PART III.—TROPICAL DISEASES

CHAPTER XIV

INFECTION AND ITS CARRIERS

The theory is gaining ground that most of the diseases dangerous to life and health in the tropics are caused by infection from micro-organisms rather than by climate. Places formerly most deadly to the white man have been transformed into healthy stations by means of modern sanitation and the extermination of those insect pests which have been proved to be carriers of disease-causing germs.

The importance of getting rid of such insects as flies, mosquitoes, bugs, ticks, pediculi or lice, and fleas cannot be too much emphasized.

House flies are carriers of the germs which cause diarrhoea, dysentery, enteric fever, cholera, and other bowel troubles. They pick up the infection from latrines or any place in which the stools of infected persons are found. Wherever they settle, they deposit the germs with their excreta, and food thus infected will, if eaten, cause disease.

Mosquitoes may carry the germs of malaria, filariasis or sleeping sickness (Africa), yellow fever (South America).
INFECTION AND ITS CARRIERS

Bugs, which in some parts of India infect the houses and furniture, and are also picked up from the railway carriages when travelling, may cause kala azar.

Lice or pediculi may carry the germs of relapsing fever, typhus, and trench fever.

Ticks may carry the infection of African relapsing fever.

Fleas may carry germs, such as those of plague, and they may also carry the eggs of worms.

The tsetse fly of Africa carries the germs of sleeping sickness.

Other parasites which may infect man and cause special symptoms are the tape, round, thread, and guinea worms.

Precautions against Germ-carrying Insects, etc.—

Flies.—All latrines and places where faces are kept should be provided with fly-proof screens or covers to keep out flies, and should be periodically inspected.

Food should be kept in fly-proof safes and should never be left uncovered. Muslin or fine net covers, weighted with beads, should be used to protect food placed on the table, especially sugar, milk, jam, and other sweet things loved by flies.

The breeding-places of flies, such as stables, etc., should be kept clean and dry; no rubbish heaps or dung should be allowed to stand anywhere in the compound.

Bugs.—When houses or furniture are once infested
with bugs it is very difficult to free them from these loathsome insects. The rooms may be fumigated with sulphur, and petroleum emulsion may be used to paint into the crevices of beds and furniture. Petroleum emulsion may be made by dissolving ½ oz. of soap in 8 tablespoonfuls of boiling water and adding this, while still warm, to ½ pint of petroleum.

Fleas.—Fleas may infest dogs, cats, mice, and rats. They breed in dust and dirt, and do not like exposure to sunlight, so cleanliness is the best preventive. Where fleas are prevalent, floors should be well cleansed and then washed over with carbolic solution. All rugs and carpets should regularly be taken outside, well shaken, and exposed to the sun. Dogs should be washed with carbolic soap. All rats and mice should be exterminated.

Fruit and Vegetables.—Uncooked fruit must not be eaten unless perfectly sound and ripe. It should have an intact skin which must be removed. Salads of raw vegetables should not be eaten, unless their origin and conditions of growth are known to be above suspicion. In any case all green stuff should be carefully looked over and washed with cold boiled water, or, better still, with water in which enough potassium permanganate has been added to give a pink tinge.

The Mosquito.—The mosquito is a gnat having two pairs of wings, only the front pair of which are developed. It has a proboscis or trunk which consists of a sharp stabbing apparatus for piercing the skin, a minute duct along which the poisonous secretion passes
through the bite to the blood, and another larger tube through which blood is drawn up into the stomach of the mosquito. The antennæ or feelers of the female are covered with short downy hairs, those of the male with long silky ones.

The mosquito is found in the tropics and in those countries which have a cold winter and hot summer. The male mosquito lives on vegetables, but the female also sucks the blood of animals and man.

The eggs are laid in masses either on the surface of stagnant water or in damp places near to water. When the eggs are hatched, which may be in two or three days, or during the cold weather after a long period, the worm-like larvae live on or near the surface, and having moulted several times, reach the pupa or nymph stage, and float on the water. After a day or two the pupa case bursts and a fully developed mosquito emerges, which settles on its discarded case to dry its wings and then flies away. Each female may lay many thousands of eggs during a season. During the cold weather some of the adult mosquitoes sleep in dark and out-of-the-way places; in the spring they revive, and the females are ready to begin laying their eggs again.

Mosquitoes bite most freely in the early evening or during the night. They do not like currents of moving air, nor do they fly high or for long distances. Water or moisture is necessary for their development.

Where the mosquito abounds it is very difficult to procure absolute protection from their bites. Certain
precautions, however, can and should be taken. The dwelling-place should be high and dry, the neighbourhood of marshy land, collections of water, or native huts being avoided. No puddles or pools of water should be allowed to remain round wells, in drains, or anywhere in the compound. Broken crockery, empty tins, or anything which might contain water should never be left lying about. All wells should be covered with mosquito-proof wire netting, and should be frequently inspected. If mosquito larvae are seen to be present in any cistern, tank, or collection of water, they should be destroyed by treatment with kerosene or petroleum. A few tablespoonfuls of this thrown on the surface once a week will render the water unsuitable for the mosquito, and any eggs or larvae present will be destroyed.

Vegetation should not be allowed too near the house. Every one should sleep under a mosquito net, especially those sleeping on the ground floor or out of doors. A punkah or electric fan is an additional protection against mosquitoes.

*Human Carriers.*—A person is said to be the carrier of a disease when, after having recovered from all symptoms, or after he has had the disease in such a mild form that its existence has not been detected, the germs are still present in his faeces. The carrier himself has become immune to their effects, but they are still infective to other people. The presence of a carrier in a house or village is a danger to the community.
Anti-Toxins and Vaccines.—Disease-causing germs may gain access to the body through a breach in the skin, such as that made by a bite, scratch, cut, abrasion, or wound of any kind, or through the mouth, lungs, or any of the natural orifices. If these germs succeed in finding a good site, where conditions are favourable for growth, they begin to multiply at an incredible rate and to manufacture their special poisons or toxins. The mischief caused by these germs may either be almost entirely confined to one spot, as in the case of an abscess, or the germs and their poisons may be carried in the blood stream to all parts of the body, resulting in an acute fever. The nature of the disease produced will depend on the variety of germ.

Anti-Toxins.—Nature has provided the body with several methods of defence against these invaders and their toxins or poisons. One of the most important means is that undertaken by the different varieties of leucocytes or white cells of the blood. Among their duties are the destruction and removal of germs and the production of substances which will destroy their poisons. These substances are called anti-toxins. As every poison is said to have its antidote, so every toxin probably has its anti-toxin, though up to the present, the anti-toxins of only a certain number of diseases have been discovered and are available for use.

The production of anti-toxins in the body goes on in sickness and in health. People are said to be immune to a disease, when they have, continually
circulating in their blood, a sufficient quantity of the anti-toxin of that disease to destroy or neutralize its germs and their poisons, if any should gain access to the body.

The anti-toxins of some diseases, however, may be limited or absent from the blood; but when germs attack the body and give rise to these diseases, the process of manufacture is stimulated to activity. The result of such a disease will depend on whether the output of anti-toxin is large enough to destroy the poison before it has had time to damage the body irretrievably. Often the race is a very close one: if the infection is virulent, or the body defences poor, then the result may be tragic.

Medicine and nursing play a very important part in the destruction of the invading army of germs and the conservation of the strength of the patient; but a most effective addition to the armoury of defence is the ready-made anti-toxin. Certain diseases affect animals as well as man. Blood taken from an animal who has suffered from one of these diseases, contains large quantities of the anti-toxin of that disease. If the serum or liquid part is separated from the solid and injected into the body of one suffering from a similar infection, the anti-toxin in it will at once begin to act on the poisons present in his blood and destroy them; therefore no valuable time is lost while the white cells in the patient's blood are preparing their own anti-toxins.

Hence rapidly spreading and virulent infections,
such as those of diphtheria, snake-bite, or tetanus, are best treated by an immediate injection of anti-toxin serum.

Vaccination.—Inoculation or vaccination is a most valuable means of protection against certain acute infective diseases such as smallpox, enteric fever, etc.

A vaccine for a disease or infection is a preparation of specially treated germs which, if introduced under the skin, will produce a mild form of that disease. The presence in the body of the poison from these germs has the effect of stimulating the white corpuscles of the blood to pour out quantities of anti-toxin, which will destroy similar germs if any should at a later period gain access to the body. These anti-toxins exist in the blood for a definite period after the injection, the period varying with the variety of germ. For this reason the immunity obtained by vaccination lasts only for a limited time, and vaccination, whether it be for smallpox, typhoid, or other diseases, must be repeated periodically in order to secure protection.
CHAPTER XV

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Malaria.—In districts where malaria is prevalent most people sooner or later become infected by the malarial parasite. The infection is conveyed to them through the bite of a mosquito, which is itself infected by the germ. When these minute parasites have once got into the blood-stream, they enter the red blood corpuscles, destroy them, and in the process produce poisonous substances.

