing occurs. Occasionally the rupture extends to the anus, when a surgical operation is required.

11. Surgical Emphysema, *or entrance of air into the tissues of the neck*, may occur during labour. As a consequence of the straining, air escapes from the lungs and penetrates the neighbouring structures. It is distinguished by puffy swelling of the parts, which crackle when pressed. A hot fomentation (p. 590) should be applied.

12. Puerperal Fever. This is a very dangerous fever, sometimes occurring after confinements. It depends on poisoning of the blood from the absorption of putrid matter retained within the womb (*see* p. 333). When a woman, on the third day after labour, is seized with shivering, and this is followed by a hot and sweating stage with feelings of relief when the discharge or 'cleansings' are passing freely, it may be mild and temporary sepsis and of little consequence. But when, after perspiration, no relief is experienced, when the breasts become flabby and smaller, when the discharges lessen or cease altogether, and when the pulse remains above 120 beats in the minute, there is reason to fear puerperal fever. Such fever will become certainty if prostration of strength, difficulty of breathing, and suppression of milk come on. Pain and tenderness of the abdomen are very frequent and prominent symptoms. There is bilious vomiting, thirst, and profuse perspiration. The tongue and breath are foul, the face sallow, and there is probably diarrhœa, marked by the passage of hard lumps of fæcal matter. At a later period *pyæmia* (*see* p. 333) may occur, and one or more of the joints may become swollen and painful. Puerperal fever is highly contagious, and may be carried by attendants from one lying-in woman to another. The first thing necessary is to act on the bowels and skin. Prescription No. 27 should be given. A rectal injection, composed of 2 ounces of castor oil and 10 or 12 ounces of soap-and-water, should also be given. Injections of warm water (with, if possible, 20 to 30 drops of Condy's Fluid added) should also be thrown up the vagina. The belly should be covered with hot linseed-meal poultices. Great attention should be paid to the ventilation of the room, and disinfectants should be freely used (*see* p. 636). The diet should be milk with beaten-up eggs and beef tea.

13. Malarious Post-partum Fever. At a later date than that on which *puerperal* fever occurs, women after delivery are, in the tropics, liable to attacks of ordinary ague and 'fever' to which the above term has been applied. In malarious patients give quinine as soon as the child is born. If malaria occurs, it does so after milk has been secreted, the secretion of

milk is not checked, and there is no tenderness of the abdomen as in puerperal fever. It should be treated as ague (*see* p. 70).

14. PHLEGMASIA DOLENS, or *white leg*, is a painful swelling of one or both legs, beginning generally in the thigh and extending downwards to the leg. It may come on from one to five weeks after delivery, with shivering, fever, thirst, quick pulse, nausea, furred tongue, and pain in the loins. The swollen part is hot and tender, and presents a pale, shining appearance, while the power of moving the limb is nearly lost. Such cases generally do well, although recovery is tardy; and the limb may be stiff years afterwards, with tenderness, perhaps the feeling of a cord beneath the skin down the inner part of the thigh, and swelling of the leg. The swollen part should be continually fomented with poppy-head infusion; saline purgatives (Prescription No. 27) should be given, and white mixture, No. 60, to act on the skin and urine, while pain may be relieved by chloral. The leg must on no account be rubbed but should be raised on pillows, the foot being the highest part so that the circulation in the foot may not be impeded. Generous diet and tonics will be necessary.

15. PUERPERAL MANIA occasionally attacks women shortly after childbirth or at the period of weaning, especially where there has been *over-nursing*. It may commence with a little feverishness, or it may follow convulsions or puerperal fever. It is often characterised by loquacity, laughing, singing, obscene talk, sometimes a tendency to murder the child, and it often terminates in melancholia. If there is any hereditary family tendency to insanity, recovery may be delayed indefinitely, but in most instances a few weeks restore the patient. In the majority of cases there are fæcal accumulations in the lower bowels, for which aperients and injections are required. The infant should be artificially fed. Tonic medicines, nourishing diet, and cheerful surroundings are necessary, and bad cases may require special restraint against homicidal or suicidal tendencies. As the disease is liable to recur, and as debility favours an attack, a woman who has once suffered from puerperal mania should never nurse again.

Diseases of Pregnancy. (1) *Indigestion during Pregnancy.* The occurrence of nausea and vomiting during the early months of pregnancy is so common that it has been mentioned as one of the symptoms of pregnancy. As the nausea usually comes on when the woman begins to move from the recumbent position in the morning, and either before or shortly after leaving her bed, it is usually known as morning sickness.

Treatment. Simple morning sickness needs no treatment, but if it troubles the patient she should take a small cup of tea and a piece of dry toast before sitting up in bed in the morning. This, associated with the regulation of the bowels, is usually all that is required. If the sickness persists after the patient rises, potassium bromide is the best drug to use (Prescription No. 55).

When vomiting and nausea continue all day the patient should

be kept quiet in bed, nourishment in the shape of albumen water and whey should be given in very small quantities frequently. The patient should suck ice or take sips of very hot water to relieve the thirst, and a mustard plaster on the pit of the stomach may relieve the trouble.

Constipation is of very common occurrence in pregnancy and if allowed to persist may lead to far-reaching results for mother and child. The importance of the regular action of the bowels is considerable at all times, but during pregnancy it is even more marked, as the waste products of both mother and child have to be eliminated through the maternal system. Two subsidiary conditions are often found associated with constipation, these are heartburn and flatulence. Heartburn is the result of imperfect digestion of food, and though not actually caused by constipation is greatly aggravated by it. Flatulence is usually due to abnormal decomposition of food in the bowels, a process which is necessarily promoted by constipation.

Treatment. Regulate the diet, give fresh fruits, vegetables, salads, brown bread, jams, and preserves. Give plenty of fluid to drink, as if there is insufficient fluid the intestinal contents become dry. In many cases of constipation great benefit is derived from large draughts of water before going to bed, and in the morning while fasting. If it be found impossible to regulate the bowels by such means, laxatives should be tried, or enemata, and as a last resource purgatives must be administered. Apenta water, one wineglassful every morning fasting, or magnesium sulphate mixture (Prescription No. 53) in half-ounce doses may be given. Castor oil should be avoided as it constipates after the first purgation. To relieve heartburn give suitable and easily digested foods and carminatives such as Prescription No. 57 or No. 34.

Excessive flatulence may be relieved by soda-mint or ginger-mint tabloids, two to be taken as necessary.

Neuralgia occurring especially over the face is common in pregnancy. In the case of diseased teeth extraction or stopping according to circumstances should not be deferred on account of pregnancy. For simple neuralgia iron and quinine mixture is useful (Prescription No. 51). Liniment of aconite applied externally may be used.

Salivation is not common. Astringent mouth washes, *e.g.* alum lotion, or tannin lozenges may be useful.

Faint feelings may be felt about the time of the quickening, but are not troublesome in healthy women. A teaspoonful of sal volatile and the recumbent posture for a short time are all that is required.

Swelling of the Legs. When the legs are swelled much and "pit" or show an indentation when pressed on, the patient should lose no time in putting herself under medical treatment, as this is sometimes due to disease of the kidneys, which wil need careful treatment.

Cramps of the legs are not uncommon, are due to the altered pressure of the enlarging uterus on the veins from the lower limbs.

Varicose veins of the legs and of the rectum (piles) are common in the later months of pregnancy. If the large veins of the legs are much swollen, an elastic stocking or bandage may be worn, and the patient should rest with the legs up as much as possible. For piles the bowels should be carefully regulated, and all long standing and excessive exercise should be avoided. The stools should be kept soft, and after a stool a couple of teaspoonfuls of Burroughs and Wellcome's hazeline diluted with $\frac{1}{2}$ ounce of water may be injected with a small rectal syringe. If the piles are inflamed a hot compress or bread poultice may be applied and is most soothing; after this hazeline ointment should be freely used.

Irritation of the Breasts. Almost from the onset of pregnancy there may be a sense of fulness and tenderness in the breasts, sometimes with darting pains referred to the nipples. By the second month enlargement of the breasts may become noticeable. The breast has a knotty feel due to the growth of the milk glands. In the later months blue veins may be seen under the surface of the skin. There may be a watery discharge from the nipple.

During the later months of pregnancy, especially before the first confinement, the nipples should be bathed twice daily with equal parts of eau-de-Cologne, or brandy-and-water, and they should be gently pulled out by the fingers. Any flannel covering worn over the nipples should be dispensed with. It is also a good plan to expose the nipples to the air for some hours daily. These measures prevent cracking during suckling, render the nipple harder and longer, and therefore more easily accessible by the child's mouth. When the breasts are very heavy and tender they may be slung by a handkerchief passing under each breast and tied over the opposite shoulder.

Irritability of the bladder is common during the early months,

and is the result of the increased pressure of the womb on the bladder. The patient should not drink too much fluid, and should avoid tea. The trouble will pass off naturally in a month or six weeks after its beginning.

Retention of urine is uncommon except when pregnancy takes place in a backwardly displaced uterus. The patient should send for medical assistance quickly, as a catheter will have to be passed and the womb put into position.

Pruritus. Irritation of the private parts may be due to eczema. The bowels should be kept acting freely, and the discharge should be frequently washed away. Borax 10 grains to 1 ounce of water, carbolic lotion 2 grains to 1 ounce, liquor plumbi subacetat, lead lotion, may all be used, as they are soothing.

Miscarriage. *Miscarriage* occurs some time before the sixth month of pregnancy. If the child is born after that time it is called *premature labour.* The most usual period for *miscarriage,* usually called *abortion* in the early months, is about the third month, and it is thought more likely to happen about the time corresponding with what would have been the natural monthly period had not pregnancy occurred. When it has once occurred it is very likely to happen again; indeed, in some women it becomes a habit. The causes are various, often depending on debility, and often brought on by imprudence in horse exercise, dancing, or from excitement, from passion or fright. It also frequently results from blows, falls or concussions, such as missing a step coming downstairs, bumps in a carriage, jolting in a dandy, etc. In other instances it is due to local weakness or disease of the womb. Attacks of dysentery often lead to miscarriage; also abuse of purgatives. There is in some women an inherent weakness of constitution, which prevents pregnancy passing on to the full time. Attacks of malarious fever add to this weakness, rendering miscarriage in such persons an ordinary sequence of conception. Syphilis also accounts for many miscarriages, and where present the woman should take 5 grains of iodide of potassium three times daily from conception until the time at which miscarriage previously occurred is passed.

Symptoms. When threatened with a miscarriage the patient experiences a sense of uneasiness, languor and weariness, with aching pain in the back, loins and hips, and a slightly bloody discharge. After these symptoms have lasted a variable time there are pains very like those of labour, often vomiting, and sometimes

profuse bleeding, the blood passed being of a vivid red colour. This may continue for several days, the pain and bleeding recurring at intervals; or the miscarriage may commence suddenly, and the whole be over in a few hours. The *ovum* or *fœtus* is expelled in the shape of a reddish-white ball, the size of a pigeon's egg at three months, and larger in proportion afterwards. After the *ovum* or *fœtus* has passed away the pain and bleeding cease. The danger and after-injury are in proportion to the amount of pain and hæmorrhage.

Treatment. If the bleeding is slight and the pain trifling, the abortion may sometimes be prevented by *perfect* quiet and rest on a hard bed in a cool room, aided by a dose of 30 minims of chlorodyne in 1 ounce of water. But if increased pain and bleeding occur the miscarriage will certainly take place, and the danger to be guarded against is profuse loss of blood. The patient should not be allowed to move from the bed, and if the bleeding is profuse the mass should quickly be removed. As before mentioned, the bleeding ceases directly the abortion is over. The after-treatment requires even more care than after confinement. The patient should rest in bed seven or eight days and then return gradually to her employments, while the diet should be simple and the bowels be maintained moderately open. Getting about too soon after a miscarriage is not infrequently the origin of some malady of the womb, from which the woman may long suffer.

CHAPTER XV

MANAGEMENT OF THE INFANT AT BIRTH

Treatment after Birth. As soon as the child's head is born, the eyes should be wiped clean with a piece of soft linen, which should have previously been put ready to hand for the purpose. A clean piece of old handkerchief is suitable for this. It is important to wipe the eyelids immediately, as otherwise the discharge from the maternal passages or the cheesy material on the eyelids may get into the eyes when the infant opens them and may irritate and cause inflammation of the eyes. When the body is born the mouth is wiped out to clear out any mucus or froth from the back of the throat, and the baby is then put in such a position that it may not be smothered by the bed-clothing. Then, provided the child cries vigorously (which it will probably do unless it is still-born), the cord should be tied and cut. The best ligature material for the navel cord is a piece of surgical silk, but if this is not at hand an efficient substitute may be provided by making a strand of eight to ten thicknesses of sewing-cotton or linen thread. If the material used for the ligature is too thin it may cut through the cord instead of tying it. The ligature should be tied as tightly as possible round the cord at a distance of 2½ inches from the navel.

Unless the child is stillborn it is not necessary to hurry over tying the cord; it is better to wait until the beating in the cord has ceased, as by this the child receives more blood from the placenta and is more vigorous. As soon as the cord has been tied it should be cut about ½ inch beyond the ligature; if there is any oozing of blood from the cord it should be tied again with another ligature. When the child has been separated from the mother it should be wrapped up in a warm blanket or piece of flannel and put away in a safe place while the mother is being attended to. Care should be taken lest the child slip and be injured; to guard against this, the back of the infant's neck should be held in the space between

the thumb and first finger of one hand, while the thighs are grasped with the other. Warmth is at this time of importance, as the infant has just passed from the temperature of the mother's body (98·4° Fahr.) into a colder atmosphere, but the eyes must be guarded from glare if it is put beside a fire. The eyes should be carefully washed with warm boric-acid lotion (Prescription No. 14), or failing this, with plain boiled water.

As soon as the warm bath is ready the infant must be washed thoroughly, but before the bath the infant's body should be anointed all over with sweet oil to remove all the sticky, cheesy material which is found on so many babies. Special care must be taken to remove this material from the folds of the joints and from the top of the head, as the infant is likely to get irritation of the skin or eczema if this is neglected. When the body has been oiled and the cheesy material removed the infant is soaped all over and is then immersed in a bath of water. The best soap to use is Castile soap, or Wright's Coal Tar soap; carbolic should not be used, as it may irritate the tender skin. The temperature of the bath-water should be 98° Fahr., and if a thermometer is not at hand the elbow will afford the fairest test of the degree of heat, the hand not being sufficiently sensitive. The oiling and bathing of the child must be done quickly (it is possible to do it within four minutes), in order to avoid undue exposure of the child. It must be remembered when washing or lifting the child that its bones are soft and unable to sustain the weight of the body. It should therefore be allowed to rest on the bath, and never held up by one or both arms. In washing the face and head, care must be taken that the soap or soapy water does not get into the child's eyes, as this might cause inflammation of the eyes.

After the bath the babe is put on the nurse's knees, and gently dried with soft warm towels (old ones softened by many washings) and then the cord is again looked to; if the ligature appears to be loose a fresh ligature must be applied; the cord shrinks in water and unless it is looked to the first ligature may slip off and the infant lose a considerable amount of blood. The ligature is cut off near the knot and the cord is dressed. A piece of clean soft rag is doubled and cut in a circular shape 4 to 5 inches in diameter. In the centre of this a hole is cut through which the cord is drawn, it is then folded in the cloth and the mass is then laid against the child's body, in which position it should be kept by the belly band.

After this binder is applied two fingers should pass easily beneath it, the object being not to impede breathing but simply to maintain a slight pressure over the navel, which at this period is the weakest part of the infant's body. The dressing of the cord should be removed and renewed daily. In three to ten days the navel string dries up and comes off, leaving a small sore which heals quickly. The cord should not be pulled off nor interfered with, but should be left to drop off by the natural process.

As soon as it has had its first bath the babe should be put into its cot, covered with a blanket and surrounded by hot-water bottles if the weather is cold, and allowed to go to sleep. When it wakes in five to six hours it should be put to the breast, as this promotes the contraction of the uterus and stimulates the secretion of milk in the breast. The milk first secreted has natural aperient properties, and therefore the babe does not stand in need of drugging with castor oil, treacle, or any other purgative medicine. It is only when the first milk of the parent is not obtained, owing to the child being put to a wet nurse, or in cases of premature birth when no milk is at first secreted, or from the first milk not being sufficiently purgative, that the administration of any medicine is desirable. Then half a teaspoonful of castor oil is the best aperient. The bowels of a new-born infant contain a greenish-black tarry substance called meconium, which generally begins to pass a few hours after birth, often with the first flow of urine, and continues to pass at intervals for thirty-six hours. In the great majority of cases the purgation caused by the first milk, colostrum, is enough to clear the bowels; and medicine, by causing diarrhœa, will do more harm than good. If the stools remain black on the third day the aperient given to the mother on that day will probably effectually clear out the child's bowels.

Food. The practice of feeding a full term infant immediately after birth is strongly to be deprecated. A healthy infant requires no nourishment except that which it gets from its mother. If food was essential to the child during the first thirty-six hours, nature would probably have taken care to provide it. There is sufficient secretion from the mother's breasts to serve the scanty wants of the child. If after the first thirty-six hours the milk secretion is not established the infant should be fed two-hourly with milk and water.

Fresh cow's milk 10 ounces, cream ½ ounce, sugar 2 teaspoon-

fuls, water (boiled) 15 ounces. Place in a wide-mouthed bottle closed with cotton-wool; stand in a pan of water and boil for twenty minutes. Cool down quickly and stand in an ice-box during the hot weather and rains, or in some cool, well-ventilated place in the cold weather. Of this mixture one tablespoonful warmed to 98° F. should be given to the babe every two hours and a fresh quantity prepared every twelve hours.

If the infant is premature 2 to 3 teaspooonfuls of this milk-mixture should be given every 1½ hours at first, as the premature baby being a weakling cannot stand any prolonged deprivation of food.

After the mother's milk appears, the infant should obtain nourishment from this source alone. When suckling, the mother should lean over and support the breast, allowing the nipple to fall into the babe's mouth. During the first month the child should be fed every two hours by day, and once at night. The feeds should be so timed that one is given at 10 P.M., one at 2 A.M., and the first morning feed at 6 A.M. After the first month the intervals between suckling should be prolonged to 2½, 3, 3½, and finally to 4 hour intervals at six months. After the first month, by care and firmness the habit of not suckling from 10 P.M. till 5 to 6 A.M. may also be acquired, to the great comfort of the mother. Very often when an infant cries it is from thirst not hunger, and it should be given 1 to 2 teaspoonfuls of cold boiled water. The infant should be applied alternately to each breast. Sometimes a child, for some inexplicable reason, prefers one breast, and the mother, to avoid contention, concedes the point; or in consequence of a cracked or sore nipple the mother puts the child more to one breast than the other; this is most injudicious and is likely to lead to abscess of the neglected breast.

Clothing. The clothing of new-born infants should be light, loose and warm, as the innate power of generating heat is at a minimum in the newly born. Thin flannel, or silk and wool fulfil these requirements better than other textures. The garments should fasten in front, and the skirt should be attached to the bodice. Sleeves and armholes should be made wide so that there is no twisting of the child's arms into unnatural positions. Infants are frequently caused pain by their tender arms being thrust through narrow armholes, and from their skin being pitted by rough seams and tight garments, or by having pins or needles stuck into them while their garments are being adjusted. Safety-pins should

be used, and the body should be protected from harm by slipping the fingers under the binder, etc., before pinning or sewing it.

The child should be put into its cot from the first, and this should be warmed with hot-water bottles and bags if necessary. Failing more elaborate things an ordinary laundry basket makes an excellent cot for a new-born infant. If the child sleeps with the mother it is likely to become unhealthy through not having a continuous supply of fresh air.

Cleanliness and dryness are of the greatest importance. The child should have a warm bath once a day and should have its face, hands, feet, legs and buttocks sponged with warm water in the evening when its night clothes are being put on. The urine of the infant is passed very frequently, and the bowels are often moved, and if wet and dirty napkins are not quickly removed they irritate and inflame the skin and may cause severe eczema. Napkins should never be of waterproof material, should be changed whenever soiled, should always be washed out with fresh water before being dried and used again, and should be fastened with a safety-pin or with broad tapes stitched to the corners. "Blue seal" vaseline is the best application for chafing. Wet bibs are likely to give the infant cold on its chest and a sore neck. No soiled clothes should be allowed to remain on, and no wet clothes should be dried in the nursery. Mothers should remember that the training of the child can begin when it is one week old, and if they insist on cleanliness the child very quickly understands and will never soil its clothes, but will give warning by crying, which should be attended to at once. The formation of clean habits will save the mother endless trouble besides being much healthier for the child. And such discipline is easier at the beginning than is the rectification of bad habits once contracted. For the same reason babies should not be rocked to sleep but should be taught to go to sleep when laid in their cots. Nor should they ever be given those pernicious so-called comforters which fill their stomachs with wind and noxious germs, and can always be relied on to produce indigestion.

[The best material to use for napkins is turkish towelling, but diaper may also be used. No soda should be used in washing the napkins as this is harsh and may cause irritation of the infant's tender skin.]

Occasional Maladies and Conditions after Birth. After the birth of an infant various circumstances may give rise to uneasiness.

1. Birth, Still. If the child is born apparently dead, or 'stillborn," and does not cry, it may present either of the following appearances: Firstly, the

face may appear flushed and livid, the skin red, and the cord tense and pulsating. The first thing is to wipe out the back of the mouth with a finger covered with a handkerchief, so as to clear it from sticky mucus or fluid; then tie one ligature round the cord upwards of three inches from the navel. Then place the second ligature round the cord an inch or so below, but do not draw the knot tight. Now divide the cord between the ligature tied tight above and the ligature laid loosely below. The latter is not to be tied tightly until a teaspoonful of blood has escaped. This will often be followed by breathing, the child beginning to cry. If respiration does not take place, the child's body should be sprinkled alternately with cold and warm water, the limbs and spine should be gently rubbed, slight pressure should be made on the chest over the heart, and, lastly, artificial respiration should be tried. Secondly, the face may be pale, the features collapsed, the lips blue, the jaws fallen, the limbs cold, while no pulsation is felt in the cord. Before the cord is tied and divided, warm and cold water should be sprinkled on the breast; the back of the mouth should be cleared; the face and buttocks may be slapped with the corner of a wet cloth; the nose and back of the mouth may be tickled with a feather; and if none of these means excite breathing, artificial respiration should be tried. While artificial respiration is being tried a hot bath should be prepared (temperature 98° Fahr.), in which, after the cord is cut and tied, the child may be immersed. Infants have been recovered after upwards of two hours spent in such endeavours.

2. Breasts, Swollen. In some infants, a few days after birth, the breasts (boys and girls) are found swollen, and a whitish fluid is observed on the nipple. The swollen part should *not* be squeezed, which would cause a gathering. Unless, from dirt or undue handling by ignorant persons, signs of inflammation appear, no application is necessary. Slight inflammation is often checked by a cold-water compress, held in place by a wide bandage.

3. Cold in the Head is common, some infants sneezing immediately they are born. To avoid this, infants should be kept out of draughts.

4. Cleft Palate. This means that the roof of the mouth is split. When this occurs to any extent the child cannot suck, and therefore cannot be fed in the ordinary way, as the food passes back into the nostrils instead of down the throat. The infant must be placed in a semi-erect posture and fed with a spoon or soft rubber tube, and the food must be tilted suddenly down the throat. The milk will then be swallowed without passing into the nostrils. But, as soon as possible, nipples provided with artificial tongues or palates should be procured. With care an infant with cleft palate may be well nourished, but the defect should be remedied by surgical operation as soon as possible.

5. Constipation. Give cooled boiled water, 2 to 4 drachms, three times daily, honey ½ drachm, or extract of malt or olive oil, ½ drachm, two to three times daily.

6. Cyanosis. In exceptional cases this condition may be present. The whole surface is preternaturally dark, and cold to the touch. It depends on an organic defect in the heart, and is incurable, although the child may live for some years. It may be only temporary.

7. Head, Alteration of Shape of. From pressure during birth, especially if forceps are necessary, the shape of the head may be altered,

the face may be disfigured, or bluish swellings may be raised on the scalp. This need not excite apprehension. The head, or face, will gradually assume its natural shape, and swellings about the scalp seldom require more than bathing daily with water.

8. LOCKJAW AND TETANUS. Due to infection of the navel.

9. 'NAVEL-STRING,' BLEEDING FROM THE. Arises from the cord being carelessly tied or from tapes being used, which are liable to slip. The proper treatment is another ligature below the first. Or the bleeding may come on when, after six or seven days, the 'navel-string' separates. To stop this bleeding, pressure should be applied by placing some absorbent cotton-wool, or boracic lint, on the part, and a wide bandage. If this does not succeed, alum (20 grains to 1 ounce of water) may be applied under the pad with a camel's-hair brush.

10. NAVEL, ERYSIPELAS OF. Not likely in clean children.

11. NAVEL, ULCERATION OF THE. In some cases the navel remains red or ulcerated, presenting 'proud flesh,' and the irritation may give rise to convulsions. This is generally easily cured by the use of alum wash and simple 'dressing' under the bandage.

12. OPHTHALMIA. The eyelids stick together after sleep, the edges are red, the eyes are closed when exposed to light, the lids swell, and 'matter' is discharged. This is often due to uncleanliness, or to infection from the maternal passages, or to soap getting into the eyes during the first washing, or by the infant, from lying in bed with the mother, getting perspiration or sour milk in its eyes. The *treatment* is perfect cleanliness, frequent bathing and syringing of the eyes with boric acid solution, 10 grains in 1 ounce of water, smearing the lids with vaseline to prevent them sticking together, and keeping the child in a darkened room.

13. SPINA BIFIDA. This is a malformation of the spine, with protrusion, in the form of a tumour, on the lower part of the back. The part should be protected from pressure, and it may gradually solidify. It should be shown to a surgeon at the first opportunity.

14. SUFFOCATION OF INFANTS. Care must be taken that a child's bed-clothes do not smother it. Even the close wrapping of a child's head in a shawl to protect from cold may effectually smother it, without any convulsive struggle as indication of what is taking place. The mother should never go to sleep while suckling, as, the child's face being pressed on the breast and both being asleep, the child may be slowly suffocated. To keep a child quiet a bag of wash-leather or of linen containing sugar is sometimes thrust into its mouth, which may also lead to suffocation. It is an inexcusable practice, and, further, leads to indigestion.

The superstition that cats suck the breath of infants is not well founded. They may lie on the face or accidentally draw some article of clothing over the face, and so cause suffocation. The moral, however, is the same: never to leave an infant in a room with a door or window open or a cat therein.

15. THRUSH, OR WHITE MOUTH, due to want of cleanliness, can be avoided by washing out the mouth before and after feeds with boric-acid lotion (*see* p. 537).

16. TONGUE-TIE. If the infant sucks and protrudes the tongue at all over the lower lip it is not *tongue-tied*, even although for some days it may not suck

vigorously. 'Tongue-tie' depends on the fold of membrane (or *frænum*) beneath the tongue being too far forward, and it may be seen in some cases extending nearly to the tip of the tongue, which cannot be raised by passing a finger under it, while the milk flows out of the mouth. The method of relief is the partial division of this structure, for about one-eighth of an inch or less, with a *blunt-pointed* pair of scissors. The snip with the scissors should be directed *downwards* towards the jaw, not upwards to the tongue, to avoid cutting a blood-vessel passing through the part, from which, when cut, a troublesome bleeding has proceeded. The operation is not advised in the absence of a medical man, unless in very bad cases; and the infant must be fed with a spoon, if possible with the mother's milk—or, if not obtainable, with milk-and-water.

17. URINE, ACIDITY OF. Infants sometimes expel urine frequently, although only a few drops at a time. This usually depends on irritability of the bladder caused by acid urine. The small amount passed quickly dries on the diapers, and there is no evidence, by wetting, of urine having passed. But the urine is highly coloured and leaves a stain which may be mistaken for blood. Two or three grains of citrate of magnesia should be given twice a day.

18. URINE, RETENTION OF. Sometimes infants make no water during the first twenty-four hours. When this is the case and the infant appears in pain, crying and drawing up the legs, a warm bath, or fomentation over the lower parts of the bowels, will prove successful. If a male, draw back the foreskin and wash away any foreign matter.

19. VOMITING. Some infants vomit *immediately* after suckling, the milk returning unsoured or without evident cause. This probably depends on a copious supply of milk, which the infant takes too fast or in too large a quantity.* A finger should be placed near the orifice of the nipple, to prevent too rapid flow (*see also* p. 538).

20 'RED GUM' AND JAUNDICE. 'Red' or 'yellow gum' is the term popularly given to discolorations of the skin, which may occur to infants two or three days after birth. But all instances of discoloration of the skin are *not* jaundice, as the surface is often discoloured from the blood being congested in the skin, probably from the effects of cold or owing to pressure from protracted labour, and such discoloration requires no treatment. When jaundice occurs the child's skin is yellow, the whites of the eyes are yellow, the urine is dark, staining the clothes yellow, and the 'stools' are white. If the eyes are yellow, and if white linen is stained yellow by the urine, there is jaundice. It is due to the liver being engorged, from the lungs not acting properly at first. As a rule no medicine is required, the first milk of the mother being sufficient to open the bowels of the infant. In bad cases, when the whites of the eyes are yellow and the bowels constipated, half a teaspoonful of castor oil may be given. It is some days before the skin loses the yellow tinge.

EXAMINATION OF INFANTS. It is often difficult for a mother to know exactly when her infant first becomes ill, or even in some cases to be sure that it is really sick. It is also difficult to decide whether a fit of crying is due to bad temper,[1] to passing discomfort, or to disease.

[1] Generally speaking, this is acquired, and the result of bad management.

The *general demeanour and expression* are instructive. A flushed or a pale face, disinclination to play, drowsiness by day and restlessness at night, and unusual fretfulness, are signs of approaching illness, and may signify possibly *ague*, or other maladies soon to be declared by their distinct symptoms.

The *cry of an infant* is often very characteristic of the malady from which the child is suffering. The cry of passion is a furious one; the cry of sleepiness is a drowsy one; when roused from sleep there is generally a sobbing cry; a shrill cry denotes hunger or thirst, and is often accompanied by movements of head and hands, as if seeking the breast; the cry of teething is fretful and intermittent; an infant with earache will cry in short, piercing tones, putting the hand to the affected ear, pulling at it, and perhaps rolling the head. If after giving a baby suitable nourishment or a drink of water it still keeps up a continued cry, there is probably pain in the ear. Bowel complaint causes a straining cry, with drawing up of the legs; in bronchitis the cry is gruff and husky; in inflammation of the lungs it resembles a moan; in croup the voice is hoarse, and the breathing sounds as if drawn through muslin; in inflammation of the brain the cry is often a piercing shriek at intervals, alternating with moaning and rolling of the head from side to side. It should not be forgotten that crying may arise from a pin pricking or a tight string or a rough fold of clothing.

When necessary to examine a child, as to the existence of tenderness in the bowels, for instance, it is useful to bring the child suddenly before a bright light, as one of the apparently greatest pleasures of an infant consists in gazing at such an object. It almost always ceases to scream, and continues quiet while thus attracted, when the bowels may be examined by gentle pressure with the fingers. If the pressure causes the child to cry out, with frowns or contractions of the countenance, there will probably be some condition affecting the bowels.

If during illness a child, especially an infant, sleeps, it may be accepted as an indication of a mild form of disease or of a diminution of serious symptoms. With regard to the administration of medicine to children, if they are old enough, appeal to their reason, for if children are deceived they will soon become suspicious, and future trouble will be entailed. If too young to be reasoned with and children will not take medicine, they should be compelled. Let a refractory child be laid across the knees, the hands, *nose*, and feet being tightly held. Then by means of a medicine spoon, or other spoon, pour the dose into the mouth, and it must be swallowed. Medicine should be made as palatable as possible for children, as giving nauseous doses is quite unnecessary and excites a child, the passion probably doing more harm than the medicine, forcibly administered, does good.

The average weight of an infant at birth is 7 lb., and the average length 18 inches.

It may also be mentioned that tears are not shed by infants until they are from three to four months old, and that the eyes of infants are blue up to the sixth or eighth week of age. If no 'motion' is passed in the first twenty-four hours, examine the anus; it may not be properly formed and may require attention from a surgeon.

Feeding of Infants: Proper Food, Milk. Although a tropical climate is not so fatal to infants of European parentage as

once supposed, still an amount of carelessness as regards food, which in England would give rise only to minor maladies, will in India become the cause of fatal disease. But with care as regards feeding, and under good hygienic conditions, there is no reason why European-born children should suffer from passing the first years of their life in the tropics. At the time of birth the digestive organs of the child are in an immature state, and it is only gradually that their powers become developed. For the first few months no saliva is secreted, there are no tears, and the glands in the stomach act feebly if at all, and the alimentary canal is comparatively short. The teeth do not appear until the lapse of several months. All conditions point to feeble digestive capacity, and evidence that the food must be specially adapted to the digestive powers. Of such food *there is only one kind, namely, milk.*

Women should suckle their Children. It is in accordance with nature that a *healthy* woman should suckle her offspring. The avoidance of this duty often reacts injuriously in various ways on the system of the mother. As nursing, generally speaking, prevents conception up to the tenth month, so it prevents the ruin of the mother's constitution by too rapid child-bearing. Moreover, it is advantageous to the breasts that their natural functions should be carried on, and may probably prevent the future development of breast diseases. But there are certain conditions of system, as a consumptive tendency, which forbid nursing, and the remarks apply only to healthy women.

Question of supplementing Mother's Milk by Hand-feeding. When the mother finds her milk inadequate to supply the wants of the child, the question arises whether the mother's milk cannot be supplemented by hand-feeding. Many mothers are averse to delegating the duty of suckling to other women. In the minds of some people there is an objection to their children being suckled by a native woman; but although the mother who bears a child may possibly impress constitutional peculiarities on it, the milk of another cannot subsequently do so. Others, again, may be unable to bear the expense of a wet-nurse or 'dhai'; or a suitable wet-nurse is not procurable. Such circumstances must sometimes lead to *supplementing* the milk of the mother by hand-feeding. It sometimes happens however that when the milk is not sufficient for the wants of the infant, it is also more or less deficient in qualities on which its nutritive properties depend;

and it may be therefore unsuited for use. The limited supply may show that the constitution of the mother is unequal to the tax, and milk of the best quality cannot be secreted by a person whose constitutional powers are failing. However a partially breast-fed child is as a rule healthier than an entirely bottle-fed child, and, provided the mother's health is maintained, it is permissible to supplement the breast by the bottle. If this is not done, a wet nurse should be employed. But if from any cause a wet-nurse cannot be obtained, it will be advisable, on the appearance of the symptoms detailed at p. 495, for the mother to leave off suckling and to trust to hand-feeding.

Composition of Milk, and the Selection of a Wet-nurse. One hundred parts of milk contain nearly ninety parts of water, the remaining being solid constituents, as *casein*, a protein. sugar, fat, and various salts. The milk of women is liable to certain natural changes at different periods of suckling. The first milk differs from that afterwards formed in containing slightly purgative principles. Until the end of the first month the amount of sugar is less than afterwards, and the *casein*, or *protein* matter, is presented in a more easily digestible form than subsequently. From the eighth to the tenth month sugar is in excess. Casein is most deficient during the tenth and eleventh months, and most abundant during the first two months. During the first month there is also more butter, or fat, and salts than at any other period.

From the above it is evident that when *selecting a wet-nurse* one of the requirements should be that the milk should have commenced about the same date as that of the mother. The general health of the woman should be attentively considered; her teeth should be good and her breath sweet; and freedom from piles, from enlarged spleen, and from *any skin disease* must be ascertained. If either the woman or her husband has suffered from prolonged sore-throat, she should be rejected, as it is probably venereal. The condition of the candidate's child should be examined, and the mother of a weak, puny, badly nourished infant should be rejected, especially if there are sores about the buttocks, 'privates,' or corners of the mouth, which are also probably venereal. No woman who has suckled any other than her own child should be engaged unless the child is seen, for a woman may contract disease of the breast from one child and convey it from her breast to another. It should also be ascertained that there is no epidemic disease where the woman comes from, as smallpox, scarlet fever, or measles. The condition of the woman's breasts should be examined. They should be round, prominent, with veins visible, and affording a rather hard, knotty feeling. It is not necessary that the breasts should be large, as those of a moderate size often furnish most milk; but it is important that the nipples should be well developed and projecting, and free from sores. A little milk

should be procured, which should present a bluish-white colour and possess a sweet taste. If tested with litmus-paper it should afford an alkaline, not an acid reaction; and if examined under a microscope, all globules should be seen floating about separate and free, and not massing together. Allowed to stand a few hours, it should give a thin film, resembling cream. Dropped into water, healthy human milk should form a cloudy mixture, and not sink in thick drops. The goodness of the milk may also be judged of by observation of the nurse's child. If it sucks heartily, the milk is most likely good; if it sucks laboriously, desists and cries, the reverse is probably the case. Inquiry should be made as to whether the woman has been 'unwell' since nursing, for if so the milk is never so good, and will probably soon stop altogether. It is also important to know whether the nurse takes opium or is taking any drug which may affect the infant through her milk. Although the age of the wet-nurse's child should as nearly as possible correspond with that of the infant requiring wet-nursing, the age of the wet-nurse herself is not so important a matter. A woman from twenty to thirty years old is advisable. Native women commence having children at an early age, and cease to do so proportionally early; and neither a very young girl nor a woman approaching the termination of her child-bearing era is desirable. The woman should be of temperate habits, not addicted to over-eating or to drink. In certain parts of India a moderate indulgence in tobacco-smoking must be permitted, as some women—Bheels, for instance—will rarely take service if debarred from the customary pipe. Cleanliness, equanimity of temper, cheerfulness, and an open, frank disposition are to be greatly desired. Lastly, the association of the woman with her friends and relatives should, if practicable, be stopped. If she becomes 'unwell' or pregnancy occurs, the child should be taken from her. When a change of *ayahs* has to be made, the woman should not be told until a successor is at hand, as the tidings, perhaps exciting the woman, may influence the milk, and so injuriously affect the child.

The possibility of *deception* should be held in view. A woman by drinking largely, and by allowing the milk to accumulate, may present for a time the appearance of breasts well supplied with milk, while in reality the daily amount secreted is not sufficient for a healthy child. Such deception may be suspected, when a thin, feeble-looking woman appears with overflowing breasts. The only sure method of detection is applying a child to empty the breasts and watching the rapidity of the reaccumulation of the milk. It should also be ascertained that a child shown by a wet-nurse is not a borrowed one.

Wet-nursing from Birth. The milk of a healthy woman may be too rich for the delicate stomach of a weakly infant during the first two or three days of its existence. It should in such rare cases, therefore, be fed artificially for the first seventy-two hours; and on the first three or four applications of the child to the 'dhai' it should be permitted to take only a small quantity of milk. If a wet-nurse, confined at the same time as the mother of the child were available, the precautions as above would not be required, but this can rarely be the case. It is in instances of the kind,

when the child does not take the first milk from the mother, that some aperient dose may be necessary.

It occasionally happens that, from some unexplainable cause, the milk of one woman disagrees with a child while that of another woman suits. Such exceptional case may be suspected when, after regulating the diet of an apparently healthy 'dhai,' and after any costiveness of the bowels of the woman has been removed by castor oil, the child still does not thrive. Under such circumstances a change of nurses may be necessary. But alterations of the kind are often attended with much trouble and expense, and therefore should not be made on insufficient grounds. Very frequently when an *ayah's* milk disagrees, the reason may be found in the fact of the woman on becoming an *ayah* being able to indulge in a richer diet, while leading a more lazy life. Owing to the anxiety of parents that the nurse of their child shall be strong, too much or too rich food is often provided, the result being a change in the character of the milk, which therefore disagrees with the child. The fact of a child not thriving so well as could be wished cannot be immediately accepted as a reason why artificial feeding should be substituted, but must be regarded as indicating some dietetic error requiring amendment, and the desirability of some exercise and employment for the woman. Or, the child may not thrive from the fact of the woman surreptitiously suckling her own infant. Or there may be a superabundance of thin poor milk, which is suggestive of its soon ceasing altogether.

Weaning. The propriety or otherwise of weaning a child in India must be considered with reference both to the condition of the child and of the mother or nurse (*see* Over-nursing). Speaking generally, weaning should not be commenced until the child has attained the age of twelve months, and then only provided the child is strong and healthy. If the child is not in good health, suckling should be continued until the child has cut at least twelve teeth. A good rule is, if dentition is backward, delay the weaning; although suckling may be supplemented by some of the 'malted' foods mentioned above. Weaning should not be commenced when a tooth is irritating, not in the autumn, the season of diarrhœas, and not when there is cholera about. When weaning is determined on, it should be a gradual process, and should be begun at night. The better way is to separate the child from the mother, and if it cries it may be soothed with some tepid water. It will probably get very little sleep; but by the second night, if the mother *has not yielded*, half the work will have been done. The third night the child will probably sleep, or it will be satisfied with water. The diet thenceforth should be on the lines laid down in the next chapter.

The mother's breasts ordinarily give no trouble when weaning is performed gradually.

Over-nursing. The first signs are a dragging sensation in the back when the child is at the breast and an exhausted feeling afterwards, often described as a ' sinking at the pit of the stomach,' and in exceptional instances there may be an *excessive secretion* of thin, poor milk. In these cases there is a constant oozing and loss of milk, which keeps the clothing wet, while the child suffers from its innutritious, watery character, and the mother from the amount of the discharge. These symptoms are accompanied or quickly followed by loss of appetite, constipation or diarrhœa, sleeplessness, pain in the left side, often pain at the top of the head or neuralgia, or throbbing of the temples, with giddiness and depression of spirits, singing in the ears, disorders of the sight, palpitation of the heart, and a short dry cough. The monthly ' discharge ' may reappear, and may be irregular or excessive, with constant ' whites.' In extreme cases the countenance grows pale and sallow, the body wastes, and there may be night perspirations and swelling of the ankles. When such symptoms appear it is useless attempting to support the strength by more generous diet. The woman should cease suckling.