They increase at an appalling rate; in a week or ten days after the bite they may exist in the blood in such numbers that the poison from the broken-up corpuscles is sufficient to produce an attack of malaria.

The characteristic symptom of malaria is fever, which recurs at intervals of twenty-four, forty-eight, or seventy-two hours, the interval depending on the particular species of parasite in the blood. The patient may have been out of sorts for several days, languid, and perhaps irritable. The actual attack begins suddenly with what is called a rigor; in young children a fit or convulsion may be the first symptom. In a rigor there is shivering, chattering of the teeth, and occasionally sickness. The patient complains of
cold, and if in bed, buries himself in the coverings. The temperature, if taken in this stage, is found to be several degrees above normal and still rising. The shivering fit is soon followed by one of excessive heat; the bedclothes are flung aside, the patient is flushed and his skin is hot and dry. He complains of thirst, breathes rapidly, and the pulse is quick. There may be severe headache, and sometimes there is delirium or vomiting. The temperature is anything from 102 to 106 degrees. This stage usually lasts for several hours. It is followed by profuse sweating which drenches the clothes and bed coverings. The temperature quickly drops to normal, the thirst ceases, and the sufferer is comfortable, though he may feel tired and languid.

If no treatment is given the attack is repeated at regular intervals.

All attacks are not typical and the symptoms may vary. They may be alarmingly severe or they may be so mild that the nature of the indisposition is unsuspected. The danger of slight cases is, that occasionally there is a sudden development of dangerous symptoms, with wild delirium, unconsciousness, or serious stomach and intestinal trouble. It is often very difficult to distinguish malarial attacks from meningitis, dysentery, enteric fever, or cholera; so the importance of having immediate medical advice is evident. In some cases it is quite impossible to be certain of the nature of the illness without examination of the blood.

_Treatment._—Fortunately there is a drug which has
what is called a specific action on the malarial parasite. This drug is quinine. If quinine is taken regularly it renders the blood unsuitable for development of the parasite, and when it is actually in the blood, quinine taken in sufficient doses will effectually destroy it. In districts where the malaria-carrying mosquitoes abound it is almost impossible to avoid being bitten, so it is advisable to take a course of quinine at intervals as a malaria preventive.

Children do not as a rule actively dislike quinine, and will take it without objection. A good way to give it is in milk. Let the child first have a mouthful of milk or of bread and butter, then give the powdered quinine in a tablespoonful of milk. Quinine tabloids do not easily dissolve; if given whole, the tabloid should be followed by a glass of water which has been made acid by the addition of a little fresh lime-juice. The acid will help to dissolve the quinine. In every case quinine is best taken after food, when the stomach contents are acid.

A child of one year can take half-grain doses three times a day, a child of two years one grain, of four years two grains, and so on, adding a half grain for each year up to twelve, when the dose will be six grains. A grown-up person may take ten grains three times a day during an attack.

As soon as an attack of malaria begins the child should be put to bed and given an aperient. Dilute lemon-water or fresh lime-juice may be drunk in the thirsty stage. The first dose of quinine should be
given after the temperature has begun to come down. It may not prevent the next attack, but it will lessen its severity. The quinine should be given every six hours for the first two days, then three times daily for a week, or as the doctor may direct. After malaria a child is anaemic and below par, therefore a tonic or change of air is advisable.

*Malaria, especially in a child, should never be regarded lightly. The outcome of a severe attack is always a matter of uncertainty, and even mild attacks, frequently repeated, may do lasting damage.

Prevention.—To understand the principles of prevention the fact must be clearly grasped that the disease can be conveyed to man only through the bite of a special species of mosquito which has become infected with the parasite through sucking the blood of a malarial patient. If the malaria-carrying insect can be exterminated in any district in which malaria is prevalent the disease will die out in that place. The mosquito can be got rid of by destruction of the adult insect or by making it impossible for the eggs to develop into maturity. A combination of these two methods is effective.

Kala Azar.—This is a chronic infective disease in which there is enlargement of the spleen and liver, irregular fever, anaemia, and wasting. It has often been confused with malaria, from which, however, it is quite distinct. It is found in India, China, Arabia, Central Africa, Europe, and America.

Kala azar is due to the presence in the body of a
parasite, which is probably conveyed through the bite of a flea or bug. It attacks natives rather than Europeans, who rarely acquire the disease.

Treatment is by injection of a drug, and should be in the hands of a skilled doctor.

Plague.—Plague is one of those epidemic diseases in which the infection is spread through the agency of an insect, namely, a flea which infests the rat. The disease itself is caused by a minute germ which is contained in the blood of the infected rat. Plague is one of the most fatal of diseases to mankind and it is also deadly to rats. The presence of a dead rat in a house or compound at once excites the suspicion that it may have died of plague, and its body should be sent to the sanitary authorities for examination as to the cause of death.

Rat fleas live by sucking the blood of the animal, so if a rat is infected, the plague germs which exist in the blood are sucked up with it into the stomach of the flea. When the rat dies it is forsaken by the fleas, which migrate to other rats or may take refuge on the body of a human being, and through a bite infect him with plague. The germs may also enter the body through an abrasion of the skin caused by scratching, and it is possible that food which has been contaminated by rats may cause infection.

People of all ages, even young children, may get plague. Epidemics frequently occur in India, where cities and villages may be devastated by the disease. They also may occur in the tropical colonies.
Fortunately Europeans, unless they are actually brought into contact with cases, are not often attacked.

The disease shows itself at varying periods after the germ has entered the body; it may appear in two days or less, or the interval may be as long as two weeks.

Before the actual symptoms appear, the patient may have been ailing for a few days with vague pains, loss of appetite, and depression.

There are three different types of plague. The most common is the bubonic, in which infection is concentrated in the glands, often those of the groin, sometimes of the armpit, and occasionally under the jaw. The second type is most fatal, the poison being virulent and affecting the whole body, so that from the beginning the case is hopeless. The third or pneumonic type attacks the lungs; it resembles a severe pneumonia—these cases are almost always fatal.

In all these types the temperature may be 103 or 104 degrees, and even as high as 107 degrees. There is often a rigor in the beginning. The pulse is quick and the breathing hurried. These symptoms may come on very suddenly, the disease progresses rapidly, and within a very few hours the patient looks and is alarmingly ill. There is extreme weakness, the skin is burning hot, the eyes are sunken and bloodshot, the lips may be sore, the tongue is swollen and furred. The patient does not answer when spoken to, he is generally delirious, but may be unconscious or there may be convulsions.
In the bubonic type the swollen glands may be evident on the first day or they may not appear till the fifth. They may vary in size from a nut to a goose’s egg. There may be either severe pain, little, or none. When the bubo appears the temperature begins to come down, there is profuse sweating, and the general condition of the patient improves. If the bubo is not treated it generally bursts, and there is a good deal of evil-smelling discharge. In some cases the bubo does not burst and the swelling gradually subsides.

Convalescence may take place in a week to ten days, or in two to three weeks. Death may occur about the fourth day; or later from exhaustion.

Some epidemics are less serious than others, but are never to be trifled with. Government takes special measures to deal with epidemics and plague areas.

In an outbreak of plague all persons not actually engaged in combating the epidemic in medical work or in nursing should leave the place. Rats and fleas are the great danger, and their complete destruction should be aimed at. Cats and dogs and other carriers of fleas should be regarded as possible carriers of infection.

In nursing cases of plague, ventilation of the sick-room should receive special attention. All discharges should be disinfected.

Treatment.—The patient should be made as comfortable as possible. Ice-bags and sponging will give relief during the fever stage. The buboes may have
soothing applications, such as glycerine and belladonna, or, if inflamed, antiseptic poultices may be applied. In epidemics, help is usually sent as soon as possible, and treatment is taken in hand by the hard-worked medical staff and their assistants.

**Cholera.**—Cholera is much to be dreaded. It comes in epidemic form, is very infectious, and is one of the most fatal of diseases. The germs are passed in the watery stools of the patient in countless millions, and if by any means some of these manage to get into water, they multiply at a terrific rate and infect all who drink it. Though the infection is chiefly spread by means of water, it may also be carried by flies, or other insects which alight on the stools or vomit, pick up germs, and convey them to any food or liquid on which they may rest. Articles of clothing or linen soiled by the patient are dangerous, and may carry the disease unless they are disinfected.

Cholera attacks those who are run down, the weakly, or those who are depressed by fright, though it may also attack the strong and healthy. It comes on quite suddenly, or it may begin with what is like ordinary diarrhoea.