CHAPTER XVI

THE HAND FEEDING OF INFANTS [1]

THE best of all foods for an infant is without doubt the milk of its own mother. If, for some reason, that be not available, the next best food is the milk of another woman, a wet nurse. When that also is impracticable the child has to be, as it is called, brought up by hand. There are then four main questions the mother requires answered :

A. What to feed the child with ?

B. How to keep harmful germs from the food ?

C. How often to feed the child ?

D. What quantity to feed the child with at one time ?

We will answer A, the most difficult question, first.

A. WHAT TO FEED THE CHILD WITH

Of the various artificial foods the child may be fed with, the best, as a rule, is fresh cow's milk, modified so as to resemble human milk in its composition. We do not mean 'humanised' milk as it is advertised by manufacturers and shops, but cow's milk humanised at the time of feeding by the mother or nurse. Still more than such shop-sold humanised milk is the mother to avoid all the various foods that claim to improve on Nature in their knowledge of, and in catering for, baby's requirements. Some of these foods have their use at certain times, as we shall show later : at present we are concerned with the usual food of a healthy infant for whom human milk is not available.

Before giving instructions for modifying milk, we must study briefly the relative proportions of the important constituents of human milk as compared with the milk of those other animals

[1] For much that is in this chapter we are indebted to the teaching of Dr. G. F. Still, as set forth in his book on the "Common Disorders of Childhood," published by the Oxford Press.

from which milk may conveniently be obtained for use as infants' food.

PERCENTAGE COMPOSITION OF HUMAN AND OTHER MILKS

	Human	Cow's	Indian Cow's	Goat's	Ass's
Protein (Casein)	0·6	3·25		3·0	1·0
Protein (Lactalbumen)	1·4	0·75		0·7	0·8
Protein (total)	2·0	4·0	4·0	3·7	1·8
Fat	3·5	3·5	5·0	4·2	1·0
Sugar (lactose)	7·0	4·0	4·0	4·0	5·5
Salts	0·2	0·7	0·7	0·5	0·4
Water	87·3	87·8	86·3	87·6	91·3

The sugar of milk is called 'lactose' and can be bought under that name at any druggist's.

Considering for the time the selection only between cow's and human milk, we see that cow's milk contains more protein but less sugar. There are also other differences, which are not evident from the above table, and an important one is that whereas human milk, as the child takes it direct from the breast, contains no micro-organisms at all, cow's milk, as supplied to the consumer, invariably does. Further, there are also in milk certain ferments which assist in the digestion of its constituents, and these ferments are not present in equal proportions in cow's and human milk. Moreover, we know from bacteriological observation that the blood of children who have been breast-fed has a higher power in killing bacteria than the blood of a child who has been brought up on cow's milk: and so breast-fed children are less liable to some infectious diseases and more likely to recover from them. Yet another important difference is that the casein of cow's milk sets in a coarse curd, whilst human milk curdles in fine curds, so that it is the more easily digested.

To Humanise the Milk, therefore, we have two main considerations in mind: (1) one is to dilute the cow's milk so as to reduce the protein to the human level, and then it is obvious we shall have to add some lactose, and in most cases some fat, to bring those up to the human level. (2) The other is to make the curd, if possible, a fine one, as it is in human milk.

(1) As has been explained, after the dilution of milk we must add (*a*) fat, and (*b*) lactose to humanise it.

(*a*) *Fat* is supplied by the addition of cream, which is the natural fat of milk. But creams vary much in strength, especially as to whether they are obtained by standing the milk or by centrifugalisation. In the former case they may be very weak, only containing 15 per cent. of fat, besides the fact that the milk has to stand a long time before the cream can come off is against that variety in India. Centrifugalised cream varies much in strength, but is usually about half fat. It may be reckoned, broadly, that the addition of 1 drachm of such cream to 3 ounces of milk will give an increase of 2 per cent. in the fat content: further a level teaspoon of cream is about 2 drachms, though it should be measured, as a rule, with a minim measure. From these facts the proportion that is required in any milk to humanise it after dilution may be calculated. It will be noticed in the percentage table that the Indian cow gives on an average more cream than the English cow, and this must be allowed for in humanising the milk. The superior richness of Indian milk will come as a surprise to most European residents here, who are accustomed to condemn the thin fluid supplied to their table. The explanation lies in the evilness of the Indian dairyman and of the domestic servant. Of course individual cows vary much, even more than the cowkeepers, for the latter are universally bad, and one cannot expect pure milk without one watches it withdrawn from the cow oneself and then locks it up. The sooner the housekeeper recognises that fact the better, for the most honest of Indian menials is helpless in the presence of milk.

The buffalo gives a still higher percentage of fat than the Indian cow, about 7 to 8 per cent.

If cream be not available butter may be used to supply the necessary fat, though it is not so digestible as cream. A piece of butter the size of a large pea may be put into a feed of 3 or 4 ounces of milk.

(*b*) For the addition of *lactose* a similar rule on which calculations may be based is that the addition of one level teaspoon of lactose to 3 ounces of milk will increase the percentage of lactose by 5 per cent. Indian cows are about the same as English as regard their lactose content.

However, even after such humanisation the milk may not

agree with baby. We have still factor (2) *the curd*, to consider. This may be made finer in various ways. Sometimes diluting the milk with barley-water instead of water will do it: and this has a slight laxative effect, which may be beneficial. On the other hand the starch in the barley-water may disagree. For the making of barley-water (*see* p. 619). Dilution with lime-water (*see* p. 640) may serve the purpose also, a teaspoon of lime-water to 3 ounces of milk. The best diluent, however, for milk is Nature's own, which is whey (*see* p. 628). The only objection to whey is that it takes time and care to make, and sometimes is not practicable. When its use is essential for a short time, then it must be made; but as a rule we can do without its regular use.

One of the most convenient methods of making the curd a fine one is to add sodium citrate to the milk: unlike barley-water this has a slight constipating effect. The correct amount to use is 1 grain to each ounce of milk, but not more than 5 grains should be used in any one feed.

By a careful study, therefore, of the above, and the use of a little simple arithmetic, it is obvious that we can humanise any cow's milk, the important points being that we are to make the fat about 3 to 4 per cent., and the sugar from 6 to 8 per cent.

Taking the milk of the average Indian cow, the following recipes will give food suitable for infants of all ages: assuming that the milk is pure to begin with, that the cream is centrifugalised cream and is carefully measured with a minim measure, and that a level teaspoon of lactose is about 0·75 grain in weight, and that its addition, therefore, to 3 ounces of the milk will increase the lactose content by 5 per cent.

At one month:

Milk	5 drachms
Water	10 drachms
Cream	½ drachm
Lactose	½ teaspoon

At two months:

Milk	1 ounce
Water	1½ ounces
Cream	40 minims
Lactose	1 teaspoon

At three months :

Milk	1½ ounces
Water	1½ ounces
Cream	½ drachm
Lactose	1 teaspoon

At six months :

Milk	4 ounces
Water	2 ounces
Lactose	1½ teaspoons

At nine months :

Milk	6 ounces
Water	2 ounces
Lactose	1½ teaspoons

Such milk as the above, when freshly prepared, is preferable to any advertised humanised milk, the preparation of which interferes with the value of the milk in other ways. There are some children, however, who cannot digest the curd of cow's milk even when humanised, and in some of these it may be necessary to dilute the milk even more than is necessary to bring the protein to the human level : in such cases more than the above amounts of fat and lactose will have to be added to bring those constituents up to the human level. Yet some children even will not take cow's casein however diluted, and some of these will flourish on a mixture of cream, whey and lactose : or even on cream and barley-water for some time, though a return to milk should be aimed at. This recipe will do well for such children under six months of age :

Whey	4 ounces
Cream	4 drachms
Lactose	1 teaspoon

Milk of Other Animals. Sometimes the milk of the goat or ass will be found to agree better than cow's milk. A study of the percentage composition of the milk of these animals as given on p. 497 shows that while ass's milk is of service, because of its small proportion of casein, it is poor in fat, and requires, therefore, the addition of cream. It will require no dilution and no addition of lactose, and therefore has its advantages. Ass's milk is not so difficult to obtain in India as in England, it being possible, usually, to make an arrangement with a dhobie.

The curd of goat's milk is finer than that of cow's, and some children do better on it. The goat has to be carefully kept, however, to exclude the goaty flavour from the milk, and the milk will require dilution on the same principle as cow's milk. Goat's milk has, however, two other advantages. One is that this animal is only very rarely subject to tuberculosis, a point that we shall refer to again under sterilisation of milk: the other is that the goat is a mobile animal and can march from one camp to another almost daily without failing in its supply of milk.

Having dealt with fresh milk of different kinds it is now necessary to say something about condensed and powdered milks, and about some of the popular infants' foods.

Condensed Milk. Condensed milk is the food of many children of the poorer classes in England, because it is cheap; moreover it often appears to agree. But its use is responsible for much rickets, and sometimes for scurvy. And here we would draw especial attention to the fact that there is something of a living nature in fresh milk which is necessary for the complete nutrition of the child, and without which, though appearing to flourish and grow fat, he lacks something in his development; which lack appears sometimes to show itself in chemical or biological changes in his tissues, so that he is a more ready prey to organisms than if fed on fresh milk. That is why prolonged heating is not so good for fresh milk, because it destroys that something; a point we shall refer to again.

Condensed milk is sold either sweetened with much cane sugar, or unsweetened. The sweetened variety has so much sugar in it that it is impossible by mere dilution to humanise it, that is to say, to bring its various constituents into their human proportions. To do so would require much manipulation. If these condensed milks are to be given to a child, they should be modified in this way:

Sweetened variety to be diluted seven times, and 1 teaspoon of centrifugalised cream added to every 3 ounces.

Unsweetened variety to be diluted four times; add 1 teaspoon of cream and 1 teaspoon of lactose to every 3 ounces.

Remember that the unsweetened variety will keep only as long as ordinary milk once the tin has been opened.

From what we have said above it will be understood that

though very useful at times, it is not justifiable to feed infants for prolonged periods on these milks.

Powdered Milks. The same remark might be made about the powdered milks. They are most useful, *but* they have been subjected to great heat. Glaxo is an excellent example of a powdered milk, and on simple dilution gives a ready humanised milk, whose casein, moreover, sets in a fine curd.

Proprietary Infant Foods. Before starch can be digested it has first to be converted into sugar. Infants do not possess the power of turning starch into sugar until they reach the age of seven months, sometimes not till later. That is why natural milk contains all its carbohydrate in the form of sugar (lactose), there is no starch. Now many of the foods commonly sold as specially suited for infants contain starch, in the form of some cereal, and therefore they are not suited for the very young infant. It is true that the photographs of the advertisement may show that Mrs. Smith's child has increased from skin and bone to fatness: but the advertisement says nothing about the tendency to rickets that such foods often produce. At the same time some of these foods are most useful, and they are by no means all to be condemned for all occasions. But no one proprietary food is universally suitable; each case requires considering on its merits as to the particular child and the particular food. Do not listen to the voice of the monthly nurse or of any other nurse when she recommends a certain food. Her little knowledge is a dangerous thing, and before you change baby's diet you should consult a doctor.

Dr. Still divides proprietary foods into five classes:

(1) Those made of milk and cereal, in which all the starch of the latter has been converted to sugar. Of such nature are Allenbury's Foods, Nos. 1 and 2, and the Malted Milk of Mr. Horlick.

(2) Those made of milk and cereal, whose starch has been partly converted to sugar. Such are Nestlé's (Milo) Food, and Carnrick's Soluble Food.

The above two classes are suggested as *substitutes* for fresh cow's milk; the following three classes only as *additions* to cow's milk, they contain no milk themselves.

(3) Cereals entirely converted. An example is Mellin's Food, which contains no starch.

(4) Cereals partly converted: such are Allenbury's Food No. 3,

Savory and Moore's, and Benger's. These contain a good deal of starch.

(5) Cereals with practically no conversion to sugar, *i.e.* these are very starchy foods. Such are Ridge's, and Neave's Foods, Robinson's Groats, Robinson's Patent Barley, Frame Food, Robb's Biscuits, cornflour.

Foods of this last class are only suitable for a child of nine months or older.

Except for Allenbury's Foods Nos. 1 and 2, nearly all patent foods are lacking in fat, and even with the addition of fresh milk the deficiency is not made good: it is necessary to add cream as well.

As with the preserved milks, these proprietary foods have a temporary use in some cases of indigestion and when travelling; but their principal use is when we wish to increase the child's diet and introduce it to something more than milk from the age of nine months or a year onwards. These foods form a convenient stepping-stone to such articles as soojee or bread and milk. Indeed Mellin's Food is often used with advantage from the age of three months: children like it and it contains no starch to raise the digestive difficulty.

B. HOW TO KEEP HARMFUL GERMS FROM THE FOOD

The Sterilisation of Milk. Many infants die from diarrhœa, especially during the summer months. This diarrhœa usually arises from infection by micro-organisms which have been conveyed to the child through the milk. Now milk as it leaves the cow should be sterile, *i.e.* free from micro-organisms, so that it concerns us to see how these harmful germs can get there. This may occur in one of three principal ways:

(1) The cow or goat giving the milk may be diseased. If it were not for this possibility we should use raw milk much more frequently than we do, taking care to guard it from infection after it had left the cow; because we believe, for the reasons we have given above, that sterilised milk is in the long run not so good for the child as the raw material. But the danger of a diseased cow is tuberculosis, and milk is a common means of infecting children with tuberculous diseases in Great Britain. Fortunately the disease is not so common amongst cows in India, and if the

housewife is content to observe strictly the ceremony of the withdrawal of milk twice daily, as described on p. 551, and if the cow appears healthy, we consider the use of such fresh and raw milk justifiable, indeed preferable to the use of sterilised milk. But everything depends upon the completeness of the arrangements for the reception of the sterile milk into sterile vessels and its safe storage: it demands the constant attention twice daily of the housekeeper, and cannot be deputed to a native servant. The goat is even less liable than the Indian cow to tuberculosis; but the goat, unfortunately, is in parts of India liable to Malta fever and her raw milk may convey the disease.

(2) The contamination of enteric fever, or diphtheria, or diarrhœa, or cholera may be conveyed from the hands of the cowman, or from the water in which the milk-cans have been washed.

(3) After sterilisation, when the milk is being stored, the contamination of diarrhœa, cholera, or enteric fever may be conveyed to it by means of flies or other insects.

To obviate this last means of infection it is necessary to cover the milk carefully. To combat the infections mentioned under (1) and (2) we must either:

(*a*) Kill the germs in the milk by heating the milk, or (*b*) see that no germs get in the milk by carefully selecting a healthy animal, and then watching the milking as described. It is obvious that (*b*) is more trouble, and it may be asked why bother about (*b*) if (*a*) is good enough. But we have already explained why we think sterilised milk is not so good for children as fresh milk, especially if it is sterilised by prolonged heat. On the other hand, if some method of sterilisation is adopted, and often it may be necessary, or certainly expedient, there will be a choice between what is called *pasteurisation* and *boiling*.

Pasteurisation consists in raising the milk to a temperature of 155° to 160° F., and keeping it there for twenty minutes. The operation is best done in an apparatus sold for the purpose. Soxhlet's apparatus or Aymard's steriliser are those best known: the principal is that of a water-bath. Pasteurisation is, on the whole, the best method of rendering the germs in milk innocuous, but sometimes it is a bother to carry it out, and boiling may be done instead. But the boiling should not be prolonged, or the milk, besides developing an unpleasant taste and having its albumen coagulated, loses some of its vital properties mentioned above. It

is sufficient to raise milk just to the boiling point and then to remove it from the fire. It is then preferable to cool the milk rapidly; because if germs obtain access to it later they will find the warmth conducive to their rapid growth. The milk should be given to the infant at a temperature of about 100° F.

Travelling with Children. The preparation of the infant's food once or twice a day involves a certain amount of work, also arrangements for heating it and cleansing apparatus, which cannot easily be attended to away from one's own home. When the family is in camp the arrangements should certainly be made, as they usually can be done then without difficulty. But on railway journeys and sea voyages, and sometimes for a few days in a hotel, they cannot be carried out, and something simpler is required. This is where the principal use of the preserved sterilised milks, condensed and powdered milks and of some infants' foods comes in.

For a short railway journey condensed milk, sweetened or unsweetened, or powdered milk, prepared as above, will do excellently: so also will Horlick's Malted Milk, and some of the others. In other cases, and especially for a long journey or a sea voyage, the sterilised milks are very useful. The Aligarh Dairy Company put up a suitable milk in sterile bottles, or the voyager home can procure what he requires from the Army and Navy Stores and have it put in the refrigerating room of the steamer. But for the reasons we have given above it is best not to continue the use of such preserved foods over a longer period of time than is conveniently necessary.

Sometimes children seem to like this temporary food better than their permanent diet and demand more, and improve on it. But the mother should remember that it does not follow that the milk which agreed so well with little Willie on his journey to Mussoorie or his voyage home from Bombay is the best for him in the long run.

Feeding bottles must be kept scrupulously clean, and for this reason the simpler the shape the better. The slipper-shaped bottle now so popular is good for this reason, and also because its shape compels some older person to keep her attention on the child and control the rate of feeding. Some children tend to feed too quickly and suffer from indigestion in consequence. At the same time, because attention is required in feeding a child with this bottle, care should be taken that the nurse is not tempted to hurry the

meal so as to betake herself to a more congenial occupation. The old-fashioned feeding-bottle with a long rubber tube was a very bad one: not only was it impossible to clean the tube properly, but the child was left with the bottle to suck at it when it liked. The teats of the feeding-bottle should be conical and easily cleaned: they should be put into warm water and thoroughly rinsed after each meal.

C. HOW OFTEN TO FEED THE CHILD

Diet of a Healthy Infant. Up to the age of nine months the hand-fed child will thrive best as a rule on cow's milk modified as already described. The feeds should be given at regular intervals and, unless there is some special reason to the contrary, the infant should be waked at feeding-time if he be asleep. The training of a child in this way, and in many others, begins from birth, and much depends upon the firmness and sense of the nurse in the early days. A child should not be allowed to tyrannise over its mother. For instance, though at first the feeds should be given two-hourly, one feed should be missed at night from the beginning, then a little later two night feeds should be missed, and when he is three months old he should sleep from 11 P.M. to 5 A.M. without food. If he does not do so, it is the fault of the mother and the nurse, and means that the infant has been badly managed. When he is six months old the night interval may be increased to seven or eight hours.

D. WHAT QUANTITY TO FEED THE CHILD WITH AT ONE TIME

The quantities that an infant should take at each feed are given in the following table from Dr. Still's book:

FEEDING TABLE

Age	Interval	Number of Meals	Amount in each Meal	Total in 24 hours
1st week	2 hours	10	1 ounce	10 ounces
2nd to 6th week	2 hours	8	1½ to 2 ounces	12 to 16 ounces
6th week to 4 months	2½ to 3 hours	6	3 to 4 ounces	18 to 24 ounces
6 months	3 hours	6	6 ounces	36 ounces
10 months	3 hours	5	8 ounces	40 ounces

All increases should be made gradually, ½ ounce at a time.

When the child is nine months old a food such as Mellin's, or

a starchy food, can be introduced into some of the meals, mixed with the milk. A little broth may also be given, and from twelve months a lightly boiled hen's egg daily. Between the age of twelve and fifteen months the feeding-bottle should be dispensed with and the child fed with a spoon, or it may drink out of a cup. Bread and butter may now be given also. There must still be five meals a day. A suitable dietary for a child of twelve to eighteen months is the following, the hours depending in India partly on the time of year.

6.30 A.M. Cup of milk. Slice of bread and butter, or soojee.

10 A.M. Cup of milk.

1.30 P.M. Breadcrumbs and gravy. Or later a little mashed potato and gravy. Or bread and broth. A rice or sago pudding, or pulp of stewed prunes.

5 P.M. Cup of milk, with soojee or rice and milk if not had at first meal. Or bread and butter and hen's egg.

9 P.M. Cup of milk.

After the age of eighteen months, when children get their first double teeth, it is permissible to give them a little fish, flesh or fowl; and a little thin oatmeal porridge. Minced meat should be given at first, preferably minced chicken. At first meat should be given only occasionally, but after the age of two years it may be in the daily dietary. Fresh fruit juices are always allowable, and stewed or baked apples make a change from stewed prunes. Still up to two years of age the staple diet remains milk.

It is unnecessary for us to lay down a child's diet beyond the age of two years. Rather is it advisable to say what a child should not have. Amongst meats the following are to be avoided: goose, duck, high game, pork, salmon, tinned or salt fish, sausages, preserved meats, ham and kidneys.

No raw vegetables such as celery, radishes, lettuce, should be given, and at first turnips and carrots are best not given.

New bread, pastry, plum cakes and hot rolls are not for small children: neither are nuts or candied fruits. It would seem unnecessary to add that alcoholic drinks, tea and coffee are not to be given to children, but we not infrequently see with sadness the mother taking her afternoon tea and giving her child some too; a picture little better than the almost obsolete one of father giving baby a taste of his gin. The effect of tea in exciting children is

not sufficiently well known. No child should have tea or coffee, certainly not before the age of ten years.

Another thing parents should remember is that a child's taste in food is to some extent to be consulted. It is wrong to insist on a child's eating fat if the child feels it will not agree with him. Similarly his desire for sugar is a natural demand of the body, and, provided it does not lead to sweets in between meals, it should in moderation be satisfied.

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CHAPTER XVII

DISEASES OF CHILDREN

Introductory : Bronchitis : Broncho-pneumonia : Chorea : Constipation : Convulsions : Croup : Diarrhœa : Fever : Indigestion : Infantile Paralysis : Night Terrors : Rickets : Rupture, Infantile : Scurvy : Teething : Thrush : Vomiting : Wasting : Wetting the Bed.

Introductory. Children are subject to the same diseases as adults, but have a greater liability to some and less to others. Moreover, the signs and clinical appearance of the small patient are often different from those of the adult. The infant cannot speak and tell us his symptoms, so we have to rely more closely on our observation to tell us the condition of things. Further, although the resistance of the child to disease is less, yet his rallying power is more rapid than that of the adult; and it is equally surprising to see how quickly a healthy child will become dangerously ill, as to note how rapidly a child that was not long before *in extremis* will regain his normal health once he starts getting better.

Many of the diseases to which children are liable have already been described and will be found in other chapters. Thus the infectious fevers, which are most common in childhood, will be found in Chapter IV; diseases of the skin, even though they affect children more than adults, are all in Chapter X; and the disease of childhood called adenoids will be found appropriately in Chapter XII. The present chapter contains accounts of diseases which are either peculiar to childhood, or which show marked differences when occurring in children to what they do in the adult. Page 490 should be read again here.

BRONCHITIS

Acute bronchitis in children resembles the disease as already described in adults (*see* p. 131); but in children bronchitis is relatively commoner than in adults, and is as a rule a more serious disease.

In children the mischief is more apt to spread down the bronchial tubes to the smallest branches, and so to the lungs, causing broncho-pneumonia; while in the adult the main branches are, as a rule, the seat of the disorder; and it is in proportion to this downward extension of the inflammation that the relative danger lies. For the more the smaller tubes are affected the less can the blood become properly aerated, and death may take place from suffocation. The disease begins with symptoms of an ordinary 'cold,' and for some days perhaps nothing more serious is apprehended. The child's temperature should be taken frequently, and if above normal the patient *must* be put to bed. By degrees there is more fever and restlessness, while the commencing implication of the bronchial tubes is denoted by short dry cough.

With increase of fever the cough becomes more noisy, frequent and painful, and the breathing quick and wheezing. The breathing is performed chiefly by the muscles of the abdomen instead of the chest, which may be seen, or felt, moving much more forcibly than in a state of health. The child feels as if the chest were stuffed, and wheezing breath may be both heard and felt on one or both sides when the ear, or hand, is placed on the chest. When the breathing is very difficult, and particularly during the paroxysms of coughing, the veins of the forehead and neck stand prominently out, and the face is flushed. The fever and cough are generally worse at night, and the child is therefore then more irritable and restless. But it will often sleep for several hours, until reaccumulation of phlegm wakens the patient, and causes a paroxysm of suffocative cough. The expectoration, if coughed up, is white and glairy. But often the phlegm secreted by the inflamed bronchial tubes is only coughed into the mouth, when it is swallowed by the child, who cannot understand the desirability of spitting the phlegm out. Often the fits of coughing cause vomiting, which sometimes much relieves the child, by clearing the throat and entrance to the windpipe, and to some extent (from the pressure exerted by the act of vomiting) the bronchial tubes also, of accumulated mucus and thus allows easier respiration. Although the skin is feverish and warm, it remains moist. The mouth and tongue, although warm, are also moist. There is no appetite, but always thirst. If the disease grows worse it tends to drift into broncho-pneumonia, and then the paroxysms of cough become more frequent, until the child has no strength left to cough. Then the face becomes pale,

while the lips grow livid and parted, the nostrils dilate with each inspiration, and the breathing is more hurried and difficult. Convulsions sometimes precede a fatal termination, but generally death takes place without much suffering, the child passing gradually into an unconscious state. Favourable symptoms are: lowering of the pulse, diminution of the heat of the skin, less difficulty of breathing, cessation of wheezing, lengthened periods of sound sleep, and return of appetite.

The cause of bronchitis in children is usually cold, especially when the air is damp and foggy. Sometimes a smoky fire will be the irritant that causes an attack, and mild bronchitis may arise during the irritation of teething. Bronchitis is especially common with and after measles and whooping-cough. Children with diarrhœa or other signs of indigestion are liable to bronchitis more than others: so also are those with adenoids.

There is not as a rule much danger about bronchitis itself: it is the liability of the catarrh to extend further down the tubes and produce broncho-pneumonia (*see* the next section) that makes the disease a serious one.

Treatment. When the approach of the malady is feared the child should be kept in the house, and the temperature of the apartment should be maintained as equable as possible both by day and night. The great importance of an equable temperature, whatever that temperature may be, cannot be too much insisted upon. In a cold climate the proper temperature of the sick-chamber would be 65° F., but in India it must generally be much higher. But however high it may be, it should be maintained equable, and the patient should be guarded against draughts and cold. It is also advisable to moisten the atmosphere of the room by means of a bronchitis kettle, as described on p. 598, and the half-tent therein spoken of should be erected. If compound tincture of benzoin be added to the water in the kettle, 1 drachm to the pint, it is also of assistance. In the early stage of bronchitis, before the phlegm is loose, give Prescription No. 70, 1 drachm every three hours to a child a year old; double that dose to one of three years. If the child is younger or is very weak omit the compound tincture of camphor from this prescription. When the cough becomes loose, change the medicine to Prescription No. 73, in the same doses. If this medicine produces diarrhœa, omit the ammonium carbonate from the prescription. If the bronchitis is at all severe at this

stage a little brandy or whisky is advisable; 10 minims every three hours for a child of one year. The diet should consist of milk. Solid food is not to be given; neither will the child care for it so long as there is fever. Throughout the illness, the patient should lie with the head rather high, and be encouraged to cough frequently; not being allowed to sleep too long lest dangerous accumulation should occur. When all severe symptoms have subsided, the patient may return gradually to his usual diet. For some time afterwards care should be taken that the patient is not exposed to cold, as he will remain very susceptible to any influence affecting the chest.

During convalescence Prescription No. 71 may be taken with advantage.

BRONCHO-PNEUMONIA

The section on Bronchitis in Children should be read first, and from this it will be understood that broncho-pneumonia is an extension of the same catarrh further down the small tubes to the lung cells themselves. The same causes operate therefore for broncho-pneumonia as for bronchitis, the symptoms are similar but more exaggerated, and the treatment is on the same lines. Broncho-pneumonia is very common in infants up to the age of two years, and frequently accompanies measles, whooping-cough and diarrhœa. Most of the cases of pneumonia in small children are really broncho-pneumonia. The attack begins with bronchitis as already described, and then the symptoms become more severe, the restlessness is greater, the breathing is more rapid and obstructed, and the sides of the nose can be seen working with each breath. The lips become blue, and the temperature is usually higher than in bronchitis. The fever may last several weeks and then gradually subside. But if the child grows worse, he usually becomes drowsy and at length dies of exhaustion. Broncho-pneumonia is a very serious disease, and amongst small infants quite half those attacked succumb.

Treatment should be as already laid down for bronchitis. The room should be warm and equable in temperature. The child has got to fight for what air it can get to its lungs, so do not allow relatives and others to crowd into the room and use up what air there is. Use the bronchitis kettle (p. 598) with a half-tent. If the weather is not too hot, a jacket poultice (p. 593) or hot turpen-

tine stupe should be applied to the chest; but particular care must be taken both not to scald the child's skin and not to allow him to catch a chill while the heat is being applied or removed. In the early stages give Prescription No. 73, 1 drachm every three hours, to a child of a year old. If the child gets blue about the lips and face, two or three leeches (*see* p. 611) should be applied over the lower part of the breast-bone. After that benefit may be obtained from tincture of digitalis, 1 minim every two hours in a little water, in cases of exhaustion. The diet must consist of milk only, and alcoholic stimulants will be necessary. Either whisky or brandy, 10 minims every three hours for a child a year old or under, and double that dose for ages up to five years, should be given.

CHOREA

Chorea is known vulgarly as St. Vitus's dance: it is a rheumatic affection of the brain. Chorea is commoner in children of a neurotic tendency, especially amongst girls. Sometimes a nervous strain, such as fright or some other emotion, or overwork at school, seems to be the exciting cause of an attack of chorea. But it is important to recognise that chorea really is rheumatism; because then we shall treat the disease with the respect to which a rheumatic affection is entitled, and we shall be on the look-out for heart complications, which are liable to occur even in the mildest forms of chorea. Chorea generally begins insidiously; the first thing that is noticed may be that the child begins to drop things, or to fall about. Sometimes chorea is preceded by 'night terrors' (*see* p. 529), or by vague pains of a rheumatic nature, which are often regarded as 'growing pains.' Other premonitory symptoms are: moping and melancholy combined with fidgetiness and restlessness, bad temper, and inability to sleep. Then there are slight contortions of the face, or slight convulsive movements of the legs. When fully formed, there may be convulsive movements of any or all the limbs. In walking the leg is suddenly thrust to one side, or pulled backwards; or in conveying the hand to the mouth it is snatched towards the forehead or shoulder, or above the head.

Chorea is rarely severe enough to be a dangerous disease in itself; but it is a serious disease because of its possible heart complications. Never neglect chorea; and always call in a physician. There are two very good reasons why a physician should take

charge of the case throughout: one is that he alone can detect and in some cases ward off the onset of a heart complication. The other reason is that the most efficient drug *treatment* of chorea lies in large doses of arsenic thrice daily, and the attendance of a doctor is essential to make sure that no signs of arsenical poisoning are being produced as a result of such treatment.

Apart from the treatment by arsenic or other drugs it is important that the child should be entirely confined to bed. The disease lasts as a rule some two or three months, and the first few weeks must be spent in bed. In severe cases the child should be isolated from other children. When the movements are very severe and uncontrolled, much relief can be obtained from a hot wet pack (*see* p. 588). Do not return the child to school too soon after an attack, or the disease may recur; an interval of two months after apparent recovery is advisable.

CONSTIPATION

Constipation in infants may be due to some malformation of the bowel, and when the complaint is persistent from birth an examination of the rectum should be made by a doctor. But usually constipation is due either to unsuitable food or to a sluggish action of the bowel muscle. Under the former cause will come the explanation why cow's milk is more constipating than human milk, for certainly hand-fed children as a class are more subject to constipation as well as to diarrhœa than are the more fortunate breast-feeders. Under the latter heading comes the explanation that the large intestine of the infant has sharper turnings in it than that of the adult, so that the onward course of the fæces is less free. In any case the complaint is a very common one and, if neglected, may give rise to wasting of the child, or to convulsions; while such occurrences as constant screaming, or frequent vomiting after feeds, or streaks of blood with the stools, or prolapse of the bowel are often attributable to chronic constipation. In older children a pasty complexion, thinness of the child, and his getting easily tired are common results of constipation.

The symptoms of constipation in infants, or children, vary. The bowels do not act with regularity, but while in one case there is simple infrequency and hardness of the motions, in another the stools are little balls, scanty, hard, frequently white, greenish

or mottled in colour, and passed with more or less straining. Sometimes such stools are accompanied by watery, greenish discharge, or by white, or jelly-like mucus, or are even streaked with blood, the result of the mechanical irritation caused to the lining membrane of the lower bowel by the hard fæces.

When there are simply infrequent and hard motions, the child may be otherwise apparently quite well, or the only indications of ill-health may be fretfulness, uneasy sleep, and irritability of the bladder, causing wetting of the bed. But as the stools assume the appearances last noted other symptoms arise, as flatulence, colicky pains, fœtid breath, indigestion, occasional vomiting, and sometimes fever.

In the *treatment* of constipation in children the first essential is the enforcement of regular habit. As we have previously said the training of a child begins in its first week of life, and much may be done in this way by the nurse. The same remark about habit applies to older children, and no false modesty should hinder the frequent inquiry of the parent as to the regular action of the bowels.

When the object of treatment is to secure one good motion there is nothing better than castor oil, in dose appropriate to the age (*see* p. 6); but it must be remembered that castor oil has a constipating after-effect and therefore is not appropriate in chronic constipation. Also castor oil given frequently in small doses, such as 1 drachm doses of Prescription No. 42, to an infant has a purely constipating effect, and therefore in this form also castor oil is unsuitable for chronic constipation. Our remarks below are to apply to chronic constipation.

In the case of the breast-fed infant a little manna at night is often useful, or a little Dinneford's Fluid Magnesia twice daily may be enough. Or again a somewhat richer diet on the part of the mother may act beneficially on the child.

In hand-fed children the question arises whether the constipation should be treated by change of diet or by drugs. The former seems more reasonable and within limits should be attempted, but if unsuccessful at first should not be carried too far or the food that is intended only to be laxative will cause indigestion.

On the side of diet the use of barley-water (p. 619) as a diluent for the milk, or the addition of cream to the feed, or a teaspoonful of brown cane-sugar in water may have the desired effect. Among the proprietary foods Mellin's is very useful for this purpose, or

Allenbury's, or the Malted Milk of Mr. Horlick. These may even be used once daily for a breast-fed child to treat constipation. If the fæces are hard, dry and lumpy it is a reasonable conclusion that their unusual dryness is the cause of their not being expelled so readily from the bowel, and in such cases the condition may be cured by lubrication or stimulation of the lower bowel. A piece of soap may be pared to the thickness of a quill, dipped in salad oil, and introduced into the anus. This will frequently be followed by an easy stool. Rubbing the belly with cod-liver oil or cocoa-nut oil, the friction being principally made from above downwards, is also often efficacious. Injections are sometimes used, but it is well to avoid these means if possible, although they are excellent remedies in cases of great debility with constipation. The best injection for children is glycerine, of which not more than 1 to 2 drachms should be used in each injection, made up to 1 ounce of fluid, with water.

Amongst drugs liquid paraffin is very useful; for a child of six months, 30 minims once daily, or more often, may help to regulate the bowels. Larger doses may be given, as the liquid paraffin acts as a lubricant and will not harm the bowel. Or the fluid magnesia may be given, and is especially useful where flatulence accompanies the constipation: a teaspoonful once daily is usually enough. For severe constipation in infants the best thing is often the mercury and rhubarb powder of Prescription No. 76. This may be given once to thrice daily as required. It should not be continued more than three successive days without medical advice.

As the child gets on to a more varied diet the constipation is usually much benefited, and the use of prune pulp, the pulp of a baked apple, and similar foods is indicated; but here again the warning above given must be remembered, not to give the child indigestion in treating his constipation. Plantains are sometimes used for this purpose, and if ripe are often efficient and well borne; but some children will not digest them. As the child gets older the confection of senna, a teaspoonful or more at bedtime, is useful. because it is liked by children and may be spread on bread and butter like jam. It is certainly a good thing to have whatever preparation is used of a pleasant taste, and that is the secret of success of many of the proprietary preparations that are sold for the purpose, such as the Syrup of Figs. The active principle of most of such preparations is either senna or cascara. Cascara is

very suitable for children, and is palatable also when mixed with malt. It may even be obtained in the form of chocolates. For older children, as well as for infants, liquid paraffin is useful, 2 to 4 drachms twice daily. The general hygiene must also be attended to, and regular exercise in the open air with plain diet, including fruit and green vegetables, and no hurrying over meals are important factors in the establishment of regular actions of the bowels.

CONVULSIONS

Convulsions in children may be either of one part of the body only or of the whole body. Thus of the former kind are a spasm of the throat, called sometimes spasmodic croup, or by doctors laryngismus, or a peculiar spasm of the hands and feet called tetany, or a mere twitching of some part of the body, a hand perhaps, or part of the face. A general convulsion is usually something more evident and amounts to an actual fit, which may be indistinguishable from an epileptic fit in the adult. It will be readily understood how some of the lesser convulsions of parts of the body may easily pass unnoticed by the parent: even a general convulsion may not be recognised, since it may consist of but a temporary loss of consciousness or a mere starting during sleep. Yet it is important to recognise these mild convulsions, since they may develop into the more serious kind, and at this early stage they are more amenable to treatment. Besides, the best treatment of convulsions consists in their prevention, and that can only be done if the milder convulsions are recognised as warnings. Infants of only a few days old may have convulsions: they may twitch their limbs and roll their eyes; such children are usually very drowsy. Infants of a few weeks old may have convulsions suddenly. These are usually due to indigestion and give warning that the food should be attended to (*see* pp. 496 *et seq.*).

But convulsions are commonest in children of eight months and upwards: both general convulsions of the whole body and those of parts of the body already mentioned. There is no essential difference between a general convulsion in a child and an epileptic fit. An attack of general convulsions presents spasmodic contractions of the arms and legs, which are suddenly rendered tense and hard, and are drawn upwards and inwards towards the body; the eyes are also turned up under the lids, the mouth perhaps

screwed to one side, while the teeth grate, the lips twitch, and froth appears at the mouth. The head and neck may be drawn backwards, or to one side, and the throat may be affected as in spasmodic croup. Sometimes the convulsions are limited to one side of the body. During the fit the urine and fæces may be discharged involuntarily, and a clammy moisture breaks out over the whole body. The pulse is weak and often irregular, the breathing laboured, and the pupils of the eyes will be found either contracted or dilated, but always insensible to light. This condition may last for a few minutes, or may endure, with intervals of remission, for hours, the child being more or less insensible during the whole period. At last the child falls asleep or cries loudly, or lies in a kind of stupor, slowly returning to consciousness, or becoming profoundly insensible. In bad attacks it may die from spasmodic closure of the air-passages, the face becoming purple. The head is thrown back, violent efforts are made to breathe, and a crowing noise like that of croup is heard, which gradually becomes fainter as the child sinks.

Of the convulsions that affect part of the body only spasmodic croup is the most important, and is described separately on p. 519.

The principal predisposing cause of convulsions is an inherited neurotic tendency. Children who suffer from convulsions in infancy are more likely to suffer from epilepsy in after life; the same neurotic tendency is at the back of that condition also. That is also a reason why we should try to cure convulsions in infancy, as their increased frequency tends to habit, and that in its turn encourages the onset of true epilepsy.

Apart from the neurotic tendency the most important predisposing cause of convulsions is rickets, so that in any child with convulsions, rickets must be searched for and a diet arranged that will contain sufficient fat. In some there is a local irritant cause such as teething, worms, indigestion, the excitement of anger or other emotion, or the onset of a fever. Constipation is by no means an uncommon cause of convulsions, and this factor as well as the others just mentioned must be considered in treating each case.

The *treatment* of convulsions may be considered under two heads, one for when a convulsion is actually occurring, the other for in between the fits. When a convulsion occurs, the whole child, except the head, should be immersed in a hot bath; a mustard

bath is better still if one can be speedily obtained (*see* p. 595). The administration of 2 grains of calomel for a child a year old is the next step. Then some of the chloral and bromide draught (Prescription No. 29) should be injected by means of a small syringe into the child's rectum. A suitable dose is 1 drachm for a child of three months, which may be repeated in three hours if necessary; for a child of one year double that dose is suitable. This will usually be found most efficacious. When the child has recovered he should be taken to a physician to determine so far as possible the cause of the convulsions and to act accordingly. Remember to avoid constipation; and as rickets is so common an association, it will be found that 1 or 2 grains of potassium bromide in 1 drachm of Prescription No. 46 thrice daily is often beneficial. The possibility of some local irritation, as teething or worms, exciting the convulsion is also to be remembered. Lancing the gums was formerly a common treatment for convulsions; it is, however, only indicated if there is a tooth nearly through that is causing redness and swelling of the gum. All possible causes of local irritation should be removed from any child, especially a nervous one; for instance, a long and tight foreskin in a male child may require removal for this reason.

CROUP

The word 'croup' is very loosely used, and has a somewhat different meaning to the lay public and to the medical profession. The former use the word to express any crowing sound in a baby's throat, especially if it comes on suddenly and is accompanied by cough. The medical profession are avoiding the term 'croup' as much as possible, since it has been used even amongst themselves to express conditions widely different from one another. For instance, *membranous croup* is diphtheria nearly always, and the reader is referred to p. 46 for an account of that condition. *Inflammatory or catarrhal croup* is acute laryngitis occurring in children, an account of which will be found on p. 443. A third variety is called *spasmodic croup* or laryngismus stridulus, and occurs in neurotic and rickety children, usually in hand-fed children during the first year of their life.