The chief symptom is a profuse watery diarrhoea, the stools may be solid or semi-solid at first, but after a time the patient passes a liquid which is compared to rice-water and is nearly colourless, with little flakes or shreds floating in it. The discharge from the bowel is almost incessant. At first there may be only griping pains, but later they become severe and cramp-like,
Vomiting of material similar to that passed by the bowel sets in. Within an incredibly short time the appearance of the patient changes. He looks terribly ill with sunken eyes and hollow cheeks. His face is pallid and grey, his skin cold and clammy, beaded with drops of sweat. The pulse is quick and thready, later it may become very feeble; the temperature is sub-normal. No urine is passed. There is restlessness and there may be delirium. Thirst is intense, owing to the loss of fluid, since the patient loses all he takes in. Death may occur within a few hours or in a day or two. If the symptoms subside and the body becomes warmer, vomiting ceases, and urine is passed, recovery may then take place and convalescence be established within a few days.

The disease may take a more prolonged course, with the setting in of fever. The face then becomes flushed and the tongue dry and furred, and symptoms resembling those of enteric fever may appear. The stools may now be more solid, but are still evil smelling. The patient may die after a week or two, or he may slowly recover.

*Treatment.*—The course of cholera is so rapid that treatment, to be of use, must be begun without delay. The patient must be put to bed at once, and kept lying down. On no account must he be allowed to sit up for any purpose. Hot bottles must be supplied and constantly refilled with hot water. Blankets should replace sheets. Sips of iced soda or plain boiled water may be given to allay the thirst, and stimulants
such as champagne or brandy and water may be of use. No food of any kind should be allowed.

Medical help should be obtained promptly; for the most successful treatment is by the injection of salt solution into a vein, or cellular tissue of the body, and this can only be done by an expert. The fluid injected is of value in replacing some of the body fluid which has been lost. It is the loss of fluid which is one of the most serious dangers of the disease, so the importance of this treatment will be realized. Failing the immediate advent of the doctor, a solution of potassium permanganate may be made, and the patient encouraged to drink as much of this as possible. Enough permanganate to give a pink tinge to the water is required. Or if pills of potassium permanganate can be obtained, a 2-grain pill may be given every fifteen minutes for two hours, then one every half-hour till the stools are of a green colour. Every effort must be made to keep up the body warmth, and by the administration of stimulants to tide the patient over the danger period.

It must not be forgotten that all vomit and material passed from the bowels are highly infectious.

During an epidemic great care should be taken over food. All water should be boiled, weak tea or lemon-water may be used as the staple drink. Uncooked fruit and vegetables, such as melon or cucumber, should be avoided. War should be waged against flies, and all food protected from them.

Diarrhoea, which is sometimes a premonitory
symptom of cholera in an epidemic, should be promptly treated. Chlorodyne, an old-fashioned and useful medicine, chalk mixture, or lead and opium pills, may be given. All chills, damp, and over-fatigue must be avoided. A cheerful spirit is an invaluable asset during an epidemic.

**Sleeping Sickness.**—This most serious condition is caused by the presence in the blood of minute germs called trypanosomes, which infect big game or cattle, and are conveyed to men through a bite from the tsetse fly. This fly is found in certain parts of Africa and South-West Arabia. It inhabits a narrow belt of ground not more than fifty yards wide near the banks of rivers or lakes, where there is uncultivated vegetation and trees. It is an ordinary-looking fly, brownish or dark grey in colour, with a long proboscis. It bites during the day-time only, and flies near the ground.

Sleeping sickness occurs in Nigeria, Uganda, and Rhodesia. Europeans are occasionally attacked, though it is most common among the natives.

It is most important to recognize the early symptoms of the disease. Round the bite there is inflammation lasting for a few days. Fever follows, and in Europeans there is a rash of large ring-shaped patches of redness, generally on the chest and back, though occasionally patches may be seen on other parts of the body and face. After a few days the fever subsides, but it reappears at irregular intervals. The general health soon suffers, there is weakness and listlessness, anaemia, painless enlargement of glands, and there may be
headaches. After months, perhaps years, the characteristic symptoms of advanced sleeping sickness may appear, usually with a fatal termination.

Treatment.—Treatment, to be successful, must be begun at an early stage. If there is any suspicion of sleeping sickness, especially if the patient has been bitten by a tsetse fly, an examination of the blood should at once be made. Should it be found that trypanosomes are present in the blood, the patient should be sent home for treatment without loss of time.

Relapsing Fever.—This is an infectious fever which is caused by the presence in the blood of microorganisms called spirochaetes. These gain access to the body through the bite either of bugs, lice, or ticks, the latter being small oval insects with head, chest, and body in one mass, and four pairs of legs. The female of the tick is larger than the male, at times it may be half an inch in length, but is generally smaller than this. It attaches itself to the skin of a human being during the night, and sucks blood till gorged, then drops off. It is found in all parts of the tropics.

To avoid being infected with relapsing fever, native houses, which are sometimes infested by ticks and other insects, should be avoided at night-time. Neither native bedsteads nor the ground should be used as sleeping-places, and the close neighbourhood of a village should not be chosen as a camping-place.

The chief symptom is fever, lasting usually from five to seven days, and beginning suddenly with rigor
or chilliness and rising to 104 or 105 degrees or even higher. The pulse is quick, varying from 110 to 120 degrees. There may be giddiness, nose bleeding, or vomiting, with severe headache, and sometimes there is delirium. Occasionally there is a rash. At the end of the week or earlier, the temperature suddenly drops to normal with rapid recovery; but after an interval of from five to thirteen days, there is a similar but milder attack, which, however, does not last so long; in some cases this may be followed by repeated attacks. The danger of relapsing fever lies in the complications which may occur. These may affect the eyes, the nerves, the kidneys, the joints, etc.

_Treatment._—The patient should at once be put to bed and carefully nursed, and should be put in charge of a doctor as soon as possible for treatment. The most effective drug is given by injection, and can only be administered by an expert.

_Dengue._—This is an epidemic tropical fever which is occasioned by the bite of a mosquito.

There is an interval of from five to nine days after infection, before the patient becomes feverish and shows actual symptoms of dengue, though there may have been warning pains in a limb or in one of the small joints of a toe or finger. The attack begins suddenly with fever, headache, prostration, and severe rheumatic pains in the back. The eyes are often bloodshot and the face flushed. The temperature is 103 degrees or more and the pulse rises to about 120. After several days of misery, the temperature gradually
comes down, and a few days of comparative comfort are passed; but these are followed by another attack of fever lasting a few hours only and accompanied by a rash of dark red spots. These appear first on the hands, wrists, elbows, and knees, and then extend to the limbs and chest, after which they quickly fade.

* The attack resembles one of influenza in that it leaves a legacy of great weakness and depression. Rheumatic pains in the knee, shoulder, or one of the limbs almost always persist for some time. These pains are usually severe in the morning and grow less as the day goes on.

The treatment is rest in bed, and the avoidance of chill. The diet should be light during the fever, and the patient should be well fed during convalescence.

**Sandfly Fever.**—This is a fever of three or four days' duration which is epidemic in India. It is caused by the bite of an infected sandfly, which is a blood-sucking insect, grey or drab in colour, and so tiny that it easily passes through the meshes of mosquito netting. It is attracted by artificial light, and feeds chiefly in the evenings or during the night. The bites cause raised lumps, sometimes blisters, and are extremely irritating.

The symptoms appear from four to seven days after the bite, with fever, sometimes a rigor, headache, especially behind the eyes, and pains in the back and legs, with muscular stiffness. The eyes are bloodshot and the face flushed. The patient feels drowsy but
cannot sleep. On the second day the temperature may be 103 or 104 degrees, and remains high for about twenty-four hours, then it gradually falls, with sweating, diarrhoea, or nose bleeding. On the fourth day the temperature reaches normal and the patient is convalescent. There is extreme weakness, which often lasts for some weeks.

The treatment is bed, nursing, and light diet while there is fever.

Smallpox.—This is one of the most serious of the acute infectious diseases which are epidemic in the tropics. Its chief characteristic is an eruption, which is apt to leave permanent scarring. The infection is carried by people who have been in contact with others suffering from the disease, or by discharge from the patient, and is often picked up in public carriages, railway trains, etc. It attacks people of all ages, and is especially fatal to children.

The disease shows itself in nine days or a fortnight after exposure to infection, by a chill, or, in a child, by convulsions, with headache, backache, and vomiting. The temperature rises to 103 or 104 degrees during the first day and the pulse is quick. There is restlessness and there may be delirium. On the second day, in some of the cases, what is called a primary rash may appear on the lower part of the abdomen, sides, or inner portion of the thighs. This may be either a red flush like that of scarlet fever or it may resemble the rash of measles. About the fourth day the true rash of smallpox comes out, and as it
appears, the temperature falls and the patient becomes more comfortable. The eruption of raised red spots or papules is first seen on the forehead and wrists, and it quickly spreads over the body. The papules become blister-like, with a flat top; these blisters or vesicles inflame, fill with matter or pus, and become more globular. As this happens the temperature again rises, and the general symptoms return. The face swells, and the eyelids become puffy, so that the patient cannot open his eyes. Pustules may even form in the mouth and throat, rendering swallowing and talking difficult or impossible. On the tenth or eleventh day the fever disappears and convalescence begins. The pustules dry up and form scabs, which, when they fall off, may, or may not, leave scars. This is the course of an ordinary case of smallpox, but there are other more severe types such as the confluent and the hæmorrhagic or black, both of which are very fatal.