The affection designated *spasmodic croup* is a form of the convulsions of children. It is popularly known as 'child-crowing.' Infants in poor health often wake up in the night with a start,

and for some time cannot get their breath—a condition designated by nurses 'a catch in the breath,' but which is in reality a minor degree of spasmodic croup. When fully developed the principal symptom of spasmodic croup is a remarkable *crowing* inspiration, unattended with cough, and coming on suddenly, often on first waking from sleep. For a minute or so the child makes ineffectual efforts to draw breath, and struggles violently, but at length the difficulty is overcome and breath is *drawn in* with a loud crowing sound. The difficulty of breathing is during inspiration, and in the intervals between the paroxysms the difficulty ceases, which does not happen in other forms of croup. Of these attacks there may be several during the day or night. In extreme cases the face becomes livid, the whites of the eyes bloodshot, the thumbs are clenched in the hands, the fingers and toes are bent, and the joints of the wrists and ankles are forcibly turned inwards, and very violent attempts are made to breathe. Occasionally death results from suffocation or exhaustion, but the malady is not so dangerous as inflammatory croup (*see* p. 443). The spasmodic tendency of the parts about the throat sometimes excites a peculiar condition, in which the child is able to swallow solids with ease, but chokes when it tries to drink fluids.

Spasmodic croup depends on spasmodic or convulsive action of the muscles about the upper part of the windpipe. It is distinguished from other forms of croup by the very sudden accession and decline of the fits or paroxysms, and by the perfect freedom of the breathing in the intervals. Also, by the absence of fever or catarrhal symptoms, and generally by the absence of cough. As laryngismus stridulus is of the nature of convulsions a treatment similar to that described for convulsions should be adopted. During the spasm a hot sponge should be applied over the throat, and the Prescription No. 29 injected into the rectum in the doses above recommended. Two grains of calomel also should be given by the mouth, and in the intervals of attack Prescription No. 46 administered in drachm doses thrice daily.

DIARRHŒA

Diarrhœa is the commonest and most fatal of all the infant disorders. It is most common in the hot weather and rains, and especially so amongst hand-fed children. This is because the

diarrhœa is usually caused by the action of micro-organisms which flourish best in warm weather and which gain access to the child's bowels through the milk. Apart from this exciting cause the commonest predisposing cause is an error of diet or indigestible food, whilst a chill or the irritation of teething are also assistant causes. An infant's bowels should act from one to four times daily, and the motions should be of the colour and consistency of mustard, and free from foul or acid odour. The diarrhœa of children is often accompanied by vomiting, and is attended with more or less flatulency, and frequently by griping, which is evidenced by the straining cry of the child, and by its legs being spasmodically raised up towards the bowels when the pain occurs.

There are different forms of diarrhœa amongst infants: we can classify them in a simple manner as follows.

(1) **Simple Diarrhœa.** The mildest form: usually from indigestible food.

(2) **Inflammatory Diarrhœa.** There is fever, and the illness is more severe. The symptoms vary according to the part of the bowel inflamed.

(*a*) *The upper part of the bowel and the stomach are affected.* Vomiting accompanies the diarrhœa; no mucus evident in the stools.

(*b*) *Lower part of the bowel affected.* Mucus and perhaps blood in stools, which resemble those of dysentery. Little or no vomiting.

(3) **Cholera Infantum.** This is a severe form: not true cholera, but the stools are very watery and resemble those of cholera.

(4) **Chronic Diarrhœa.** Lasting several weeks; perhaps as a sequel of one of the above.

We will now say a little more about each of these varieties and their treatment.

(1) **Simple Diarrhœa.** The child perhaps shows signs of pain and flatulence, may vomit once or twice, and be purged six or seven times in the day. There may be curds in the stools and the temperature may be raised to 101° or more for a few hours. When the stools are a natural colour, and there is no fœtor or feverishness, the diarrhœa is probably caused by an accidental error of diet, or by atmospheric vicissitude, and it may be regarded as of comparatively little importance. When the stools are yellow, becoming

greenish after exposure, it denotes a large secretion of bile, and the disease is still a mild one.

Since the cause is usually indigestible food, the appropriate treatment is a teaspoonful or two of castor oil to expel the offending matter. After that, drachm doses of Prescription No. 72 every three or four hours, especially if there is vomiting. If only a little looseness of the bowels, then drachm doses of Prescription No. 43 at similar intervals may be given. The diet at the same time must be lessened. Less milk must be given and it must be more dilute. If the diarrhœa is at all severe it will be well to give no milk at all for a few hours, but albumen water (*see* p. 619) instead. If neglected this variety of diarrhœa may pass on into the next and more severe form.

(2) **Inflammatory Diarrhœa.** This is what doctors call gastro-enteritis; the symptoms varying according to whether the inflammation is mostly in the stomach, gastritis; or in the bowel, enteritis. If the lower bowel alone is affected the disease may be called colitis. The disease begins often with vomiting and then the child passes loose stools, which are perhaps green and slimy and offensive. If he vomits much he soon looks exhausted, the eyes sink in, and he becomes very thirsty. He is now probably unable to keep anything down but water or a little albumen water. The temperature may rise to 102° for three or four days or it may not. When the lower bowel is more affected there tends to be less vomiting but more prolonged fever, the belly is very tender, perhaps distended, and the child will pass partly liquid or lumpy motions with much mucus and often with streaks of blood, straining sometimes until the bowel comes down outside. Such colitis resembles dysentery, in fact many of these cases are true bacillary dysentery because they show the organism of that disease. A word of warning is here necessary; not every child painfully passing blood and mucus has colitis or dysentery. If a small sausage-shaped lump can be felt in the belly of such a child the disease is probably intussusception, and requires urgent surgical treatment.

The first thing in the *treatment* of inflammatory diarrhœa is to lessen the diet. Do not fear that the child will starve if you stop all milk: it is necessary. If the vomiting is severe the only food should be albumen water (*see* p. 619), of which 2 to 3 drachms should be given every half hour. After four or five hours probably 4 drachms can be given every hour, and so the frequency of feeds

gradually lessened. If even albumen water is vomited give teaspoons of warm water only for a time. But many children will keep down whey from the beginning, and it is a good thing to prepare whey and while it is being made give albumen water. As the child recovers the return to normal diet should be made gradually. If collapse occurs from the vomiting or diarrhœa, the alcoholic and mustard stimulants recommended under Cholera Infantum in the next paragraph should be adopted. In ordering medicine we must consider what are the most prominent symptoms. In any case if the child is seen on the first day of illness give a purge of castor oil. Then :

(*a*) If much vomiting, give Prescription No. 72, 1 drachm every three hours for a child under one year ; double that dose if over one year. Give also 5 minims of brandy in a teaspoon of water every two hours during the worst stage : give 10 minims if the child be a year old.

(*b*) For diarrhœa accompanied with some vomiting, give also Prescription No. 72, 1 drachm every four hours, and add ½ minim of tincture of opium in each dose for a child of six months ; and in proportion for other ages.

(*c*) If the motions are very foul, after the preliminary dose of castor oil, give Prescription No. 58, 1 drachm every three hours. At the same time Prescription No. 42, 1 drachm thrice daily, should be given.

(*d*) If slime and perhaps blood are the features of the diarrhœa, and especially in the diarrhœa of this nature which occurs at about eighteen months of age, when children are about cutting their canine teeth, then give Prescription No. 42, 1 drachm thrice daily. At the same time washing out the lower bowel by means of a soft rubber catheter passed up the rectum and attached by means of a glass junction tube to another rubber tube, and so to a funnel, will be of the greatest advantage. The bowel should be irrigated with about ½ pint of warm water or, better still, weak potassium permanganate solution, strong enough to colour the water a good pink; and this should be done once or twice a day, allowing the water to run in slowly. This may also be used in condition (*c*) above when the stools are foul.

(3) **Cholera Infantum** is not true cholera, but in the frequent and profuse watery motions it resembles that disease. Collapse is soon produced from the diarrhœa and vomiting, which is always

severe. Fortunately this severe type is less common than the already-mentioned forms of diarrhœa, though there is no hard-and-fast line between this variety and that last described. Such a serious condition requires prompt action. To combat the collapse the infant should be put into a warm bath, preferably a mustard bath (*see* p. 595). When the vomiting is severe no food can be given: teaspoons of albumen water may be tried every half-hour. If even albumen water is vomited, give ordinary cold water; and if water cannot be retained then salt solution, 1 drachm to the pint, should be injected per rectum, since some means are necessary to supply the child with fluid, overcome the collapse, and satisfy the extreme thirst. With the teaspoons of cold water or albumen water 10 drops of brandy or whisky may be given every two hours, or double that dose for a child over six months. This assists in stopping vomiting; but the alcohol should not be given in larger doses nor maintained for more than a day or so. As the child gets a little better the alcohol may be better given in the form of sherry whey (*see* p. 628). This may be used alone, 2 ounces at a time, for a day or so; but here again the child should gradually be got on to ordinary rennet whey.

For medicine in cholera infantum give Prescription No. 72, 1 drachm every three hours with ½ minim of tincture of opium in it for a child of six months, and in proportion for other ages.

The reader will have deduced from the above that the treatment of any infant with diarrhœa does not brook delay. It is well to call in the child's medical attendant as soon as possible. Little children so quickly become dangerously ill: fortunately they often regain their normal health with almost equal rapidity.

FEVER

What has been said about fever generally at the beginning of Chapter IV applies equally to children: it remains to add that children get fever more readily than adults on account of their less stable nervous equilibrium, and that many cases of a rise of temperature in children are due to causes that would not show themselves in that way in later life. For instance, simple constipation or, in India, a brief exposure to the sun are by no means uncommon causes of fever in children; and the general disturbance that attends teething is sometimes shown by an attack of fever.

Such rises of temperature are more common in neurotic children. Sometimes at intervals of several weeks or months a child will have a few days' fever for no apparent cause; in most of these cases a digestive disturbance is at the root of the trouble, sometimes constipation. In other cases a child will have a constantly raised temperature, or sometimes he will be normal in the morning and nearly 100° F. in the evening. This state of things may go on for months without apparent cause. As already stated, the child is usually of a nervous type and may suffer from night terrors or other nervous disturbances as well. In every case of persistent or recurrent unexplained fever the child should be taken to a doctor, and a thorough examination made. There are sometimes causes of such fever, unsuspected by parents, in the throat, ears, intestines, and even in the kidneys.

INDIGESTION

As in the adult, the digestive processes of the infant may be at fault either in the stomach or in the intestines, and the deficiency may be evident in many ways as vomiting, constipation, diarrhœa, the passage of curds in the motions, or the occurrence of griping pain in the belly accompanied by gaseous distension. The first-named symptoms are dealt with separately: we will here describe the two last named, which are both of very common occurrence. And first we would remark that most of the indigestion in infants is due to improper feeding, and so the preceding chapter which deals with the feeding of children should be read before the account of the particular symptom from which the child is suffering is looked up.

A. **Milk Curds in the Motions.** The appearance of tiny white flecks in the motions of the infant is an extremely common occurrence, and may pass unnoticed unless the presence of diarrhœa directs attention to the motions and calls for their closer examination. These white flecks consist of casein, the protein that forms the curd of milk. Their appearance in the motion always demands attention, because it means not only that the child is not digesting all the milk given him, but also that these undigested particles of food may act as an irritant to the bowel and give rise to further trouble. The appearance of curds, especially in very young infants, in many cases means that the cow's milk given is insufficiently diluted, and if this error is corrected according to the principles given

in the last chapter the curds may disappear. But in other cases insufficient dilution is not the cause, but a natural intolerance to the curd of cow's milk; and where dilution alone with water or barley water is insufficient to cure the condition, then sodium citrate, 1 grain to the ounce of milk, should be added to the feeds, as described in Chapter XVI. This will usually be sufficient; but if the addition of sodium citrate to the milk still does not help the breaking up of the curd fine enough to enable its digestion, then it is advisable to stop all milk for the time and put the child on whey, which has no curds. The whey should be made with rennet (*see* p. 628). When the condition has been relieved by this whey diet, the addition of cream should be made in the proportion given in the last chapter, and on this whey-cream diet the child may be kept for a few weeks. A return to milk, however, should be attempted before long, making the change gradually, diluting the milk at first with the whey-cream mixture. Sometimes instead of using whey the curds may be made to disappear from the stools by peptonising the milk (*see* p. 627), but it is not advisable to continue a diet of peptonised milk for long, and we prefer giving whey in any obstinate case.

In cases where the infant is extremely ill and requires stimulation as well as modification of its diet, the whey may be made with cooking sherry as described on p. 628 But it must be borne in mind that there is an appreciable amount of alcohol in this diet, since 1 ounce of sherry whey contains the equivalent of nearly ½ drachm of brandy, and therefore though most valuable in tiding a child over a bad time, yet sherry whey is not to be continued as the staple diet for many days

Now as there is no casein in whey it is obvious that on a whey diet there can be no curds in the stools, yet even so it sometimes does not agree, and when this fact becomes evident after a few more days' illness on the part of the child it is best to give up cow's milk altogether. We have then three alternatives, of which the best of all is a wet nurse, a fact on which we have laid stress in Chapter XV. No scruples should hinder the employment of a wet-nurse at such a time if one is obtainable.

If a wet-nurse is unobtainable the infant may be tried on donkey's milk, as described in Chapter XVI. Failing a donkey, or while a wet-nurse or a donkey is being procured, we advise the feeding of the child on one of the powdered milks, such as Glaxo, prepared in the manner described in the previous chapter. But,

as we have said there, the administration of these prepared foods for long is inadvisable because of their scorbutic tendencies, and whilst such a food is being given raw meat juice (*see* p. 627) or some fresh fruit juice should be administered daily over the same period.

B. **Wind in the Stomach.** The wind may be in the stomach itself or in the intestine. Sometimes it is evident on looking at the child's belly where the wind is, as the part distended may stand out prominently. If the gas is in the stomach there may often be vomiting and belching and hiccough, and sometimes sleeplessness. Wherever the wind is there is likely to be griping pain, called colic, and the infant may kick and scream for an hour continuously when such pain comes on. Wind is the commonest cause of griping pain in infants; other common causes are constipation and the undigested food as curds remaining in the bowel; wind often accompanies the two latter conditions. When a child screams much, look at its stools: they may show the presence of curds or of some other dietetic error. Flatulence in infants usually means an error of diet, and when it occurs the parent should consider the diet in the light of what has been said in the previous chapter and try to find out where the mistake is. It may lie in one of the following circumstances: the feeds are too large; the feeds are too frequent; the child feeds too quickly; there is too much carbohydrate, either starch or sugar, in the feeds, thus it may be due to the barley-water in a small infant, the milk is not diluted enough; there is too much fat in the food.

The *treatment* therefore may lie in the rectification of any one or more of the above errors of diet; and the condition should be dealt with from consideration of its cause. Any particular attack of flatulence may be relieved at the time by the homely dill-water, a tablespoonful of which may be given either with the feed or after it. Peppermint-water is similarly efficacious; and if the wind is in the stomach itself, and especially if there is vomiting at times, bismuth with the peppermint-water is indicated, such as Prescription No. 72, 1 drachm every three or four hours. But the bismuth mixture should not be continued more than two or three days, as it tends to constipate. When the child is screaming severely relief may be given at the time by gentle friction with the palm over the child's belly, by frequently changing the child's position, sitting him up then lying him down, and by hot fomentations on the belly. If there is reason to think the child has taken something

that disagrees with him, a teaspoonful or two of castor oil should be given on these occasions, while if constipation is the cause a small injection of glycerine and water into the rectum may remove lumpy fæces and allow wind to pass.

INFANTILE PARALYSIS

Infantile paralysis is really one of the fevers, and is infective and due to the presence of a micro-organism. But the disease is more conveniently classed here, as those affected are nearly always children under three years of age, though sometimes young adults are attacked.

The seat of the disease is in the spinal cord, where certain nerve-cells are destroyed. As a result of this the muscles served by those nerve-cells are paralysed.

The illness may begin in various ways. Usually there is fever for four or five days, on the decline of which the child is found to be unable to move one or more limbs. Sometimes the onset is quite sudden, and sometimes again so insidiously gradual that the actual date of its beginning cannot be fixed. When the paralysis is first noticed it is at its maximum and it will tend to get better, rapidly at first and then gradually up to a period of about two months. After that there can be no improvement in the muscles paralysed, but considerable further improvement may take place during the next year or so in the training of other muscles to take on the part of those paralysed. It should, however, be understood that recovery can never be complete.

The *treatment* of infantile paralysis cannot aim at removing the cause of the disease, because nothing can repair the damaged nerve-cells. Treatment must lie in massage, electrical treatment and regulated exercises of the helpless limb. The most important of these is massage, and as it will have to be done twice or thrice daily it is obvious that some one at home must do it, and therefore the mother of a paralysed child should early set about learning the art of massage. The child should be taken to a doctor at intervals for him to note progress, advise further treatment, and especially to watch for the onset of any surgical deformity, such as club-foot, which may arise as a sequel of the paralysis. Should such occur it is advisable to take the child to an orthopædic surgeon. A word of encouragement is necessary to parents whose children may be

so suddenly disabled by this disease; although the disability is in a sense permanent, yet the lapse of time allows such power to develop in compensating muscles that, apart from entry into one of the public services, the useful activity of the affected one may not be lessened. Several leading public men have had infantile paralysis.

NIGHT TERRORS

Older children are subject to a nervous affection called *night screaming*, or *night terrors*. They wake up suddenly, apparently horribly frightened, and commence screaming violently. While thus screaming, they are generally quite unconscious of what is occurring around them, and cannot recognise, or be comforted by, their friends, or they think some object near them is some animal coming to attack them. The screaming may last a few seconds, or it may be continued for an hour or more, and in confirmed cases the sudden waking up and screaming may be repeated several times during the night. One cause is stuffing of the nostrils or large tonsils. There are generally also some of the minor symptoms of convulsions previously noted, and night terrors may terminate in convulsions. It is frequently attributable to dreams and nightmare from indigestion, or to the cold feeling arising from wetting the bed, with which it is often associated. Sometimes the cure of this latter ailment will stop the fits of night screaming. In male children circumcision will cure this condition in some cases. This affection occurs in children who are naturally neurotic. Any cause of excitement or strain to the child must be removed: it may be he is working too hard at school. Any local cause of irritation, as those already mentioned, must be attended to. For medicine Prescription No. 55 should be given in doses proportionate to the age of the child and the severity of the attack; thus a child of seven years might be given ½ ounce of this mixture at bedtime, or even double that dose. Night terrors is akin to sleep-walking, and the same children may be subject to both. Sleep-walking in children requires similar treatment to that given for night terrors.

RICKETS

Rickets is one of the commonest diseases of infants, especially common in England. It is not nearly so common in India. Probably this is because Indian children are breast-fed to a greater

extent than English children, since the disease is commoner amongst the hand-fed. Moreover, many of the English children in India are of the better class, whereas rickets is especially common amongst the poorer city-dwellers. It is quite possible, however, for rickets to occur amongst the breast-fed, since the disease is often not evident till the second year of life, by which time the child will have been weaned, and if the child is then put on unsuitable diet he is liable to get rickets. For there is no doubt that rickets is a diet disease. What the particular error in diet is that causes rickets is uncertain, but it appears that an excess of starch in the food may be a factor, but even more important than that is a deficiency in the absorption of fat. That is why rickets is so common amongst those who have been fed upon the advertised patent foods, because, as explained in Chapter XVI, the characteristic of many of these foods is an excess of starch, and most of them are deficient in fat. It is unnecessary to describe in detail the appearances of advanced rickets, the large, square, flat head, the pigeon breast, the beaded ribs, the curved legs, the rounded spine, the pot-belly and the stunted growth; because these signs are so evident that before they are established the advice of a doctor will have been sought.

It is necessary for the mother to know rather the first signs of rickets, and first it is necessary to realise that rickets is not a disease of bones only, but of all the body tissues, and that it may show itself first elsewhere than in bony changes. Probably the first thing that attracts attention is that the child is peevish, its food appears to do no good, its sleep is disturbed and the pillow is found wet with sweat from his head. There is, perhaps, a little fever, and then sweating all over, and a tendency to kick off the clothes at night. He is late in getting his teeth, and late in learning to walk; or reluctant to walk, if he has learnt already. That is partly because the ends of the bones near the joints are swollen and tender, but also because the muscles themselves are weak. For rickets is not a very painful disease: if there is marked tenderness of the limbs, scurvy should be suspected (*see* p. 532). The thickening of the bones near the joints becomes especially evident at the wrists, where the swelling soon amounts to a deformity.

A child with these signs should be taken to a doctor.

The best *treatment* of rickets is to prevent it, and the best means of doing this is to breast-feed the child. If breast-milk is not

available, the next best thing is fresh cow's milk without the addition of any starchy patent food before the age of nine months. And here again we must refer the reader to Chapter XVI. Do not use barley-water to dilute the milk. Even lime-water is not entitled to the good reputation it possesses in this disease. In modifying the cow's milk take care to add cream as already advised, since a deficiency of fat is now recognised as the main cause of rickets. When the child is a year old, breadcrumbs in bacon fat make another good means of giving fat. The administration of cod-liver oil is also recommended, either in the form of Prescription No. 46, a teaspoon twice a day, or, better still, one of the proprietary combinations of cod-liver oil and malt extract, after meals.

Plenty of sunlight and fresh air is essential, and exercise in the open air if the child is old enough. Orange juice, sweetened, is also useful if there be a tendency to scurvy as well, which, unfortunately, sometimes is the case.

RUPTURE, INFANTILE

Infants are sometimes born ruptured, or may become ruptured from natural weakness and non-closure of the parts, and straining when crying, or from costiveness, and also from the condition that requires circumcision. A rupture in infants is curable, if only proper care be taken, by means of a truss. The chief care is to see that the rupture, after the beginning of treatment, never comes down: this is met by the wearing of the truss day and night, and by taking care that, when it is changed daily for the sake of cleanliness, the nurse or mother must make pressure over the opening while a fresh truss is being applied. Two or three trusses must be in use so that a clean one is always available. A cure may be looked for within two years, often in one year. In children of five or six years of age and older, the chance of a cure by the truss is very small, and operation is called for. A figure-of-eight bandage may be substituted if well-made trusses are not available. Further, a truss may be made out of a skein of Berlin or lamb's wool of thirty-five to forty threads. This may be crocheted into a flat band about 2 inches wide, and looped at the end. After replacing the rupture, place the looped end of the skein over the seat of rupture: pass the other end round the body and through the loop, which must be carefully adjusted over the seat of rupture.

Then carry the end down between the thighs, bring it up outside the thigh and fix it to the loop. A pad may be used if necessary.

Besides the rupture in the groin, a rupture may also occur at the navel. The treatment is the same as above described. As a substitute for a truss, a piece of lead, a rupee, or a cork, covered in lint, may be used to cover the weak spot after the rupture has gone back, and can be fixed in place by strips of plaster and a light flannel bandage 2½ inches wide. The same care never to let the rupture protrude at the time of changing the truss must be taken.

SCURVY

Infantile scurvy, sometimes known as scurvy rickets, is scurvy occurring in infants. It has nothing to do with rickets except that both diseases are due to errors of diet. The disease occurs in children fed only on sterilised foods, without the compensation of fresh meat or fruit juices. The child becomes gradually ill, loses weight and looks pale. He then comes to lie still, and is in evident pain when any movement is attempted or limb grasped. There may be swelling of part of a limb. If he has teeth the gums are swollen, and may even hide the teeth. The disease usually begins between the ages of six months and a year.

What makes the limbs tender is the bleeding deep down on the surface of the bone. When this occurs in the thighs it causes the child to lie with the thighs separated and turned outwards. Bleeding in other parts may occur, and be evident as bruises under the skin: for instance, a black eye appearing without cause should arouse suspicion. Blood may also come in the urine and make it appear 'smoky.'

As with rickets, the best *treatment* of scurvy lies in its prevention, and hence, for a hand-fed child, the addition of some fresh element into the diet is advisable. If the milk is always boiled or pasteurised, the addition of orange or grape juice or raw meat juice (*see* p. 627), 2 teaspoons thrice daily, is advisable. Of course the meat juice must be raw: bought meat extracts are useless for the purpose. The treatment of an established case should be on similar lines. The outer floury portion of a boiled or steamed potato beaten up into a thin cream with milk is also valuable in treatment: 2 heaped teaspoons of potato to 1 ounce of milk: give 2 teaspoons of this

cream thrice daily for two or three weeks. Give all milk unboiled, with due precaution to milk the cow and store the milk in a clean manner. Handle the child as little as possible ; do not bathe him ; wrap him in loose clothing without sleeves and leave him undisturbed, cleaning him when necessary.

TEETHING OR DENTITION

When the child is in good health, and the teeth appear naturally, they do so in the order shown by the figures. The two lower central incisors, or front teeth, penetrate the gums about the seventh month (Fig. 52) ; the corresponding upper central incisors in from three weeks to a month afterwards (Fig. 53) ; the two upper lateral incisors about the eighth or ninth month (Fig. 54) ; the two lower lateral incisors generally a month afterwards (Fig. 55). The anterior molars or grinders of the under jaw make their appearance about the fourteenth month, those of the upper jaw following shortly afterwards (Fig. 56). The canine or ' eye teeth ' are cut between the sixteenth and twentieth months (Fig. 57). Last of all, the second molars are cut between the twentieth and thirtieth months (Fig. 58).

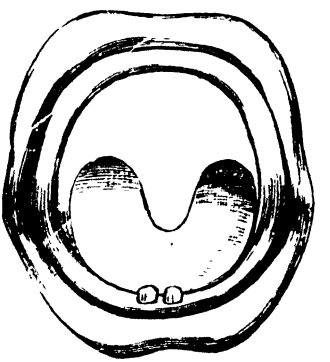


Fig. 52. 7th month

Thus, the cutting of the twenty temporary, or ' milk teeth,' as they are called, is completed, as a general rule, at the age of two and a half to three years.

Formation of the Teeth. At birth the teeth consist of pulpy substance buried in the gums, and it is not till the fourth month that they assume shape and hardness. Infants at this period and up to two years may suffer from symptoms of teething. Teething is usually held to be the cause of many ailments, but its effect in this respect has been exaggerated. The time is one of transition : the diet is often being changed at this period. Moreover, at this time disorders of many kinds, convulsions, bronchitis, and diarrhœa may occur, and are likely to be attributed to the teething, which is a visible process, when they are really due to

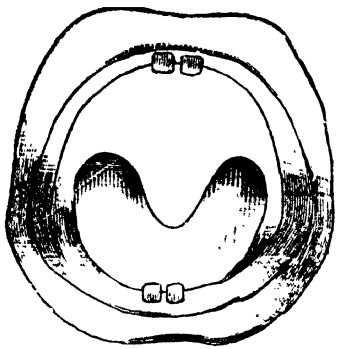


FIG. 53. 8th month

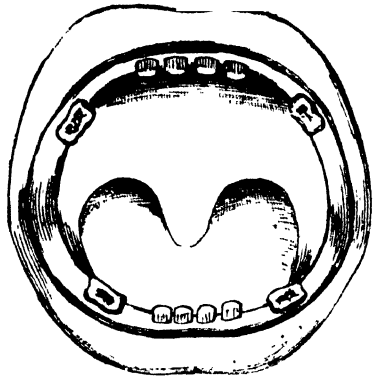


FIG. 56. 14th month

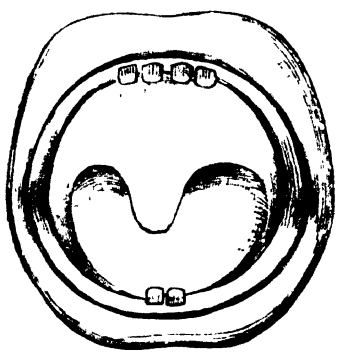


FIG. 54. 9th month

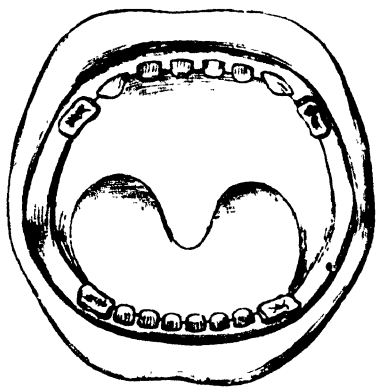


FIG. 57. 18th month

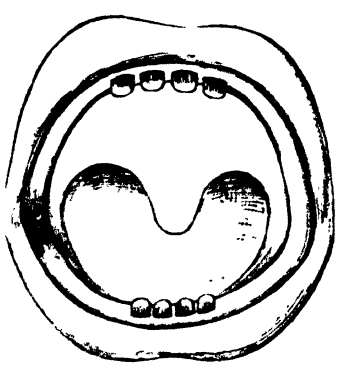


FIG. 55. 10th month

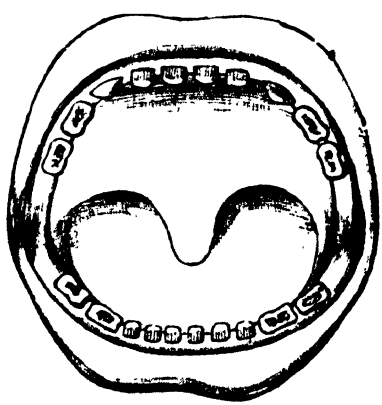


FIG. 58. 2nd year

DIAGRAM OF DENTITION

some quite different and less evident cause. There are, however, certain minor evils undoubtedly due to teething in some children. If the process is going on naturally, there may be no symptoms at all, or perhaps a little feverishness, dribbling from the mouth, or occasional diarrhœa. The commonest complaints during teething are restlessness and feverishness at night. The child is cross, and loses colour. Do not alter the child's diet at such a time unless the occurrence of diarrhœa requires it. The child may like to have his gum rubbed, and after the age of nine months a piece of hard breadcrust may be given him with advantage to gnaw and help the teeth along with.

When a tooth is near the surface, there is a prominent, shining, and sometimes white appearance of the gum, and the child, who before was pleased to have the gums rubbed, does not willingly permit them to be touched. If the child is feverish, or otherwise suffering, the gum may be lanced. But the gum-lancet should seldom be used unless there is evident irritation or prominence of the gum, or when it appears the gum will certainly burst in a day or two. Under such circumstances lancing the gum will spare the infant much suffering. In a smaller number of cases it may be necessary to lance a red and swollen gum when the tooth is not so near—as when a child has convulsions, or is attacked with other serious ailment. But this is done to relieve the turgid gums, *not* to divide them down to the tooth.

Lancing the Gums of Children. This is very easily managed, and any intelligent person seeing it done once or twice may do it effectually. The operation may be performed with a gum-lancet, the edge of which must be placed vertically on the top of the inflamed gum, and moved along, pressing firmly at the same time, till the edge of the instrument grates on the tooth. Care must be taken that the instrument does not slip.

The best way to lance the gums of infants is to place two chairs near a window, so that the light falls on the operator. The child's nurse, sitting on one chair, should allow the head of the child to fall gently backwards on the operator's knees. Then the lancet may be easily used as mentioned above. If the child is restless, a shawl may be wrapped round its body to prevent the hands being raised to the mouth.

It is, unfortunately, a popular belief that decay of the milk teeth does not matter; and that small children need not have their temporary teeth stopped. This is a very great error. It is

most important both to prevent and to remedy dental caries in childhood.

Children often bolt their food on account of toothache, and apart from that, decayed teeth may injure the health directly by the absorption of the septic matter into the circulation. The mouth of the child should, therefore, be regularly inspected, and on the first sign of decay in any one tooth he should be taken to the dentist. Up to the age of three a child's mouth should be cleaned daily by the nurse : after that age he should be able himself to use a toothbrush under supervision. The times at which the tooth-cleaning is to take place is important. It should be done twice daily, once *after* breakfast in the morning, and again at bedtime.

After the bedtime cleansing no food on any account should be given : the good-night chocolate is a pernicious custom, because it is from the retention and decomposition of small particles of food in between the teeth that decay first sets in. A convenient tooth-powder is given in Prescription No. 69 ; some of the proprietary pastes as Kolynos or Colgate's Cream are also excellent. It is a good thing to train a child from the earliest to chew hard food : from the age of eighteen months little crusts to gnaw are very good. The food of civilised man is so soft that the stimulus to the growth of teeth formerly given by hard chewing is now lost to a great extent : hence the advisability of some hard material for children, at each meal. It is regrettable that children are often not allowed to take their bones in their fingers to gnaw them.

Teeth, Second or Permanent Set. The growth of the second set of teeth causes absorption of the roots of the temporary or milk teeth, and thus facilitates their shedding, the crowns falling off and leaving room for the permanent teeth to come forward and supply their places, in which process the following order is usually observed. First, about six years of age, the first *permanent molars* or ' grinders ' (four in number) appear, *immediately behind* the milk molars, and for a short time the child has four permanent and twenty temporary teeth. The front teeth, *middle incisors* (four in number), are next shed and renewed, usually when the child is between seven and eight. Then a year or so later the side or *lateral incisors* (four in number) are replaced by others. The anterior temporary *molars* (in number four) are replaced about the tenth year by the *bicuspids*, and about the tenth year the posterior temporary *molars* (four in number) are replaced by similar teeth (second bicuspids). About the eleventh or twelfth year the *canine* teeth (four in number) are replaced, these being the last of the milk teeth to be exchanged. Near the twelfth year four more true or large *molars*

arise, and the appearance of these teeth is regarded as a sign that the child is twelve years old or over. The third double teeth (molars), or 'wisdom' teeth (four in number), seldom appear until between the seventeenth and the twenty-fifth year. The number of the second or *permanent* set of teeth when complete is thirty-two.

As a rule, no trouble attends the appearance of any of the permanent teeth, excepting the 'wisdom' teeth. But sometimes the front teeth are too crowded, and the side teeth may grow so out of line as to irritate the mouth and require extraction.

The cutting of the 'wisdom' teeth is often attended with pain. The difficulty arises from the teeth appearing so close to the curvature or angle of the lower jaw that the mucous membrane of the mouth, where passing from the cheek to the jaw, is caught by the rising 'wisdom' tooth, and nipped every time the mouth is closed. Ulceration is produced, and a troublesome sore may result. Sometimes there is stiffness, or even closure of the jaw in consequence. The best *treatment* is to cut away, with a sharp pair of scissors, any overhanging fold of membrane, so that the teeth may not press upon any part of the texture of the mouth when the jaws are closed. The ulcer will then heal, particularly if touched occasionally with a camel's-hair pencil charged with strong alum water, or with vinegar.

What has been said as to the necessity for cleansing the teeth twice daily *after* meals applies equally to the permanent set, and the advice given there as to the benefits of hard food should be borne in mind. It often happens that with closely set teeth the tooth-brush is unable to remove all food material from between some of the teeth. The toothpick is then permissible; and the use of dental floss silk for this purpose is also advisable. Dentists should be consulted frequently: every six months, even if nothing wrong with the teeth is suspected, is not too often.

THRUSH

Thrush is a fungus which grows on the inside of the mouth. In appearance it is white, like little pieces of milk curd: sometimes there is inflammation of the mucous membrane of the mouth as well. The fungus is probably the same as one that grows in sour milk, and this suggests its means of access to the mouth. Thrush in itself is not dangerous; but as it usually occurs in small and

badly fed children, especially in the hand-fed, so it has come to be associated with the presence of the other signs that go with poor nourishment.

Sometimes an appearance resembling thrush is found at the outlet of the bowels, when the thrush is popularly said to have 'passed through.' The parts should be washed with alum solution, Prescription No. 20.

For *treatment* of the disease in the mouth, the diet should first be attended to, often the addition of a little cream is what is required. After each meal the mouth should be wiped out with a swab of wool moistened in warm water, and then glycerine of borax applied by smearing it over the inside of the mouth with one's clean finger.

VOMITING

Vomiting as a symptom in adults has been dealt with on p. 226, and this should be read here as it is generally applicable to children. The only difference is that in the acute vomiting which is due usually to indigestible food, the best emetic for infants is not the emetic draught there mentioned, but a teaspoon of ipecacuanha wine.

But vomiting in infants is sometimes a chronic occurrence. Many children 'posset,' as it is called, after their food, returning a little milk and some gas at the end of the meal. This is not of importance and is only a message from the stomach that the child has taken more than he needs. So long as vomiting in infants comes on soon after food, and is only a small proportion of the amount taken, and so long as the child is flourishing in health, no anxiety need be felt. But if the vomit is frequent and the child's health suffers, it means that the state of his stomach is the same as the state of his intestines when he has diarrhœa. The section on Diarrhœa in Children on p. 520 should be read, and the diet arranged accordingly, being guided by what is said under Inflammatory Diarrhœa or Gastro-Enteritis. It may even be necessary to feed the child a teaspoon at a time on whey or albumen water, or even plain water, till the stomach can retain. Prescription No. 72 in drachm doses every three hours, and containing 5 drops of brandy in a dose, will be useful for the first day or so in such severe cases.

WASTING

The wasting of children, which is sometimes called atrophy, or by doctors marasmus, is a symptom which may result from different causes. By far the commonest cause is improper feeding, and in that case the wasting is usually attended by symptoms of indigestion, pain, or diarrhœa.

Other causes of the wasting of infants are chronic constipation, heart disease and congenital syphilis, and in older children abdominal tuberculosis. It will, therefore, be quite evident to the reader that a child that is losing weight should be taken early to a doctor, in order that the cause of its wasting may be diagnosed. We will speak here only of the commoner causes of wasting, the digestive. It takes a very little divergence from the standard of milk given in the last chapter to render the food unsuitable for the infant at a given age. Sometimes it is the dilution of the milk that is at fault, and usually the dilution will be too little rather than too much. Sometimes it is the presence of too much cream that causes the indigestion and wasting: and here the mother lies between two dangers; too much cream may give rise to wasting, and too little cream may be the cause of rickets. Or it may be the sugar that is in too large proportion and so upsets digestion. Or the child may have been fed too often; a nurse is sometimes tempted to quiet a crying child with a meal in between feeding hours, and this error applies to breast-fed as well as hand-fed children. The intervals and quantities given in Chapter XVI must be strictly followed. For often the quantities given are too large, and this may cause the wasting also. Mother and nurse are so pleased when baby takes all his feed and cries for more; they give it him and he seems to thrive at first. He is bigger and weighs more than the average for his age, and he becomes an exhibition baby. Until one week when he does not advance, and thenceforward falls weekly until he is a wasted child. Sometimes the same sort of thing happens when a child is put on to some new, usually a proprietary, food. He does very well at first, but not in the long run. We have already referred to constipation as a cause of wasting: the section on that condition should be read.

A wasting child is usually pale, with sharp features, thin arms and legs, and sometimes a prominent belly. He cries much in a

minor key, often seems hungry at meal times, but unsatisfied afterwards.

The *treatment* of wasting must be directed first to finding the cause. If the child is breast-fed, do not wean him without doctor's advice. It is usually wrong to do so, and in any case he should be partially breast-fed, if not entirely. If hand-fed, be guided by the rules for hand-feeding given in Chapter XVI. If, in consequence, you find it necessary to alter his diet, begin him on less than he should be having normally, and gradually increase to that amount. Be very slow in your increases. For a child that is badly wasted it is, of course, necessary to consult a doctor. It is in such cases ass's milk has its use ; or a wet nurse if one is available. If the child is on modified cow's milk omit the cream, because wasted children are usually only further upset by excess of fats. For the same reason cod-liver oil does not suit them as a rule. See that the child is well protected from chills, especially round the belly. Medicines are not so much required as careful dieting, and must be adapted to the individual case. The extract of malt, half a teaspoon in a feed thrice daily, is often valuable in these cases.

WETTING THE BED

The age at which a child develops control of his urination varies with the individual child, and depends much on the training he has received. A child's training in this respect begins with the first week of his life, and a child trained by a good nurse should be by the time he is a year old, if not always clean in his habits, at any rate able as a rule when awake to give due notice that he will require attention. He will still wet the bed at night for another six months, perhaps up to two years of age ; but after the age of two and a half years such incontinence, especially during waking hours, is abnormal.

The complaint usually is a nervous one, and occurs mostly in neurotic children : fortunately it tends to get better of itself, and even in the worst cases has usually disappeared by the age of twelve years. But because the child tends naturally to grow out of it, and because the treatment of the complaint is often attended with failure at first, the parent must not therefore adopt a policy of masterly inactivity and wait for things to get better. For, meanwhile, the child will be growing up unduly sensitive and

ashamed of his disability, and his education even may be interfered with. It is hardly necessary to say that a child who wets the bed should not be sent to a boarding school, which would unfairly subject him to a life of misery. Yet it is sometimes done.

In the ordinary course of his training a child should be made to empty his bladder at bedtime. If he wets the bed he should be roused again in the middle of the night, or at his parents' bedtime, to empty the bladder again. If such regular habits are insufficient to cure his disability a doctor should be consulted, and whatever treatment he recommends should be persisted in, in spite of the failure which at first is the rule rather than the exception. It is necessary to consult a doctor early for two reasons: one is that there may be some ascertainable cause of local irritation, the removal of which may cure the child's incontinence, and which it may take the doctor's trained skill to discover. For instance, sometimes thread-worms cause this complaint; less often a long foreskin, adenoids, or even a stone in the bladder may be the cause. The other reason is that the complaint may often be cured by administration of the tincture of belladonna in large doses, beginning at 5 minims and working up perhaps to 20 minims thrice daily; but such large doses are not to be given without medical surveillance, as the symptoms produced may be alarming. It may be dangerous to give anything like that dose in some children.

Moreover, a skilled examination of the urine, such as can only be performed by a doctor, is essential in each case.

Apart from the treatment already suggested, in a nervous child success may be attained by giving ½ ounce of Prescription No. 55 at bedtime: sometimes double that dose may be necessary. As regards diet, there should certainly be no tea or coffee allowed, and the restriction of starchy and sugary foods is helpful. No green vegetables or fruit, and very little sugar. Steady persistence in treatment is required in spite of an initial lack of success.

CHAPTER XVIII

THE PRESERVATION OF HEALTH

EVERY officer, on first arrival in India, brings with him one priceless possession—sound health. He should study how to preserve it. Not only is a life of constant or frequent sickness somewhat of a burden, but no officer can hope to rise to the head of his department, or, having risen, to successfully take up that post, without good health. The higher the appointment, the greater the demand on the energies of the individual, and one of the first requisites for high office is physical ability to stand the continuous strain of hard work under the trying conditions of the Indian climate. It becomes the interest, therefore, as well as the duty, of every officer to take such precautions as are practicable to preserve his health throughout his service in India.

Formerly a service in the East was looked upon as a gamble with one's health, as a career bound to be attended with a considerable amount of sickness and ill health. This inevitable illness was attributed to the influence of the climate. The liability to disease was supposed to lessen with lengthened residence, as a result of acclimatisation. We have learned much regarding tropical diseases of recent years, we are on the eve of discovering much more, and the time is coming when, with the exercise of due precautions, residence in India, as regards adults, will be attended with but few more risks to health than would be incurred in an equal period of the life spent in Europe. The Indian climate causes discomfort to Europeans, and prolonged residence leads to enervation, and may thus predispose to disease or retard recovery from illness once contracted ; but the chief cause of sickness is now known to be due to the numerous parasites which flourish in the tropics and prey on the European immigrant. Sir Patrick Manson recently stated that 99 per cent. of tropical diseases were caused by germs. The preservation of health depends, therefore, upon the avoidance of

these parasites, their destruction, or the neutralisation of their powers of mischief. The acclimatisation of the old resident is practically the personal application of knowledge, learned in the bitter school of experience. In England, where sanitary measures of far-reaching effect have been carried out and millions of pounds spent in the process, the individual's health has been safeguarded on every hand. His drinking-water has been filtered and regularly submitted to rigorous bacteriological tests; waste water, sewage and house refuse have been removed, and treated with the latest scientific methods. The purity of his food, meat and milk supply has been under constant supervision. Daily notification of all cases of infectious disease has resulted in the prompt isolation of all such persons liable to infect him; even the domestic animals have been on occasion inspected to see that they suffered from no disease transmissible to man. Accustomed from childhood to these precautions and safeguards, he accepts the conditions as a matter of course. Arrived in India, according to the station to which he is posted, he will find few or none of these safeguards to his health in existence. He will in future have to supervise his own water-supply and act as his own food inspector. In accordance with the way he carries out these duties will be the state of his health, for the experiment which he is now making is a personal one; his own health is the stake, and he himself the party most concerned. The responsibility cannot be thrust upon another. The sanitary precautions which are recommended in the following pages have been made as few and as simple as possible. They will not be found unduly difficult of execution, and once they become a routine procedure, the little trouble involved will hardly be noticed. Much may be learned by a short residence in the bungalow of a senior officer. The hygienic measures to be adopted may be divided into those that are General and those that are Personal. Methods that directed to the prevention of special diseases such as malaria, smallpox, enteric fever, cholera and plague have already been described, and will be found under the headings of those diseases. General hygienic measures with slight modifications are applicable in all parts of India; but personal hygiene must be varied in accordance with variations of climate and physical conditions of the country.

GENERAL HYGIENE

General hygiene includes: (A) the choice of a residence and attention to its light and ventilation; (B) attention to the conservancy of the premises and its neighbourhood; (C) the provision of a pure water and milk supply; (D) the quality of the food supplied, the methods of its cooking, and protection from contamination by flies.

A. HYGIENE OF THE HOUSE AND COMPOUND

There are few stations in which the newcomer has much choice of a bungalow; he is generally obliged to take whatever house may be vacant at the time and suited to his modest pay. Thatched roofed bungalows are cooler, and in the rains drier than those with terraced roofs, but they are burdened with many disadvantages. If cool, they are dark, and swarms of mosquitoes hide about the bamboos and thatching of their verandas. Rats take up their residence above the ceiling cloths, occasionally snakes, or civet cats; the latter in the breeding season stink abominably. In the rains the thatch rots, and during the annual repairs the bungalow is filled with the most objectionable dust. There is, moreover, the danger of fire, not only arising from the carelessness of one's own servants, but also originating elsewhere from the carelessness of others, and carried on to the thatch in the form of floating sparks, etc. It is impossible to keep such a dwelling free from mosquitoes. Of late, improvement is manifest in the type of houses built for the European residents. The old-fashioned thatch roof has been largely replaced by pucca or tile roofs.

In towns building by-laws have been gradually adopted which for the future ensure that the minimum sanitary needs of the buildings will be secured. It is impossible to frame rules for the construction of a dwelling-house adapted to Europeans and suitable for every part of India, as the material available and the climate differ in various parts of the country.

Where the selection of a residence is possible the following points should receive attention:

Site. The house should be situated as far as possible from native dwellings in order to avoid proximity to malarial-infected children and mosquitoes, large numbers of which are found amongst

the native population who take little or no precaution against infection. The site should be on raised ground and not in a depression. It should be open to the prevailing winds but shaded by a few trees. The aspect should be for the bedrooms north or east and for the pantry north. The soil should be porous and easily drained and not retentive of moisture. Gravel or light loam is the best. Usar, kankar, and clay should be avoided. The house should be built on a pucca plinth of at least 2 feet above the level of the surrounding ground.

Rain-water should flow rapidly away from the house; that falling from the roof should impinge on stone slabs to prevent erosion and the formation of pools of water near the foundation.

Floors. With recent advances in the knowledge of disease and its causation, the importance of well-made cleanly floors has become more evident. Badly made concrete floors are easily riddled by rat-holes, and allow plague-infected rats to die in close proximity to the inmates. Dusty floors breed and harbour fleas, by which the virus of plague is carried from rat to rat and from them to the human residents.

Floors should be composed of 4 inches of lime-concrete covered by 1 inch of cement, concrete or brick on edge well pointed with cement, or of smoothly hewn stone of a non-porous description. Almost anything is preferable to the ordinary earth floor, through which not only damp but bad air may rise, for the atmosphere does not end where the earth begins, but permeates it in all directions, and in winter the interior heat may draw through the soil noxious gases from the neighbourhood. Lime-concrete floors are liable to break, require constant repairs, and unless thickly covered feel cold, while thick coverings harbour dirt and insects. A very useful and cleanly floor is made from lime concreted with cement facing in which patterns are worked by the insertion of small pieces of broken crockery. The cleanest and best floors are of glazed tiles in the plains and of wood in the hills where white ants are not prevalent. Where wooden floors are employed a ventilated air-space beneath the floor to prevent dry rot must be constructed. To keep white ants out of floors the 2 feet plinth should be constructed with 1½ inches of rammed earth on which is placed 1 foot or more of sand mixed with arsenate of sodium, over which the concrete facings, as above specified, are placed. It would be healthier if the floors were bare, but constructed as they are of cement or merely

beaten plaster, it is customary to hide their nakedness with some sort of matting. Under this matting, and in it, a terrible collection of dirt speedily forms. The matting should be taken up and the floor swept, cleaned and lime-washed at least twice a year, whilst at the same time the matting should be thoroughly cleaned and exposed to the air before replacement.

Walls. The materials with which walls are constructed will differ largely in accordance with the character and cheapness of the materials available and with the needs of the district and climate.

Thick Walls. Thick walls keep out the heat during the day, though they retain it to some extent during the night. Thin walls are unbearable to live in in the hot weather, especially in the northern provinces of India. Outer walls should be about 1½ feet thick, and should consist of first-class brick, lime pointed. Inner walls may be of second-class brick in mud; and partition walls may be as thin as 14 inches. In Burma, wood is almost entirely used in the construction of the houses, and the walls are often simply lattices or jilmils which can be opened up for the free entrance of air from all sides of the houses. In the hills brick is difficult to obtain. The outer walls are of stone, lime pointed, and the inner of stone in mud.

Plaster. Irregularly plastered walls rapidly show a deposit of dust. The plaster should be composed of lime and surki or brick dust or sand, smoothed by the use of a long, square, wooden rod which when pressed over the wall gives an even surface.

The house should be kept as clean as possible. It should be whitewashed throughout at least once a year—twice would be better. It should not be heavily furnished, and if curtains and purdahs must be used for privacy and æsthetic purposes, they should be few in number and light in colour, as on all dark material mosquitoes love to hide during the light of the day.

Roofs. In the plains the best roofs are jack arches on steel beams over which 3 inches of lime-concrete is placed. Double interlocking tiles also make a very good roof. Country tiles should be avoided as they require constant expense for repairs, are easily displaced by high winds and monkeys, and harbour rats and squirrels. In the hills steel sheets are employed. In Burma pent-roofs are used, generally composed of wooden slabs or of galvanised-iron plates, the sites of which are turned upwards and nailed into a batten. The edges are covered over with strips of sheet-iron

forming semicircular channels, which are placed with the concavity downwards over the upturned edges of the sheets.

Fittings. Where white ants are prevalent doors and window-frames should be of teak wood.

Ceilings. Ceilings in the plains in modern houses are usually of the jack arch type and colour-washed. The chuts or ceiling-cloths made from whitewashed cotton-cloth look neat when first constructed, but when the space is rat-ridden, may become most objectionable. Care must be taken that all apertures between the wall and the overhanging roof or pent-roofs are well stopped or protected by netting; otherwise birds, squirrels, rats, bandicoots, cats and bats will find their way in the interior. Such intruders dying in the roof give rise to much trouble and to disagreeable effluvia; while alive, the noise they make, especially at night, is anything but pleasant or conducive to repose, and their droppings make the rooms beneath most unpleasant. In the hills the ceilings of wood with a beading of various patterns are much better constructed than in the plains. Indian houses, as a rule, except in the plains of Bengal, Madras, and Bombay presidencies, possess chimneys and fire-places. Such apertures assist the ventilation of the apartment; during the rains fires may be advisable on account of damp; whilst in northern districts fires are always acceptable, if not actually necessary, during the cold weather. The verandas in the plains cannot be dispensed with, and their breadth should be between 10 and 15 feet. On the verandas it is customary to keep a few ferns and shrubs in pots: the fewer there are the better, as they form harbouring places for mosquitoes. Doors and windows, especially in malarious districts, should be covered in by galvanised-iron wire nettings of $\frac{1}{24}$ inch mesh fitted into separate frames; these can be opened during the day and closed during the night to prevent the entrance of mosquitoes.

Light and Ventilation. The action of sunlight and oxygen on the destruction of harmful bacteria is well known. Windows should, therefore, be of the size of at least one-tenth of the floor space. Ventilation, when the doors and windows are closed, should still be maintained in lower rooms: by the construction of clere-story windows opening 1 foot beneath the roof level or in upper rooms by ceiling ventilators, discharging the hot air through a curved pipe, or in rooms with no ceilings by ridge or eave ventilators.

Space. The dormitory space in European barracks found necessary for soldiers is 90 superficial feet and 1800 cubic feet per man, and private houses should not give less. In European hospitals 120 superficial feet and 2400 cubic feet are allowed, showing the greater necessity of fresh air and ventilation in the sick chamber. But no artificial ventilation and no amount of cubic space will obviate the necessity for natural ventilation, and this is only obtained by open doors and windows, or the accessory methods of ventilation noted above. In the hot season it is necessary to close the doors and windows during the day to prevent the entrance of hot winds, but on the approach of sunset doors and windows should be thrown open for the free admission of air throughout the dwelling. The gauze doors and windows should be closed about 6 P.M. to prevent the entrance of mosquitoes.

The Compound and Servants' Quarters. The compound ought to be kept clean and free from jungle. It is desirable that it should be covered with grass kept short. Grass-cutters should not be permitted to remove every particle of grass as is their custom. A few trees, if they are not situated too near the bungalow, are an advantage. Their shade is useful to the owner's horses, which cannot have too much fresh air, and which are frequently groomed in the open under a tree instead of in the stable. There should be no hollows to permit of the collection of rain-water.

Amongst the virtues of the native servant a knowledge of and attention to sanitation is not included, and hence it is necessary to pay periodic visits of inspection to his quarters to see that a few obvious sanitary rules are not neglected. The quarters should not be entered without permission, as his female relations often reside with him. It is a good rule to stroll round the cookhouse, servants' quarters and stables each Sunday morning. The points to observe are that kitchen refuse is not allowed to accumulate, holes or irregular drains made, or empty tins left lying about. Cakes of cow-dung should not grace the walls, and all stable refuse should either be removed at once, or buried in a hole dug in the vegetable garden. There will usually be only one well in the compound. This well should be cleaned out each hot weather and ten to twenty seers of freshly slaked lime thrown into it. The water of a second well, if there is one, should be used for the horses and for garden irrigation. It is just as well to inquire where the *dhobi* actually washes the clothes, and if in some filthy

tank, as is not unusual, a resort to a cleaner supply, such as a running stream, must be insisted upon.

B. CONSERVANCY

Too much attention cannot be paid to the removal of excrete materials from the house and compound. Constant inspection is necessary, especially in the hills, or the compound will be polluted by the native servants, and by bathroom refuse carelessly deposited by the sweepers in any corner. It must be remembered that the germs of many diseases, including typhoid, cholera, dysentery, and infantile diarrhœa, are carried by flies or given off from the body in the urine and excreta, and that if these insanitary conditions are allowed to continue, and are carelesssly left about, the germs are again carried back into the house by flies. In municipalities dejecta from the bathrooms should be disinfected by phenyle and placed in the conservancy receptacles covered with a lid. In those places in the plains where there are no municipalities, dejecta should be taken away from the houses for a distance of 400 yards, and carefully buried or burnt in incinerators. Where cholera or typhoid has occurred, the dejecta should be boiled in kerosene-oil tins before being disposed of. It should be recollected also that Indian sheep and cattle will greedily devour human ordure, especially in the hot season when grass is scanty. In this manner the germs of certain maladies—tapeworms, etc.—may be conveyed in flesh food into the human system.

C. PROVISION OF PURE WATER- AND MILK-SUPPLY

In the larger municipalities, the water-supply is obtained from rivers, canals, or from tube wells. In the former case it is subjected to careful filtration through sand beds; but where this purification is not undertaken, and wells are the chief sources of supply, it is obvious that contamination may occur from the vessels, ropes, etc., used by the people to draw water from the wells, and that therefore the water must be boiled and cooled before it is used.

Milk. In India milk, from its liability to intentional adulteration, accidental contamination, and from the fact that it forms an excellent medium for the growth and multiplication of many dangerous germs, is a perilous fluid to consume in its raw state,

It should be sterilised (*see* p. 503) before use. If not obtained from the owner's cow, it should be obtained from a cow milked on the premises, if such an arrangement is feasible.

During the prevalence of sickness, especially of enteric fever or cholera, the precautions given above must be redoubled. Certainly no water should be drunk which has not been thoroughly and recently boiled. The importance of this in India cannot be overestimated. It may be filtered in addition, if necessary or desired, but this filtration must be done before boiling and not after. As regard filtration, there is practically only one reliable filter on the market, the Pasteur-Chamberland. This is very efficient when first brought into use. Objections to it are the fragility of the candles, which are expensive, and the care which must be taken in cleaning them. If not thoroughly cleaned, bacteria will finally grow through the kaolin of which they are composed. The candles should be removed once a week and well brushed. To keep them thoroughly efficient, they should also be boiled at least once a month. Water which is intended for drinking purposes should be drawn from a well reserved for that purpose. It should be drawn from the well in an iron drum or empty kerosene tin. It should not be carried in *mussucks* or *ghurras*. Prior to boiling it is best kept in a large enamelled iron jug or aluminium vessel. Most Indian bungalows have a small pantry or bottlekhana furnished with a charcoal *engitti*, where afternoon tea is made. Here the boiling should take place: it is then easy by personal inspection to see that the water is actually boiling. Having once sterilised our supply of milk or drinking water, it is equally important to preserve it from outside infection. Such infection is most likely to be brought by flies: and it is important to appreciate the fact that one fly by lightly settling on a jug of milk may convey to it the organisms of cholera or enteric fever, and that in a very short space of time the whole of that milk would be teeming with millions of those micro-organisms.

The best way to keep milk after boiling is in jugs or bowls covered with pieces of thin muslin weighted round the edges with beads to prevent their blowing off. A large supply of such d'oyleys should be kept, of sizes to fit various vessels and enough to allow of their being frequently washed. Water is best stored after boiling in wine or whisky bottles. In the hot weather these may be cooled in an ice chest, or merely by standing them in a *nand* of water, or

again by swinging them in a grass-filled basket from a tree, or from a beam on the veranda, throwing water on the grass occasionally. This method will only act if there is a good wind. There is no objection either to cooling the water in an earthen pitcher or *surahi* provided that vessel is daily cleaned with solution of potassium permanganate. Potassium permanganate crystals should be in the godown of every house and a solution made up daily of a pinkness approximate to the intensity of an ordinary pink cabbage rose. With this solution milk and water vessels should be cleaned every morning : and a multitude of other uses can be found for it. When there are children in the household, or if for any reason it is required to use the milk unboiled, additional care should be taken : and it is possible to train servants to make the *gwala* wash both his own hands and the cow's udder first with soap and water, and then with the permanganate solution, before milking the animal. It is hardly necessary to say that this routine will not be carried out unless frequent inspection is made to impress the menials with the fact that you attach importance to it.

D. THE QUALITY OF THE FOOD-SUPPLY AND THE METHOD OF COOKING

In the larger municipalities the meat is now under inspection, but where this is not carried out the reader is advised to purchase 'a guide to meat inspection for regimental officers' compiled under the direction of the Q.M.G. published for 1*s.* 6*d.*, which will give the main points to be observed in the selection of meat. Tainted meat should not be eaten ; meat should be washed if possible with vinegar and hung up in a cool meat doli to which flies have no access. During the prevalence of cholera over-ripe fruit, raw cucumbers and melons should be avoided. All food should be eaten hot as the danger of pollution by flies is thereby avoided.

As the digestion of the Europeans is weakened by residing in the tropics, the food should be carefully cooked. Native servants have very many methods of rendering tough old fowls edible : roast meat, and roast fowls are very seldom sent to table without having received a preliminary boil by which in most instances the nutritious juices are largely extracted. Another constant source of dirt and contamination of food is the use of dirty jharans (dusters) and cloths

for straining soup and milk. The housewife should give out daily a special muslin square to strain the milk, and clean dusters for the pantry and kitchen. Too much stress cannot be laid on this most important item in the housekeeper's daily routine work.

PERSONAL HYGIENE

Habits. Early rising is the rule in India, and one to which the newcomer will speedily learn to adapt himself, provided he follows the first part of the maxim, and goes early to bed. Whatever the young officer may have been able to do at home, he will soon find that late nights do not agree with him in the East, especially in hot weather, when, owing to the discomforts of the heat, etc., rest is so disturbed and sleep so coy. To be up and fresh at six in the morning necessitates retiring at ten the previous evening.

A daily bath in India is not a luxury but a necessity, and there are many occasions when a second one does not come amiss. Old residents usually take a warm bath followed by a cold douche, and this procedure is probably the safest and best: though there is no objection to a cold tub if personal experience shows that it does not disagree. The cold bath, however, should be avoided if one is subject to looseness of the bowels or has recently suffered from malarial fever. A swim in cold water is a great luxury when obtainable: experience, however, would seem to be against it from a health point of view, as many of the station baths and bathing platforms, etc., have been allowed to fall into disrepair, and consequent disuse; nor do the older residents, when tried by the practical test of a subscription, seem to have any great desire for their restoration.

Clothing. The new arrival will soon learn to adapt his clothing to suit the climate of the part of the country in which he is stationed. He is advised to buy his underclothing certainly, and with some exceptions his other clothes also, in the country of his adoption. By doing so he will be supplied by persons familiar with his requirements with articles suited to his needs, and not loaded up with useless and unsuitable kit destined, after much journeying, to feed moths and white ants, etc. The great desideratum is to be so clothed as to avoid contracting a *chill.* For this purpose it is usually necessary to wear some light absorbent material next the skin. Articles entirely made of wool are apt to be heavy and

to shrink greatly after washing. To avoid this, vests and drawers are made of mixtures of wool and cotton, which is cheaper, or of wool and silk, which is dearer than pure woollen articles. For others who can afford it and prefer it, silk underclothing may be worn. Thus protected against chill, the other articles of clothing can be adapted to the demands of the occasion and the season. Khaki drills and serges for travelling and shooting, tussore (Assam) silk suits for office wear, and suits of various kinds of light and medium materials, to be procured from any tailor for wear on other occasions. In the hot weather and rains, whenever possible, it is a great comfort to wear suits that can be washed. Your tailor may be trusted to make your clothes fit loosely—a great point as regards comfort which is apt to be overlooked when the suit has been made in England. For night wear light woollen pyjamas should be worn during the colder months. These, however light they may be, are too thick for hot-weather use in India, and must be replaced by similar articles of silk or cotton. The latter may safely be used if the precautions noted below are carried out.

Just as in England many serious diseases have their origin in a common cold, and diseases of the respiratory tract are to be particularly guarded against at certain times of the year, so in the tropics serious intestinal affections follow upon, if they do not arise in, an abdominal chill; for in the tropics the abdomen and its contents represent the danger-zone, and not the organs in the chest. The time of greatest danger of an abdominal chill is whilst asleep during the rains, when after a heavy downpour there may be a rapid fall of temperature. To obviate this danger of chill, the wearing of cholera belts—broad flannel bands to cover the abdomen—used to be advised. Their use is not free from objection; they are apt to slip out of position during sleep and, should they retain their place, are, followed, when applied, by a broad band of prickly heat, the irritation from which causes disturbed sleep. Their constant use, by keeping the part bathed in moisture, tends to weaken the natural powers of resistance of the protected area to changes of temperature. Hence, it will be sufficient precaution if the jacket of the pyjama suit is tucked into the pyjamas, to prevent it rucking up and exposing the abdomen. In addition a rug or blanket should always be on the bed inside the curtain and one loose end of this blanket should be placed across the abdomen, the remainder lying free. The sudden changes of

temperature which take place usually produce a semi-conscious state at the time of occurrence, and it is quite easy to pull a little more blanket across the abdomen sufficient to prevent any danger of chill. I have carried out this little plan with complete success during my residence in India, and hence can speak from experience. The sufferer from cholera, diarrhœa, or dysentery will undoubtedly experience a feeling of relief and comfort from a cholera belt. But this is commonly due to the binding by it of the abdominal walls and contents. A web belt of the gymnasium or horse-girth type buckled over the gauze vest or pyjama jacket will afford the same benefit without the disadvantages. The man who has always been in the habit of wearing a flannel cholera belt in India cannot discard it with impunity. He should wait until he gets into a temperate climate when the vessels of his skin recover their contractility, then let him abandon it for ever. The new arrival in India should never except under medical advice take to one.

As a protection against the heat of the sun a solar topee, or pith helmet, is requisite. This should protect the temples and nape of the neck as well as the top of the head. The newcomer is advised to purchase one of the pattern of the Cawnpore Tent Club. Individuals who are especially sensitive to heat may have their riding and camp jackets fitted with a spinal pad to protect the spine when riding or driving long distances in the sun. These can either be built into the jacket or made to fix on with buttons when required. Some people are strong in the praise of the sun-proof fabrics that have lately come into the market and are supposed not to allow the harmful rays of the sun to pass through them. There is no harm in trying these, but our experience of them is as yet not sufficient to say that they are of much use.

Bedding. It is customary in India when travelling for each person to take with him his own bedding. This is often carried in a waterproof kit holdall, generally known as the Wolseley valise. Apart from the expense, these valises are heavy and cumbersome. All that is really necessary is a good-sized waterproof sheet, and a couple of straps or suitable pieces of rope. It may be noted here that when purchasing a waterproof coat for use in the rains, care should be taken to select one the parts of which have been sewn together, not merely glued with some composition, which is sure to melt on exposure to the heat in a break in the rains. When setting up house it is advisable to purchase an iron bedstead fitted with a

Lawson Tait spring mattress. These beds are clean and healthy, and being of iron and wire, do not harbour undesirable guests.

Food. As a rule too much meat is eaten by Europeans in India, and it would be better if a more vegetable and farinaceous diet was generally adopted. Whatever meat is eaten should always be well cooked owing to the greater danger there is in this country of the meat being infested with parasites. Fruits and vegetables are scarce in the hot weather and rains, and the latter, when procurable, are generally tasteless and insipid. However many meals are taken in a day, the practice of taking a cup of tea and a little buttered toast or biscuit, soon after rising in the morning and before leaving the bungalow for work or exercise, cannot be too strongly recommended. Of late years tinned foods have come more largely into use. Their consumption is not unattended with danger from ptomaine poisoning. These preparations in any climate do not improve with keeping, and certainly deteriorate more rapidly in the tropics than in colder regions. As a rule they may, however, be eaten without risk, provided the following safeguards are adopted. They should be procured of well-known brands, fresh from a reliable firm in some large centre. Those obtainable from small dealers may be cheaper, but are certainly less safe, being often the old stock of large importers sold cheap to effect a clearance. As soon as the tin is opened, the contents should be turned out into a clean dish, and should be eaten that day. Once opened, these tinned foods should not be kept, as with a few exceptions they rapidly decompose in India, especially in the hot weather and rains. So long as fresh articles of diet are procurable their use is not to be recommended as, apart from their greater cost, they are lacking in certain substances essential to health and which are present in fresh food. It is not unusual to see Brand's essence—a very expensive preparation—being used in the sick room of a bungalow whilst numbers of healthy young chickens are running about the compound, any one of which a good cook could speedily convert into a preparation as good as the essence, and being fresher, of more value therefore to the patient. Some little knowledge of cookery is advisable for all residents in the East, particularly those who are destined for lonely stations in the interior. To these I should advise writing to one of the well-known stationers in Calcutta and purchasing a small book on Indian cookery. There are several such books, and the stationer may be trusted to advise the one

most suitable on learning the requirements of the purchaser. When furnishing for himself, the young officer is strongly advised to invest in a set of aluminium cooking vessels. More expensive at the beginning, they will be found cheaper in the end. Very good patterns to suit all requirements may be seen in the price lists of various firms and in the catalogue of the Indian Aluminium Company, Madras. For keeping milk, etc., suitable enamelled iron ware can be obtained in any good store.

Drink. The most natural drink is water. Unfortunately in India it is almost always open to suspicion, and so long as it is mainly obtained from shallow surface wells of unstained brickwork, must remain so. It is only really safe after it has been well boiled.

It may be said that boiled water is insipid. Nevertheless it should be the staple drink. It may occasionally be flavoured with lemon or lime juice, freshly squeezed or of the kind bought in shops; but too much of this acid juice should be avoided; it probably favours the onset of boils. Neither is it good constantly to drink soda or other aerated water in order to quench the thirst: this tends to promote indigestion. Tea is an excellent form in which to take boiled water: and this again should be weak and used in moderation. It should be infused, not stewed. A slice of lemon or a teaspoonful of lime-juice preparation is a good substitute for milk when the latter is not obtainable or its source of supply doubtful. Cold tea will be found an excellent thirst quencher on the march or in camp. Coffee and cocoa, excellent in the cold weather, will generally be found too heavy by most persons during the remainder of the year.

Alcohol. As regards the use of alcoholic drinks, there can be no doubt that the more sparingly they are partaken of in India the better. So long as work, physical or mental, has to be performed abstention should be the rule. It follows, therefore, that no alcoholic drinks should be consumed during the day. With the evening comes relaxation from the day's labour, when stimulants may, with less harm, be indulged in. It would be better still if their consumption was delayed until the dinner hour. In whatever form alcohol is imbibed, it should be drunk well diluted. Short drinks are most injurious; the practice may be excused, it cannot be defended. The consumption of alcohol amongst Europeans in India is steadily diminishing, and with this reduction is a corresponding improvement in the sickness and mortality. One hears

less nowadays of sudden deaths from heat apoplexy, which formerly from old records would seem to have been so common. Certain it is that the very worst preparation for prolonged exposure to the sun in the open is a previous overdose of alcohol.

Exercise. Whilst it is true that severe muscular work and great mental activity are incompatible, the double tax on the majority of individuals' energy being too heavy, still some form of bodily exercise is essential in India if health is to be maintained. The brain is clearest and the body most vigorous in the early morning after a good night's rest, and hence if much mental work has to be got through, a beginning should be made soon after *chota hazri* and the taking of exercise postponed until the afternoon. If both outdoor work and office work have to be performed each day, then it is better to get the outdoor work done early in the morning, so as to avoid the greater heat of the sun later in the day, the office work being performed subsequently. The most convenient time for exercise will be found to be in the late afternoon, after the conclusion of the day's work. Whenever possible, the exercise, whatever form it takes, should be carried out in the open air. The close, heated air of an Indian racket court is the one objection to an otherwise excellent game. The recreation finished, clothes wet with perspiration must be changed at once and much illness will thereby be avoided. If for any reason to change is impossible, a sweater should be donned immediately, and the change subsequently effected as early as possible. To sit down to cool is to court a chill. After violent exercise a shower bath is very grateful. In a few stations plunge baths are still maintained. If made use of, there must be no hanging about; the time for their use is immediately after the game; the plunge should be made whilst piping hot, before any cooling off has taken place. It should be no more than a plunge and should be followed by a good rub down and clean dry clothes. No person who has recently recovered from malarial fever, or is subject to malarial attacks, should indulge in this luxury, and the same holds good, only more emphatically so, for sufferers from any form of diarrhœa or dysentery.

Camp Life. Life in camp in the cold weather is very enjoyable and, with a few simple precautions, very healthy. No trip should be made without a mosquito curtain for protection at night, a good mackintosh sheet to ensure the bedding being dry, and a kettle for boiling the drinking-water. Particular care should be taken

over the milk and drinking-water and the general principles laid down on a previous page relative to these articles carried out. It is sometimes convenient to take one's own goats with one on the march, and this is decidedly a good thing provided they are healthy goats. In Bundelkhand some of the goats suffer from Malta fever and the disease may be conveyed by their milk. Vegetables locally procured must only be eaten after being thoroughly cleaned and cooked. As regards medicines it will generally be sufficient to make up a modified equipment based on that suggested in Chapter I and in Chapter VIII, and having regard to the proximity of small dispensaries and other places for obtaining supplies readily.

Every officer going into camp should have a map of the district with him; on this he should mark the sites of the Government and District Board dispensaries, every year growing more numerous and better equipped, and officered by doctors whose knowledge of their profession is rapidly rising with each batch turned out annually from the medical schools. The presence of these dispensaries has done away with the necessity of carrying about in camp a stock of drugs which become inert from age and exposure.

Hills. As business or pleasure may necessitate a visit to the hills it may be mentioned that the sudden change in temperature and atmospheric pressure which is experienced in making the ascent, is not unattended with some risks. On arriving at the foot of the hills and prior to the ascent, some thick flannel underclothing should be worn and an overcoat should be placed over the back of the seat ready for wear should the officer feel chilly. On arrival at the hill station no violent exercise, such as tennis, football, or polo, should be indulged in until the expiration of at least a week. This interval gives the heart and lungs time to adjust themselves to the altered conditions of the rarefied atmosphere. A chill whilst in the hills is apt to be followed by a peculiar troublesome diarrhœa, the so-called 'hill diarrhœa' (*see* p. 113).

CHAPTER XIX

NURSING

Aspect and Appearance of the Sick-room

The Sick-room. The sick-room should obviously be in the quietest part of the house. In India it will frequently be advisable to choose the coolest room. Hence one with an adjoining veranda would be preferred as preventing contact with the direct rays of the sun. The room should be lofty and high, admitting as much air as possible, and containing little furniture. In cases of infectious diseases all hangings, carpets and curtains should be removed.

The Bedstead. This for preference should have a spring mattress; and it is essential that the bed should not be too wide, a feature sometimes overlooked in private nursing when one is called upon to nurse a patient on a double bed. If too wide, it will be impossible to nurse the patient, to change the sheets, or to attend to helpless cases with any degree of comfort. For bedridden cases a high bedstead is less tiring for the nurse and does not affect the comfort of the patient in any way.

Its Position. The bed should not be placed up against the wall, though on occasion this will be found useful in helping to prevent a delirious patient from falling out; nor should it directly face the light, which should be allowed to fall cross-ways on the patient, except in most head injury cases when it is necessary to place the patient with his back towards the light.

Plenty of fresh air is essential without the presence of draughts, which can be excluded by means of screens, or in the absence of these, by means of a blanket or rug hung on the mosquito frame.

Mattresses. The most desirable mattress is a horse-hair one, but often in the hot weather in India all that can be tolerated is as light a one as possible, sometimes a piece of matting over the quilt on the bed giving the greatest degree of comfort.

Cleanliness of the Sick-room. This is one of the most important

duties the nurse must be responsible for. A daily dusting of the furniture, preferably with a damp cloth, is essential, also a proper and efficient sweeping of the floor. This should be done in such a manner that as little dust as possible is created, for which purpose tea-leaves sprinkled on the floor before the sweeping is done will be found useful. For infectious cases, when possible, sluicing with some disinfectant, such as Sanitas or Jeyes' Fluid, or anything else ordered, added to the water is to be recommended. No food should be allowed to be kept in the patient's room, everything of this nature being kept in an adjoining room easily accessible to the nurse.

All excreta should at once be removed, and if required for the doctor's inspection should be kept in covered vessels, and disposed of afterwards on the earliest possible occasion.

The Qualifications and Duties of a Nurse

The private nurse, though having ordinarily only one patient to look after instead of a wardful, has often much more responsibility thrust upon her than the hospital nurse, necessitating the exercise of a nice judgment and common sense; for during the absence of the doctor she is entirely responsible for the well-being of the patient. She must therefore be careful to obtain full particulars as regards the treatment ordered, and must anticipate as far as possible all eventualities that might arise during his absence, and get his directions how to deal with them. If not actually required to prepare the patient's food herself she will be called upon to supervise the preparation of it, hence a knowledge of sick-room cooking, including the making of artificially digested foods, such as Benger's Peptonised Milk, etc., will be necessary. Anxious, though well-meaning relatives will be a constant source of trouble to her, calling for the exercise of much tact and patience; however, the doctor's orders as regards visitors, either members of the family or friends, should be rigidly adhered to. She must be bright and even tempered, firm yet always courteous. Gossip of all kinds in the sick-room should be avoided, especially the recital of harrowing tales of her former experiences. As a private nurse, she will be called upon to suit herself to the needs of each case, so must not insist on imaginary rights, being ready and willing, if asked, to perform other than what might strictly be called her professional duties.

NAME AGE DISEASE

Date	Hour	Temp. Pulse Resp	Nourishment	Stimulant	Medicine	Stools	Urine	Vomit	Sleep	Remarks

She must be clean, punctual, obedient, and observant, and cultivate the habit of accurate statement, which is most important in nursing, as it helps the doctor to a correct diagnosis of the case.

She will find the form (p. 561) of bedside report most useful.

Among the points to observe in connection with her patient are :

His Position in Bed. Whether he is quiet or restless ; preferring to lie with his knees drawn up, which is an indication that this position gives him the most ease, as thereby the muscles of the abdomen are relaxed. If in that position, whether he is quiet or restless, as in colic. Observe if he has a preference for lying on any particular side, as in pleurisy and pneumonia, when usually the affected side is chosen. Difficulty of breathing will make him want to sit up, and in heart diseases a leaning-forward position over pillows or even the back of a chair may be voluntarily chosen. Any tendency to lie with the head thrown back, especially in children, should be noted, as also a tendency to slip down in bed, requiring him to be constantly lifted up. The latter is an indication of extreme weakness, as is also sleeping with eyes half-open. Absolute stillness and helplessness, with no desire to do anything for himself, are met with in the later stages of enteric, or long-continued fevers.

Expression and Appearance. These are often very indicative of the complaint a patient is suffering from. Observe whether he is heavy or restless, or has an anxious and wide-awake look, or is tremulous, whether he is flushed or pale. Any sudden onset of pallor in cases of enteric fever and gastric ulcer should be watched for and reported at once, as it may mean an attack of internal hæmorrhage.

In all cases of difficulty of breathing, whether due to lung trouble or heart, the edges of the ears, cheeks, and lips will be of a bluish tint ; any rapid increase of this should be noted, also whether there is much dilatation of the nostrils combined with restlessness.

Discolorations, scars, swellings, bruises, etc., in fact anything abnormal, can easily be observed and made a note of, while washing the patient, without unduly attracting his attention.

Pain. This is always an indication that something is wrong. The extent of pain, locality and duration should be noted, as also its character ; whether dull and constant, sharp shooting occurring

in paroxysms, etc. An increase in the pulse-rate and the respirations during an attack enables one to judge of the severity of the pain.

Skin. Whether normal, dry, or moist. Profuse perspiration, either in fever or any other disease, such as phthisis, should be reported, and the time of its occurrence noted.

Ears. Whether there is any pain or discharge. Deafness and singing in the ears often follow the administration of certain drugs. In head injuries the escape of any blood or clear fluid from the ears should be watched for; when a discharge is present, tenderness and pain in the bone behind the ear may occur. It should always be reported.

Eyes. Any features other than normal should be remarked, such as sensitiveness or the reverse to light. Any irregularity in the size of the pupil, or a tendency to squint, even though only occasional, also redness of the conjunctivæ or lids, increased lachrymation, discharge, or pain.

Nose. There may be profuse discharge from the nose as in cases of nasal diphtheria. A tendency to snore, indicating some obstruction as in adenoids. Dilatation of the nostrils, as when the breathing is difficult, such as is the case in pneumonia.

Lips and Mouth. Whether the former are moist, dry, or cracked, as in long-continued fevers; the teeth covered with crusts, or foul, as in enteric; the latter condition requiring constant attention to prevent its recurrence. Ulcers may form on or round the lips; the gums may be spongy, as after the administration of certain drugs; also there may be an increase of saliva.

The Tongue. The manner in which a patient puts out his tongue when asked should be noticed, whether in a straight line or inclined to one side as in cases of partial paralysis. Also whether it is dry, moist, or furred, and the nature, colour and extent of the fur on it.

Temperature. This should be accurately noted by means of the clinical thermometer at the regular periods stated by the doctor, and in no case should the patient be allowed to place the thermometer in position himself.

The method of taking the temperature has been already described in Chapter III, p. 27. After use the thermometer should be well washed, and on all occasions when not in use kept in a small tumbler of carbolic 1 in 20, containing a small piece of cotton-wool at the

bottom; this is a preventive against possible breakage. Whether the temperature is taken in the mouth or armpit, in no case should these parts be exposed for dressing or washing for quite half an hour previously.

Pulse. The pulse is usually taken at the wrist by placing two or three fingers on the artery there, and it requires some experience on the part of the nurse before she is able to recognise its peculiar features. The arm should not be bent at the elbow when taking it, and if possible it should be taken without the knowledge of the patient, preferably when he is asleep. Another place for taking the pulse is the temporal artery in front of the ear. If the pulse is difficult to take at the wrist the nurse might count the patient's heart-beats by placing her hand on the chest just below and internal to the left nipple. The points to be noted are its frequency, size, compressibility and regularity. Further information about the pulse is given on p. 24 of Chapter III.

Respiration. The character and frequency of the respiration must be noted. If possible the respirations should be taken without the knowledge of the patient, *i.e.* when he is asleep, or otherwise immediately after the pulse, by continuing to keep the hand on the wrist and at the same time noting the movements of his chest. By character is meant whether the respirations are noisy or quiet, shallow or deep, regular or irregular.

Stools. Their frequency and general character should be observed, *i.e.* their colour, consistency, size, whether normal or containing blood, pus or mucus, or undigested food, and whether the patient experiences any pain in passing them. If containing blood, whether the blood is bright or resembling tar. If mucus, whether the mucus is mixed up in the stool or deposited on the top. The colour is often very characteristic of certain diseases, and the shape of the stool should also be marked, whether normal or ribbon-like, as is sometimes the case in stricture of the intestine. If in any way unusual it should be kept for the doctor's inspection without the admixture of any disinfectant, unless otherwise ordered.

Urine. The points to be observed in connection with this are frequency, quantity, colour, smell, and deposit, also if the patient experiences any pain in passing it. The usual quantity passed is about 2½ pints in twenty-four hours; this amount is increased during the cold weather and in some diseases, and when much fluid

is taken. Any particular diversion from the normal should be reported to the doctor and a specimen kept for his inspection.

There may be suppression of urine, a most serious symptom; or retention, *i.e.* inability on the patient's part to pass urine, which is retained in the bladder, greatly distending it; and incontinence, *i.e.* inability to retain the urine in the bladder. All these conditions require immediate treatment, and the first signs of their onset should not go unobserved by the nurse, who in all cases of bladder trouble should carefully measure the urine.

The temperature, pulse, respiration, urine and stools of a patient should be carefully noted on the temperature chart, which should be a twice-daily or four-hourly one.

Vomit. The time of the occurrence of this is most important, whether immediately after food, or how long after it, and whether preceded by flatulence or pain. The quantity should also be noted, also its characteristics, whether containing undigested matter or blood. If the latter, whether it is bright in appearance or like 'coffee-grounds.' This kind of vomit requires to be reported at once to the doctor, all food by mouth, and even water, being discontinued meanwhile by the nurse till further orders.