The disease may be followed by complications, chiefly affecting the throat or chest. In former times blindness was a frequent result, but with good and skilled nursing it is now not a common occurrence.

Treatment.—The nursing of smallpox is very trying and should, if by any means possible, be entrusted to a trained nurse, who will best know how to relieve the distressing symptoms and make the patient as comfortable as may be. If a nurse is not available the following hints may be of service.

Attention to the skin, with the constant application
of lint or clean boiled rag, soaked in an antiseptic solution, will give relief. When the scabs form, glycerine, vaseline, or oil should be applied so as to keep them moist. The patient will be sensitive to light, so that the room should be darkened, preferably with material of a red colour, red light being said to prevent scarring. Special attention should be paid to the eyes, which should be frequently bathed with weak boracic or salt solution (one teaspoonful to a pint of water). The patient and nurse should be absolutely isolated, and every precaution should be taken against spread of infection.

Fortunately we have, in periodical vaccination with calf lymph, a most valuable preventive of smallpox. All those going out to India and the tropics should be vaccinated before sailing; and during epidemics, revaccination is necessary. After exposure to infection, vaccination and isolation for sixteen days should be the rule. Speedy vaccination may prevent the disease, or at any rate modify its severity.

**Dysentery.**—*Acute dysentery.*—Dysentery is one of the common bowel diseases of India and the tropics. It is caused by infection from parasites, which, swallowed with liquid or solid food, attack and injure the delicate lining of the intestines.

The chief symptoms of dysentery are diarrhoea, with the passage of blood and mucus in the stool, and moderate fever. It is a most exhausting disease, for poisonous substances are manufactured by the germs which affect the body generally. As soon as symptoms
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appear the patient should be taken in hand without delay and receive prompt and effective treatment.

Treatment.—The germs which cause dysentery are of different kinds, and treatment which will cure dysentery caused by the one variety will have little or no effect on that caused by the other. As the symptoms of both are in most respects similar, microscopic examination of the stools is the only satisfactory method of ascertaining which infection is present, and consequently, the right treatment to adopt. For these reasons it is important to call in the doctor as early as possible. In the meantime the patient should be put to bed at once, kept warm, and put on a strict milk diet. No solid food of any kind should be given. A dose of castor oil may be taken as a preliminary until the doctor comes and orders appropriate treatment. If there should be delay in his coming, small doses of Epsom salts may be given. A teaspoonful of this may be dissolved in 2 tablespoonfuls of water, and 1 teaspoonful of the mixture given every two hours to a child of six, 1½ teaspoonfuls to a child of nine, and 2 teaspoonfuls to one of twelve. A grown-up person may take as much of the salts as will lie on an anna dissolved in half a wineglass of water at two hourly intervals.

Milk may be taken plain or with soda water, hot or cold, and a child of six should have at least 2 pints in twenty-four hours when on a strict milk diet. The feeds should be given every two hours.

As the infection is conveyed by flies, dust, water,
and any food which has been contaminated, it will be appreciated how very necessary it is to take every precaution to cover all food, to boil all drinking water, and to avoid raw vegetables, or fruit which is unripe, unsound, or may have by any possibility become infected.

In this, as in all infective bowel diseases, it is the duty of the nurse to see that all discharges or excreta are destroyed by burning or are made harmless by disinfectants before being removed. The addition of strong crude carbolic acid, or of creosol (2½ per cent.), to the contents of the utensil after use will effectually kill all germs contained in it.

**Chronic Dysentery.**—When the condition has been neglected and has become chronic, or if the patient is subject to recurring attacks of dysentery, very careful dieting and strict moderation in eating must be the rule. Beef, mutton, coarse vegetables, pickles, highly spiced or any food difficult of digestion should be avoided. Tender chicken, fish, eggs, well-cooked fruit and the more delicate vegetables, and all kinds of milk preparations may be eaten. Chills, damp, or cold baths may, by lowering the vitality, predispose to an attack. The abdomen should be kept warm, and in the hot weather the current of air from the punkah or electric fan should not be allowed to play directly over the body. A light flannel or woollen vest is a protective, or a thin Kashmir shawl may be used as a blanket. Dysentery in adults is sometimes followed by complications such as liver abscess, which
is a very serious condition; it is therefore very important that no steps should be omitted to ensure complete recovery from the illness.

**Sprue.**—Sprue is a disease of the bowels, which rarely attacks children. Older people who have lived in the tropics for a long period and have become weakened by attacks of dysentery or hill diarrhœa, or are worried or depressed, are liable to contract sprue.

The chief symptoms are early morning diarrhœa and sore mouth. The stools are very copious, greyish in colour, frothy and malodorous. The bowels are opened about three or four o'clock in the morning, and from that time till about eleven o'clock the motions are frequent. During the rest of the day there is a respite, though there may be a good deal of abdominal discomfort with flatulence and distension. Sores or ulcerated patches are scattered on the mouth, tongue, inside of the cheeks, and sometimes the palate. They are extremely sensitive, and render the taking of hot or acid food or liquid very painful.

**Treatment.**—This condition needs early and continuous treatment. Milk diet and complete rest are the great essentials. Often a sea voyage with entire change of surroundings is beneficial. A diet consisting mainly of strawberries has, in some cases, had very good results, but it is not often possible to obtain fresh strawberries during so long a period as is necessary for the cure.

**Enteric Fever and Paratyphoid.**—Though these diseases are by no means peculiar to the tropics they
are of frequent occurrence, and, as recognition of their presence at an early stage is important, a few words as to their symptoms may be of use.

Typhoid and all kinds of paratyphoid fever are caused by poison-producing germs or micro-organisms which, in addition to giving rise to general symptoms, attack the walls of the small intestine, the result being ulceration and sometimes perforation. The germs are conveyed to the intestines chiefly in food or liquid contaminated by flies or fingers which have touched the infective discharges of a patient. They are present in urine and faeces, and if these are spilled on the clothing, it too becomes infectious. The germs do not confine their activities to the intestines, but get into the general blood-stream, which carries them and their poisons all over the body. The disease is very infectious, and the nurse and those who come into close contact with the patient need to be exceedingly careful, both to avoid being infected themselves and to prevent the spread of infection. Children may acquire the disease; but young people and those in early middle age are most frequently attacked by it.

There are differences between the various kinds of typhoid infection, which can only be distinguished by skilled examination of the blood. The symptoms are in most respects similar.

The illness generally comes on gradually, but it may start suddenly with a rigor, or in a child, with convulsions. Headache is frequently an early symptom,
sometimes there is bleeding from the nose, usually the patient is out of sorts, with vague pains, loss of appetite, and a coated tongue. There may be diarrhoea, which is sometimes followed by constipation. The temperature is varied: during the first week it rises higher each day in very typical manner; during the second week it remains high, never coming down to normal; and in the third week of the illness it usually gradually comes down a little lower each day.

A distinguishing sign which is present in a large proportion of these cases from the sixth to the tenth day, is the appearance in crops of rose-red spots, chiefly on the abdomen, but sometimes on the arms and legs.

Enteric or typhoid fever is a long illness which requires the best medical attention and most careful nursing. During its course, serious and dangerous symptoms may arise, needing prompt and skilful treatment, and the patient’s life may depend on the possibility of obtaining this. If within reach of a hospital or nursing home there is no doubt of the wisdom of taking the patient there.

As soon as the existence of the disease is suspected the patient should be put to bed and kept lying down, and his diet strictly limited to milk. No solid of any kind should be given, fruit is specially harmful. The doctor should be sent for at once. No medicine should be given unless ordered.

Enteric fever is one of the diseases which may be spread by human carriers, so when the patient is
convalescent it is well to ascertain if he is quite free from infection.

As a preventive, inoculation with a triple typhoid vaccine is advisable. All young and middle-aged people, especially those who travel much, should be inoculated at intervals of two years. Those going out to the East for the first time should always be inoculated before leaving England.

Ankylostomiasis.—This is a disease which is prevalent in Eastern Bengal and some parts of Africa, so that there is always the possibility of its acquisition by Europeans living in those districts, though, up to the present, only a few cases have been reported.

It is caused by the presence in the intestines of a minute worm, which clings to the wall of the bowel and nourishes itself by sucking the blood of the patient, who consequently becomes very anaemic and weak, with perhaps an excessive appetite and either constipation or irregularity of the bowels.

The parasite lives in muddy water and moist soil during one period of its life. It may find its way into the human stomach and intestines through the drinking of impure water, from soiled hands, or even eaten with dirt by children who have acquired the habit. Wet clothing or shoes may convey the infection, which has been known to pass through the human skin.