Appetite. Another point for observation. A record should be kept of the amount of food taken in the twenty-four hours, and whether the patient takes his food willingly or not. If there is any inclination to flatulence, retching, or pain after it. What food he most relishes and whether he appears to be digesting it or not, judging by the appearance of his stools. Food should be given at regular intervals and in quantities as prescribed, and not just whenever the patient asks for it.

Cough and Expectoration. The varieties of cough should be noted, whether dry, moist, frequent, or occasional, and whether accompanied or not by expectoration. Whether occurring in paroxysms, ending perhaps in vomiting, as in whooping-cough, and the possible causes for its occurrence; also whether the patient experiences much pain when coughing.

The expectoration should be kept for the doctor's examination, the quantity noted in the twenty-four hours, and the difficulty or otherwise with which it is ejected. Its colour and consistency varies with different diseases. It may be white, frothy, opaque, thick and yellow, sticky, plum coloured, etc., and very offensive.

Sleep. The extent and nature of sleep must be observed,

whether long continued or occurring in snatches, quiet or restless, or delirious. If the last, whether the delirium is low and muttering, as often happens in enteric, or inclined to be noisy.

Paralysis and Loss of Speech. Both these may occur in the presence of the nurse, who should watch for these symptoms in all cases where they are to be expected. The extent of the paralysis should be noted, whether partial, affecting only certain limbs, or complete.

Loss of speech may be complete, or the patient may be able to say certain words, or he may substitute wrong words, thinking he is speaking correctly.

Weight. In all cases of wasting diseases, such as phthisis and cancer, the weight of a patient should be taken. If a patient is ordered to be weighed weekly, or even daily, care should be taken that he is weighed at the same hour on each occasion and in the same clothes, and his weight registered on the temperature chart.

The Nursing of Helpless Patients

The object in nursing helpless patients is to save their strength as far as possible. They should not be permitted to do anything for themselves, nor excite themselves in any way; hence in serious cases it is advisable that none but the nurse should be admitted into the room. Though an unceasing watch may be required, it need not be made unnecessarily evident, nothing being more objectionable to many nervous people than the constant close proximity of the nurse; when not actually engaged in her duties it would be better for her to sit in the room behind a screen or somewhere where she can see the patient, yet not be seen by him. Unnecessary though sympathising questions should be avoided, as also walking on tip-toe, and whispering. A very ill patient should never be waked to take medicine, and the hours for his food during the night should be at longer intervals than during the day. Much is left to the discretion of the private nurse, but when she is in doubt as to what to do she ought to get definite instructions from the doctor. When patients are weak and have been in bed for a long time, there is a tendency to faint when they are raised into an erect position. Therefore they should be removed from the horizontal position as little as possible.

Night-clothes. For men the pyjama coat, turned back to front, will be found the most convenient article of apparel as being easy

to remove and replace. Pyjamas themselves are not necessary, though sometimes a patient will insist upon having them on, but it is more convenient for nursing purposes that he should be without them. For women who are very helpless, or exhausted, or difficult to move in any way, it is much better to invest in a few cheap night-gowns and slit them down the front, putting them on back to front. In hospitals all these conveniences in the matter of clothes and nursing appliances are ready to hand, but in private houses there is a constant demand made on the ingenuity of the nurse. As has been said, everything must be done to husband the strength of the patient, and nothing is more exhausting to a helpless case than the putting on and removal of the ordinary night-gown.

Washing and Bedmaking

This should be done about half an hour after food and got through with as quickly as possible. The morning wash, being usually the longer and more fatiguing, is often dreaded by the helpless and very weak. In such cases, when the patient is on brandy, it is advisable for the nurse to give him his first dose of it for the day as soon as this washing is over.

Place a chair or stool at the foot of the bed, and on it put all the top clothes, such as the quilt, extra blankets, and night-gown, leaving the patient covered with a blanket, if the weather is cold, or simply with a sheet.

The nurse should see that she has got everything required in absolute readiness before beginning the washing. It is easier to wash a patient when standing on the right side of the bed than on the left; hence all the necessary things, such as the basin, soap, etc., should be conveniently placed on a table on the right by the head of the bed.

A piece of flannel or lint for rubbing the soap on will be found the most convenient, and a turkey sponge to wash it off with. Do not soap the latter, as in a short time it will be found to have become very greasy. When this happens it is best to soak the sponge in strong soda and water for a couple of days. Wash the face first and then dry it, the rest of the body being covered meanwhile. The arms are proceeded with afterwards, a bath-towel being placed under each during the process to prevent the bed getting wet. Then wash the chest and abdomen, tucking the bath-towel in at the sides of the patient for the same reason. After

the legs have been washed in the same way, the patient should be turned on his left side to have his back attended to, which after it has been washed and dried should be briskly rubbed with methylated spirits, or if preferred eau-de-Cologne, and then dusted with starch, zinc or boracic powder, or a mixture of all three, as given in Prescription No. 66.

Advantage should be taken of his being in this position to change the bottom and draw sheet if required, so as to avoid unnecessary turning.

The former should be rolled up along its length and placed close up against his back, as he is on his left side, the clean bottom sheet meanwhile being rolled up in a similar manner, but to half its width, and placed close beside it, the edges of the unrolled half being tucked under the unoccupied side of the mattress. If the draw sheet is required to be changed, this should be done at the same time. A draw sheet is simply an ordinary sheet folded in half, along its length. It is rolled up afterwards in exactly the same manner as the bottom sheet, the rolled-up end being next the patient, and the free end under the mattress. In putting in a draw sheet care should be taken that the upper edge of it is well under the pillows, otherwise there is every possibility of it being rucked, and drawn down, especially if the patient is capable of sitting up in bed. Having got the bottom and draw sheets as described, the patient is turned over on his right side, and the rolled-up portion of both unrolled and tucked under the mattress on the opposite side of the bed. When in this position on his right side, the opportunity should be taken to wash his left hip and side. Should the top sheet need changing, the clean sheet is spread over the dirty one, the latter being withdrawn from under it without exposing the patient.

The blanket and quilt are then replaced.

Another method of changing the bottom sheet of a patient, especially useful in cases of fracture of the lower limbs, when it would be inadvisable to turn him from side to side, is from below or vice versa, the procedure being exactly the same as has already been described.

Mackintosh. All patients who have to be nursed for any length of time in bed should have a short mackintosh spread under the draw sheet. Both these should be kept absolutely without wrinkles, as otherwise bedsores might result. In paralytic cases, or in

enteric, or when there is any incontinence of urine or fæces, the mattress should be further protected by a long mackintosh under the bottom sheet, extending from under the pillow to the end of the mattress.

The Mouth and Teeth. These in helpless patients need constant attention, especially in cases of long-continued fever, gastric trouble, or in enteric. A tooth-brush with the bristles firm and not liable to fall out will be found the most efficient, or otherwise a swab of cotton-wool at the end of a splinter of wood such as goes to compose the ordinary sweeper's broom in India can be used. Borax and glycerine, lime-juice and glycerine, or a solution of listerine on the brush are all invaluable for removing the fur from the teeth and tongue. A feeding-cup in place of a tumbler for gargling purposes should be used for helpless cases who lie on their back, and anything from a small bowl, if available, or the bottom of a soap-dish or nail-brush dish to gargle into. The feeding-cup for the mouth-wash should be kept apart for that purpose, as the smell of any disinfectant has a tendency to cling to it.

The Hair. The easiest and most comfortable way of doing a woman's hair is to part it down the middle and plait it into two plaits. Needless to say the comb and brush should be kept scrupulously clean.

Washing the Hair in Bed. This is easily done with a little practice. A low pillow may be kept under the head during the process, if the patient is uncomfortable without it. Protect it with a mackintosh, over which place a folded blanket and bath-towel, closely tucking the lower edges of these round the neck so as to prevent the night-gown from getting wet. After having soaped the hair well, remove the pillow, and carefully place the basin of water under the head, which should be supported meanwhile with the left hand. Then use a sponge for rinsing purposes. After the basin is removed the head lies on the bath-towel and the hair is dried as quickly as possible.

Heads that are lousy or contain nits require constant attention. If very bad, it is best to apply a carbolic cap, by which is meant a circular piece of lint sufficient to cover the whole head, with a runner round the edges of it, so as to make it fit closely. This is soaked in carbolic 1 in 20 and applied overnight, the hair having been previously well rubbed with the lotion. By next morning many of the lice will be found to be dead. In every such case, the

hair should be combed night and morning with a fine-tooth comb dipped each time it is used in carbolic 1 in 20, to which a few drops of tincture of iodine have been added. This is the best way of getting rid of the nits. (*See also* Chapter X, p. 396.)

The Eyes. Boric lotion (Prescription No. 95) will be found most useful for any affection of the eyes, such as redness or irritation, caused by sleeping with the eyes half open, which will sometimes be the case when a patient is very weak and exhausted.

The Ears and Nostrils. These must not be forgotten in the daily wash. They are matter of no great difficulty in adults: in very young children a pair of dressing-forceps, or a thin splinter of wood with a piece of cotton-wool wound round the end, dipped in vaseline will be found useful for cleansing purposes, but both these need to be used with great care and gentleness.

The Moving in Bed of Helpless and Very Stout Patients. This is often a matter of much difficulty. A pulley at the head of the bed is a great help, but is not often met with in private practice. In its absence the best way to lift a helpless patient up in bed is to place the draw sheet somewhat low down under his buttocks. He is then told to raise his head, cross his arms over his chest, and with his knees drawn up to place his heels just below the lower edge of the draw sheet. In this position it is quite easy for two people on opposite sides of the bed to lift him up into the desired position. When required to keep him in a sitting posture, support his back with pillows, if a back-rest is not available, and place a bolster or a large pillow rolled up in a sheet under his knees, the free ends of the sheet being tied round with a long piece of bandage to the head of the bed. This will prevent the patient from slipping down. In every case where a pillow or bolster is used in this way, it should be seen that it is well protected by being put under the mackintosh or by having another piece of mackintosh rolled round it under the sheet in which it is tied.

Feeding the Patient

As has been said before, all food during illness should be given at regular intervals and in stated quantities, both to be determined by the doctor, and a careful account kept by the nurse of the amount taken by the patient during the twenty-four hours. In most cases milk forms the chief article of diet. This, if unable to be digested pure, should be diluted with water or barley-water,

lime-water, or whey in the proportion, to begin with, of two parts of milk to three of the diluent. A feed of 5 ounces in all is the quantity which an adult as a rule can comfortably take every two or three hours. During the night he should be fed at longer intervals, say every four hours, but much depends on his condition, and definite instruction should be obtained from the doctor about rousing him from sleep for his food.

As a long-continued course of milk diet is apt to nauseate a patient, his feeds might be flavoured alternately with a little coffee, cocoa, or tea, and given iced, or warmed, as directed. All sick patients unable to sit up should be fed from a feeding-cup and slowly, the head being slightly raised meanwhile by placing the left hand under the pillow, while a table-napkin is kept under his chin.

When there is difficulty in swallowing, as after operations on the tongue, it will be necessary to attach a few inches of rubber tubing to the spout of the feeding-cup. The end of the tubing is then introduced far back at the side of the mouth, and the food poured in in small quantities at a time, the act of swallowing taking place almost involuntarily. This method should be adopted also in partially unconscious cases, when much care should be exercised in feeding, so as to avoid a fit of choking or coughing. A patient will often object to a feeding-cup; in these instances a bent glass tube or a piece of rubber tubing or a squill (such as is provided in restaurants for iced drinks) placed in the tumbler containing the feed, will be found an efficient substitute.

When possible no food should be kept in the patient's room, nor milk left uncovered on the table beside him until he feels inclined to drink it.

In convalescence the appetite is often very capricious, and the nurse has to exercise much ingenuity in getting the patient to take his food. Extreme cleanliness and daintiness in serving it must be observed, the sight of a large quantity of food often nauseating a patient with a delicate appetite. See that the plates are hot, and that his tray is provided with everything necessary before carrying it into his room, and do not let him wait for first one thing and then another. If the nurse finds it necessary to taste his food first, she should not do so in his presence, and certainly not with the same spoon she is going to offer him. She should do her best to vary the dishes as much as possible, but always in

strict accordance with the doctor's orders, explaining to him the risks he runs if those orders are disobeyed.

Water and Ice. The former is as a rule given freely so long as it is seen that it does not interfere with his feeds, a patient very often after large and frequent draughts of water being naturally disinclined to take anything more nourishing.

Ice in small quantities is very useful for preventing vomiting after a feed, or vomiting after an anæsthetic, though in the latter case drinks of about 8 ounces at a time of hot water containing 10 grains of soda bicarbonate repeated every half-hour or hour, is often ordered by the surgeon. The patient as a rule vomits immediately after it and is relieved.

The best way of preventing crushed ice from melting too quickly is to keep the chips on a piece of flannel stretched over the mouth of a tumbler or cup; while a hatpin or cap-pin, or a large darning needle, will be found useful in chipping ice, this method causing little waste besides being practically noiseless.

Medicines. Medicines to be given by mouth should be kept apart from those for outward application only, such as liniments and lotions, which moreover should be kept in special bottles and be labelled "Poison." These are very important precautions to observe to avoid catastrophes, especially in amateur nursing.

Whether in the form of draughts, pills or powders, the medicines should, after a careful reading of the directions, be given at the times stated and in the quantities ordered. When required to be measured, a graduated medicine glass should be used as tablespoons and teaspoons are very inadequate substitutes. Unless expressly stated to be given immediately before or after food, the times for giving medicine should be so arranged as to not tot closely follow nourishment, especially when there is an inclination to vomiting. A slice of lemon or orange or a pinch of salt will be welcome after a nasty-tasting dose, especially in the case of cod-liver oil and castor oil. The least objectionable way of giving the last is to squeeze a few drops of lemon juice into the medicine glass, add to this a teaspoonful of brandy, then pour in the castor oil, letting it float on the surface of the lemon juice and brandy, the same quantities of which should cover it on the top. The whole should be taken down quickly, not sipped, and a slice of lemon sucked afterwards. In cold weather the medicine glass should be set in a cup of warm water so as to render the oil more

fluid and prevent it sticking to the sides of the glass. Pills, tablets and powders are placed on the tongue and swallowed down with a draught of water. The first two in India either become like bullets when they are to be crushed, or deliquesce into a sticky mass. The pleasantest way of taking powders is in a cachet or gelatine capsule such as supplied by some druggist firms. When neither is forthcoming, and the powder will not dissolve readily in water and has a tendency to cling to the mouth, it might be mixed in a teaspoon with a little glycerine. This way of giving powders is recommended in the case of children and unconscious people.

The private nurse should always ascertain whether a medicine is to be repeated as formerly, or altered in any way, also she ought to be conversant with the effects of certain drugs, observing carefully any bad effects from the medicine administered; for instance, nausea, vomiting, diarrhœa, headache, etc., and not failing to report her observations to the doctor.

Stimulants. These may be given in the form of brandy, whisky, rum, or, on occasions, strong coffee.

They are prescribed for the purpose of stimulating the patient, and should not be too freely diluted with water, one to two parts of water for an adult being usually the right mixture; therefore, when brandy is ordered it should not as a rule be added to a feeder full of milk, or given directly after a feed of milk, as its stimulating effects would thereby be lost. When a certain quantity of stimulant is prescribed for the twenty-four hours, it should be so portioned out as to be given at regular intervals, care being taken that the patient does not have to do entirely without it during the night, when his strength is often at its lowest.

In cases of sudden collapse, brandy mixed with hot water will be found to be more effective than if mixed with cold water.

The Use of Bedpans

As the aim and object in nursing is to save the strength of the patient as far as possible, it is necessary in all cases where he is unable to get out of bed without unduly tiring himself, that the nurse should insist on the use of the bedpan. This is sometimes a matter of difficulty, but with a little patience and insistence, the patient can soon be got to use it. Bedpans are either of the slipper shape or round, the former being usually considered the more comfortable. In cases when a patient is able to help himself a

little he should be told to draw his knees up in bed, supporting himself on his heels and elbows. In this position he can raise himself up sufficiently to allow of the bedpan being placed under him. In helpless cases, the nurse will have to have assistance in raising him. Should he be very thin, a pad of wool or folded linen placed over the thin end of the pan will make him more comfortable. All dragging away of the bedpan when removing it should be avoided, as liable to produce bedsores. In cold weather the pan should be heated by being immersed for a moment in hot water before being offered to the patient, and in cases of excessive perspiration, as a further precaution against bedsores, it is advisable to slightly oil the portion that will be in contact with the patient. He should never be allowed to remain on it longer than is absolutely necessary.

Air and Water Beds and Cushions

These are very necessary for relieving pressure, and thus preventing bedsores, in cases of long-continued illness, or when there is incontinence of fæces or urine, or when the patient is very thin.

They are both expensive items in private nursing, especially in India, as the rubber is liable to perish. When full sized, which is the most desirable for paralytic cases, they extend over the whole length of the bed. The tubular air or water bed consists of a number of stout tubes arranged crossways and kept together by means of a strong frame of canvas. Each tube is provided with a separate valve and can be filled with either air or water independently from the others, hence this form of bed is very desirable, as the tubes immediately under the buttocks can be left uninflated, thus relieving pressure of those parts, and making the use of the bedpan more convenient. A tubular bed is supplied with a pump resembling a bicycle pump for filling it with air, and a funnel if the tubes are required to contain water.

A full-sized water bed is necessarily heavier than the same sized air bed, but is generally considered to be more comfortable by the patient. It should be filled about half full with lukewarm water. If filled too full the patient is apt to roll off it.

Both air and water beds should be placed on the mattress and covered with a blanket over which is placed the bed-sheet. If instead of being made of rubber they consist of waterproof canvas, a long mackintosh over the blanket will be necessary as a protec-

tion, as this kind of bed is very difficult to clean when once it has got soiled. A convenient substitute for a full-sized water bed is an oblong rubber pillow about 3 feet by 2 feet to contain either air or water: this can be placed immediately under the buttocks, where relief from pressure is most needed.

A water pillow of this size should be filled just sufficiently full to allow of the two sides lightly touching each other when the hand is placed in the middle of it. Circular air-cushions are also most useful, and in India more easily obtained than any of the above. These, as well as the small-sized water bed, should never be placed directly against the patient, but under the draw sheet, not only because the contact with the rubber would be found to be hot and disagreeable, but also for reasons of cleanliness. All water beds when not in use should be kept partly filled with water to prevent their perishing.

Special Nursing Points in Some Diseases

Enteric or Typhoid Fever. Enteric fever makes the most demands on the capabilities and patience of a nurse, even though it may happen to be only a mild attack; for in every case the same precaution as regards feeding and gentle handling must be observed in view of possible complications, such as hæmorrhage, or perforation of the intestines.

To begin with, every care should be taken by the nurse to prevent the spread of infection. All utensils, such as feeding-cups, bedpans, urinals, etc., should be kept rigidly apart for the patient's sole use, and should after the termination of the illness be boiled. The patient's linen, such as sheets, nightgowns, etc., should be kept saturated in a bath of some disinfectant, such as 1 in 20 carbolic, for twenty-four hours, before being sent to the wash, as the source of infection lies in the discharges from the bowels and the urine. All soiled linen must, therefore, be soaked in the disinfectant before being washed. No soiled sheets should be left under the patient longer than is absolutely necessary, and the tow or linen used for receiving the discharges of a typhoid patient should be burnt. The bedpan and urinal before use should contain about one pint of disinfectant, such as 1 in 20 carbolic, and after use should have the same quantity added to the contents before they are disposed of, which should be as speedily as possible.

The disinfectant might be omitted, if so ordered, when a stool is put up for the doctor's inspection.

The nurse should observe scrupulous cleanliness when attending to an enteric patient, being careful to wash her hands with soap and water, using a nailbrush every time after removal of the bedpan. On every other occasion she should dip her hands in a bowl of disinfectant such as carbolic 1 in 20, or biniodide 1 in 2000, after attending in any way to the patient. She should never sit down to meals with unwashed hands.

Further instructions about disinfection will be found in Chapter XXII.

The Bed and Daily Washing. The patient's bed should be protected with a long as well as a short mackintosh, and bedsores guarded against by the use of an air cushion or water pillow. The clothing should be light and warm, and a hot-water bottle placed at the feet if required.

The morning and evening wash are indispensable, the first for reasons of cleanliness, the second usually as a sedative to produce sleep. The washing should be done as quickly as possible so as not to fatigue the patient, special attention being paid to the mouth, which should be well cleansed with borax and glycerine, all crusts being removed as far as possible from the teeth and tongue. To prevent their reforming, it is necessary that before and after every feed the mouth should be rinsed out with some water out of a feeding-cup.

The back needs special attention to prevent the formation of bedsores (*see* p. 329). For this reason also, as well as to prevent the possibility of a severe attack of bronchitis, a change of position is very necessary, it being usual in all cases of typhoid to turn the patient from side to side every two hours. This is most essential in the later stages of the disease, when the patient is apt to lie listless on his back taking notice of nothing. A condition of perfect rest is essential for a typhoid patient, so in no case should the change of position be effected by himself. He should be rolled over gently, a pillow being placed behind him and another between his knees, when lying on his side; when on his back, a pillow should always be kept under his knees in order to relax the abdominal muscles. He should also not be allowed to lift himself on and off the bedpan.

The temperature, pulse and respiration should be taken four-

hourly, and noted on the chart along with the stools and amount of urine passed in the twenty-four hours. The form of bedside report already mentioned will be found most useful, as it is necessary for the nurse to keep a detailed daily account of the patient's symptoms and progress for the doctor's inspection.

Spots. These may be seen either isolated or in the form of a rash on the abdomen, chest, or back. They are of rose colour, rounded, sometimes slightly elevated, and fade on pressure, returning when the pressure is removed. The nurse should watch for them between the seventh and twelfth days of the illness, as sometimes they are very faint and fade quickly.

Stools. Ordinarily the stools are of a pea-soup colour; but they should be carefully inspected for signs of hæmorrhage, which might take place in the third week, when the appearance of sloughs or dark bits of skin streaked or edged round with red will be observed to make their appearance in them. The hæmorrhage may be so slight as to be hardly noticed in the stool, and it may not have any bad effect upon the patient, or it might be copious, of a bright red colour, calling for instant attention. A severe attack would be preceded by excessive pallor, a sudden fall of temperature, and a quickened pulse. In this case, in the absence of the doctor, should the nurse not have got definite directions from him how to act, she should apply an ice-cap over the patient's abdomen and stop all food by mouth, keeping him lying flat on his back and perfectly still, his head lowered and the foot of the bed raised on bricks.

Any undue abdominal distension, with inability to pass flatus, should also be watched for, as it might lead, in the later stages, to perforation of the intestines. This too would be indicated by a rapidly rising and small pulse and a sudden drop in the temperature. In either perforation or hæmorrhage the treatment should be the same till the doctor arrives, the usual enema either daily or every other day being immediately discontinued, and the patient only allowed to use a pad under him instead of being lifted on to the bedpan.

Feeding. The food, which will be liquid, should be carefully strained. It should be given at regular intervals and in the quantity ordered. As sleep is so beneficial to the patient, he should not be disturbed for his feeds, but the nurse must be careful not to mistake stupor and extreme prostration, which sometimes occur

in the later stages of the disease, for natural sleep. In these cases the patient must be roused for food.

The Convalescent Stage. This is usually very tedious, but all the above precautions as regards feeding, moving, disinfection, etc., should be rigidly adhered to till otherwise ordered. The patient develops a very good appetite, but he should not be allowed to overeat; and when he is once put on solid food, care should be taken that he is given nothing in the way of hard crusts of bread, chicken bones, etc., till permission has first been obtained.

As the muscles of the calves of the legs waste very much during a long-continued illness such as typhoid, the nurse would do well to use gentle massage and kneading after the morning wash, to help him to stand when he is once allowed out of bed; but should there be any indication of swelling of the legs, with or without pain in the groin, no massage should be attempted. The fact must be reported at once and the limb kept warm and absolutely at rest in a raised position with a cradle over it to remove the pressure of the bed-clothes.

Pneumonia. The nursing points to be observed in pneumonia are free ventilation of the room and absolute rest, both mental and physical, the chief danger being heart failure. The recumbent position is recommended when possible, but most adult patients should be allowed to choose the position they are most comfortable in, a great many preferring to be propped up in bed with pillows; whatever the position, a change in posture, such as being turned from side to side, is most necessary.

The clothes should be warm but light, in order that the respiration might be impeded as little as possible; hence the patient should have on what is called a pneumonia-jacket made of gamgee, or a layer of cotton-wool between two folds of gauze. This covers the front and back of his chest, fastening with tapes at one side and on each shoulder, which makes it easy to remove. The gown will for the same reason be turned back to front. Sponging should be twice daily with hot water to induce the skin to act. The mouth needs constant attention, as it is always parched and dry. Food must be given in a feeding-cup in small quantities and frequently, remembering that a hot drink is more soothing for the cough than a cold one.

Note the quantity and the character of the sputum, and if poultices are ordered for the pain on the chest, see that they

are put on quickly with as little disturbance to the patient as possible.

The temperature is taken four-hourly. In cases of hyperpyrexia cold sponging may be ordered, when a strict watch must be kept on the pulse, any weakness of its force calling for an immediate removal of the pack; also with a very high temperature, especially in alcoholic patients, delirium might be looked for. If he becomes very violent, do not exhaust his strength by trying to battle with him. To prevent him getting out of bed put the bed against the wall, or protect each side of it with four or six bamboos tied to the curtain-poles. These will be found much more convenient than backs of chairs.

Pulse and Respiration. The latter being out of proportion to the former, any steady rise in the pulse-rate, accompanied with difficult breathing and increased lividity of the edges of the ears, nostrils, lips, finger-nails, must be reported at once, as these may be the first symptoms of impending heart failure. If inhalations of oxygen are ordered, see that the cylinder is unscrewed and set going, away from the patient, and do not, until this is done and the flow of the oxygen properly regulated, attempt to attach the tubing and funnel through which the patient receives it to the nozzle of the cylinder, for if the latter is unscrewed too much the rush of oxygen will smash the funnel and tubing to pieces and terrify the patient.

The nurse should watch for the first signs of the approaching crisis and prepare for it by having stimulants such as brandy, strychnine, etc., ready at hand, for it is a period of great prostration for the patient, especially when the temperature drops suddenly to normal. Perspiration should be encouraged by means of hot blankets and bottles and hot drinks. His clothes should not be changed until he has quite ceased to perspire, when every precaution against his catching cold must be taken.

Pneumonia is not a long and fatiguing disease such as typhoid to nurse, but it often gives grave cause for anxiety, especially in the case of alcoholic people, in the young or very aged, and in those suffering from heart and kidney disease.

Phthisis. In this disease plenty of fresh air and sunshine are essential, and the keeping up of the patient's strength with nourishing food. An open-air existence is generally ordered, though he may be confined to his bed, but in cases where this is not possible

the nurse should see that his room is bright and sunny, with many open windows. No upholstered furniture or curtains should be allowed in the room unless covered with removable washable covers, nor are hangings desirable. The bed should be placed not at one side, but in the middle of it, to allow the air to circulate round it freely. As dust is so irritating to a consumptive patient, damp tea-leaves should be used freely for sweeping the floor with, and a damp duster for the removal of the dust from the furniture, etc.; the latter as well as all floor brushes should be soaked daily in carbolic 1 in 20 after use.

The clothing must be light but warm, flannel next to the skin being advised, as night sweats are very frequent; when these occur the patient should not be left in his damp clothes, but wiped dry and redressed.

The appetite is often capricious, dyspepsia sometimes being a troublesome feature; but the nurse should do her best to tempt him in every way to eat. Hot drinks are useful when the cough is very troublesome.

Bathing and Washing. Unless he is confined to bed, in which case he must be washed in the usual way, bathing is generally allowed, every precaution against his catching cold being taken. If in the previous twenty-four hours there has been the slightest streak of blood in his sputum, the bath should be discontinued till further orders. In bedridden cases who are very thin the back needs special attention.

The temperature, pulse and respiration of the patient, if there is much fever, are taken every four hours or at particularly stated hours. They should be charted on the chart, along with the weight, which is another point for care. A patient should be weighed in the same amount of clothes, at the same hour on each occasion, on the same machine, and if possible by the same nurse.

When hæmoptysis is anticipated, the nurse should get instructions from the doctor how to proceed and have everything in readiness, for even a slight attack may be a precursor of a second and fatal one. The discontinuance of all drinks by mouth and rest in bed are the first essentials in these cases, the patient being allowed to choose his own position, as the recumbent one does not always give the greatest relief, sometimes bringing on more coughing and another attack of hæmorrhage. She should try her best to allay his fears about himself, so as to prevent mental excitement,

and if the remedies ordered by the doctor fail to have effect she should send to him at once. In cases of sudden collapse hot-water bottles should be in readiness. When patients are on tuberculin treatment the nurse must note the effect of the injection on each occasion, and report symptoms of headache, giddiness, pain and constriction in the chest, etc., also if the site of the injection becomes very swollen or red.

Precautions against the spread of the disease are very much in the hands of the nurse; she must also caution patients against what habits to avoid, such as the tasting of the baby's food with the same spoon by consumptive mothers and trying the teat of the bottle. Kissing should be avoided as being dangerous, also such habits as sucking the tips of pencils and pens, as these might be used by some one else. Sputum-cups must contain some strong disinfectant such as carbolic 1 in 20, and, their contents burnt, the cups themselves, as well as all feeding utensils, should be subjected to a daily boiling.

All handkerchiefs or cloths used to receive the discharges of the patient should preferably be burnt, but if this is not possible they should be well boiled before being sent to the laundry.

When attending to a patient, the nurse must not place herself in such a position where she is likely to receive the discharges from his mouth in an attack of coughing.

Rheumatic Fever or Acute Rheumatism. The chief point in the nursing of this disease is to keep the patient warm, as rheumatism is usually the result of exposure to cold and damp, some people showing a greater tendency to be affected in this manner than others. The patient should not be allowed out of bed, and should be clothed in light flannel and lie between blankets. The joints, either the ankles, knees, elbows or wrists, become swollen and painful, and should be wrapped round with cotton-wool and flannel and the pressure of the bed-clothes taken off them. The temperature is raised and the urine often scanty and containing much deposit; the nurse should measure the urine.

Feeding is most important, so in the absence of the doctor the safest course for her to pursue is to keep the patient on milk diet only, rigidly avoiding all meat essences and stimulants and giving him copious draughts of barley-water flavoured with lemon, in order to assist the flow of urine.

As one of the favourite remedies for rheumatic fever is salicylic

acid, the nurse should be acquainted with its possible effects, some patients being unable to tolerate the drug for a lengthened period. It is always depressing; there may be noises in the ears with deafness and giddiness; also headache, stupor, and delirium sometimes supervene, and there may be blood in the urine.

Any one of these symptoms must be watched for and reported; the grave ones may come on very suddenly and will require an immediate discontinuance of the drug. On no account when the temperature reaches normal should the patient be allowed to sit up or get out of bed until permission has been obtained. A convalescent from rheumatism should be warned to wear warm light flannel clothing always, and avoid as far as possible a recurrence of the disease.

Diarrhœa and Dysentery. In both these cases the patient should not be allowed out of bed, and should keep a flannel binder round his loins and abdomen. The diet and treatment will be ordered by the doctor, and must be rigidly adhered to. Long-continued diarrhœa often results in soreness of the anus, which can be relieved with a little boracic ointment.

One stool daily should be kept for the doctor's inspection, and the bedpan reserved for the patient's sole use. Precautions similar to those in enteric should be taken to disinfect dysenteric stools.

Kidney Diseases. In these cases warmth is essential, also a rigid adherence to the diet prescribed. The urine must be carefully measured, its characteristics noted, and a daily specimen put up for the doctor's inspection unless otherwise ordered. Any inclination to complete suppression is to be reported at once. Swelling of the legs, also any giddiness, shortness of breath and convulsions, should be watched for.

As perspiration should be encouraged, the morning and evening sponging should be with warm water. Vapour and warm baths may be ordered. A tendency to constipation should not be passed unnoticed. Barley-water in copious drinks is usually ordered, but alcohol and meat essences must be avoided unless especially prescribed.

Renal and Gall-stone Colic. For both these, in the absence of the doctor, the only means at the disposal of the nurse for the alleviation of the intense pain is by hot fomentations over the seat of the pain. The patient is generally doubled up with the pain, and perspires profusely. Hot drinks are appreciated. In

the former the urine should be measured and kept for inspection, and in the latter the nurse should carefully examine stools for the presence of gall-stones, straining each through muslin. She should also in this case watch for any symptoms of jaundice.

Bed Sores and their Prevention. A detailed account of this will be found in Chapter IX on p. 329.

CHAPTER XX

THERAPEUTIC APPLICATIONS, &c.

Application of Cold : Application of Heat : Baths : Bladder Wash-out : Blisters : Blood-letting : Bronchitis-kettle : Carbon-dioxide Snow : Climates : Cupping : Enemata or Rectal Injections : Flatus Tube : Hyperæmic Treatment : How to give a Hypodermic Injection : Inhalations : Injection of Male Urethra : Intravenous Injections : Iodine Paint : Leeches : Massage : Mustard Plaster : Nasal Douche : Nasal Feeding : Rest Cure : Sprays : Turpentine Stripe, cold : Transfusion : Vaccines and Tuberculin : Vaginal Douches : Washing out the Stomach

The Application of Cold. Cold may be applied either A, locally, or B, generally.

A. Cold is employed locally in recent injuries to diminish the amount of swelling likely to ensue, or in acute inflammation to relieve the pain, or in some diseases to relieve local pain or congestion, such as a cold compress to the head in violet headache and delirium.

In the first class of cases it may be difficult to determine whether cold or heat should be applied. A good general rule for a bad spran is to apply cold for the first twenty-four hours. This will help to limit the amount of effusion. After that period the object is to absorb what effusion has already occurred, and for this purpose heat should be applied. For inflammations as a rule heat, not cold, should be applied, as this is evidently Nature's remedy, and we are assisting Nature in making the part hotter. Sometimes, however, the patient cannot stand more heat, as on an inflamed knee-joint, and then cooling applications will be best. In this matter the sensations of the patient may be consulted, as they are generally a safe guide. The local application of cold may be effected by the following means :

(1) *Evaporating Lotions.* These are used for the purpose of keeping the affected part cool, thereby reducing inflammation. A

piece of mackintosh should be placed under the part to be treated on which a piece of lint, or cloth, dipped in the evaporating lotion ordered, is placed. The lint should not be covered with a piece of protective, or wool, or even a bandage, but left exposed to the air. Constant renewal is necessary. Prescription No. 17 is a suitable evaporating lotion, or one may be made by mixing 2 ounces of spirits of wine and 2 ounces of vinegar in a pint of cold water; or iced water alone may be used.

(2) *Ice in a Cloth or India-rubber Bag.* Rubber ice-caps may be of different shapes, the most usual being round. They should be half-filled with chips of ice, and before the stopper is screwed in, the air should be squeezed out in the same manner as when filling a hot-water bottle, otherwise the ice-cap is apt to roll off the spot to which it is applied. The addition of salt intensifies the cold, and sawdust may be used to absorb the moisture caused by the melting of the ice. The ice-cap should be refilled before the last of the ice is melted, and before application should have a piece of lint or cloth tied round them, as the constant drip of moisture is unpleasant to the patient. When a rubber ice-cap is not at hand, use a bladder, a flannel bag, or even a folded handkerchief to hold the ice chips.

(3) *A coil of Tubing.* Rubber and metal coils can be purchased designed to fit the head or other parts of the body where it is desired to apply cold. By a siphon action ice-cold water can be made to circulate through the coil from one pail to another. This is very useful in sunstroke, meningitis and on other occasions.

B. The application of cold to the whole body may be effected either by (1) sponging, (2) cold packs, (3) cold baths.

(1) *Cold Sponging: First Method.* Ordinarily by cold sponging is meant the following:

The patient, after having had his clothes removed, is left on a blanket over a long mackintosh, with a sheet or a light blanket covering him, and the sponging is proceeded with in sections with water gradually reduced in temperature by ice. An ice-bag or wet cloth is kept on his head meanwhile. The sponging should be done in a downward direction, each limb being treated for about five minutes at a time, and then dried and covered up, before the next is proceeded with. Begin with the arms, then sponge the chest and abdomen, afterwards the legs, and finally the back, turning him over on his left side while doing the last.

Cold Sponging : Second Method. As a substitute for a cold bath in cases of hyperpyrexia, when the weather is very hot and a full-sized bath unobtainable, the following way of reducing the temperature will be found useful. It is not what is called cold sponging in the ordinary acceptation of the term.

Having stripped the patient, place him with a towel pinned round his loins on a large mackintosh extending over the whole of the bed and pillow, the end of the mackintosh at the foot of the bed being so folded as to make a tunnel to allow of the flow of the water into a bucket on the floor. To assist this, the head of the bed should be raised by means of a couple of bricks placed on the floor. Place an ice-bag on the patient's head, or better still at the nape of his neck, and quickly sponge him down with a large sponge, or a towel with cold water, gradually reducing its temperature by ice. In all methods of cold sponging, especially if long continued, it is advisable to keep a hot bottle to the patient's feet to guard against collapse. The sponging may be continued for half an hour or longer, according to the condition of the patient. The temperature is taken at intervals, in the mouth, and should not be reduced by more than 3°, as an excessive drop would be liable to produce shock or collapse.

Cold water, barley or lemon drinks may be given during the treatment. Afterwards, the patient may better be left in a wet pack if his condition can stand it, and if the temperature is likely to rise again quickly, or he may be dried and have his clothes put on.

(2) *Cold Packs.* The patient having been stripped, has a towel pinned round his loins, and is left on the bed on a blanket under which should be placed a long mackintosh. An ice-cap or cloth wrung out of iced water should be kept on his head. Two sheets, rolled lengthways, are kept in readiness in a tub of cold water, to which ice, if ordered, may be added. Having turned the patient on his left side, one of the rolled-up sheets, after having had the excess moisture wrung out of it by twisting the ends in the opposite directions, is quickly placed under him, the sides being made to overlap and closely fit his limbs ; the second sheet is treated in the same manner and placed over the entire length of the front portion of his body. He is then covered with a blanket and left for fifteen or twenty minutes, when the pack may be renewed by means of two other sheets already kept rolled up in the bath, being substituted

for those just removed. When it is advisable to disturb the patient as little as possible the sheets, instead of being changed, may from time to time be moistened with a sponge of very cold water, or rubbed over with a lump of ice. In cases of incontinence of urine or fæces, it is better to cold-pack a patient by means of towels used instead of sheets, one for each limb and one each for his back and chest, he being kept on a slipper bed-pan all the time, care being taken that he is quite comfortable meanwhile. A pillow placed under the bottom mackintosh and blanket to support his knee will be a help in this.

Cold packs may be continued for hours and even days, any tendency to excessive shivering or collapse being counteracted by means of a hot bottle kept against the feet. The temperature during a cold pack should be taken at intervals in the mouth, and if the patient is delirious and unable to hold the thermometer under his tongue, it may be taken in the rectum. On removal from the pack, he is wiped down, his nightgown put on, and he is covered with a light blanket. A warm drink may then be given and the patient allowed to go to sleep. Rubber hot-water bottles, partially filled with ice-cold water, and placed along the spine, during a cold pack, are of much assistance in reducing the temperature in very hot weather; especially when there is much difficulty in moving the patient, as the sheets under him get hot more speedily than the others.

(3) The cold bath is described on page 594.

The Application of Heat. Like the application of cold the application of heat may be either A, general, or B, local.

The general application of heat is usually for one of three purposes, either (*a*) to treat collapse by restoring the skin circulation to the patient, or (*b*) to provoke perspiration and in this way cause the skin to relieve the kidneys of some of their work, or (*c*) as a nervous sedative; in this way the warmth is useful in delirium and insomnia.

The local application of heat is used to promote an increased flow of blood to the part affected, and to increase the inflammation there. The increased blood-supply tends to the more rapid cleansing and healing of the part, as well as to the lessening of pain.

A. Heat may be applied generally in the following ways:

(1) The *General Hot Bath.* (*See* p. 595.)

(2) The *Mustard Bath.* (*See* p. 595)

The mustard bath is invaluable for infants collapsed with diarrhœa and vomiting, and for those with convulsions.

(3) *Tepid Sponging.* This is done in the same way as cold sponging, lukewarm water being substituted for cold water. It is generally ordered for the reduction of temperature when cold sponging might prove too great a shock to the patient; also as a sedative at night to induce sleep.

(4) *Hot Packs (Wet).* These are intended for the purpose of producing perspiration or as a sedative to the nervous system when the patient is delirious. The procedure is the same as for a cold pack, the sheets being wrung out of water at a temperature of about 100° to 112° F. When ordered as a sedative the water should be somewhat cooler. For inducing perspiration the patient is left covered with two blankets, having a mackintosh between them till he has quite ceased to perspire. An ice-bag should be kept on his head, and drinks given during the pack, and afterwards, as they promote the secretion of sweat. For removal from the pack, quickly withdraw the wet sheets. Do not attempt to dry him; but replace the bottom and top blankets with warm dry ones, the top mackintosh also being taken away, and leave him thus for about a couple of hours.

(5) *Hot Pack (Dry).* Proceed as in hot wet pack, using hot dry blankets instead of sheets.

(6) *Hot-air Bath.* The apparatus required is Allen's, with the boiler portion of it removed. Having placed a blanket under the patient, his clothes are taken off, and a blanket folded lengthways put over him. Then large wicker cradles are placed over him, two or three being sufficient, and these covered with first a blanket, then a mackintosh, and finally a second blanket; the coverings being tucked in closely round his neck and at the sides. The blanket next to him is then removed by inserting the hand under the last cradle at the foot of the bed and drawing it away. The apparatus with spirit lamp will have to be raised to a sufficient height at the foot of the bed, to enable the spout to be inserted just under the last cradle. The box in which it is packed is generally of the right height for this. The spout should have been wrapped round with a piece of wet flannel to prevent the blankets from getting burnt. These must be tucked closely round it to prevent the escape of the hot air during the bath. The patient may have an ice-cap on his head, and is given drinks such as barley or lemon

water, as these assist in the production of sweat. His pulse and general condition must be watched carefully. If there is any extreme discomfort he should be removed from the bath, otherwise it should be continued till profuse perspiration is produced.

To remove the patient from the bath, take away the lamp, and cover him with a hot blanket folded lengthways which is introduced under the cradles from the bottom upwards. Then remove the cradles one by one by slipping the hands under their coverings and drawing them out. The top blanket and mackintosh then fall upon him, and should closely envelop him, and he is left till he has

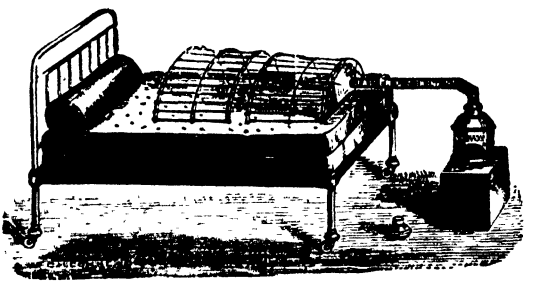


FIG. 59. Allen's Vapour Bath

ceases to perspire, when he should be sponged down quickly with warm water and a warm nightgown put on.

Every possibility of a chill afterwards should be guarded against.

Hot-air or vapour baths for patients in the sitting position. Sit the patient on a cane-bottom chair over which is placed a blanket, cover him closely round the back with blankets, so arranged that the lower ends of them extend to the floor on all sides of the chair, closely enveloping it. Then introduce the spout of the apparatus under one corner of the blankets, pinning them down round it to prevent the escape of the hot air or vapour.

(7) *Vapour Bath.* For this the most convenient form of apparatus is Allen's with the addition of the boiler, which is filled with boiling water. In the absence of the above a large-sized kettle or angithi might be used with a tin funnel curved slightly downwards and sufficiently long to be introduced just under the last cradle. The method of administration is the same as for a hot-air bath, except that a long mackintosh should be placed under the blanket on which the patient lies to prevent the

bed getting wet. Care should be taken that no moisture drops on him from the end of the funnel. This can be achieved by means of a piece of cotton-wool or flannel being placed over his legs, or a small cup tied on to the end of the funnel to receive the drops. The method of removal from a vapour bath is the same as from a hot-air bath. Similar precautions against the patient catching cold being necessary.

(8) *Hot Bottles.* The application of these requires much care, as burns frequently result, especially in unconscious or paralytic patients, if they are applied without a sufficient amount of covering between them and the patient. They should be put in a flannel bag, and placed so that a piece of the top blanket is between them and the patient. The most convenient form of hot-water bottle is made of rubber, but they may be of tin or earthenware. In filling a rubber bottle, exclude the air. This is done by not filling it completely and then placing the hand over the empty portion and squeezing out the air before the screw is put on. Often the rubber washer round the screw is broken or missing; a piece of thick leather of the required size makes an efficient substitute. Tin hot-water bottles should be filled quite full to prevent them from rusting. All hot-water bottles have a tendency to leak at unsuspected moments. They require frequent changing, which should be done without any disturbance of the patient. Empty whisky, beer, or vinegar bottles may be used, but there is always a danger of these bursting when filled with boiling water. It prolongs the life of a rubber bottle to use a funnel when filling it. Hot bricks wrapped round in flannel may be used as a substitute when nothing else is obtainable.

B. Heat may be applied locally in any of the following ways, each of which has its special application under the circumstances mentioned in the text:

(1) *Fomentations (Wet) for any Portion of the Body where there is not an Open Wound.* Spongiopiline or two or three folds of flannel, lint, wool, or even towelling of the required size may be used. Place the material wrapped round in a wringer such as a towel, duster, or any piece of cloth, in a bowl. Pour boiling water over it and apply to the part, after having been wrung dry by the ends of the wringer being twisted in opposite directions. Cover with a piece of protective, such as mackintosh, over which is placed a pad of wool, the whole being kept in position with a bandage or

binder. If spongiopiline is used the protective will not be required as one side of it is of waterproof material.

This kind of fomentation may be repeated at stated intervals every two or four hours according to the size of fomentation. If required to be continued for half an hour or longer at a time, another piece of flannel or whatever material is being used should be kept in readiness in its wringer in another basin, so that there should be no time lost between the application of each fomentation, thus obviating the chance of the patient catching cold. After removal, the part should be well dried and protected from cold by the application of a piece of wool and a bandage.

(2) *Fomentations for Open Wounds.* Lint, old rags of several thicknesses, or wool may be used. And as in private houses dry sterilisation is a matter of some difficulty, the material selected may in its wringer be boiled up in boric lotion (Prescription No. 14) or carbolic lotion 1 in 60 (Prescription No. 16, one part, water two parts), in a clean saucepan, to render it aseptic, before being applied. If stained with any sort of discharge, the same fomentation should not again be used. In applying fomentations to open wounds thorough cleanliness of the hands is necessary: they should be washed with soap and water, using a nail-brush, and then immersed for a few minutes in antiseptic lotion. The fomentations are repeated at stated times, and should be covered with a piece of waterproof protective and wool to prevent evaporation.

(3) *Fomentation (Dry).* Bran, sand, or salt may be used for these. They should be well heated in a tin or old saucepan over the fire before being put into a flannel bag of the required size, and then applied to the part. Another bag being kept in readiness to be put on, when the first becomes cold.

Protective is not required for these kinds of fomentations. A thick piece of flannel over the bag will keep the fomentation warm longer.

(4) *Hot Turpentine Stupe.* Required: A bowl, a kettle of boiling water, some turpentine, a piece of lint or flannel of two thicknesses of the required size, and a towel or duster in which to wrap the flannel. In such case the towel is usually called a wringer.

Put turpentine, 1 drachm to ½ ounce according to strength required, into a warm jug, and mix with it 1 pint of boiling water; pour over lint, wring, and apply as a hot fomentation. For infants and young children it is convenient to place the dry lint on the

wringer, sprinkle over it 2 drachms of turpentine, then cover up in the wringer, pour over it 1 pint of boiling water, wring and apply. Watch carefully; eight to fifteen minutes may be enough for a child.

Turpentine stupes may be applied every four hours, care being taken that the part does not become unduly reddened, and that no blisters form. If the skin is very tender, it may be smeared with a little oil or vaseline before the next stupe is applied. On removal a piece of dry cotton-wool is placed over the part.

(5) *Linseed Poultice.* Required: Crushed linseed, a basin previously heated with warm water, in which to mix the meal, a kettle of boiling water, a poultice knife, which is one with a long flexible blade of steel, or in its absence, a carving or table knife, some material to spread the poultice on, such as old cloth, lint, or tow. If either the cloth or lint be used, the material should be cut about 1½ inches larger than the size required for the poultice, in order to enable the edges to be neatly folded over the meal. If tow is used, it should be teased out evenly, leaving a margin of about the same depth all round, which is rolled in a spiral over the edge of the poultice after it has been spread on the tow. Any ordinary table may be used for making the poultice on, instead of the usual poultice board, which resembles a pastry board.

Method: Pour a little boiling water into the basin, and sprinkle in the meal with the left hand, continuing to add it, and more water, till the mixture has reached a firm consistency, and sufficient of the meal has been stirred in for the size of the poultice required. The stirring is done quickly with the knife held in the right hand; when ready, turn the mixture out on the linen and spread quickly and evenly with the knife, which should be dipped at intervals in a jug of hot water; this in order to prevent it sticking to the meal. Turn down the spare edges over the poultice, and apply covering with a thick piece of wool or flannel kept in place by a bandage or binder. A well mixed poultice should leave the sides of the utensil in which it is prepared quite clean when turned out, and should not adhere to the skin when taken off. For sensitive skins when poultices have been long continued, a piece of fine muslin may be used to cover the poultice with, or the skin smeared with a little oil. Isolated tender spots may be covered with a thin piece of wool dipped in the oil or vaseline. On removal of the poultice a pad of cotton-wool is applied to the part to prevent

the risk of the patient catching cold. Linseed meal poultices, if large, are generally applied four-hourly; if small, two-hourly. In either case everything for the next application should be got in readiness before the first poultice is taken off. Poultices should be made as quickly as possible, as they should be applied as hot as can be borne. If a poultice has got cold or lukewarm in the process of making, it should be rolled up with the meal side inside, and put in the oven between two hot plates till warm again.

(6) *Bran Poultice.* This is made in the same way as the linseed poultice.

(7) *Bread Poultice.* Stale bread is broken into small pieces and a quantity sufficient to make a poultice of a firm consistency boiled in water for a few minutes. The surplus water having been strained off through a piece of muslin, the poultice is spread on lint or linen and applied in the usual manner. Bread poultices need renewal at short intervals as they soon become cold.

(8) *Mustard Poultice.* This is a mixture of mustard and linseed meal, in the proportion of 1 to 3 parts of linseed meal for an adult, and 1 to 5 or 6 parts for a child. The mustard can either be mixed dry with the dry linseed, before adding the boiling water, or it may be mixed into a smooth paste with warm water and then stirred into the linseed. It is always advisable to smear the skin with a little olive oil or vaseline before these poultices are applied, or cover the poultice with a piece of fine muslin. They should be kept on till a burning sensation is experienced and should not be repeated except when ordered.

(9) *Jacket Poultice.* These are usually of linseed meal and are applied to both back and front of chest, extending well over on each side of the chest. They are made on two large pieces of linen kept in place by a strap of cloth pinned on to each piece over the shoulders. Keep in place with a binder of flannel, or a folded towel pinned round the body.

(10) *Starch Poultices.* For irritable affections of skin, such as scabs on the head; mix a tablespoonful of starch in cold water and add boiling water till it is a smooth paste, spread on linen and apply.

Such poultices as those already described, except No. 2, are quite unsuitable for application to an open wound or where there is abrasion of skin, because they are not aseptic. Where there is an open wound requiring fomentation, the directions given in

Prescription No. 6 should be followed, or the directions given under (2) fomentations for open wounds.

Baths. Judiciously used, warm baths are remedies of great utility, but improperly used they do harm. The effect of a hot bath is to relax the muscles, to dilate the peripheral blood-vessels, and ultimately to produce faintness In weakness of the heart this danger is exaggerated. It is, therefore, necessary to watch a person placed in a warm bath; while in the bath the reclining position should be assumed, as this renders fainting less likely. The time which a person should remain in a warm bath must be regulated by the effect. Faintness requires removal; the person should lie down, and be dried in that position.

The temperature for baths is: cold, 33° to 70° F.; tepid, 85° to 92° F.; warm, 92° to 98° F.; hot, 98° to 106° F. or higher. But the skin of infants will suffer from a degree of heat innocuous to an adult. Infants have been scalded to death in too hot baths. The temperature for children should not exceed 96° to 98° F.

The complaints for which warm baths are most useful in adults are those accompanied by great and spasmodic pain, as gravel, rupture, or stoppage of urine. For children warm baths are chiefly required in convulsions, croup, pain in the bowels, restlessness from teething, flatulence.

Modified Turkish baths are often beneficial to tropical invalids, who, without organic disease, suffer from prolonged residence in the East. The patient should leave the hot chamber as soon as perspiration occurs, and should take a tepid douche, instead of the plunge into the cold bath. The mistake usually made is staying too long in the hot room. Small portable steam baths can be purchased for use at home.

The Cold Bath. In India, the cold bath as a means of reducing temperature is sometimes a matter of difficulty, since a full-sized bath in which the whole body can be immersed at one time is not usually met with. When obtainable the mode of procedure is as follows:

The patient's clothes having been removed, a towel is pinned across his loins, and a sheet slipped under him on which he is lowered into the bath, in which a pillow or air-cushion should have been placed. This makes him more comfortable, as does also a strip of canvas or cloth tied round the bath on which his head can rest while he is undergoing the treatment. A blanket is

thrown over the bath and an ice-bag or piece of cloth wrung out of iced water should be kept on the patient's head. The temperature of the water is gradually reduced from 90° to 65° F., by means of ice, and the length of time usually allowed for the bath is from ten to twenty minutes. Excessive blueness of the skin or a feeble pulse would be indications for an earlier removal. The patient is lifted out on the sheet, which should be allowed to drop away, while the blanket over the bath falls on him and covers him on his passage to the bed. This should have been got ready with a warm blanket spread over it on which he is received. The patient is then dried with warm towels, and his nightgown put on, and a warm drink given him. In cases of collapse a hot bottle will be required for his feet, and a stimulant such as brandy in hot water given to him. The temperature after the cold bath should be taken in the mouth or rectum.

Hot Baths. Hot baths may be for general or local application and may be of plain water or medicated.

General Hot Bath. Proceed as for a cold bath, the water being at a temperature of 100° F. The patient is lifted into the bath in a sheet, and covered over with a mackintosh and blanket. The former is drawn away quickly when he is taken out, and the blanket tucked closely round him while he is being carried back to bed, where he is left between warm blankets. Cold drinks may be given.

Hot packs, hot baths, are, like vapour and hot-air baths, often ordered for kidney disease. Great care should be exercised to prevent the patient getting a chill.

Medicated Hot Baths. Mustard Bath. A tablespoonful of mustard to every 6 gallons of hot water is generally ordered. In all cases the mustard should be tied in a muslin bag, from which it can be squeezed when put into the water. This kind of bath is very often ordered for children, when its temperature should range gradually from 98° to 104° F. The child is kept in it, if necessary in the nurse's arms, till the skin is slightly reddened, when it is removed and put between warm blankets. Care should be taken that the child's whole body, except the head, is kept immersed in the bath. A mustard bath as a foot bath is very soothing for a bad cold, the quantity of mustard being in this case about 1 ounce to an ordinary sized basin of hot water.

Bran Bath. This is prepared by adding bran in the proportion

of 6 pounds to a gallon of water; then boil and strain and add to an ordinary hot bath.

Local Hot Baths. *Hip Bath*, or sitz bath, ordered generally for pelvic diseases or difficulty in micturition.

A zinc bath is used, the water being only sufficient to cover the patient's loins, while his legs hang over the edge of the bath. Cover him closely with a blanket while in the bath, so that the upper portion of him not in the water may not get chilled.

Iodine Bath. One teaspoonful of tincture of iodine to a pint of water hot is the usual proportion. Iodine baths are useful for the purpose of stimulating ulcers.

Brine Bath. From 4 to 8 pounds of common salt is mixed with hot water in an ordinary sized bath.

Bladder Wash-out. The same apparatus as for a rectal wash-out is used, the catheter being either of glass, metal, or rubber. If of glass or metal it should have a piece of rubber tubing attached to it to connect it with the piece of glass tubing mentioned for giving nutrient enemata. This latter glass tube may be dispensed with if care is taken to completely fill the apparatus with the lotion ordered, so as to exclude the air.

Warm boric lotion (Prescription No. 14) is usually used for a bladder wash-out, and careful asepsis is necessary. The whole apparatus having been boiled before use and the orifice of the urethra washed with aseptic hands with some antiseptic solution, such as Prescription No. 14 or No. 19, before the catheter is inserted, the funnel is then raised and depressed as described in "rectal wash-out" (*see* p. 606) till the fluid is finished. Gentle pressure over the bladder, just as the catheter is being withdrawn, will assist in the complete return of the lotion.

Blisters. These are produced by means of cantharides plaster or blistering fluid. Before application the part should be washed with soap and water, and then sponged with methylated spirits in order to remove the grease from the skin. Cantharides plaster is spread thinly on a piece of sticking plaster, leaving a margin which when the blister is applied to the skin, adheres, and maintains the whole in position. The plaster cut to the required size is slightly moistened with warm water and placed on the spot to be blistered, and kept in position with a loose bandage, so that there may be no pressure on the blebs. In young children it is advisable to put a piece of fine muslin between the plaster and the

skin. The blister begins to smart in about two hours, and may be taken off in six or eight hours. But the time necessary to produce a blister depends on the sensibility of the patient's skin. If no blebs form or only a few, a fomentation or poultice may be applied. When the blister is taken off, all the raised blebs should be snipped at their most bulging parts with a pair of clean sharp scissors, and the fluid allowed to drain out, but none of the raised skin should be removed. Then the part should be dressed with Prescription No. 77 spread on lint or linen. In six hours this should be taken off, when other blebs will have formed. These must be snipped and the fluid drained out. Then the place should be dressed twice daily with simple ointment.

If, after blisters, boils form near the part, they should be fomented or poulticed.

Blistering Fluid. Where this is used the part operated upon should be outlined with some kind of emollient, such as vaseline, to prevent the fluid extending to the surrounding parts of the skin. Two or three coats of the fluid may be painted on, time being allowed for each to dry before the next is applied, a feather or camel's-hair brush being useful for the purpose. A pad of wool secured with a loose bandage is then put on, the after-treatment being the same as for a cantharides plaster. No kind of blister should be applied to children except under medical advice.

Sticking Plaster as a Dressing for Blisters. This will be found useful for blisters, abrasions or any chafing of the skin on parts such as the back of the heel, due to ill-fitting boots, or on the inner portions of the knees caused often by riding. A strip of the plaster is placed over the spot and left on. Bathing has no effect upon it, and walking or riding may be continued to be indulged in without any special discomfort. When possible the raised skin of the blister should not be removed after the fluid has been drained off, before the application of the plaster.

Blood-letting. Formerly blood-letting from a vein of the arm was freely practised for fevers and as a part of various reducing treatments. It is but little employed now, but may even save life in acute congestion from heart or lung diseases. It should only be performed by a doctor.

Bronchitis or Steam Kettle. This is a large-sized kettle with a tube about 2 feet long in place of a spout. An ordinary kettle can be used with a tin tube made to fit over the spout. It

is filled with boiling water, and kept at a suitable height on an angithi or spirit lamp beside the bed, care being taken that there is always a steady flow of steam issuing from the tube.

The head of the bed should be closed in by sheets or blankets, they being hung round the back and sides of the bed to about half its length, the top also being covered, thus forming a tent to prevent the escape of the steam into the surrounding atmosphere. A proper tent frame for use with a bronchitis kettle is not always obtainable, but a couple of clothes-horses, or screens, arranged at

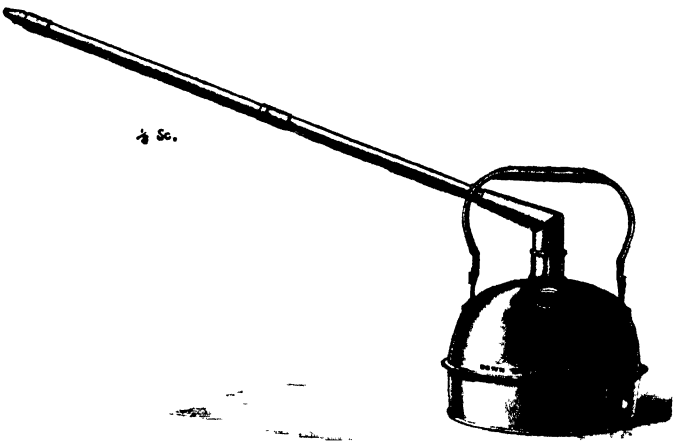


Fig. 60. Bronchitis kettle

the head of the bed, answer the purpose. In their absence the mosquito curtain frame can easily be utilised for hanging the coverings on.

The end of the kettle-tube is inserted just within the tent at the side of the bed, care being taken that it is nowhere within easy reach of the patient if he happens to be delirious, or if he is a child. There have been many instances of accidents in these cases through the patient seizing hold of the end of the spout and scalding himself. To avoid such calamities it is safer to put a child into braces made of cloth (*see* Fig. 62), the arms going through the loops, to which are attached straps to be tied on to the head and sides of the bed. A wire cage about 6 inches square, one side of which is open, can easily be made for the protection of the end of the tube. It is tied on to the rails at the side of the cot with the open side against the rails, and the end of the

tube inserted in it. The latter, in a proper bronchitis kettle, is usually supplied with a flattened out detachable funnel having a

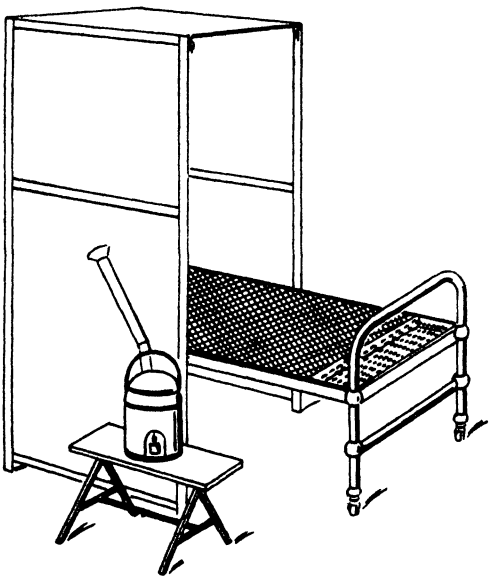


FIG. 61. Diagram to show arrangement of a half-tent round the head of a bed for use with a bronchitis kettle

bit of wire gauze within it, in which is a bit of cotton-wool whereon may be sprinkled some tinct. benzoin, etc., if such inhalation be ordered.

When a bronchitis kettle is used, care must be taken that it is



FIG. 62. Diagram of child's braces

kept going constantly till discontinued, in order to maintain an equable moist atmosphere with the avoidance of draughts.

Carbon-Dioxide Snow. The application of a stick of solid carbon-dioxide is the best treatment for small superficial nævi (birthmarks) and for warts. Carbon-dioxide is obtained from the

cylinders used to aerate soda-water, and goes into a pencil of solid snow when allowed to escape into a confined space of tubular shape. The treatment should only be carried out by a skilled medical man.

The Passing of a Catheter on Female Patients. The catheter may be of glass, metal, or rubber, and should have been boiled before being used. The patient lies on her back, with her legs drawn up, and knees separated, a sheet being thrown over them to prevent undue exposure. A basin to catch the urine is placed between her knees on the bed. The nurse with carefully washed hands separates the labia and washes the parts round the meatus with an antiseptic lotion such as biniodide of mercury 1 in 3000, one part of Prescription No. 13 to two parts of water; then keeping the labia separated with the thumb and forefinger of her left hand she introduces the end of the catheter into the meatus with her right hand, and allows the urine to flow into the receptacle on the bed. Gentle pressure over the bladder towards the end will assist in the complete evacuation of the urine. Should the end of the catheter touch anything, such as the bedclothes or the surrounding skin, it should be reboiled before being used. If the catheter is of rubber, some sterilised oil will be required for lubricating it. Sometimes the urine ceases to flow before the bladder is empty, in which case the catheter should be slightly withdrawn and then replaced.

When glass or metal catheters are used, a short length of rubber tubing should be attached to the end to guide the flow of urine into the basin. This prevents the urine from dribbling down the side of the catheter. When removing the catheter, pinch the tubing with the right hand, or stop up its orifice with the forefinger, to prevent the urine left in it at the moment of removal from soiling the bedclothes.

A catheter should be cleansed after use by being held under a tap with the eye upwards and allowing a strong stream of water to flow through it.

Climates. Tropical climates have a deteriorating effect both on the European races and the indigenous populations. In popular language the inhabitants become 'slack.' That is why leave home is so beneficial to the Englishman in India and reflects its advantages in his more energetic work. The climate differs much in different parts of India; but, apart from the hills, the climates are principally

either dry and subject to extreme heat in the summer and moderate cold in the winter, such as the climate of the Punjab, or they are moist, warm and equable as those of Bengal and the Bombay coast. Intermediate between such extremes is a climate like that of the United Provinces, which resembles that of the Punjab more than that of Bengal in its greater part.

There are many factors that determine the climate of a place, such as the local soil, the amount of vegetation and water, the configuration of the land, rainfall, prevailing winds, elevation and distance from the sea. But the principal factor is the temperature, and the distance from the equator is a factor in determining that.

Fortunately people get acclimatised to their own part of India, and consequently dislike parts where the climate is radically different, and sometimes never feel well there. Hence the resident of the Punjab feels miserable in the damp heat of Calcutta, and pities the pallid inhabitants of Bombay; while the down-country man wonders how any one can prefer the dry and extreme breathless heat and dust of the Punjab. In a dry heat man maintains his constant body temperature principally by radiation, hence the tall thin man, who has a larger surface of body area, feels more comfortable in the Punjab : while the short fat man, who relatively loses more heat by sweating, is better designed for life in lower Bengal than his tall comrade.

Of the hill climates of India the Himalayan are the best, the stations there varying from 3000 to 10,000 feet in height. These climates are very beneficial to Europeans after most illnesses or after residence in the plains, but they must not be considered equal to a change to England. For one thing the direct rays of the sun are in the hills still powerful and in the summer the climate is not so invigorating as in England : for another the food to be obtained there is by no means equal to good English fare. Where it becomes a question of going to the hills or going home, the patient must be guided by his doctor's advice, which will have reference to the nature of the illness, the probable length of convalescence, and the personal requirements and conveniences of the patient.

Convalescents from acute illnesses do well in the hills; so do all children, and cases of anæmia and of chronic malaria, provided that care be taken, on making the change, that the patient does not catch a chill.

Cases of chronic dysentery or of diarrhœa as a rule are not

suited for the hills, and in this respect some hill stations are worse than others; usually the high but damp stations, as Darjeeling, are ill-suited for diarrhœas.

Cases of heart disease are not suited for the higher hill stations: on the other hand they do not stand great heat well, so it is better to send them to a moderate elevation of from 2000 to 4000 feet.

Regarding cases of phthisis or pulmonary tuberculosis they all do badly on the plains in the hot weather. The factors that are so harmful to these patients are heat, dust and strong winds. For nearly all early cases of phthisis the hills are especially suitable, and in some of the best sites sanatoria for this disease have been established. But cases of phthisis with high fever, and those with affection of the larynx, should not be sent to the hills: if the evening temperature be as a rule over 100·4° F., the patient is not likely to benefit from a high elevation. Even amongst early cases of phthisis there are some, of bronchitic nature, who do best in a moist and equable climate, such as may be obtained on the sea coast.

Cases of chronic bronchitis, not tuberculous, and those with emphysema are likely to do best in a warm, moist, equable climate on the plains: they should avoid the hills. In a warm, moist climate also, cases of Bright's disease should reside: kidney diseases should avoid the hills: a climate that will allow free action to the sweat glands is likely to give them most relief. Regarding asthma, although this disease is often more profoundly affected by change of climate than any other, it is impossible to lay down any rule as to which climate is better, it is so largely a matter of individual idiosyncrasy, and this idiosyncrasy may act over quite a small area. We have seen a man who whenever he enters Cawnpore is attacked with asthma within an hour: anywhere else, even two miles out of Cawnpore, he is free. Unfortunately his business is Cawnpore.

Dry Cupping. Place a small strip of blotting-paper, soaked in methylated spirit, in a warm cupping glass, or ordinary wine-glass, having previously moistened the edge of the glass with water or oil. Light the paper, quickly invert the glass over the place chosen, and press it firmly against the skin. The closure of the glass extinguishes the flame, and a partial vacuum being formed, the skin rises inside the glass.

Wet cupping is done similarly, but before applying the glass

small incisions are made in the skin with a scalpel, or with a special scarificator.

RECTAL INJECTIONS OR ENEMATA

These may be of five kinds, in accordance with the purpose to be served: (1) Purgative; (2) Constipating; (3) Nutrient; (4) Saline; (5) Medicated.

(1) Enemata Purgative. These are given for the purpose of producing an evacuation of the bowels, and may be of various kinds.

Apparatus required—one of the following:

1. Higginson's enema syringe, as being light, portable and suitable for travelling.

2. A douche can of enamelled iron or glass, or a glass funnel, or the barrel of a 2-ounce glass syringe to which about a yard of rubber tubing is attached with the nozzle belonging to the Higginson's syringe.

For both the above apparatus a No. 12 or No. 14 rubber catheter attached to the nozzle will be found useful when a high enema is ordered, as in cases of long-continued constipation.

3. *For young children.* An india-rubber ball with nozzle capable of containing about 4 ounces; or the glass barrel of a 2-ounce syringe with No. 8 rubber catheter attached to it. The rubber ball mentioned is very difficult to keep clean.

4. Glycerine enema syringe.

For a *soap and water enema*, take about 1 ounce of soft soap (for preference), or in its absence any kind of unscented soap, and beat up with a small quantity of hot water, using a fork or the fingers, adding afterwards the remainder of the pint of hot water which is the usual amount for adults. Place the patient on his left side and, having oiled the nozzle or catheter, insert it in the anus, after seeing that there is no air in the syringe or tube. This is done by allowing the fluid to fill the syringe before use. Press the buttocks together with the left hand while giving an enema, continuing to do so for a short time after the removal of the nozzle. The enema should be given gently and slowly, all forcible pumping when using a Higginson's syringe being undesirable. In all cases see that the bed is protected by a mackintosh and that the bed-pan is in readiness to be used if necessary directly afterwards, though a patient should be encouraged to retain the enema as long as

possible. In cases of incontinence of fæces it is often possible with a little practice to give the patient the enema on the bed-pan, which might be of the slipper or round shape, the edge of the pan being inserted under him at an angle as he lies on his side.

For children, the buttocks should be raised on a pillow placed under the mackintosh. This helps them to retain the enema.

Enema of Soap and Water and Olive Oil. When this it ordered, 4 to 6 ounces of the oil is added to the pint of soap and water. In order that it should mix well, it should be added gradually after the soap has been dissolved in a small quantity of the hot water, the rest of which is added afterwards.

Turpentine about ½ ounce, being useful for the relief of flatus, is often ordered with a soap and water enema with or without the addition of olive oil. The turpentine should be added before the larger quantity of hot water and thoroughly mixed in. If poured in at the end there is a chance of its floating in globules on the surface of the water.

A warm Olive Oil Enema of about 4 to 6 ounces or even more is often given for persistent constipation, followed after a few hours or even the next day by a simple soap or water one.

Castor Oil Enemata. One ounce of castor oil is mixed with 8 ounces of thin starch or with 2 to 4 ounces of olive oil, the whole being well warmed before being injected. When castor oil or olive oil are ordered to be given without the admixture of soap and water, the apparatus used should be for preference a funnel or the barrel of a glass syringe already mentioned with tubing and nozzle attached, as the oil is apt to make a Higginson's syringe greasy and to clog it.

Glycerine Enema. This is usually given by means of a specially constructed enema syringe with a vulcanite nozzle and glass barrel, capable of containing 4 drachms, but an ordinary 2 ounce glass syringe can quite well be used. The usual amount ordered is 1 to 2 drachms for an adult and ½ drachm for a child. The glycerine should be warmed before injection, and should not be mixed with water unless it is found to be too irritating by the patient.

For very young children a small piece of yellow soap inserted into the anus with the finger often results in an evacuation of the bowels.

(2) Constipating Enema. *Starch and Opium Enema.* This is ordered to check excessive diarrhœa. For an adult 2 ounces of

the starch is mixed with 20 or 30 minims of tincture of opium. It should be given nearly cold and very slowly by means of the apparatus already described, consisting of a funnel or glass barrel and catheter attached. It should not be thought that such an enema as this, which is meant to be retained in the bowel and not expelled like the purgative enemata, is really curing the diarrhœa, although it may make it less. The starch and opium only allay the irritation of the rectum for the time and allow the patient to retain the motions longer, so that it is a useful enema at bedtime in order to give a patient with diarrhœa a restful night. It does not aim at treating the condition which is the real cause of the diarrhœa.

(3) Nutrient Enemata. These are ordered in cases when the patient is unable to be fed by mouth. As the rectum has very little power of digestion, it is necessary that food to be given rectally should be predigested by being peptonised.

Four to 6 ounces for an adult every four or six hours is the amount usually ordered, and this should first be strained, and injected at a temperature of 95° F. A pinch of salt added to the enema aids the process of digestion by the bowel. The apparatus required is the barrel of a 2-ounce glass syringe or a funnel to which is attached about 1½ feet of rubber tubing. This being connected by means of a glass tube about 3 inches in length (an eye dropper or a fountain-pen filler will serve quite well) with a No. 12 rubber catheter. This glass tube is for the purpose of seeing that the fluid is filling the apparatus uniformly without the presence of air-bubbles.

A nutrient enema as a rule should not be larger than 4 ounces.

For an adult:

(1) Beef tea . . . . . 2 fluid ounces
Milk . . . . . 2 fluid ounces

Heat together to about 140° F. (as hot as the finger can comfortably bear), then add liquor pancreatis, 1 drachm, and bicarbonate of soda, 20 grains, and keep warm for one hour. Brandy, 1 ounce, can be added if necessary.

(2) Yolk of 1 hen's egg
Milk . . . . . 4 fluid ounces

Beat up together, warm to about 140° F., then add liquor

pancreatis, 1 fluid drachm, bicarbonate of soda, 20 grains, common salt, 20 grains, and keep warm for one hour. For children of under six years of age a nutrient enema should not exceed 2 fluid ounces.

Larger enemata, given at longer intervals, are sometimes useful, especially where prolonged rectal feeding is required. The quantity may be gradually increased up to as much as 8 ounces or even half a pint; these must be injected very slowly (quarter of an hour for half a pint).

Having got the feed ready, the patient is turned on his left side and some of the food poured into the funnel and down the catheter, which must have been oiled. Then nipping the end of the latter between the thumb and forefinger of the right hand, it is introduced into the rectum to about 8 inches of its length, the funnel of the apparatus being meanwhile depressed to the level of the bed. Then raise the funnel and allow the fluid to flow in very gradually. Quite five minutes should elapse in giving a 4-ounce nutrient enema. Withdraw the catheter before the last of the fluid leaves it, otherwise air would be introduced into the rectum. For children, or when there is any looseness of the bowels, the buttocks should be raised on a pillow when giving a nutrient enema, and kept pressed together with the left hand. All patients on nutrient enemata should be given an enema of plain water once daily, of course before the former is given. The power of absorption the rectum possesses is so limited that a certain amount of food is always left behind, hence the daily plain water enema is necessary.

A Rectal Wash-out. In addition to the above plain water enema, a rectal wash-out is often ordered before the administration of each nutrient enema. This is proceeded with as follows:

The same apparatus is used and a pint of plain warm water. Having filled the funnel with water, and seen that the tube is free from air, the catheter is introduced into the rectum and the water allowed to flow on till the funnel is nearly empty, then the latter is depressed below the level of the bed, and the return flow received in a utensil on the floor. This is continued till the pint of water is finished, after which the nutrient may be given. It is not necessary to raise the buttocks on the pillow for a rectal wash-out.

(4) Saline Rectal Injections. These are made of solution of common salt in water, 1 drachm of salt to the pint of water.

They are used in cholera and other conditions of collapse and to allay thirst when water cannot be given by the mouth. They are usually given at a temperature about 100° F., but if the rectal temperature is already 100° F. it is advisable not to warm the water at all, and where the rectal temperature is over 102° F. the injection should be of quite cold water. These injections should be given slowly with a funnel and rubber tube as already described. They are intended to be retained in the bowel, and the hips of the patient should be raised well and the pillow removed from the head so that the injection may reach as high up the bowel as possible.

Two pints may be given to an adult, though usually more than one pint will not be borne at first, and half a pint to an infant.

(5) Medicated Rectal Injections. In a similar way to the saline rectal injections just described injections containing drugs such as potassium permanganate or others may be given. Such an injection is useful in some cases of chronic dysentery or to cleanse the bowel of children with foul diarrhœa. Enough potassium permanganate should be used to make the water a strong pink, and the injection should be retained by the patient for ten or fifteen minutes if possible. The method of giving the injection and the quantities are the same as for the rectal salines. The water should be conveniently warm.

The Flatus Tube. This is a long thick rubber tube with a hole at one end, and is used for the expulsion of gas from the bowel in cases of abdominal distension. Having warmed the tube in a basin of warm water, the end with the smaller hole is oiled and inserted to about 8 inches of its length up the rectum, the other end meanwhile being kept all the time in the bowl of water, otherwise air would be introduced. The escape of gas causes bubbles to appear in the water.

The tube should be left in about half an hour at a time.

Hyperæmic Treatment. Hyperæmic treatment consists in assisting nature to bring more blood to an inflamed part: *i.e.* in producing congestion. This can be done by a firm bandage for the arm or leg, or by some form of suction apparatus. Little suction cups are now sold for application over boils and are of assistance in hastening their course and in securing a free discharge of the matter.

How to give a Hypodermic Injection. It will not often be necessary for the reader of this book to give a hypodermic injection.

When a doctor is available this proceeding should certainly not be attempted without him; but where it is impossible to obtain medical aid hypodermic injections may be given when urgently required, such as of morphia for the relief of severe pain, or of emetine for amœbic dysentery.

For the purpose a hypodermic syringe is necessary, and an all-glass syringe is the best of its kind. Such are made cheaply nowadays and should take to pieces entirely. The syringe must be carefully sterilised by boiling it in water together with a pair of forceps, the water remaining at the boil for at least five minutes. Then the forceps may be fished out of the water and by its means the syringe put together. If the syringe is required for use at once it may be cooled by putting it in some cold 1 in 20 carbolic lotion

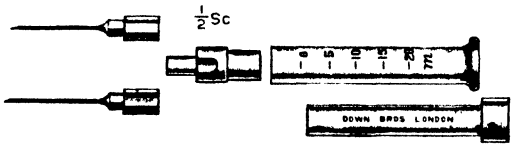


FIG. 63. All-glass Hypodermic Syringe

before being put together. The needle is affixed also by the forceps and the syringe is ready.

The substance to be injected, if a liquid, is then sucked up into the syringe: if in solid form, and it usually is in the form of a small tablet, it must be first dissolved in some water that has been boiled in a small spoon. The tablet can be put in the water while it is still almost boiling and when it has dissolved the liquid can be sucked up into the syringe. The syringe should then be turned needle up, and the piston moved until the bubbles of air in the barrel have been expelled. If there is any doubt as to the sterility of the needle, this may be secured now by slowly passing it through the flame of a spirit lamp. It is usual to give a hypodermic injection in the forearm, and the spot selected should be painted over with tincture of iodine just before the operation. A fold of skin, skin only, not underlying tissues as well, is now picked up between thumb and finger of the left hand, and, with the syringe held in the right hand, the needle pushed boldly in. When in properly the needle will be felt to be free in a subcutaneous space. The piston should then be pushed home down the barrel, or as far down the barrel as the dose is intended to be given, and the needle

then withdrawn, the left thumb and forefinger still steadying the patient's forearm during the withdrawal.

Inhalations. Apart from the bronchitis kettle described above, drugs may be given by means of an 'inhaler.' Of these



FIG. 64. Inhaler

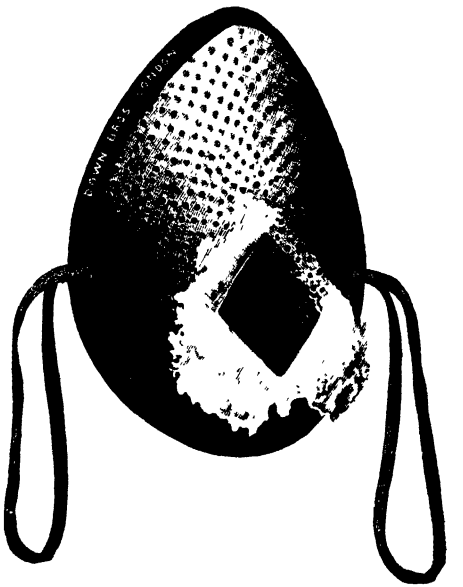


FIG 65. Burney Yeo's Inhaler for Dry Inhalation

there are two principal kinds, the moist and the dry, a specimen of each of which is pictured here. In the former the medicament to be used is placed in boiling water: in the dry, or Burney Yeo's inhaler, it is poured, a few drops at a time, on cotton-wool at the apex of the inhaler.

The moist inhaler is principally used in bronchitis and in throat diseases; while the method of dry inhalation is employed more often in the treatment of pulmonary tuberculosis.

Injection of the Male Urethra. A glass syringe 3 inches long with a smooth round nozzle ½ inch long should be used. The patient, *having passed water*, puts the nozzle into the orifice of the urethra and holds the head of the penis with the left thumb and fingers. The piston is then pressed down with the right forefinger, while the syringe is held with the thumb and other fingers. The nozzle is then withdrawn, the patient still nipping the penis to

prevent escape of the injection. After two minutes on relaxing the hold of the penis the injection is forcibly discharged. Repeat this process six or eight times a day and whenever urine is passed.

Intravenous Injections and Infusions. Sometimes, when it is required that a drug should act quickly, a solution of the drug is injected directly into a vein, usually into a vein of the forearm. Quinine may be given thus in pernicious malaria. Salvarsan also is usually given intravenously. The operation is sometimes difficult and always requires skill: it is not to be attempted by any but a doctor.

The introduction into a vein of several pints of salt solution of a definite strength is one of the means of treating collapse, and is much the best means of treating the collapse stage of cholera. As so much fluid in these cases has been lost by the stools and the vomiting, its equivalent has to be replaced into the circulation, and when correctly done this is the means of saving many lives.