Fortunately the disease may be cured by thymol, which must be administered under a doctor's direction.
Thread Worms.—Thread worms are minute, thread-like parasites, which get into the lower bowel, and by their presence in large numbers cause severe itching at the orifice, and consequent scratching. Sleep is disturbed, and there may be grinding of the teeth and restlessness. The infection may be acquired by eating raw vegetables contaminated with eggs of the worm, and it is kept up by scratching and fingerling the itching part.

The worms may be got rid of by an injection of salt water, or an infusion of quassia chips, made by pouring boiling water over them and cooling.

Round Worms.—Infection of the bowel with round worms is common in the tropics. Children and adults are liable to get infection from swallowing the eggs (which are not visible to the naked eye) in drinking water, or with fruit or uncooked vegetables. The egg develops in the intestine into a large round worm several inches long. The presence of such a worm may cause no definite symptoms, but usually there is indigestion, variable appetite, bad breath, disturbed sleep, and nervous irritability. Occasionally there may be nettle-rash. It is not very rare for a worm to be vomited or to appear from the nose. There may be only one worm present or they may exist in numbers.

Treatment.—The worm may usually be killed and expelled by santonin powders, which should be taken under direction of a doctor. Where the presence of the worm is suspected a dose of from half to one grain
of santonin combined with half a grain of calomel may be given to a child of three, one grain of each to a child of six, two grains of each to a child of twelve. The faeces may be examined under a microscope, and if ova or eggs are seen, it is certain that a worm is present in the intestines.

Tape Worms.—These are occasionally found in people dwelling in the tropics, but only when they have eaten pork or ham, as it is from the flesh of a pig that the infection is derived. Tape worms are immensely long and flat and the head is very small. The tape-like segments are brittle, and easily break off at the divisions.

The symptoms of tape worm infection are sickness, loss of appetite, anaemia, and irritability; the discovery of one or more segments in the stools is a sign of the presence of a worm.

The worm may be got rid of by giving male fern. The dose for an adult is one teaspoonful of the liquid extract of male fern. It should be taken fasting in the morning, the intestine having been cleared out previously by two days' preparation. To ensure a clear bowel, an aperient such as castor oil should be taken each evening for two days: the diet should be soft the first day, and only liquids should be taken the day before the male fern is given.

A dose of salts should be taken six hours after the male fern if the worm has not already appeared.

It is necessary to ascertain if the head has come away, for if this is left behind the segment attached
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to it will go on producing new segments until the worm has attained its previous size. In about three months this will have happened, and the same treatment must be repeated. If tape worm is suspected in a child, the doctor should have a specimen of the stool for examination; if a worm is present he will prescribe the necessary medicine and method of giving it.

- Guinea Worms.—The Guinea worm is common in India and Africa. The male is less than an inch in length, but the mature female may be a yard or more long though almost pin-like in diameter. It is a worm which, when it is extremely minute, may be swallowed in impure water. The female worm having gained entrance to the intestine burrows its way through the tissues and after some time finds its way to the surface. It may appear under the skin of the body or limbs, generally of the leg. Sometimes coils of the worm may be seen or felt under the skin, but more often the presence of the worm is indicated by a small blister. When this breaks, or is pricked, a milky fluid exudes, which, if examined, is seen to consist of hundreds of minute creatures, the offspring of the worm. Occasionally the head of the mature worm protrudes through the opening. The natives have a custom of winding the worm round a piece of stick, which is turned a little each day till the creature is withdrawn, but usually the worm breaks before the process is complete and is left in the body, causing irritation and inflammation.

Treatment.—The most satisfactory treatment is to
keep the part continually moist by means of a wet compress. If this is constantly wetted, in two or three weeks the worm will come out of its own accord, or it may be absorbed. It is wise, however, to receive treatment by a doctor who is accustomed to dealing with such cases.
CHAPTER XVI

OTHER INFECTIONOUS DISEASES

Influenza.—Influenza is one of those epidemic diseases, against the spread of which no precautions seem to be effective. It occurs in all parts of the world and at all seasons of the year.

The symptoms of influenza are extremely variable, though the respiratory system is most commonly affected, with catarrh of the nose and throat, bronchitis, and a tendency to the development of pneumonia. In some epidemics the nervous, and in others the digestive, system is most often attacked, or fever may be the most prominent symptom. In the gastric type, there is vomiting, which is commonly accompanied by abdominal pain and diarrhoea. In the nervous type, there is severe headache, and pain in the back and limbs. In all varieties, there is fever, which may be attended with delirium; and intense depression follows the attack.

Influenza is of importance from the fact that it often produces a great weakening of the body's defences, so that other infections are liable to gain hold and spread with rapidity. Complications affecting the lungs, heart, kidneys, etc., not infrequently accompany
influenza, and in children the ears are apt to suffer. Many chronic illnesses date from an influenzal attack.

_Treatment._—The patient should be isolated, put to bed at once, and kept there till the temperature is normal and all symptoms have disappeared. While in bed the diet should be light and nourishing, and during convalescence both generous and appetizing. The depression should be counteracted by cheerful surroundings and, if possible, a change of air.

_Diphtheria._—This usually comes on suddenly with vomiting, pains in the back and limbs, moderate temperature, and a rapid and weak pulse. The breathing is harsh, and there may be slight cough. Swallowing is painful, the breath is offensive; and the glands of the neck may be enlarged. If diphtheria is known to exist in the locality, such symptoms will at once excite suspicion of the nature of the illness, which is made certain when a greyish membrane is seen covering the back of the throat and tonsils, or in some cases, the inside of the nose. The early stages of diphtheria resemble a bad sore throat or an attack of tonsilitis—only a microscopic examination of the exudate from the throat and discovery of the germs of diphtheria can give an immediate diagnosis. Any doubtful case should, if possible, be verified by this means. Prompt treatment by the injection of diphtheria anti-toxin is necessary.

The great danger in diphtheria is that the throat may be so filled by the membrane, that breathing is rendered difficult or impossible. It may be necessary
to keep the passage open by placing a tube in the larynx, or by making an opening in the trachea below the obstruction and keeping the passage clear by means of a tube, in order that air may reach the lungs. Other dangers are those of heart weakness and paralysis.

_Treatment._—The patient should be kept absolutely at rest, not being allowed to sit up or move for any purpose, and all sudden movements should be prevented.

_Diphtheria_ is an illness that demands constant attention on the part of doctor and nurse, and every endeavour should be made to get skilled treatment and nursing for the patient. Germs may be coughed up or spat out with the discharge, therefore much care in the avoidance of infection is necessary. In the absence of a doctor the directions given in membranous laryngitis may be followed.

_Scarlet Fever._—This begins with high fever, rapid pulse, sore throat, and vomiting. In young children a convulsion may be the first symptom. The throat is inflamed and, if examined, is seen to be of a dark red colour. The rash comes on in twenty-four hours or more. It consists of a dark red flush, first affecting the neck and chest, and then spreading all over the body and face, except for a white area round the mouth. On looking closely into the rash, it is seen to be composed of bright red spots placed closely together. The tongue is coated and white, and as points of red can be seen through the coating, it is said to be a "strawberry tongue." In two days to a week, the rash disappears, and the flaking or peeling stage begins.
This latter stage is of uncertain duration, and until it is over, the patient is infectious and should be kept isolated. Scarlet fever needs careful nursing; and a watch should be kept on the child's health during convalescence and for some time after, as complications affecting the kidneys, heart, eyes, and ears may arise.

_Treatment._—The main points in nursing are the avoidance of chills and attention to the throat, which should be frequently gargled. A simple gargle, such as alum or salt and water (one teaspoonful to the pint), may be used, if no doctor is in attendance. The diet should be liquid till the fever has disappeared and the throat is free from pain.

_Measles._—Measles usually comes on gradually, with a cold in the head, watering of the eyes, cough, sneezing, and discharge from the nose. The rash, which consists of small red spots, appears first on the forehead near the hair, and behind the ears, then spreads to face, neck, and body. There is but little fever, the child suffers from discomfort at first, but only exceptionally is he really ill. The danger of measles, like that of other common contagious illnesses affecting children, is that of complications. Bronchitis and pneumonia are apt to follow. During convalescence, the child's throat and ears should be examined, as enlarged tonsils, adenoids, and ear trouble may date from measles.

Infection is greatest during the stage of "cold" before the appearance of the rash.

The treatment is bed and isolation, plenty of fresh air, and the avoidance of chill.
German Measles.—This is in no way related to ordinary measles. As a rule there are no symptoms, though in some cases the glands of the neck may be enlarged. The rash of red spots is widely spread over the body and fades quickly. The child should be kept in bed for a day or two, till it is certain that the rash is not that of any more serious condition.