It is not, however, to be attempted except by doctors: if no doctor is at hand attempts should be made to give fluid by the mouth and by rectal injection.

Iodine Paint. This is sometimes used instead of mustard or blisters. It should be lightly applied with a feather or brush every day, or less frequently after the first three or four days, so as to maintain an irritation of, but not to blister, the skin.

Iodine paint acts more energetically on some sensitive skins, and therefore must be used with caution. The ordinary effects are, after a second application, itching and smarting, which soon subside. After several applications, the upper layer of skin becomes loose and may be rubbed off. If too much paint is applied, blisters may form. For sensitive skins, the mild tincture of iodine which is less than one-fourth the strength of the official strong tincture of iodine, should be employed. But generally, the iodine paint of Prescription No. 9 will be found the most useful. When used for daily and long-continued application over extensive areas, it is advisable to paint it on in strips of about 1½ inches wide, leaving an interval of the same width of skin free, each strip being painted on alternate days.

As iodine in any form of paint stains the clothes, the part painted should be covered by a piece of lint or linen. Iodine stains may be removed from clothes by washing them in a solution of carbolic lotion 1 in 20, Prescription No. 16.

Leeches—How to Apply Them. The leech has three teeth, and makes a triangular wound. The Indian leech, being smaller than the European, does not take so much blood. Leeches should be kept in a cool place, in a jar of water with mud at the bottom, the mouth of the vessel being covered with muslin. The water should be changed every two or three days. There is often trouble in getting leeches to fix. The part to which they are to be applied should be cleansed with a cool moist cloth, so as to leave it damp. If they do not bite readily, the part may be moistened with a little sugar and water, or milk. If this does not answer, the skin may be slightly scratched with a sharp needle till the blood comes. Sometimes rubbing a refractory leech in a dry towel, or placing it for a moment in warm water, will cause it to bite. To apply leeches in one circumscribed spot, put them all in a wineglass, which is to be turned down over the part. If required over a large surface, they must be put on singly; they should be held lightly by the tail, wrapped in a piece of wet cloth, so that they may not be inconvenienced by the heat of the hand. If the leech does not fix soon, it is better to return it to the water for a time, trying another in the meantime. More leeches than the number to be applied should be obtained, as, often, some will not bite. It is advisable, if possible, particularly with children, to apply leeches over some bone, against which pressure may be exerted to stop the bleeding, if necessary. A rule with regard to children is to employ small leeches. Two little leeches may be used instead of one large one, the bites of the former rarely bleeding so much after their removal. When applied, they should not be disturbed or torn off, as the teeth may be left in the wound. They should be covered with a light cloth until, having filled, they will fall off, in about three-quarters of an hour. Then the leech-bites should be fomented with hot water, if it is wished to encourage the flow of blood, otherwise they should be covered with dry lint. A little salt should be sprinkled on the leeches after they drop off, which causes them to disgorge the blood, if required again. They should then be returned to clear water, which should be frequently changed. A leech will suck nearly 1 drachm.

Leech-bites will generally stop bleeding without interference; if not, the measures noted at p. 267 should be adopted.

Massage. Massage is methodical shampooing, and consists of rubbing, stroking, kneading, principally in the direction of the

muscles. It stimulates the skin, muscles, and superficial vessels, promoting the flow of blood and lymph and the excretion of effete matter, thus exciting appetite to supply the place of removed material. It also increases the muscular strength and promotes sleep. In these ways it proves a substitute for exercise. In many cases massage may be efficiently performed by Indian servants, who freely practise this remedy themselves. But in some cases skilled knowledge is required such as is only obtained from a skilled nurse or masseur.

Massage is contra-indicated in diseases of the heart, phthisis, gastric ulcer, and acute inflammations of joints: but is useful in some chronic inflammations of joints, and, with or without rest, treatment is most useful in many nervous diseases, especially in hysteria and neurasthenia.

Mustard Plaster. This is used as a means of counter-irritation. Mustard and flour in the proportion of two of the former to one of the latter are mixed into a smooth paste with cold water, and spread on a piece of brown paper or on some non-porous material of the size required, and applied to the spot, being kept in position, if necessary, with a piece of cotton-wool and a bandage. When the maximum effect of a mustard plaster is desired do not mix it with boiling or even hot water, as this changes the character of the mustard. For very tender skins, and always for children, the plaster may be covered with a piece of fine muslin, the proportion of flour being increased. For children it should never be applied without orders. It is left on till a burning sensation is experienced and a uniform redness without blisters produced. On removal, generally after twenty minutes for an adult, sponge the part with some warm olive oil, and dust with powder, covering it afterwards with wool and a bandage to exclude the air. Mustard leaves, sold by chemists usually in packets of six or twelve, are a useful and handy substitute for a mustard plaster, but these should have been kept in sealed tins, and should be fresh, as otherwise they often prove to be ineffective. They are applied wet, after being dipped in cold water for a moment before application.

Nasal Douche. A nasal douche of the pattern illustrated or one similar may be employed with advantage in the treatment of a cold in the head, which see. The glycothymoline solution there recommended or a similar one may be used.

Nasal Feeding. The apparatus required is similar to that for giving a nutrient enema, and consists of the barrel of a 2-ounce glass syringe, or a glass funnel capable of holding about 2 to 4 ounces, to which is attached a foot and a half of rubber drainage tubing; the latter being connected by a small glass tube a couple of inches long with a rubber catheter. This may be a No. 6, 8, or 10, according to whether it is required for a child or for an adult. The whole apparatus should be brought to the bedside in a bowl of warm water, and the feed to be given should likewise be in readiness, having been made lukewarm and then strained. The last is necessary in order to avoid possible blocking of the eye of the catheter. The easiest position for nasal feeding is the recumbent one. The patient lies on his back, a low pillow, if any, under

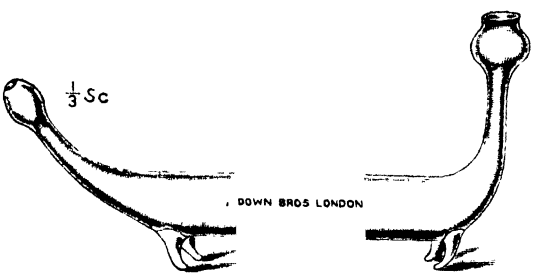


FIG. 66. Nasal Douche

his head, which should be inclined to the left side and slightly extended backwards, the chin pointing upwards. This position helps to prevent the catheter curling up in the pharynx. The mouth should always be kept closed, and the catheter inserted as quickly as possible. With children, it is advisable to roll the child round in a sheet or blanket to prevent struggling. Having got everything in readiness, and seen that the nostrils are clear, stand on the right side of the bed, and place the bowl beside the patient on the left; then after emptying the apparatus of water, leave the funnel turned downwards in the water (this in order to exclude air while the catheter is being inserted), and having vaselined the entire length of the catheter, seize it between the thumb and forefinger of the right hand at about 4 inches from the eye, and quickly insert the point into the nostril in a backward and downward direction; if directed upwards it will strike the roof of the nose and curl up. The catheter should be allowed to descend until

the glass tube is within 2 inches of the nose. The glass tube is only for the purpose of seeing that there are no air bubbles present when giving the feed. Allow a moment or so to elapse to see that the catheter is in the right position and not in the windpipe. Such a misplacement in a conscious patient would result in a fit of coughing, also it would be noticed that air proceeded from the funnel at each expiration only. Bubbles of gas from the stomach will probably make their appearance in the water under the funnel. As soon as the patient has got accustomed to the presence of the catheter lift the funnel out of the water with the left hand, nipping the rubber tubing just below it with the second and third fingers of the same hand. Then pour in the feed quickly and evenly, till it is finished. If there is any stoppage in the flow, do not pull out the catheter, but run the fingers a few times down the length of tubing attached to the funnel. The catheter should be withdrawn before the last of the food has left the glass tube, otherwise air would be introduced. To withdraw, hold the catheter firmly just before the nostril, and do not let go till it is entirely withdrawn, else there is every possibility of the small quantity of food still remaining in it descending the windpipe, and thus producing a fit of coughing, and probable vomiting. Nasal feeds are usually given four or six hourly, according to the age of the patient and quantity ordered. The nostrils should be used alternately, as a long-continued course of nasal feeding is apt to produce irritation and soreness in them. After use the apparatus should be taken to pieces and well washed, the catheter being held eye upwards under a tap if possible. It is then left in boric lotion till the next occasion.

Rest Cure. A rest cure, or, as it is sometimes termed when employed in its full and unmodified form, the Weir Mitchell treatment, consists in the absolute rest in bed of the patient, his isolation from relatives and friends except for the one nurse who is to look after him, and a generous diet containing plenty of milk, with the addition often of massage and sometimes of electrical treatment. The rest must be entire, no reading allowed at first, though the patient may be read to an hour a day by the nurse; letters are not to be received or sent, and women are not even allowed to do their own hair, nor to sit up in bed at first. The treatment commonly lasts a month or six weeks. To carry it out in full a nursing home is expedient; but a modified form of rest cure may often be adopted with advantage where a firm-minded but kind relative may take

the place of the nurse, and the cure carried out in quiet lodgings in the country or even in a friend's house or hotel in the hills. The kind relative, however, cannot be the patient's husband. Such treatment is most beneficial for severe neurasthenia, or for hysteria, and for some other conditions, especially those involving nervous fatigue, conditions which are not uncommon in India. It is usually women who require rest cures. Often the mere separation from their husbands for a month or so is sufficient to restore their health: and for this reason the domestic separation sometimes involved by the onset of the hot weather in India, hard though it often seems, is not always an entire misfortune.

A rest cure may be a failure if not strictly conducted. The companion or nurse should be always patient, but not too sympa-

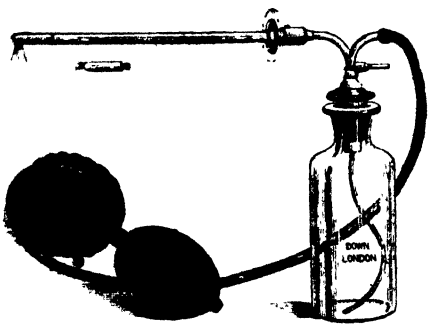


FIG. 67. Spray for Pharynx or Larynx

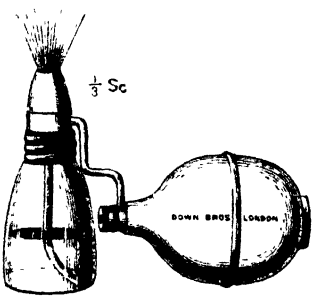


FIG. 68. Nebuliser

thetic when the invalid exaggerates her woes, as sometimes she does, and be always firm when she is fractious. Sometimes the chief difficulty is over the milk which has to be got down, but this must be insisted on. It is well to begin treatment on milk only, a glass of milk every two hours, and then to add cream and eggs, and get on to a meat diet, still insisting on at least three pints of milk daily. After the month in bed, an after-treatment in a bracing climate is often beneficial.

Sprays. For the application of medicaments to the back of the pharynx or to the larynx, or for any form of sore throat, a spray is often useful. The action is simple. Such a spray with two ends, one for the pharynx and one for the larynx, is here illustrated

If the medicine to be used is oily, the spray should be of the kind called an atomiser or nebuliser; a nasal atomiser is illustrated here. By the aid of compressed air the medicament is forced in

a spray against the side of the containing glass, and so escapes as a fine vapour. The proprietary medicine glycothymoline may with advantage be employed in this way in nasal and throat catarrhs.

Cold Turpentine Stupe. Take a piece of flannel and wring it thoroughly out of turpentine; apply cold as a fomentation; turn up the edge of the flannel frequently, and remove when the skin is well reddened. Three minutes, or even less, may be enough for a young child.

Transfusion. Transfusion is the term originally used to describe the direct transference of blood from a healthy person to a sick or anæmic patient. It has its dangers and is now practically never employed. Infusion, which see, is done instead.

Vaccines and Tuberculin. A vaccine is an emulsion of dead micro-organisms; rarely living vaccines may be used. They are used in the treatment of diseases due to these organisms and act by producing immunity to living organisms of the same kind as the dead ones injected.

It requires high pathological skill to make vaccines, and they should not be used except under most efficient medical surveillance.

Stock vaccines, made not from the patient's own organism but from some of the same kind, can be purchased ready diluted for injection; but skill and experience is required for their dosage, and they are only for use by a doctor. The same remarks apply to the use of tuberculin, some varieties of which are vaccines in their nature.

Vaginal Douches. These may be given either by a Higginson's enema syringe with a special vaginal nozzle, which is always supplied with it; or by means of a douche-can of enamelled iron or tin or glass, to which is attached about 1 yard of rubber tubing and a glass vaginal nozzle. If with the first a basin with the lotion ordered will be required, care being taken that the end of the syringe is always well under the lotion in order to prevent the pumping in of air. If a douche-can is used, it may be hung on the wall, or held raised above the level of the bed. For purposes of self-irrigation when the patient is allowed to sit up, a Higginson's enema syringe will be found the most convenient when used over a chamber. In all cases the nozzle should have been previously sterilised. If of glass, it is easily boiled; if of vulcanite, it must be left in an antiseptic solution, such as carbolic lotion 1 in 20 (Prescription No. 16), for about twenty minutes before use.

The lotions generally employed are perchloride of mercury 1 in 4000, Prescription No. 18 diluted; or mild tincture of iodine 1 drachm to 1 pint. The temperature of the douche is about 104° F., and the quantity required from 3 to 4 pints. Before insertion the nozzle should have been completely filled with the lotion to exclude the air. The patient lies on her back on a bed-pan, with her head slightly lowered. The vaginal orifice is then swabbed out with the same antiseptic lotion that is to be used for the douche; and the nozzle of the apparatus introduced into the vagina in an upward and backward direction to about 3 inches of its length, and the fluid allowed to flow until nearly finished. After removal of the

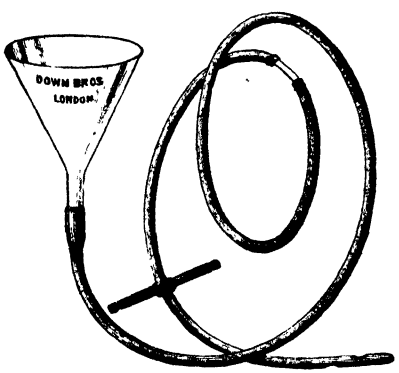


FIG. 69. Rubber Tube and Funnel

nozzle, gentle pressure with the left hand over the uterus will prevent any of the lotion being retained.

Washing out the Stomach. Washing out the stomach, or lavage as it is sometimes called, may be performed by a stomach-pump, but is better done by means of a rubber tube about 4 feet long, and a funnel as shown in Fig. 69. About 18 inches of the tube are to pass into the mouth, the remainder will remain outside. The end of the tube may be lubricated with a little butter, though this is not necessary, and the tube is then passed backwards against the roof of the mouth, following the curve of the palate into the gullet, and so into the stomach. At the same time the patient should be asked to swallow.

Warm water, preferably containing 1 grain of sodium bicarbonate to 1 ounce of water, should then be used to wash the stomach out with, pouring it into the funnel, and, after each half-

pint or pint, lowering the funnel so that the stomach contents will flow therefrom into a bowl placed on the floor. This procedure is of the greatest use in cases of poisoning, in order to remove the poison from the stomach. It is also of use in dilatation of the stomach and in other forms of dyspepsia.

A similar procedure is employed when it is desired to feed the patient by such a tube, the milk or prepared food being poured into the stomach by the funnel and left in.

Also in the feeding of children with severe sore throats, such as diphtheria, where food cannot be swallowed, it is necessary to pass a thin tube, such as a rubber catheter, down the nose into the stomach and pour in the milk in this way : *see* Nasal Feeding on p. 613.

CHAPTER XXI

INVALID DIET

Albumen Water : Arrowroot or Cornflour : Barley-water : Beef-tea : Benger's Food : Bran Bread : Calves'-feet Jelly : Chicken Cream : Chicken or Mutton Broth : Chocolate : Eggs : Grated Bread crumbs : Gruel : Imperial Drink : Junket : Lemonade : Meat Extracts : Milk Preparations : Milk Jelly : Peptonised Beef-tea : Peptonised Milk : Raw Meat Juice : Raw Meat Sandwiches : Sago : Tapioca : Whey (Rennet) : White Wine Whey and Lemon Whey

Albumen Water. The white of 1 egg to 4 ounces of cold water, or 5 whites to 1 pint of water. Lemon essence or cinnamon water as flavouring.

Carefully separate the white from the yolk, seeing that no pieces of the shell fall into the cup. Add the cold water and stir lightly with a fork, but not sufficiently long to produce a froth; then strain. In India it is advisable to make albumen water freshly for each drink. If found too cold it can be slightly heated, but not enough to coagulate the albumen.

If the patient is on brandy this can quite well be added to the albumen water, or a little lemon juice can be used as flavouring.

Arrowroot or Cornflour. 1 dessert-spoonful of arrowroot, or cornflour, ½ pint of boiling water or milk.

Mix the arrowroot or cornflour into a smooth paste with a little cold water or milk. Pour the ½ pint of milk over it, and boil slowly for 5 minutes, stirring constantly.

Sweeten to taste, and add wine or brandy if ordered.

Barley-water. 1 ounce pearl barley, 1 pint cold water, rind and juice of 1 lemon, sugar to taste.

Wash and blanch the barley by putting it into cold water and bringing it to the boil, after which strain and throw away the water. The pint of cold water, sugar and lemon are then added to the barley and the whole brought to the boiling-point, and allowed to simmer for about 1 hour. Then strain and use.

Barley-water made from Robinson's Patent Barley Flour. This is a quicker method.

One dessert-spoonful of the flour is mixed into a smooth paste with a little cold water and added to 1 pint of boiling water, then brought to the boil and allowed to simmer for at least 10 minutes, stirring constantly. Sugar to taste and flavouring are added afterwards; orange juice being sometimes preferred to lemon juice.

The above two recipes make a cooling and refreshing drink. When used for the purpose of diluting milk, usually in the proportion of 1 ounce of barley-water to 3 ounces of milk for an adult, the sugar and lemon juice should be omitted. When required for infants under three months the quantity of barley flour should be reduced to 1 teaspoonful. In the latter case, of course, sugar is added afterwards.

Barley-water should be made twice daily and be kept in a cool place. In no case, after having once been brought to the boiling-point, should it be allowed to boil again, as this induces rapid fermentation, making it unfit for baby's food.

Beef-tea (slow way). ½ pound of lean rump-steak. ½ pint of cold water.

After removing all fat and skin shred the meat into as small pieces as possible. Place in a covered jar with the water, some salt, and a small piece of ginger, and stand the jar in a saucepan of simmering water, or in a cool oven for 2 to 3 hours. Then strain and add salt to taste.

Beef-tea (quick way). The ingredients and method are the same as above, but instead of using a jar place the ingredients in a saucepan and stir over a moderate fire for about ½ hour, then strain and add salt to taste.

Before serving remove all fat from the surface with pieces of kitchen paper.

Beef-tea should never be allowed to boil, as boiling coagulates the albumen in the meat, thus rendering it difficult of digestion.

Gravy-beef is not good for the purpose, as it contains a good deal of gelatine, which can only be extracted by boiling. If beef-tea sets when cold, it is a sign that it has been boiled. When cooked in simmering water it is more nutritious though less savoury than when cooked in the oven, as by the latter method it is exposed to drier heat. As cold water brings out the juices of the meat, it is advisable to allow the shredded beef to remain in the water for

about 15 minutes before commencing to cook it. It should never be boiled to reheat.

Benger's Food. For older children and adults. ¾ ounce or 1 tablespoonful of Benger's, 2 ounces or 4 tablespoonfuls of cold milk or water.

Mix to a smooth paste in a basin, then add gradually, whilst stirring, ½ pint or a breakfast-cupful of boiling milk, or milk and water. Set aside away from fire for 15 minutes, when the digestive process will have been sufficiently advanced; then pour into a saucepan and slowly heat, stirring constantly till it boils. If the Benger's Food is at all lumpy, which will be the case if it has not been mixed sufficiently slowly and smoothly, the lumps should be broken up by being strained through a sieve, and added to the rest, not thrown away. For invalids with very weak digestions, the self-digestive process may be extended to ½ or ¾ hour, but in the majority of cases 15 minutes is usually sufficient. For adults and children above nine months, who are in the habit of taking the food, milk alone may be used in its preparation.

For infants, the proportion of milk and water will vary with the age and condition of the child. Under three months, one-third milk and two-thirds of water should be used, the proportion of the former being gradually increased. Benger's Food as a rule does not require any sweetening.

Bran Bread.* Take about 1 seer (2 pints) of wheat-bran or chokar, boil it in two changes of water for ¼ hour, each time straining it through a sieve, then wash it well with cold water (on the sieve) until the water runs off perfectly clear. Squeeze the bran in a cloth as dry as possible, then spread it thinly on a dish and place it in a slow oven; if put in at night, let it remain until morning, when, if perfectly dry and crisp, it will be fit for grinding. The bran thus prepared must be ground in a fine mill and sifted through a wire sieve of such fineness as to require the use of a brush to pass it through; that which remains in the sieve must be ground again until it becomes quite soft and fine.

Take of this bran-powder 3 or 4 ounces, the other ingredients as follows: 4 hen's eggs, 2 ounces of butter, about ½ pint milk. Mix the eggs with a little of the milk, and warm the butter with the other portion, then stir the whole well together, adding a little nutmeg, or ginger, or any other agreeable spice. Bake in small

* From Hare's "Practical Therapeutics."

tins (patty tins), which must be well buttered, in a rather quick oven for about ½ hour. The cakes when baked should be a little thicker than ship biscuits. They may be eaten with meat or cheese at breakfast, dinner, and supper; at tea they require rather a free allowance of butter, or they may be eaten with curd or any of the soft cheeses. In wet weather the cakes tend to become damp; this may be prevented by placing them before a fire for 5 or 10 minutes each day.

The above make a bread suitable for diabetics.

Calves'-feet Jelly. 2 large calves' feet, 5 pints cold water, strained juice of 4 large lemons, rind of 2 lemons thinly pared, 1½ inches of cinnamon, 14 ounces of white sugar, 6 whites of eggs, 3 ounces of cold water, 4 ounces of Madeira.

Place the feet, well washed and split, in the water and boil quickly. Then allow to simmer gently for 6 hours, skimming frequently, after which strain and keep in a cool place till next day. Then remove carefully all the fat which has settled on the top, and put the jelly into a saucepan with the lemon and rind, sugar and cinnamon, and boil up the mixture. The whites of the eggs are then beaten with 3 ounces of cold water and thrown into the jelly, the whole being rapidly whisked with a wire whisk for 20 minutes while boiling rapidly. Then allow to simmer with the saucepan cover off for ½ hour, and strain through a flannel jelly-bag till quite clear. The wine is now added and the jelly poured into moulds and placed on ice and set.

Chicken Cream. A small quantity of boiled chicken, 1 teacupful of milk, pepper and salt to taste, some cream if desired.

Shred finely the breast or wing of a boiled chicken. Then pound it in a mortar. Heat the milk, and add to the chicken by degrees, stirring constantly till of the consistency of thick soup. Flavour with salt and pepper, and add 2 tablespoonfuls of cream. Serve hot.

Beef, mutton, veal, or fish may be treated in the same way, the fat and skin having first been removed. The above are the first articles of meat diet for convalescent enteric patients.

Chicken or Mutton Broth. 1 pound of neck of mutton, or 1 chicken, 1 pint of cold water, pepper and salt to taste.

Chop the meat and bone into small pieces. Place in a saucepan with the cold water, pepper and salt, and boil; after which skim to remove the fat, and continue to let the mixture simmer for about

2½ hours. The ingredients can be put into a covered jar placed in simmering water, which is a longer process. All broths should be allowed to boil to bring out the flavour of the meat. When ready strain, reheat, and serve with chopped parsley if desired. This should first have been washed and dried, and should be added only at the last moment, or else it will turn brown. When allowed, pearl barley, rice, vermicelli, or semolina may be added to the above broths, but they must have been previously boiled in a small quantity of the broth before being added to the rest.

Sliced vegetables, such as onion, turnip, celery, and a sprig each of thyme, parsley, and majoram boiled with the broth as seasoning render it more savoury.

Chocolate. 1 ounce of chocolate, 4 ounces of water, 1 pint of milk.

Shred the chocolate and boil for about 5 minutes in the water till quite smooth, then add the cold milk and boil again, stirring quickly to produce a froth. A little cream if desired may be added before serving.

EGGS

These may be served in various ways, as egg-flip when the patient is unable to take them in any other form; and later in the convalescent stage, they may be given boiled, poached, scrambled, as *œufs au plat*, or as omelette, soufflet, or egg jelly. Fried eggs are not as digestible as any of the above. With boiled or poached eggs, care should be taken to have the whites as lightly set as possible, as otherwise they would be indigestible. For scrambled eggs, or omelettes, a good deal of beating of both the yolk and whites is necessary to render the result light.

Coddled Eggs. This is a favourite way with Americans of serving eggs. It is certainly very digestible, though by English people it may be considered to be too insufficiently cooked to be palatable.

Break the egg into a custard-glass, preferably one with a short stem, or into a small cup, and place the glass into a basin of hot water till the white of the egg is slightly set, when serve with pepper and salt.

Egg Flip. 1 to 2 eggs, according to size; ¼ to ½ pint of fresh cold milk, sifted sugar to taste, some flavouring.

Break the yolks of the eggs into a large cup or basin, and beat

with a fork, gradually adding the milk and the sugar. Then strain into a tumbler; adding ½ ounce of brandy, or 1 ounce of port wine, or some strong coffee, or a few drops of lemon or vanilla essence. Beat the whites on a plate with a knife into a stiff froth, adding a little sugar while doing so. Pour on to the milk, and serve with a little grated nutmeg over the top. The latter can be omitted if not desired.

If required to be served in a feeding-cup, the entire egg should be beaten up in a cup, and then strained, the sugar, and brandy if ordered, being added afterwards.

Œufs au plat. 1 egg, a little butter, pepper and salt.

Put a little butter, about a teaspoonful, in a saucer or in a ramequin dish and keep on the oven or over boiling water till it is melted. Then break the egg into it, taking care that the yolk remains whole, and keep hot till the white is lightly set. Serve with pepper and salt sprinkled over it, and a little chopped parsley if desired.

This is a very palatable way of serving eggs. Grated cheese may also be used over it.

Omelette Soufflet. 3 whites of eggs, 2 yolks, ½ teaspoonful of flour, 1½ ounces of sugar (sifted), and any kind of flavouring.

Beat up the yolks, and add the flour, sugar, and flavouring. Beat the whites into a stiff froth on a plate with a knife, and cut it into a mixture, which afterwards is poured into a well-buttered tin and baked in the oven till of a light brown colour. Serve at once in the tin with a little sugar sprinkled over it.

Grated Breadcrumbs. Slices of bread, from which the crust has been removed, are baked in an oven until quite dry and brown, and then grated finely on a nutmeg grater.

These crumbs are more easily digested than ordinary bread-crumbs, and so are suitable for an enteric patient as one of his first advances on to solid food.

Gruel. ½ to ¾ pint of boiling milk or water, ½ tablespoonful of fine oatmeal or patent groats.

Mix the oatmeal with a little cold water or milk into a smooth paste. Then add to the remainder of the boiling milk or water, and continue to boil until the mixture becomes thick, stirring

constantly. If required in a more fluid form, the milk or water can be increased. Gruel should be served hot. Brandy, rum, sugar, or salt may be added if desired.

Barley Gruel. 1 tablespoonful of Patent Barley Flour, ½ pint of boiling water or milk, a pinch of salt.

Mix the barley flour and salt with a little cold water to a smooth thick paste. Add the boiling milk or water, and allow to simmer for 10 minutes, stirring constantly.

Sugar to taste may be added.

Imperial Drink. 1 large tablespoonful of cream of tartar (acid potassium tartrate), 1 pint of boiling water, some sugar, and lemon-peel as flavouring.

Dissolve the cream of tartar in the boiling water and add the sugar and flavouring. Strain and serve when cold.

Junket. 1 pint of fresh milk, 1 to 2 teaspoonfuls of essence of rennet, 1 ounce of sifted sugar.

Heat the milk and sugar till lukewarm. Pour into the dish in which the junket will be served, then add the rennet. When set it is ready to serve. Some whipped cream placed over the junket, or a little grated nutmeg or lemon-peel is to some a palatable addition.

Lemonade. ½ pint of boiling water, 1 lemon cut up into slices, the thinly pared rind of 1 lemon, and sugar to taste.

Mix all with the boiling water. Allow to remain till cold, when strain and serve.

Meat Extracts. Valentine's Meat Juice, Liebig's, Panopepton, Bovril, and Brand's Essence of Mutton or Chicken are all useful when milk cannot be tolerated. The directions are supplied with each.

Valentine's Meat Juice is usually given in the proportion of 1 teaspoonful to 8 of water, and should be given cold.

Panopepton, 4 to 8 teaspoonfuls; Brand's Essence, 1 teaspoonful at a time, either as a jelly, having been set on ice, or diluted with water to 8 teaspoonfuls.

Liebig's Extract of Meat is most palatable when served hot. A little lemon juice as flavouring is often appreciated. Patients with a distaste for milk can sometimes tolerate it if it is mixed with a little Liebig.

It must not be thought, however, that meat extracts are valuable as foods; their use is mainly stimulant.

MILK PREPARATIONS

Milk Posset. Cut 2 thin slices of bread in squares and put in a bowl. Sprinkle over it a pinch of salt and a little nutmeg. Pour in a pint of boiling milk and let stand near a fire for 10 minutes. Then stir in 1 tablespoonful of sherry or brandy.

Milk Tea. Warm a teapot thoroughly. Put in the tea and a very little water to cover it. Let stand 5 minutes. Then pour in boiling milk and let stand for 3 minutes more.

Milk with Meat Essence. Prepare any meat essence with milk instead of water. This beverage is very nourishing and digestible.

Honey and Milk. Stir a teaspoonful of honey into a cup of hot milk. This is very soothing when one has a cold in the head.

Milk and Rice Soup. Soak 2 ounces of rice for 12 hours. Simmer in 1 pint milk for 2 hours. Then boil for 1 hour. Beat in the yolks of 2 eggs and a small piece of butter, and add pepper and salt.

Milk Jelly. ½ to ½ ounce of gelatine, ½ pint of milk, 2 ounces of sifted sugar. For flavouring, the thinly pared end of half a lemon, or cinnamon, cloves, or any kind of essence. A little cochineal may be added to colour it, just before the mixture is turned into the moulds to set.

Place the milk, gelatine, sugar, and lemon-rind in an enamel saucepan over a moderate fire till the gelatine is quite dissolved. Do not allow it to boil. Then strain and place it in a cool place to cool, stirring occasionally.

When cool pour into a basin or mould, previously dipped for a moment into cold water, and allow to remain till set. When ready, dip the mould quickly in hot water to loosen the jelly, and turn out on the dish in which it is to be served. Some cream may be served with the milk jelly if desired.

Peptonised Beef-tea. ½ pound finely minced beef, 20 grains sodium bicarbonate, 1 pint cold water.

Let this mixture simmer for 1½ hours, and when cooled to about 140° F. (as hot as the finger can comfortably bear) add Liquor Pancreatis B.P., or Benger's Liquor Pancreatis, 2 drachms, or Armour's Extractum Pancreaticus, 5 grains; keep the mixture warm in front of the fire for 2 hours with occasional stirring, then strain and boil.

Peptonised Milk. (*a*) 1 pint of cold fresh milk, ½ pint boiling water, 5 grains Extractum Pancreatis (Armour's), 10 grains sodium bicarbonate.

Add the boiling water to the milk, and having dissolved the Extractum Pancreatis and sodium bicarbonate in a small quantity of the mixture, add them to the rest. Keep warm in front of the fire for 10 minutes and then bring to the boiling-point.

Two teaspoonfuls of Liquor Pancreatis with 20 grains of sodium bicarbonate may be used in the same way for peptonising milk.

(*b*) Peptonised milk made with Fairchild's Zymine Peptonising Powder. 1 pint fresh cold milk, 1 tube of Zymine Powder, ¼ pint of cold water.

Mix the powder very gradually and smoothly with the cold water and add the milk which has previously been made lukewarm. Allow the mixture to remain in a warm place for 10 minutes for the predigestion of the milk, then bring to the boiling-point. If further predigestion is required the time for this process can be extended by 5 minutes, or even longer.

Peptonised milk should be made twice in the twenty-four hours, and should be kept in a cool place, being reheated if required or given cold.

Boiling stops further predigestion. A similar result could be obtained by keeping the milk constantly on ice, but this is not quite so safe a method.

Fairchild's Peptonising Powders are useful for peptonising a variety of foods for the invalid, directions for which will be found enclosed in every box of the powders.

Raw Meat Juice. ½ pound of lean beef or mutton, 1 tablespoonful of cold water to every ounce of meat.

Shred the meat very finely after removing skin and fat. The water and a little salt are then added and the mixture stood in a basin of warm water for about 1 hour, after which strain and serve. It may be flavoured with a slice of lemon or a little claret if permitted.

For children six to twelve months old it should be given without flavouring, but with a little sugar; the dose being 1 to 4 tablespoonfuls in the twenty-four hours.

Infusions of raw meat should be kept in a cool place, preferably on ice, and should be made freshly every 12 hours as they are apt to go bad. They should be given cold.

In preparing all meat for beef-tea it is advisable not to use the mincing-machine for shredding it, except for very large quantities, as a certain proportion of the juices of the meat are lost by this method. Also when straining, the meat should be well squeezed in the strainer or piece of muslin used, so as to extract as much juice as possible.

Raw Meat Sandwiches. These are prepared from about 1 ounce to 2 ounces of lean beef, finely shredded, the fat and skin having been removed. The meat is spread between 2 thin slices of bread and butter like a sandwich. A little salt, and pepper if allowed, may be used as flavouring, and a little lemon juice.

Grated cod-roe, or a small quantity of anchovy sauce or paste helps to disguise the raw flavour of the meat.

Sago. ¼ ounce of sago, ½ pint of cold water or milk, some sugar.

Boil the sago and the water or milk for 1 hour, stirring frequently. Sweeten to taste, and add brandy or wine if ordered.

Tapioca. ¼ ounce of tapioca, 1 pint of milk.

Proceed as with sago, but boil for 2 hours.

Whey (Rennet). 1 pint of unboiled milk, 1 teaspoonful of essence of rennet.

Heat the milk to a temperature of about 100° F., add the rennet, and set aside in a warm place till the curd has set, then strain through muslin, and the whey is ready.

A quicker way to make whey is to boil the milk as soon as it begins to set; this hastens the formation of curds, which form into a solid mass, and all the whey possible is obtained when straining, but the character of the whey is not quite the same as by the first method.

Whey may be used for the purpose of diluting milk, in the same way as barley-water, and in similar proportions.

White Wine Whey, and Lemon Whey. Take ½ pint of milk and heat it nearly to boiling-point; add 2 ounces of cooking sherry, and let the mixture simmer until the curd has separated, then strain.

Lemon whey is made similarly by adding 1 teaspoonful of lemon juice to ½ pint of milk.

Both the above may be served hot if desired.

CHAPTER XXII

DISINFECTION

THE impurities in the air may be either suspended or gaseous matter. The universal diffusion of suspended material is proved by the motes which become visible in a ray of sunlight. These are particles of the local soil, spores, pollen, decaying debris from the vegetable world, decaying tissues, cells, germs of disease, particles of carbon, fibres of hair, cotton, wool, and other fabrics. Noxious gases arise from the sewers, from decaying animal and vegetable matter, from the respiration and from the skins of animals. These gases are charged with inconceivably minute particles of decaying matter, and with living germs, either animal or vegetable, which may produce disease. Bacteria, when brought into contact with dead organic matter, increase hourly by myriads and produce putrefaction. In living matter, when resistance is lowered, they produce disease, each bacterium being capable in a suitable soil of dividing and becoming two organisms every twenty minutes. A large number of diseases are due to the invasion of the system from without, by a definite toxic (poisonous) organism which grows and multiplies in the body.

In some of these the poison is given off again, and these diseases are therefore infectious or transmissible from person to person. Strictly speaking, an infective disease is one which is capable of being transferred without direct contact, and a contagious disease one which is spread by the person, clothing, or articles of the diseased individual being brought into direct contact with an uninfected person. The modes of spread of infection may be :

(1) By the breath, or particles of sputum and mucus exhaled in coughing, as in whooping cough, pneumonia, pneumonic plague, mumps, scarlet fever, diphtheria.

(2) By desquamative particles of skin as in scarlet fever and pustules in smallpox.

(3) Secretions and excretions: mucus from the throat in diphtheria, sputum in phthisis, excreta in cholera, typhoid and dysentery.

(4) By contact with septic discharges such as from wounds, as in erysipelas, gangrene, pyæmia.

(5) By food which has been prepared by cholera or typhoid carriers. By water or milk infected by these germs or by those of infantile diarrhœa and dysentery, also through uncooked vegetables such as lettuce or watercress.

(6) Through the fly, which is perhaps the filthiest of all insects. Its eggs are laid and its larvæ stage passed in fæcal matter, dung, or decaying putrescent materials. Its food varies from the costliest viands on a rich man's table to the pus from a beggar's sores; the contents of the latrine, and the vomit and discharge from a cholera patient. It flies direct from one to the other with the hairs on its legs loaded with thousands of germs, alights on the cup, or on the sweets and jellies, and leaves a trail of germs behind it. Not content with this method of disseminating disease, it proceeds still further. Its proboscis is not provided with adequate teeth and it is unable to absorb hard sugary substances, except by dissolving them in the regurgitation from its crop, the contents of which it had previously ingested, it may be, from a cholera stool. If frightened away, it leaves this regurgitated matter on the food materials. The fly also defæcates once every half hour, and in bazaars sweets are seen covered by these little black spots known as fly blows. These stools or ' blows ' are loaded with germs of disease, which are not destroyed, but often multiply, in the fly's intestine.

(7) By transmission through insects such as lice in typhus and relapsing fever, by mosquitoes in yellow fever and malaria, and by fleas in plague.

(8) By direct inoculation as in rabies after dog-bites.

All persons are not alike or always in the same degree susceptible to contagion by contact, or infection by germs. A weakened, fatigued, or chilled person will become affected more easily than a robust, vigorous man; the intemperate sooner than the temperate; the hungry and poverty-stricken before the well-fed, well-clothed and well-housed. Similarly all germs (as is the case with seeds) are not prolific, or have not the same vitality, or virulence, the latter quality greatly depending on the media on which the germ previously grew, and on its exposure to sunlight and air during trans-

ference. The large majority of germs are destroyed by the oxidising influence of the atmosphere before they find a suitable ground for their development. The question of individual resistance and immunity is full of interest, but is too long to discuss in this work.

The term 'disinfectants' has been loosely applied to substances which have antiseptic or deodorant properties; this is, however, an incorrect use of the word.

Antiseptics are substances which prevent, arrest, or impede the growth or multiplication of microbes without necessarily destroying them. Apart from surgical purposes, they are used as preservatives of food. The chief antiseptics in daily use are dilute disinfectants—such as perchloride of mercury, carbolic acid, creosote, permanganate of potash, chlorine; essential oils—such as mustard, turpentine, peppermint, cloves, and eucalyptus; quinine; salicylic and boracic acid.

Deodorants simply destroy or mask the effluvia of bacterial by-products; overpowering one odour by substituting another, or by combining with the sulphur reduce the sulphuretted hydrogen. Unless also possessing disinfectant properties they do little real good. Under 'deodorants' are classed the fumes of burning brown paper, vinegar, acetic acid, nitrous acid, ammonia, incense (loban), pastilles, carbolic powder, chlorine gas, sulphur fumes, ozone, and sanitas. Of the solid or liquid deodorants, ferrous and cupric sulphate act by breaking up the sulphuretted hydrogen, and permanganate by oxidation.

True Disinfectants are substances which destroy the specific virus which cause the infection or disease. A substance may possess the properties of an antiseptic or deodorant in dilution and of a disinfectant in strength. For instance, carbolic acid 1 part in 50 is an antiseptic, 1 in 20 a disinfectant, when mixed with sawdust or sand as carbolic powder, it is deodorant with little or no disinfectant properties.

Disinfectants are classed under three headings:

(1) Disinfectant by natural agents.

(2) Disinfectant by heat.

(3) Disinfection by chemicals, either in liquid or in gaseous form.

Natural Agents. (1) Sunlight and fresh air are extremely useful agents for destroying bacteria. Deodorants and disinfectants should never be permitted to take the place of ventilation and

cleanliness. If dirt and filth are not removed, and if fresh air is not admitted, neither disinfectants nor deodorants will do good. They simply hide the dirt and conceal the want of pure air, instead of destroying the evils arising from it. The poison of all infectious diseases may be best diluted and destroyed by fresh air. Infected bedding and blankets should be placed in the sun for eight hours daily for six days in succession before being brought into use, especially in cases of plague.

(2) **Disinfection by heat** is the simplest and most thorough of all methods. With articles of small value the safest course is to burn pathogenic bacteria. Exposure to steam, or superheated steam, is an excellent method of disinfecting mattresses, bedding, clothes, silks, and cotton goods. Dyes are surprisingly little affected by steam or hot air. New woollen goods lose some of their whiteness and fleeciness by the process, but not more so than in one or two ordinary washings by an Indian *dhobi*. Steam is inadmissible for leather goods, books, or articles containing glue. The application of dry heat, or steam, requires special apparatus which ought to be available in all the large municipalities. Unfortunately this is not yet the case.

(3) **Chemical disinfection** is a matter of considerable difficulty where spores of bacteria are concerned, but for the ordinary infectious diseases chemical disinfectants may be used as indicated below.

As a large number of drugs were placed in the market claiming to be disinfectants, of which the germicidal power was found to be low, all disinfectants are now standardised on the Rideal-Walker Co-efficient, with carbolic acid and its action on typhoid bateria as the unit. Thus to state that hycol has a co-efficient of 20 means that it is 20 times stronger than carbolic acid. If carbolic acid in a dilution of 1 in 100 will kill germs, hycol in a solution of 1 in 2000 will do so equally well.

Lime in its combinations is the best and cheapest disinfectant we possess. *Quicklime* is *calcined* lime without the addition of water and is used to destroy organic matter and bacteria. *Slaked lime* is quicklime and water in the proportion of 2 pounds of the former to 1 pint of the latter. On exposure for some time into air it combines with the water and the carbon dioxide in the air to form *calcium* carbonate, which has no disinfecting action.

Freshly slaked lime should therefore always be used for disinfection.

Whitewash is slaked lime and water and is a very satisfactory substance for destroying many bacteria.

Milk of lime is slaked lime mixed with about four times its volume of water to the consistency of thick cream. It is very useful for the disinfection of excreta, but must be well incorporated with the mass.

Chlorinated line or *bleaching powder* is a very powerful disinfectant, but must be kept in air-tight receptacles as the chlorine rapidly escapes. It may be used as a dry powder or in solution. As a dry powder it can be added to fæces to make a 4 per cent. solution.

In solution a minute quantity, 0·1 parts of chlorinated lime, disinfects 1,000,000 parts of water.

A room may be thoroughly disinfected by washing all parts with 1 in 100 solution of bleaching powder. The quantity required for a 10 by 10 feet room is 8 ounces in 3 pints of water.

Perchloride of mercury is one of the most powerful chemical disinfectants.

It occurs in heavy crystalline masses, and forms with water a colourless solution with a metallic taste. It is used for the disinfection of hands in a dilution of 1 in 5000 : for clothes in a dilution of 1 in 1000. The great drawback to the reagent is its extremely poisonous nature.

Solutions are usually coloured with aniline dyes to distinguish them from water. The Local Government Board recommends the use of a solution of ½ ounce mercuric chloride, 1 ounce hydrochloric, and 5 grains of commercial aniline blue, in 3 gallons of water. It should be prepared and kept in non-metallic vessels, wooden or earthenware. Articles soaked in the mercurial solution should be steeped in water for some hours before washing. Another drawback to its application, especially for the disinfection of cholera stools, is that, if added to liquids containing organic matter, it forms a precipitate that carries down part of the mercury in an inert form. If sulphuretted hydrogen is present in the material to be disinfected, the equally inert sulphide of mercury is thrown down.

Mercuric Iodide does not precipitate albumen. It may be obtained from Burroughs and Wellcome in small tablets which readily dissolve in water. For washing floors a solution of 1 in 1000 should be employed. For disinfecting hands and instruments a solution of 1 in 2000.

Carbolic Acid. In its pure state it is a white, or pinkish, crystalline solid which burns everything it comes in contact with. The commercial acid is a thin, tarry fluid possessing a strong odour and poisonous properties. The pure acid is used for surgical purposes, and the dilutions applicable to different purposes will be found recommended under the diseases described.

Carbolic powder is used only as a deodorant. When commercial carbolic acid is diluted by 50 parts of water it may be used for the hands of attendants and of the sick. Dilution of 1 in 20 may be used for washing furniture, clothing, utensils, scrubbing floors, and disinfecting urinals and water-closets. Fabrics to be disinfected should be immersed in a 5 per cent. solution for over an hour.

Permanganate of Potash. The well-known Condy's fluid is simply a strong solution of this drug or of permanganate of soda. It cannot be classed as a very powerful disinfectant, but acts powerfully in oxidising organic matter and destroying the food upon which bacteria subsist. In the cleaning of foul water, wounds, or cavities, such as the mouth, it has a useful sphere of action. In a dilution of 0·8 of a grain per gallon, in water containing a small amount of organic matter, it will destroy cholera germs in twelve hours, and is employed for this purpose in disinfecting wells during cholera outbreaks. In strong dilution it leaves a permanent stain which may be removed by a solution of oxalic and hydrochloric acid or lemon-juice. When added to hydrochloric acid, chlorine, or hydrochlorous acid, a powerful disinfectant is obtained.

Cyllin, Hycol, Izal, and Kerol are cresol-tar derivatives; the first two having a co-efficient of 18 to 20. They should be diluted for ordinary use 1 part in 150 to 200. Their great disadvantage is that in this strength they stain clothing brown unless sent at once to the laundry or *dhobi.*

If used for sheets and underclothing the dilution should be 1 in 200 with six-hour soaking in this fluid. Their antiseptic value is great, as neither spores, nor micrococci of non-sporing bacteria, can germinate in media to which the amount of 0·1 per cent. of these antiseptics has been added.

Lysol is a cresol soap and in the proportion of 1 in 50 destroys ordinary bacteria in an hour. It is an excellent deodorant and is only slightly poisonous. It is much used in surgery for washing the hands of the operator.

To our armoury in fighting disease must now be added insecti-

cides or substances which kill insects. The most important of these are pestirine and kerosene oil. The former is applied in houses in which plague-infected fleas are present, and the latter to wooden articles to kill bugs, and to water to asphyxiate the larvæ of mosquitoes. Keating's powder for fleas is a useful preparation.

The Gaseous Disinfectants principally used are sulphurous acid, chlorine and formic aldehyde.

Sulphurous Acid. Where a Clayton disinfector is not available the gas is usually generated by setting fire to sulphur in an iron vessel, with the addition of a little alcohol to facilitate lighting. The iron vessel should be placed in a shallow pan containing a little water. Three pounds of sulphur should be used for every 1000 cubic feet of air-space, yielding theoretically 1·1 per cent. sulphurous acid in the air of the room. The use of sulphurous acid gas is being discontinued, as its efficacy is not as great as it was formerly considered to be; the slightest protection was found to shield even sensitive microbes from its action, and also it is difficult to maintain the strength at 1·1 per cent. It is, however, an excellent insecticide.

Chlorine Gas holds a high place among the gaseous disinfectants. It may be prepared by decomposing 1½ pounds of chloride of lime with 6 ounces of strong sulphuric acid for each 1000 cubic feet of space. Or for the same space use common salt 8 ounces, manganese dioxide 2 ounces, water 2 ounces; the water and acid to be mixed and poured over the other chemicals in a porcelain basin which should be placed on hot sand. A kettle of boiling water should be placed on a stove in the room at the same time, as chlorine acts more energetically in the presence of moisture, disinfection being completed in from 5 to 8 hours.

The disadvantages in the use of chlorine are that it is a very active bleaching agent, and therefore carpets, curtains, and fabrics generally are injured by its action. It is also irritating to the throat and lungs, and care must be taken in its employment.

Formic aldehyde is a powerful disinfectant either as a spray or as a vapour generated in special apparatus. The vapour in the proportion of 1 per cent. in air is found to destroy most organisms; but the gas can, unfortunately, not be depended on to accomplish more than a surface disinfection, and possesses small powers of penetration. It has little or no toxic effects on bed-bugs or other insect parasites. For the disinfection of rooms, silks, boots, books,

etc., all the crevices of the room are carefully closed by sticking paper over them : 1 pint of formalin is added to 10 ounces of potash permanganate per 2000 cubic feet of space. The permanganate should be placed in a large pail raised on two bricks, and the formalin poured on to it. Close the door rapidly as the gas is irritating. The room should remain shut for six hours; then open and air for twenty-four to thirty-six hours.

Formalin consists of a 40 per cent. solution of the gas formic aldehyde dissolved in water. A 10 per cent. solution of formalin in water is equivalent to a 1 in 500 solution of perchloride of mercury. It can be used as a spray and is not injurious to most articles ; but cannot be used for leather, furs, and skins, as it renders them brittle.

The method of disinfecting rooms, clothes, excreta, etc., is now given :

Disinfection of the Air of Rooms in which the Patient is Residing. Ventilation and cleanliness being accorded the first places, the following agents may be used while the patient is in the room. Cloths or sheets, damped in 1 in 20 carbolic acid solution, should be hung over the rooms. For deodorants of excretal discharges, sanitas, quicklime, chloride of lime and carbolic powders are useful. A large vessel containing carbolic 1 in 20 should be placed outside the door of the sick room, and into this all soiled sheets, or underclothing from the patient, should be immediately placed for three hours. They should then be boiled for half an hour in clean water, afterwards thoroughly washed with soap, and then exposed for three days to sun and air. If disinfectants are not available, the time of boiling should be doubled.

Disinfection of Clothing, Bedding and Carpets, Tents, etc. Any material used by patients with infectious diseases should, if it can be spared, be immediately burnt. Otherwise articles of the kind should be immersed in a solution of corrosive sublimate (1 in 2000) or carbolic acid (1 in 20). This should be carried out at once, the things not being allowed to lie by, even for a few hours. A large vessel containing the disinfecting fluid should be kept near the sick-room for the reception of all bed and body linen. For bulky articles, such as bedding or blankets, moist heat, or saturated steam, is most efficacious. The hair or feathers in mattresses or pillows may be taken out and loosened, before exposure to disinfection by heat. Twenty minutes in a high-pressure steam disinfector, or four

hours to a dry heat of 250° F. should be secured. Where no apparatus for carrying out this method is available, the articles should be allowed to soak for some hours in one of the following:

Acidified mercuric chloride 1 in 1000, carbolic acid 1 in 20, izal 1 in 100, cyllin 1 in 150, kerol 1 in 150, hycol 1 in 150, permanganate of potash 1 in 80, or lysol 1 in 20. After soaking, the clothing should be boiled, and washed thoroughly with soap and water. The final washing of infected clothing should be effected separately, as diseases may be conveyed by clothes prepared in a laundry where infected clothing has been got up.

Disinfection of Utensils. Utensils used by the sick such as cups, spoons, forks, plates, etc., should be immediately immersed in some disinfecting fluid of the strength mentioned above under 'Potassium Permanganate' or 'Carbolic Acid.' Potassium permanganate is preferable, as carbolic acid might leave an unpleasant taste.

Disinfection of the Hands of Attendants. Two basins, one containing Condy's fluid, or carbolic acid solution, or lysol, and another containing plain water, should be kept ready, so that attendants may wash first with disinfecting fluid, and then with soap and water, immediately on the hands being soiled by infectious 'discharges.' The strength of the solution should be as mentioned above (*see* Carbolic Acid). If blood or thick 'discharges' have dried on the hands, they should be scrubbed with sand. The nails must be scrubbed with a brush.

Disinfection of the Body of Sick. The sick should use for washing, water to which either potash permanganate or carbolic acid has been added. In scarlet fever and smallpox, infectious matter exists in the skin-particles, and care should be taken to render these innocuous. This can be carried out by washing the skin with soap and water and applying all over the body a preparation of 3 drachms of eucalyptus oil in 8 ounces of olive or almond oil.

Disinfection of Discharges and Excreta. Urine and bowel discharges of typhoid, cholera, dysentery, and diarrhœa should be received into a vessel containing about 6 ounces of either carbolic acid solution (1 in 20), or izal (1 in 50), cyllin, hycol, or kerol (1 in 100), formalin 10 per cent., milk of lime (freshly prepared) in amount equal to the fæces, chlorinated lime in a 3 per cent. solution in amount as for milk of lime; with a further application of an equal quantity of disinfectant directly afterwards. The whole should be

well mixed and left for an hour for the disinfectant to act. When strong disinfectants are not available, the stools and urine should be placed in a kerosene-oil tin with an iron handle, and placed over a fire and thoroughly boiled for half an hour, and then buried 3 feet deep under the ground at a distance of over 150 yards from a tank or well; otherwise, if not wholly disinfected, it may infect the water and those drinking it. Burial alone is insufficient. Worms bring up the soil to the surface from a depth of several feet; germs of some diseases can remain for years active, and may be brought to the surface by worms, and spread by dust.

In using disinfectants with discharges, care must be taken that the working strength of the disinfectant used is maintained. If for example, a given disinfectant is known to kill bacteria at a strength of 5 per cent., it is useless to add a 5 per cent. solution if no regard is paid to securing the presence of the disinfectant to the extent of 5 per cent. of the whole weight, or volume, of the material to be treated. An intimate mixture of the fæcal mass and the disinfectant must be secured by means of a stout stick. The average volume of a stool is not less than 8 ounces. If we are using hycol as a disinfectant of which the working strength is 1 in 200, we must add 8 ounces of 1 in 100 dilution to obtain a final dilution of 1 in 200. In the disinfection of cholera stool perchloride of mercury should not be used, as it combines with the albumen and becomes inert. The ground soaked with discharges should be removed to a depth of 2 inches, and buried with quicklime or bleaching powder, the same substances being sprinkled over the bared ground surface. When there are pucca floors, the floor, walls, and the latrines should all be washed out with hycol, or cyllin, 1 in 200. All discharges from the mouth, throat and nose and lungs in diphtheria, scarlet fever and smallpox, measles, whooping-cough and phthisis should be wiped away with rags, which should be immediately burnt. Small vessels, containing cyllin or hycol, 1 in 100, or carbolic acid 5 per cent., formalin 10 per cent., should also be employed as spittoons. All water-closets and privies should, when epidemics of cholera or typhoid may be expected, be disinfected, whether they be offensive or not. It is well at such periods to avoid using any such conveniences which have not been disinfected, especially if, as at hotels and railway stations, they may have been used by persons from infected localities. Manure heaps or accumulations of filth, which it is inexpedient to disturb during epidemics, or which cannot be moved, should be covered, specially if to windward of

dwellings, with coarsely powdered charcoal to the depth of 2 or 3 inches, or with freshly burnt lime, or with fresh dry earth, if charcoal or lime cannot be obtained.

To test the air of privies, lay a piece of turmeric paper between two pieces of glass, so that half the paper hangs down. If the air is not pure, the part of the paper exposed turns reddish-brown after a few minutes, while the non-exposed part remains yellow.

Disinfection of Animals. Dogs and cats should not be allowed in rooms tenanted by patients with infectious disease, as they convey contagion. If such animals have been exposed to contagion they should be well washed with cyllin or hycol solution 1 in 300. Sometimes, however, certain animals have an intolerance to any carbolic preparation, which, becoming rapidly absorbed, often kills the animal. Coal-tar soap does not seem to have this effect, and a good lathering with this followed up by a dip in solution of permanganate of potash is recommended.

Disinfection of Room and Furniture after Removal of Sick. The best proceedure is to open all cupboards, hang the clothes on ropes, take out all books and open them up, close all apertures and cracks in wooden floors, windows and fire-places, and disinfect with formalin and potassium permanganate, or by chlorine as described above. The cubic space may be calculated by multiplying the height, length and breadth together in feet.

If formalin is not available, walls and woodwork should be washed with corrosive sublimate (1 in 5000) or chloride of lime (1 in 100). Whitewashed walls should be scraped and washed with bleaching powder before being rewhitewashed. Papered walls should be stripped and washed with lime before being repapered. If the floorings are earthen, or broken chunam, they should be dug up. The doors and windows should be subsequently thrown open, and kept open, for two or three days.

Boots and Books. The boots and books should be wiped down with formalin. They should then be placed in a box or chest with the leaves of the books open, and disinfected with formic aldehyde vapour.

Disinfection of the Dead Body. When a patient dies from infectious disease, the body should be washed with solution of carbolic acid (1 part of acid to 15 of water), and placed in the coffin as soon as possible. Unless the corpse is for immediate interment, the body should be surrounded and the coffin filled up with charcoal, and chlorine gas may be generated in the room.

CHAPTER XXIII

PRESCRIPTIONS

The preparations of drugs referred to in this chapter are those of the British Pharmacopœia.

1. ISAPGHUL

Two and a half drachms of the seeds, obtainable in any bazar, are allowed to simmer in water for half an hour. The resultant sticky mass is then strained through cloth to remove the husks of the seeds. The remainder, about a cupful in quantity, may then be sweetened and flavoured with vanilla or lemon to taste. This amount may be taken twice or thrice daily, and is very useful in the convalescent stages of diarrhœa and dysentery.

If there is difficulty in taking it when cold, because of its stringiness, it may be warmed.

2. LIME WATER

Lime water is usually bought ready prepared from a druggist. It may, however, be made in the following simple way: Add a piece of unslaked lime, the size of a walnut, to two quarts of boiled and filtered water. After stirring it thoroughly, allow to settle and pour off the clear fluid into a bottle. More water may then be added to the lime until it is all used.

LOCAL APPLICATIONS FOR GENERAL USE

4. ACONITE PAINT

Tincture of iodine	1 drachm
Liniment of aconite	1 drachm

An anodyne paint; used to relieve tenderness over the course of a nerve, as in neuralgia.

5. BELLADONNA PAINT

Green extract of belladonna	1 drachm
Glycerine	1 drachm

Used to relieve pain over a chronically inflamed area.

6. BORIC FOMENTATION

Boric lint to be dipped in boiling water, and wrung out by putting it in a towel and twisting the towel ends, and then applied. Cover with gutta-percha tissue or oiled paper, cotton-wool and a bandage.

A useful fomentation over any inflamed area; especially useful over a septic wound. *See* p. 591.

7. CHROMIC ACID PAINT

Chromic anhydride	30 grains
Water to	1 ounce

May be used to paint fissures or ulcers of the tongue.

8. EMULSION OF IODOFORM

Iodoform in fine powder	1 ounce
Water	2 ounces
Glycerine to	10 ounces

Sterilise before use.

Strips of gauze saturated with this form a suitable dressing for a septic wound; especially useful for tuberculous wounds.

9. IODINE PAINT

Iodine	30 grains
Glycerine	1 ounce

A paint suitable either as a counter-irritant over a chronically inflamed area or as a means of cleansing the skin.

10. LINSEED POULTICE

Crushed linseed	4 ounces
Boiling carbolic lotion, 1 in 60	10 ounces

Add the boiling lotion to the crushed linseed little by little while stirring.

This poultice is suitable for use over any inflamed area, but especially where the skin is unbroken. Used also to relieve pain in pneumonia and pleurisy. *See also* p. 592.

11. SOLUTION OF PICRIC ACID

Picric acid	2 grains
Water	1 ounce

Lint dipped in the above forms an excellent dressing for burns or other superficial wounds where there is much serous discharge from the skin.

12. TANNIC ACID AND GLYCERINE PAINT

Tannic acid	320 grains
Glycerine	1 ounce

This paint may be applied over tonsils or the pharynx when chronically inflamed.

LOTIONS

13. BINIODIDE AND SPIRIT LOTION

Perchloride of mercury	10 grains
Iodide of potassium	30 grains
Eosin (not necessary)	a trace
Water	5 ounces
Methylated or rectified spirit	15 ounces

An excellent antiseptic lotion for cleansing the skin preparatory to an operation.

14. BORIC ACID LOTION

Boric acid	6 drachms
Pink dye (not necessary)	a sufficiency
Boiling water	20 ounces

Dissolve the acid in the water, filter, and then boil the solution.

A mild antiseptic lotion.

15. CALAMINE LOTION

Prepared calamine	1 ounce
Oxide of zinc	1 ounce
Glycerine	1 ounce
Lime water to	20 ounces

A sedative lotion, useful in eczema or similar irritated conditions of the skin.

16. CARBOLIC LOTION

Pure carbolic acid	1 ounce
Hot water to	20 ounces

Add the water in small quantities to the acid and shake thoroughly after each addition.

Most useful antiseptic lotion: in the above strength is used for sterilising instruments or the skin before an operation. Half or a third of the above strength is suitable for use on open wounds or to make a fomentation with. A quarter of the above strength for use in mucous cavities such as the mouth.

17. EVAPORATING LOTION

Solution of ammonium acetate	2½ ounces
Ammonium chloride	½ ounce
Methylated spirit	5 ounces
Water to	20 ounces

A cooling lotion: lint dipped in this may be applied over a recently injured part, or to relieve the pain of acute inflammation over some parts, such as the knee.

18. PERCHLORIDE LOTION

Perchloride of mercury	8¾ grains
Sodium chloride	8¾ grains
Blue dye (not necessary)	a trace
Water	2 ounces

Dissolve; strength 1 in 250.

A strong antiseptic lotion. Instruments should not be placed in this lotion. For use on the unbroken skin half the above strength is suitable; for use in wounds or in mucous cavities one-eighth of the above strength, *i.e.* 1 in 2000, is suitable.

19. PERMANGANATE LOTION

Permanganate of potash	20 grains
Water to	20 ounces

An excellent mild antiseptic lotion: useful as a mouth-wash, or vaginal douche, or as an enema.

MOUTH-WASHES

20. ALUM MOUTH-WASH

Powdered alum	7 grains
Water to	1 ounce

As a mouth-wash or gargle.

An astringent mouth-wash: useful for tender gums. Mixed with an equal quantity of warm water can be used as an ear lotion.

21. CHLORATE GARGLE

Potassium chlorate	10 grains
Water to	1 ounce

As a gargle or mouth-wash.

A very good gargle for a septic sore throat, or as a mouth-wash for suppurating gums.

SURGICAL DRESSINGS

Where there is a shop it will be much better to buy these dressings ready made by a trustworthy firm than to make them oneself.

22. ABSORBENT COTTON

Commercial carbonate of soda	2 ounces
Water	1 gallon

Dissolve.

Two pounds cleaned and ginned cotton. Immerse the cotton in the solution. Heat and allow to simmer slowly for three hours. Rinse the wool in running water until all alkali is removed. Squeeze as dry as possible. Spread out to dry. Tease and card. Store in dust-proof receptacle. Sterilise before use.

Generally useful as a dressing or as a pad over dressings. It will be better to buy this material ready made.

23. BORIC LINT

Pass lint through hot saturated solution of boric acid. Squeeze gently to remove excess of water. Dry and fold.

A mild form of dressing: useful also for fomenting septic wounds with Better bought ready made.

24. CYANIDE GAUZE

Take of (by weight) 3 per cent. solution of double cyanide of mercury and zinc in distilled water. Immerse moistened prepared gauze (see No. 26). Knead. Wring out excess solution. Dry and fold.

This is better bought ready made.

25. IODOFORM GAUZE

Iodoform in powder	10 parts by weight
Solution of hard soap	90 parts

Stir the iodoform into the emulsion. Immerse the gauze. Knead thoroughly. Spread out in a dark room to dry. Fold when slightly moist. Store in glass jars.

This forms a suitable dressing for septic wounds, especially if there is much discharge of pus. Or for wounds near a part likely to become fouled, such as a fistula in ano. May be bought ready made.

26. PREPARED GAUZE

Preparation of gauze for surgical dressings.

1. Wash thoroughly with soap and hot water.
2. Rinse in clean water.
3. Dry the gauze.
4. Weigh one length of gauze.
5. Saturate one length in water.
6. Collect all the water which can be squeezed out of the saturated length.
7. Measure the water squeezed out. This gives the correct quantity of fluid necessary for medicating one length of gauze.
8. Dry the gauze.
9. Fold each length into six thicknesses.
10. Roll up lightly.
11. Sterilise before use.

Gauze (mulmul from the bazar) treated as above will form a suitable dressing for wounds. It may be bought ready made.

DRAUGHTS

27. APERIENT DRAUGHT

Magnesium sulphate	3 drachms
Spirit of chloroform	7½ minims
Infusion of senna to	1 ounce

A mild saline aperient, suitable for taking early in the morning, or to assist an overnight pill. Comparable to the old-fashioned "Black Draught."

28. CALCIUM PERMANGANATE DRAUGHT

Calcium permanganate	4 grains
Water	1 pint

To be used either undiluted or diluted up to eight times its volume as a drink in cases of cholera.

To be given 2 or 3 ounces at a time very frequently. If vomited, give it again.

29. CHLORAL AND BROMIDE DRAUGHT

Chloral hydrate	15 grains
Potassium bromide	20 grains
Simple syrup	1 drachm
Water to	1 ounce

A strong hypnotic or sedative draught. Useful to quiet a patient with tetanus or hydrophobia, or, under medical advice only, in insomnia. Useful for some forms of delirium. Do not give it in pneumonia or bronchitis. Also useful for convulsions in children, in doses suitable to their age.

30. EMETIC DRAUGHT

Zinc sulphate	30 grains
Water to	1 ounce

A powerful emetic; especially used to remove poisons from the stomach where a stomach-pump is not available.

31. MALE FERN DRAUGHT

Liquid extract of male fern	1 drachm
Gum acacia powder	1 drachm
Peppermint water to	1½ ounces

To be followed by a saline purge.

A draught to expel a tapeworm.

32. PARALDEHYDE DRAUGHT

Paraldehyde	1 drachm
Syrup of orange	1 drachm
Water to	1 ounce

A hypnotic draught. Nauseous in taste; but the least harmful of hypnotics.

MIXTURES

The dose of each mixture is 1 ounce for an adult unless otherwise stated.

33. ACID MIXTURE

Dilute nitrohydrochloric acid	12 minims
Infusion of chiretta to	1 ounce

To be taken with or after food. Useful in some forms of dyspepsia.

34. AROMATIC ACID MIXTURE

Dilute hydrochloric acid	7 minims
Compound spirit of horseradish	10 minims
Tincture of ginger	10 minims
Infusion of chiretta to	1 ounce

Of similar employment to No. 33.

35 ALKALINE CHIRETTA MIXTURE

Sodium bicarbonate	10 grains
Light magnesium carbonate	10 grains
Infusion of chiretta to	1 ounce

Taken before meals to promote appetite, and in some forms of dyspepsia. May be taken after meals for acidity.

36. ACID QUININE MIXTURE

Quinine sulphate	5 grains
Diluted sulphuric acid	6 minims
Water to	1 ounce

Invaluable in malaria ; and in half the above dose may be used for fever due to other causes.

37. ÆTHER AND AMMONIA MIXTURE

Spirit of æther	30 minims
Aromatic spirit of ammonia	30 minims
Tincture of orange	10 minims
Camphor water to	1 ounce

A stimulant mixture: useful in heart failure or in shock. Do not give if there is hæmorrhage.

38. AMMONIA, IPECACUANHA, AND OPIUM MIXTURE

Tincture of opium	6 minims
Ipecacuanha wine	10 minims
Ammonium carbonate	3 grains
Chloroform water to	1 ounce

A sedative expectorant: useful in pleurisy, or in phthisis where the cough is excessive. Do not give in bronchitis, if there is much expectoration.

39. AMMONIA, SQUILLS, AND SENEGA MIXTURE

Ammonium carbonate	5 grains
Spirit of chloroform	15 minims
Tincture of squills	8 minims
Infusion of senega to	1 ounce

A stimulant expectorant: generally useful as a cough mixture. Do not give in the early stages of pneumonia, or if there is nausea.

40. COMPOUND AMMONIUM ACETATE MIXTURE

SYN.: **DIAPHORETIC MIXTURE**

Solution of ammonium acetate	3 drachms
Spirit of nitrous æther	20 minims
Potassium nitrate	10 grains
Water to	1 ounce

A mixture to promote mild sweating and relieve the hot stages of fevers.

41. BISMUTH MIXTURE

Bismuth carbonate	15 grains
Light magnesium carbonate	10 grains
Sodium bicarbonate	10 grains
Mucilage of tragacanth	1 drachm
Chloroform water to	1 ounce

This mixture, in doses of 1 drachm, is also suitable for infants.

A stomach and bowel sedative: useful for many forms of dyspepsia and diarrhœa. Will colour the motions black.

42. CASTOR OIL EMULSION

Castor oil	40 minims
Powdered gum acacia	20 grains
Compound tincture of cardamoms	20 minims
Peppermint water to	1 ounce

Rub the oil and the gum together, and add the liquid constituents drop by drop, triturating very thoroughly, until a milky emulsion is obtained.

In doses of 1 drachm thrice daily this is suitable also for infants.

Useful in dysentery and in irritant forms of diarrhœa. Especially useful for mucous diarrhœa in children, and during teething trouble. Given thrice daily in above doses to infants, this will have a constipating effect.

43. CHALK MIXTURE

Prepared chalk	15 grains
Powdered gum acacia	15 grains
Cinnamon water to	1 ounce

A sedative and mildly astringent mixture. Useful in some forms of diarrhœa.

44 CHLORINE MIXTURE

Potassium chlorate	30 grains
Hydrochloric acid	40 minims

Mix and allow to stand five minutes, then gradually add, shaking well after each addition:

Water to	12 ounces

Then add:

Syrup of orange	1 ounce

Used as an intestinal antiseptic. Used by some as a routine treatment during enteric fever.

45. CITRATE AND SQUILL MIXTURE

SYN.: **DIURETIC MIXTURE**

Potassium citrate	30 grains
Tincture of hyoscyamus	20 minims
Spirit of nitrous ether	20 minims
Tincture of squill	15 minims
Infusion of buchu to	1 ounce

A mixture used to promote a freer excretion of urine.

46. COD-LIVER OIL EMULSION

Cod-liver oil	2 drachms
Oil of cinnamon	2 minims
Sugar	30 grains
Mucilage of gum acacia	3 drachms
Peppermint water to	1 ounce

To be made in a manner similar to the castor oil emulsion.

A good way of giving cod-liver oil: used in phthisis and in other wasted conditions.

47. COPAIBA MIXTURE

Copaiba	20 minims
Solution of potash	10 minims
Mucilage of acacia	2 drachms
Water to	1 ounce

An antiseptic for the urinary and respiratory tracts. Used in gonorrhœa and in septic bronchitis.

48. DIGITALIS AND IRON MIXTURE

Tincture of digitalis	10 minims
Tincture of perchloride of iron	10 minims
Syrup of lemon	30 minims
Citric acid	5 grains
Water to	1 ounce

A heart tonic: used in some forms of heart disease.

49. ERGOT MIXTURE

Liquid extract of ergot	30 minims
Glycerine	20 minims
Chloroform water to	1 ounce

To promote uterine contractions. Used after labour and in some forms of painful menstruation.

50. IRON AND MAGNESIUM SULPHATES MIXTURE

Ferrous sulphate	2 grains
Magnesium sulphate	30 grains
Quinine sulphate	3 grains
Dilute sulphuric acid	8 minims
Water to	1 ounce

This mixture is also suitable for infants in doses of 1 drachm.

An iron tonic. Used also for some forms of splenic enlargement, such as those due to malaria.

51. IRON AND QUININE MIXTURE

Quinine sulphate	2 grains
Tincture of perchloride of iron	10 minims
Tincture of nux vomica	4 minims
Diluted hydrochloric acid	5 minims
Water to	1 ounce

An excellent general tonic. Should be taken after food. Especially useful in convalescing from a long illness.

52. COMPOUND LINCTUS

Dilute sulphuric acid	2 minims
Syrup of squills	4 minims
Golden syrup or treacle	8 minims
Compound tincture of camphor	16 minims
Anise water to	1 drachm

Dose: 1 drachm.

A useful mixture, a teaspoon at a time, to allay a tickling cough. Do not give more than six times in the twenty-four hours.

53. STRONG MAGNESIUM SULPHATE SOLUTION

Magnesium sulphate	6 drachms
Water to	1 ounce

An ounce of this may be taken as a purgative. Taken in teaspoon doses, is excellent for some forms of dysentery: a teaspoon every hour till blood stops coming; thenceforward three-hourly till mucus stops also.

54. PERCHLORIDE OF MERCURY MIXTURE

*Solution of mercuric chloride	1 drachm
Infusion of chiretta to	1 ounce

A means of giving mercury for syphilis; or as an intestinal antiseptic. Should only be given under medical advice.

* Liquor hydrargyri perchloridi.

55. POTASSIUM BROMIDE MIXTURE

Potassium bromide	10 grains
Chloroform water to	1 ounce

A sedative mixture. Useful for some forms of headache, especially those due to worry: used in epilepsy: as a mild hypnotic if no pain is present.

56. POTASSIUM IODIDE MIXTURE

Potassium iodide	5 grains
Ammonium carbonate	3 grains
Chloroform water to	1 ounce

Used for chronic bronchitis and in asthma, where there is difficulty in bringing up phlegm. Invaluable in tertiary syphilis. Should not be given for more than a day or so except under medical observation.

57. RHUBARB AND SODA MIXTURE

Sodium bicarbonate	10 grains
Oil of peppermint	½ minim
Spirit of chloroform	5 minims
Infusion of rhubarb	2 drachms
Compound infusion of gentian to	1 ounce

Excellent for some forms of dyspepsia, especially for acid dyspepsia with flatulence.

58. SODIUM SALICYLATE MIXTURE

Sodium salicylate	8 grains
Potassium bicarbonate	15 grains
Chloroform water	1 ounce

Used in rheumatism, and for other joint and muscular pains. Sometimes used as an intestinal antiseptic.

59. SULPHURIC ACID AND OPIUM MIXTURE

Dilute sulphuric acid	15 minims
Tincture of opium	7 minims
Spirit of chloroform	15 minims
Camphor water to	1 ounce

A powerful astringent and sedative for the intestine. May be used early in diarrhœa when cholera is prevalent if the attack is mild. Do not give it for rice-water stools, nor for dysentery.

60. WHITE MIXTURE

Magnesium carbonate	10 grains
Magnesium sulphate	1 drachm
Peppermint water to	1 ounce

A very useful saline aperient. Taken thrice daily, is used for some forms of dyspepsia and for constipation.

PILLS

61. CALOMEL, COLOCYNTH, AND HYOSCYAMUS PILL

Calomel	1½ grains
Extract of hyoscyamus	1 grain
Compound extract of colocynth	2½ grains

A good purgative pill: one or two at night.

62. OPIUM AND ASAFŒTIDA PILL

Opium in fine powder	1 grain
Red pepper	1 grain
Asafœtida	2 grains

Has been called a 'cholera pill.' Should only be used in earliest stages and if the diarrhœa is not very severe. Never give it once rice-water stools are passed.

63. NUX VOMICA AND BELLADONNA PILL

Alcoholic extract of belladonna	¼ grain
Extract of nux vomica	¼ grain
Extract of aloes	1 grain

Used in constipation due to lack of muscular power in the bowel: one or two at night.

64. PERMANGANATE PILL

Calcium permanganate	2 grains
Kaolin	1 grain
Wool fat	q.s.

To be coated with Salol.

An excellent cholera pill. Give one every quarter or half an hour during the diarrhœa. If vomited, give another.

65. RHUBARB AND MERCURY PILL

Mercury pill	2½ grains
Compound rhubarb pill	2½ grains

A good purgative pill: is very kind. One or two at night.

POWDERS

66. COMPOUND BORIC POWDER

Powdered camphor	10 grains
Boric acid	2 drachms
Zinc oxide	2 drachms
Starch	4 drachms

As a dusting powder.

Very useful in prickly heat, to prevent bed-sores, or in other irritative conditions.

67. COMPOUND STRAMONIUM POWDER

Powdered dhatura leaves	1 ounce
Powdered anise fruit	½ ounce
Potassium nitrate	½ ounce
Powdered tobacco leaves	30 grains

10 to 30 grains to be ignited on a plate and the fumes inhaled.

As a sedative during an asthmatic attack.

68. KALADANA POWDER

Black seed (Kaladana) in fine powder	1 drachm
Powdered ginger	10 grains

A purgative pill: ingredients obtained cheaply in any Indian bazar.

69. TOOTH POWDER

Light magnesium carbonate	2 drachms
Borax	2 drachms
Oil of cinnamon	5 minims
Precipitated chalk	1 ounce

A cheap and efficient tooth-powder.

PREPARATIONS FOR CHILDREN

The doses are calculated for an infant of twelve months unless otherwise stated. To calculate the dose for other ages see p. 6.

MIXTURES

Besides those here named, the following mixtures included in the preparations for adults are suitable for children in doses proportional to 1 drachm thrice daily for infants of twelve months:

Bismuth mixture.
Chalk mixture.
Castor oil emulsion.
Iron and magnesium sulphates mixture.
The dose of each mixture is 1 drachm.

70. BABY'S LINCTUS

Compound tincture of camphor	2½ minims
Ipecacuanha wine	2½ minims
Glycerine	20 minims
Peppermint water to	1 drachm

For an irritating cough. Do not give in severe bronchitis or in bronchopneumonia, except under medical advice.

71. FERROUS IODIDE MIXTURE

Solution of ferrous iodide (strength 1 in 10)	20 minims
Extract of malt	40 minims
Chloroform	$\frac{1}{5}$ minim

Each drachm of this mixture contains 2 grains of ferrous iodide.

A good children's tonic, especially for tuberculous children. For glands in the neck or abdomen, or in convalescence from wasting diseases.

72. INFANTS' BISMUTH MIXTURE

Bismuth carbonate	5 grains
Sodium bicarbonate	$1\frac{1}{2}$ grains
Spirit of chloroform	1 minim
Powdered tragacanth	$\frac{1}{8}$ grain
Water to	1 drachm

Used in the green 'summer' diarrhœa of infants; or for vomiting. A gastric and intestinal sedative. Will colour the motions black.

73. INFANTS' IPECACUANHA MIXTURE

Ammonium carbonate	$\frac{1}{2}$ grain
Ipecacuanha wine	3 minims
Golden syrup	8 minims
Water to	1 drachm

A cough mixture for children. Useful in bronchitis.

74. PHOSPHATE SYRUP

Syrup of ferrous phosphate	$\frac{1}{2}$ drachm
Calcium hypophosphite	1 grain
Syrup to	1 drachm

A good child's tonic. Useful in rickets also.

POWDERS

75. COMPOUND SANTONIN POWDER

Santonin	2 grains
Compound scammony powder	2 grains

Suitable for a child of four years.

For round and thread worms.

76. INFANTS' MERCURY POWDER

Compound rhubarb powder	2 grains
Mercury with chalk	$\frac{1}{2}$ grain

Useful in some intestinal troubles of children; sometimes during teething; and often for constipation.

OINTMENTS FOR GENERAL USE

77. BORIC OINTMENT

Boric acid	1 drachm
Soft paraffin	1 ounce

A mild antiseptic ointment: generally useful.

78. CHRYSAROBIN OINTMENT

Chrysarobin	20 grains
Simple ointment	1 ounce

For psoriasis, and ringworm, as Dhobi's itch. Do not allow it to reach tender parts as the face, or scalp, especially not the eyes, as it is very irritant It will permanently discolour clothes. If too strong dilute with vaseline.

79. RED IODIDE OF MERCURY OINTMENT

Red mercuric iodide	1 drachm
Simple ointment	9 drachms

Mix. To be freshly prepared.

A strong counter-irritant ointment: for use over an enlarged spleen or a goitre.

80. WHITE PRECIPITATE OINTMENT

Official: Unguentum Hydrargyri ammoniati

Ammoniated Mercury	1 part
White Paraffin Ointment	9 parts

88. SIMPLE OINTMENT

Hard and soft paraffin in proportion according to the temperature prevailing.

As a basis for medicaments, or as a simple salve by itself.

89. SULPHUR OINTMENT

Sublimed sulphur	1 part
Simple ointment	9 parts

For parasitic skin diseases, as scabies (the itch).

90. COMPOUND ZINC OINTMENT

Oxide of zinc	15 grains
Calamine	15 grains
Simple ointment	1 ounce

A sedative ointment; for chapped hands, eczema, &c.

PREPARATIONS FOR THE EYE

91. ZINC DROPS

Sulphate of zinc	½ grain
Distilled water	1 ounce

An astringent lotion useful in mild ophthalmia and watery eye.

92.

Sulphate of zinc	1 grain
Distilled water	1 ounce

Similar to 91, but stronger.

93.

Sulphate of zinc	2 grains
Distilled water	1 ounce

Similar to 91, but stronger. Used in angular conjunctivitis.

94. ATROPINE DROPS

Sulphate of atropine	4 grains
Distilled water	1 ounce

Used to dilate the pupil and paralyse the accommodation of the eye, in corneal ulcers, iritis, or preparatory to testing the refraction of the eye.

95. BORACIC LOTION

Boracic acid	10 grains
Distilled water	1 ounce

Useful in many diseases of the eye such as simple ophthalmia, corneal ulcer, &c.

96. LEAD AND OPIUM LOTION

Strong solution of subacetate of lead	6 minims (drops)
Liquid extract of opium	½ drachm
Distilled water	1 ounce

A useful soothing lotion for swollen eye due to mosquito bites.

97. YELLOW OXIDE OF MERCURY OINTMENT

Yellow oxide of mercury	4 grains
Soft paraffin	1 ounce

The oxide of mercury must be most carefully ground in a mortar. Useful for corneal ulcers and sore eyelids.

98.

Yellow oxide of mercury ointment	9 grains
Soft paraffin	1 ounce

N.B. As mentioned above, the oxide of mercury must be ground up exceedingly fine in a mortar or the gritty pieces will scratch the delicate structures of the eye.

Useful in same conditions as 97 but stronger than it.

99. ESERINE DROPS

Eserine salicylate	4 grains
Distilled water	1 ounce

Used in glaucoma.

100. NITRATE OF SILVER DROPS

Silver nitrate	9 grains
Distilled water	1 ounce

Used in purulent ophthalmia and to prevent ophthalmia in newly born children.

101. ATROPINE OINTMENT

Atropine (alkaloid. N.B. Sulphate will not do)	2 grains
Oleic acid	40 grains
Soft paraffin	1 ounce

Used in iritis and ulcers of cornea.

102. COCAINE DROPS

2 per cent.

Hydrochloride of cocaine	9 grains
Distilled water	1 ounce

Used in painful affections of the conjunctiva or cornea of the eye, such as ulcer, to render the surface anæsthetic.

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