• Whooping Cough.—This begins as an ordinary cough, and it may be days or weeks before its nature is detected. The cough is in paroxysms, which gradually become more severe, till at length the characteristic whoop or deep inspiration is heard. Vomiting often accompanies the fits of coughing. Whooping cough is very infectious, so isolation from other children is necessary. It is wise to put the child in the care of a doctor, for complications due to the strain of coughing may appear, and chest and other symptoms sometimes develop. General attention to the health and plenty of fresh air are necessary. Sometimes a change may cut short an attack, but the condition may last for months.

Chicken-pox.—This is not a serious illness. The child rarely has any symptoms and there is very little fever. It is of importance, however, because, in the early stage, it is sometimes difficult to distinguish between its characteristic eruption of tiny vesicles or blisters and those of smallpox.

Mumps.—Mumps is an infectious disease in which there is inflammation of the large gland which is situated under the jaw in front of the ear. The first symptom is stiffness and tenderness of the neck, and
this is accompanied by a slight rise of temperature. The neck then begins to swell, and there is a good deal of pain, with difficulty in opening the mouth and swallowing. Both sides may be affected at once, or the symptoms may appear first on one side and after a few days extend to the other.

Treatment.—While the glands are swollen and painful the patient should remain in bed. The food should be liquid and bland, no acid or very sweet things should be allowed. Applications of dry heat will relieve the pain and, at a later stage, gentle friction with sweet oil will help to disperse the swelling. All cases of mumps should be kept isolated for at least a week after all swelling has disappeared.

Length of Time of Isolation

Diphtheria.—Ten days after the throat is well if the case is very mild; when the illness has been severe, and indeed if possible always after any attack, a microscopic examination of the throat exudate should be made, to ascertain if it is free from diphtheritic germs. Until this is the case infection is present.

Scarlet Fever.—Until all peeling has ceased.

Measles.—Two weeks after the rash has disappeared.

German Measles.—A week after the eruption has faded.

Whooping Cough.—Until the whoop has disappeared.

Chicken-pox.—Until all the scabs have fallen off.

Mumps.—Three weeks (one week after subsidence of swelling).
Time after Exposure to Infection, in which first symptoms may appear

*Diphtheria.*—Variable—one day to two weeks.

*Scarlet Fever.*—Three to five days, not often longer than one week.

*Measles.*—Nine to fourteen days.

*German Measles.*—Ten to sixteen days.

*Whooping Cough.*—One to two weeks.

*Chicken-pox.*—Fourteen to sixteen days.

*Mumps.*—Ten to twenty-two days.
CHAPTER XVII

SKIN TROUBLES

Urticaria.—Urticaria, or Nettle Rash, is generally due to the presence of some irritating substance in the stomach or intestines, such as fish, stale meat, strawberries or other indigestible food, or worms; it may be also caused by the bite of an insect. It not infrequently comes out during teething.

It appears as raised blotches or wheals, first red, then white, in the centre surrounded by a red flush. There is burning and itching. Both rash and symptoms usually disappear within a few hours. An aperient, such as Epsom salts or a small dose of calomel, may be given. A soothing application such as calamine or lead lotion will allay the itching.

Eczema.—This is a common skin disease, difficult to cure and apt to recur. It is caused by irritation, generally local, such as that of wet napkins, rough clothing or cold winds, or by digestive disturbances due to bad feeding or over-feeding. When the skin is broken various infective germs may be conveyed to it by the fingers, thus aggravating the condition. Eczema may appear on the face, behind the ears, on the hands and limbs, and between folds of skin. It
begins with a reddened and burning skin, on which are raised spots which become filled with fluid and burst. Fluid also oozes from the inflamed skin, and where the amount exuded is large the condition is known as "weeping eczema." In other cases the surface may be dry and covered with crusts. There is a good deal of irritation and consequent scratching.

Eczema is often accompanied by indigestion, and may also be associated with asthmatic attacks.

People suffering from eczema should receive medical treatment. The general health should be attended to, and the food should be plain and digestible. The parts affected should be kept clean and dry, very little water and no soap should be used. A simple ointment, such as lanoline, spread on lint, may be applied until the doctor prescribes the appropriate remedy.

**Ringworm.**—This is a disease of the skin caused by a fungus, and it may affect either the head or body. It appears in ring-shaped brownish scaly patches. The infection spreads from the centre, and as it spreads attacks the hairs of scalp or skin. These become brittle and fall out, so that ringworm affecting the scalp results in patches of baldness.

Ringworm is very infectious, so all hair brushes, towels, clothes, etc., must be disinfected and every precaution taken to prevent other children acquiring the disease. The hair should be closely cut or shaved off over an area half an inch outside the patch. The head should be washed with carbolic soap, and tincture of iodine painted over the patch daily for three days,
then repeated after a few days' interval. Another treatment is to apply chrysarobin ointment, spread on a piece of lint cut to the required size. This should not be continued after signs of irritation appear.

**Boils.**—Boils are not uncommon in those who are run down. They occur usually in or after the rains, more especially in districts where there is moist heat. They may be single or very numerous, and often appear in crops—infection being readily spread from one part of the body to another by the discharge.

The best treatment is the application of tincture of iodine. The boil should not be poulticed, but if it is coming to a head and appears likely to burst, the old-fashioned soap plaster is an effective application. A tiny hole, the size of the head of the boil, should be made in a small piece of thick brown paper or wash leather, which is spread with soap made into a thick jelly by the addition of hot water. This application will help matters and prevent the surrounding skin being touched by the discharge, which is extremely infectious. When the boil has burst the part should be cleansed with an antiseptic lotion, dried, covered with boracic powder, and a dry dressing applied. The discharge should not be touched with the fingers.

Boils occurring on the head or under the arms are likely to be troublesome, and generally need opening. They should be treated by the doctor. In all cases the general health should be attended to, and often a change of air is one of the best helps to recovery.

**Delhi Boils. Oriental or Tropical Sore.**—A tropical
sore is a serious and not uncommon parasitic infection of the skin, which begins as a small, innocent-looking, itching, raised, red spot. After some time it becomes scaly, then encrusted, and finally breaks down into a chronic sore or spreading ulcer which takes a very long time—months or even years—to heal. It is difficult to cure, and when healed leaves a depressed scar. These sores may be single or multiple; they may attack face, limbs, and occasionally the body. They are generally about the size of a penny, but may be larger. The infection is probably conveyed through the bite of an insect, and the sore may take months to develop.

The treatment should be in the hands of an expert doctor; ordinary ointments and applications have no good effect.

**Dhobi Itch.**—In the tropics, irritating diseases of the skin are very prevalent, and there are many varieties of infection causing them. The name "dhobi itch" is applied to a very irritating rash which affects those parts of the body in which there is a good deal of moisture such as the armpits, the groins, and between the legs and toes. It is possible that the infection, which in many cases is due to a ringworm-like fungus, may sometimes be derived from clothes infected during the process of washing—hence the name. The area of skin affected first shows raised red rings which are very irritating. Later they unite and become scaly and brownish in colour; or the scratching may cause the skin to become raw and red, and, if other
infections are carried in the finger nails, may result in boils and abscesses.

The parts should be well washed with carbolic soap and water, and, in the first stage, a soothing application such as lead or calamine lotion, or hazeline cream applied. When the patches are scaly and dry resorcin ointment may be used. As a preventive the clothes should be frequently changed and the body kept as clean and dry as possible. An anti-septic dusting powder may be used after bathing.

**Scabies or Itch.**—This is an intensely irritating and contagious disease caused by a small insect which burrows and lays its eggs under the skin, especially between the fingers and toes. The scratching which takes place not only causes local spread of the infection, but the abraded skin enables the germs of other skin diseases to enter and flourish. Scabies is very infectious, and is spread by means of brushes, towels, bed linen, and clothes.

The treatment is a hot bath with carbolic soap. Sulphur ointment should then be smeared over the affected parts. All clothes and bed linen should be kept separate and should be disinfected, preferably by baking.

**Pediculosis.**—Pediculosis is an affection of the scalp or body by pediculi or lice. It is not uncommon for children, especially those who are weakly or have long hair, to contract the infection from servants. The bite causes great irritation and consequent scratching; so that the head may become very sore. The insects
are easily got rid of by rubbing white precipitate ointment into the scalp. The difficulty is that the nits or eggs are attached to the hairs by a sticky material, and are not removed by washing, so, after a few days, a fresh crop of pediculi will hatch out. Dilute vinegar and water will help to dissolve them off, and may be used if the head is not too sore. Persistent use of the ointment will result in a clearance, or the process may be hastened by washing the head with liquid paraffin, but, if this is done, every precaution must be taken against accident by fire.
CHAPTER XVIII

BITES, STINGS, ETC.

Snakes and their Bites.—There are hundreds of varieties of snakes in the tropics. Some kinds are very deadly, their bites usually being fatal; others are less poisonous; and the remainder, greatly in the majority, are harmless.

The snake is regarded with veneration by the Hindus, who look upon it as a sacred animal; and they seek to propitiate it by placing offerings of milk and other food near the approach to their haunts, which are often in the crevices of old walls, in piles of wood, or in rocks or holes in the ground.

The appearance of the snake needs no description. The long, sinuous, scaly body, the absence of legs, the flat head with lidless eyes, forked tongue, and numerous teeth, are all well known.

The distinctions between different varieties of snakes and between harmless and venomous species are not easy to recognize, only an expert can always identify them with certainty. Such differences as the shape of the head and its bones, the teeth, and the arrangement of the scales, have to be taken into consideration. There is great variation in size, marking, and colour.
Poisonous Snakes.—The front teeth or poison fangs of venomous snakes are characteristic. These teeth are grooved to form a channel, within which is a duct. This duct is connected with the poison-secreting gland, which is situated under the jaw. When the snake strikes its victim the venom is ejected down the ducts into the wound made in the skin by the sharp fangs.

Every bite received from a venomous snake is not necessarily fatal, though the mark of the fangs may be visible on the skin. It is possible that, at the time of striking, the gland may have been exhausted of poison, or the quantity of poison which enters the wound small. About 30 per cent. of the cases of bite from a venomous snake are fatal.

Poisonous snakes of the tropics are of two families:—the Colubridae, to which the cobra, the King cobra, and the kraits of South Eastern Asia, and the coral snake of the West Indies and British Guiana belong; and the Viperidae, the best-known member of which is the deadly Russell’s viper.

The hooded cobras are large and brilliantly coloured, the King cobra is distinguished by its head markings, which resemble a pair of spectacles. Cobras and kraits have a round tail, and kraits have a row of large scales down the middle of the back.

Vipers have a diamond-shaped head, narrow neck, and short stumpy tail.

The symptoms of snake-bite vary with the variety of snake from which the bite has been received.

Cobra and krait venoms cause the following
symptoms: there is pain and some swelling in the region of the bite; and for a time little else may be evident, but gradually the severe symptoms come on, and in about an hour the victim has become weak and unable to stand. He is apathetic or semi-conscious. The pupil of the eye is contracted; saliva drops from the mouth and vomiting occurs; then the tongue and throat become paralysed, breathing becomes difficult and finally ceases. In less severe cases, the breathing gradually improves and recovery may take place quickly.

A bite from one of the viper family is very dangerous, and the symptoms come on with extreme rapidity. There is great pain in the wound, and in a few seconds or minutes very extensive swelling around it. Blood-stained discharge oozes from the puncture, and bruise-like red patches appear in its vicinity. The patient becomes cold and collapsed, with weak thready pulse, and is usually unconscious. The pupils are dilated. There is no paralysis. If the patient does not die at once, there is still danger of death from bleeding, owing to the great destruction of tissue in the region of the wound and consequent loss of blood, both from it and other parts of the body. Within a few minutes the poison is carried to all regions, and the result is bleeding from the mouth, stomach, intestine, etc.

Treatment.—The objects of treatment are to prevent absorption of the poison and to counteract it as far as possible. To be of any use action must be taken immediately.
A ligature, preferably an india-rubber band or tube, or anything available, such as a stocking, should be tied tightly round the limb about three inches above the wound. A strong solution of potassium permanganate should be used to wash the wound, and crystals should be rubbed into it. Incisions through the skin may be made near the wound and along the limb, to encourage bleeding. If serum is at hand an injection should be given immediately, otherwise some should be obtained without delay. Alcohol is of little use, but strong coffee or sal volatile may be given at intervals of fifteen minutes. The patient should be kept warm and quiet. Sucking the wound is not of any advantage, but if done the mouth should be well rinsed with permanganate solution, in case any broken skin exists through which the poison could be absorbed.

People should never go out of doors after dark without a light, and should always have a lamp or candle at the bedside which can be lighted before getting up when it is dark.

**Dog Bites.**—In the tropics it is very necessary to protect children from the danger of receiving a dog bite. Rabies or hydrophobia is exceedingly prevalent, and it is difficult to prevent a house dog from fighting or making friends with an outsider. In every Indian station there are packs of jackals, pariah dogs, etc., who haunt its precincts; these often become infected with rabies, and it is not at all uncommon for other dogs to be bitten and infected. Children should not be allowed to make friends with strange dogs, and if
a house dog has received a bite of any kind it must be regarded with suspicion and kept away from the children; and should the bite have been given by a dog known to be affected with rabies, complete isolation for six weeks should be the rule. The symptoms of rabies in a dog may not appear till from three to five weeks after the bite has been received.

_Treatment._—All bites from dogs, whether mad or not, must be treated seriously, and if a dog shows any symptoms of rabies, all those who have been licked by the dog, as well as those who have been bitten, should receive prompt treatment. The saliva of a dog affected with rabies is full of poison which may enter the skin through the smallest abrasion.

The symptoms of rabies in a dog may be of two types—rabies with frenzy and dumb rabies.

_Rabies with Frenzy._—In this type the dog first appears depressed, then becomes snappish and irritable, hides away in corners, eats dirt, etc. This stage lasts about three days, and is a most dangerous period as the cause of the condition is generally unrecognized. The next stage is that of frenzy or madness, when the dog runs amok, biting all who come in contact with him. This is succeeded by paralysis, then death.

_Dumb Rabies._—Dumb rabies is of shorter duration, there is similar dulness and irritability, but there is no frenzy, and the dog soon becomes paralysed and dies.

If the cause of death of a dog is uncertain, and rabies is suspected, examination of the brain will show its presence or absence.
Treatment.—The treatment of a bite from a dog infected with rabies should be prompt. A bandage should at once be fastened tightly round the limb two or three inches above the wound, to which strong carbolic acid or a caustic, such as a hot iron, should be applied. The victims, without exception, should be sent to one of the various Pasteur Institutes which are established in various parts of India for inoculation; this is the only effective treatment, and is successful if the disease has not had too long a start.

Bites received from dogs in which there is no suspicion of rabies, should be well washed and swabbed out with strong carbolic.

Tetanus.—Tetanus is not uncommon in the tropics, and as the germ flourishes in earth and dirt, wounds and abrasions which are soiled and dirty are liable to be an occasion of infection. The germs are more likely to exist in punctured or closed wounds, such as those made by rusty nails, or sharp and dirty instruments.

The symptoms of tetanus may appear in a few hours or days, but usually two or three weeks elapse before they are evident. Tetanus begins with stiffness and cramp-like pains in the muscles of the neck and jaws. The mouth becomes tightly closed so that the taking of food is difficult and finally becomes impossible. The pain and cramp come on in spasms; any sudden movement, sound, or even draught of cold air, may cause a spasm. The breathing becomes hampered, and death may take place in twenty-four hours or may be deferred for four
or five days. Some cases are less severe and may recover.

_Treatment_—The treatment is absolute rest in a quiet and darkened room. Injections of anti-toxin must be given; the doctor, who should be summoned at once, will probably prescribe drugs which will be of help in making the symptoms less distressing.

After any injury, however small, which has been contaminated with earth, it is well to show the wound to the doctor, who will give an injection of anti-tetanus serum as a preventive if there is possibility of infection by the tetanus germ.

_Small Injuries._—All abrasions, cuts, wounds, and scratches, whether accidental or inflicted by the fingers, should be washed with clean water and swabbed with tincture of iodine, some of which should always be at hand. This is of importance, especially in the case of children who are so apt to incur small injuries, through which germs may gain entrance.

_Bites and Stings of Insects._—Irritating bites and stings should be treated by an application of weak ammonia, or, if severe and inflamed, a piece of lint soaked in lead lotion may be applied and constantly kept moist till the irritation subsides. Mosquito bites are intensely irritating to some people, and the consequent scratching may give rise to infection by other germs which cause great swelling and pain.

_Scorpion Stings._—Scorpions are small crab-like creatures about three inches long. Their sting is situated at the end of the tail which, when the sting
is given, curves forwards over the back. The wound is acutely painful, and though not dangerous, may be very upsetting to a delicate child. The best treatment is to apply a bandage or ligature above the affected part if it is on a limb, and to well wash the wound with a strong solution of potassium permanganate.

Centipedes.—These many-legged animals are not all poisonous, but the bite of the poisonous variety gives extreme pain. The centipede has a way of clinging so that it is sometimes detached with difficulty, and a bitten child is apt to become panic-stricken. There is generally inflammation round the bite, accompanied by giddiness and vomiting and a general feeling of malaise. Application of strong ammonia will relieve the pain, or lead and opium lotion may be used in the form of a compress.

Spider Bite.—Spiders seldom bite man and only a few varieties are poisonous. Occasionally one sees what is called a “spider lick,” a series of blebs which appear in the neck or uncovered portion of the body and are said to be produced by a spider. A soothing lotion or ointment may be applied.

Jigger or Chigger or Sand-Flea.—This flea is found in tropical America, the West Indies, and Africa. It resembles the ordinary flea, but the female sand-flea has a way of burrowing into the skin of an animal or man and laying her eggs there. This causes a good deal of irritation and inflammation round the spot, with subsequent ulceration. When the eggs are mature they are expelled and the flea leaves. The
sore if not treated may become infected by microorganisms, and abscess, or even blood-poisoning or tetanus, may result.

Those whose feet are not protected by shoes suffer most, as the insect is commonly found in the dust and dirt of the ground. Though the feet are usually affected any part of the body may be attacked.

_Treatment._—The insect may be extracted with a clean needle before the mischief is done, or turpentine may be applied to destroy the flea in situ. The part should then be painted with tincture of iodine, and a dressing of sulphur ointment on lint applied. The sore should be protected till healing has taken place.

_Leeches._—Leeches are to be found in marshy grass and jungle, in all parts of the tropics. When walking through the grass in regions where they are prevalent, it is advisable to wear high boots or gaiters to guard against leeches attaching themselves to the legs. The danger arises from the loss of blood, which in some cases may be great, and, further, the punctures made in the skin do not always heal very readily and are apt to become septic or poisoned. The bites are not painful, and the first intimation may be the blood trickling down the legs. The wound should be cleansed and a compress tightly bound round the leg. Tincture of iodine may be applied to the wound, which should be kept covered till it is healed.
CHAPTER XIX

THE HEALTH OF THE MOTHER

The maintenance of good health in the tropics depends not only on climate and home surroundings, but also on the manner of life of the individual and the precautions taken to avoid infection.

* A mother naturally is subject to the dangers and difficulties incidental to child-bearing and child-rearing; she, like others, is liable to contract fevers and infective illnesses; further, the disastrous effect of a prolonged residence in a tropical climate is only too often seen by her neurasthenic condition.

**Nerves.**—The nervous system of the colonist, who lives a free and healthy life in the mild climate of the higher altitudes of the tropics, suffers less than that of the dweller in the plains of India or in the low-lying miasmic districts of the colonies. It is not to be disputed, however, that altitude, even with a low temperature, may in some cases have a distinctly trying effect on the nerves, and that the direct rays of a tropical sun are always dangerous to those who brave it with unprotected heads.

The colonist, like the woman who lives in an isolated
Indian station where there is little or no European society, may feel the lack of companionship most acutely, and in the case of a childless woman loneliness is accentuated. Monotony in life and surroundings has a most depressing effect on health and spirits, and the advent of a child has often been the salvation of a neurasthenic wife. Husband and wife, dependent on one another for society, may attain a state of perfect understanding, and the relations between them may be most harmonious; on the other hand, the clash of temperament, when tastes are dissimilar and not supplementary, may lead to domestic unhappiness, which is intensified in the absence of the unifying influence of a family.

Constant and congenial occupation, daily outdoor exercise such as walking or riding, a keen interest in the home and in her husband’s pursuits, and the possession of a hobby, are great safeguards for a woman. Change of scene and people at the opportune moment will often prevent a serious breakdown. When trifles become magnified to huge proportions; when thoughtless words, inconsiderate actions, or slight negligences appear to be of great import; or if sudden irrepressible outbursts of rage horrify the usually serene individual, and a black cloud of pessimism blots out the sunshine of hope—it is high time to have a change.

Even though the effort may seem too great, as it often does when nerves are jarred or over-strained, frequent visits should be paid to neighbouring settlers, or an occasional trip should be taken to one of the
large stations or cities. Interchange of hospitality is one of the essentials of life in a colony, and must not be neglected.

In official circles, and stations in which there is an European colony of any size, there is usually a very full social life. Official functions, dancing, riding, outdoor games and shopping occupy the time very pleasantly. The nerve strain caused by climate is, in the cities, augmented by an excess rather than a lack of social distractions.

Malaria.—An undetected malaria infection may be the source of chronic ill-health. Mosquitoes, unfortunately, are almost ubiquitous in the tropics, and few people escape malaria. An acute attack cannot be overlooked, but a slight one may pass unnoticed, and the infection being untreated may remain latent. A wise woman for her own sake, as well as that of others, never relaxes her vigilance, and constantly wages war against mosquitoes and other germ-carrying insects. She makes sure that house and compound provide no breeding-places for them. She sees that all, including herself, sleep under adequate mosquito nets; and when out of doors in malarious regions she does not neglect the wearing of a mosquito veil, and even wears high boots or gaiters to protect her legs from bites. She takes quinine regularly as a preventive of malaria. Realizing that the comfort of husband and family depend on her good health, she neglects no precautions, even at the risk of appearing faddy, to keep herself in good condition and free from
avoidable illness. In doing this she shows foresight and good sense as well as true devotion to her family.

Dysentery.—An attack of dysentery or other affection of the bowels should receive prompt attention; any such condition should never be allowed to become chronic.

Discharges, etc.—As a rule the woman who leads a healthy life in the tropics is not any more subject to abnormal or excessive periodical discharges than is her sister at home. Medical advice should be obtained at once if unsatisfactory symptoms connected with these should make their appearance. If any swelling or lump in breast or abdomen is detected, or if there is pain in any organ, attention at an early stage may relieve anxiety or avert much future suffering.

Furlough.—Advantage should be taken of every opportunity of going home or of visiting a place of which the climate is invigorating. It is only the very small minority who are able to afford the expenditure of time and money involved by an annual visit home during the hot season; but no woman living in the plains should on any account dispense with a yearly visit to a bracing hill station. A colonist, unlike officials or those in government employment, may not leave his work at regular intervals; but an occasional holiday in a bracing climate is desirable for one and all who live in the tropics, and for women, it is essential.
THE HEALTH OF THE MOTHER

When the health of a woman flags, or when she is suffering from any chronic disease, a complete change of climate and surroundings is often the only means by which a cure may be affected, and this should not be deferred till too late.
CHAPTER XX

THE MEDICINE CUPBOARD

A large supply of medicines is not necessary; they are apt to deteriorate with keeping, especially in a hot climate. Small quantities only should be bought, and the stock periodically replenished.

All poisons and lotions for external use should be put in plainly labelled coloured glass bottles. They should be kept separate from the ordinary medicines, in a locked compartment. The medicine cupboard itself should be locked and the key kept in a safe place.

Contents of the Cupboard

Books.

First Aid to the Injured \ Tropical editions. St.
Home Nursing \ John Ambulance.
A Book on the Care of the Baby.

Dressings.

A packet of Iodoform Gauze.
6 First Aid Dressings.
1 packet of Lint.
3 packets of Sterilized Cotton Wool.
1 dozen Bandages (different sizes).
A pair of Scissors with blunt points.
Two Thermometers (it is well to keep one in reserve in case of breakage).

Medicine Glasses: 3-oz., 1-oz., and minim.
THE MEDICINE CUPBOARD

An enamelled graduated Pint Measure.
A glass Syringe, to hold three or four ounces.
A Lauder Brunton Lancet (in case) for snake-bite.
An Enema Syringe.
Two Bedpans (small for children and full size for adults).

Drugs.—
Boracic Acid, ½ lb.
Bicarbonate of Soda, ½ lb.
Quinine Hydrochloride, 2 ozs.
Quinine Hydrochloride Tabloids (1 grain, 2 grains, 5 grains) in bottles containing 100 tabloids.
Permanganate of Potash Crystals, ¼ lb.
Permanganate of Potash Tabloids (1 grain), one bottle of 100.
Epsom Salts (Sulphate of Magnesia), ¾ lb.
Alum, ¼ lb.
Linseed, 1 lb.
Liquorice Root, ½ lb.

Medicines.—
Castor Oil, ½ pint.
Milk of Magnesia.
Syrup of Figs.
Sal Volatile, 4 ozs.
Parrish’s Chemical Food.
Ipecacuanha Wine, 1 oz.
Grey Powders (1 grain), one dozen.

For External Application.—
Tincture of Iodine.
Lanoline.
Vaseline.
Sulphur Ointment.
Boracic Ointment.
Camphorated Oil.
Sweet Oil.
Calamine Lotion (soothing application), ½ pint.
Lead Lotion (for sprains and swellings), ½ pint.
Boracic Lotion. (Dissolve one teaspoonful of boracic acid in a little hot water and fill up to half a pint.)

Alum Gargle. (Dissolve one teaspoonful of powdered alum in a pint of hot water. Use cold.)

Salt Solution. (Dissolve one teaspoonful of common salt in one pint of hot water. Cool.)

Strong Solution of Permanganate. (Put some crystals of Potassium Permanganate in a 4-oz. bottle. Add water. Shake till dissolved; keep on adding more crystals till the water will take up no more.)

Lysol or Izal, one bottle. These antiseptics should be diluted according to the directions on the bottle, when required.

A Soothing Cough Mixture. (Linseed, one tablespoonful. Liquorice root, a small piece. Juice of one lime. Sugar, two teaspoonfuls. Pour half a pint of boiling water over these ingredients and let stand till cool.)