The ship captain's medical guide, 1946 / Ministry of War Transport.

MINISTRY OF WAR TRANSPORT

THE SHIP CAPTAIN'S MEDICAL GUIDE

1946

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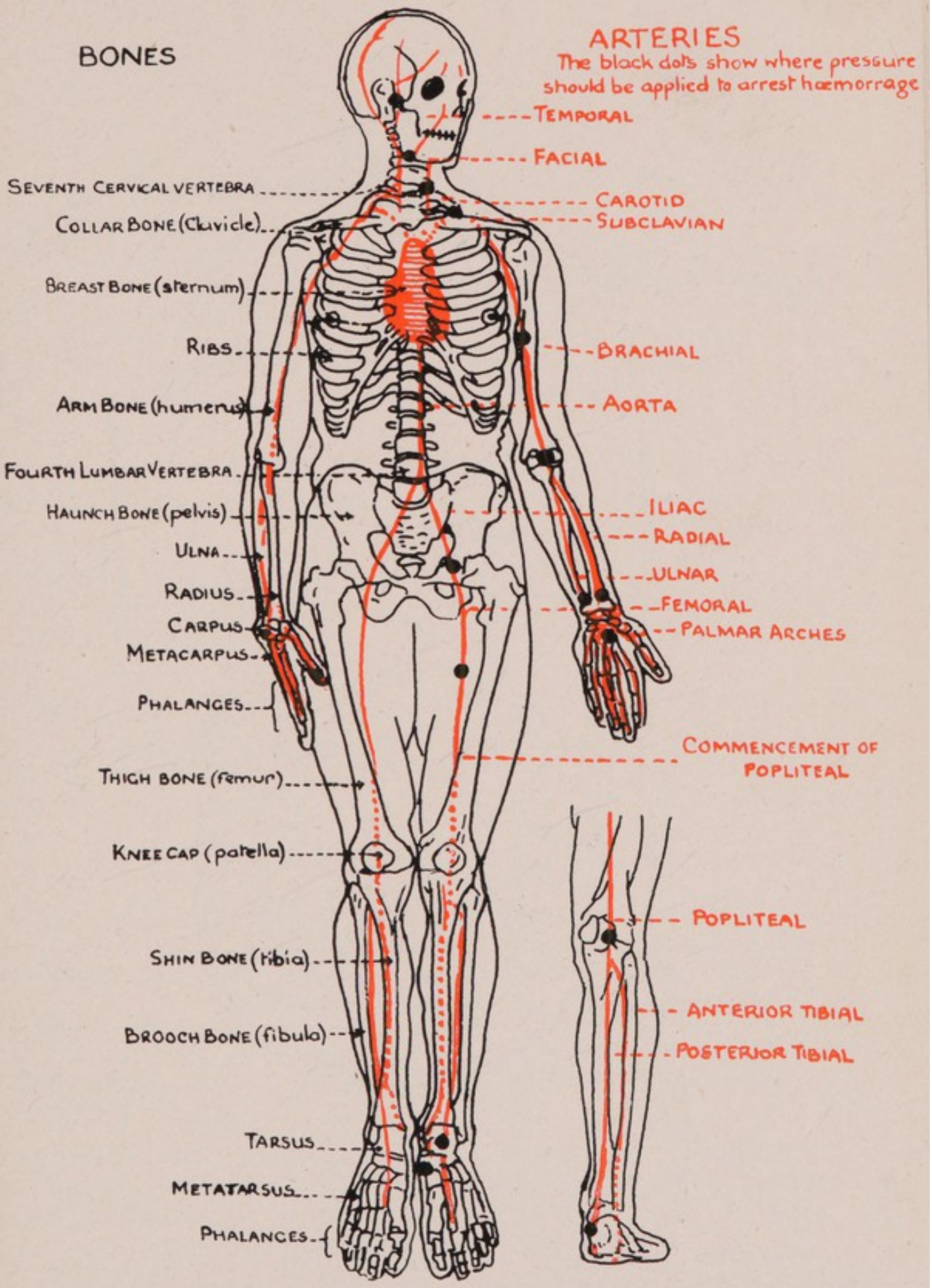

BONES
ARTERIES
The black dots show where pressure should be applied to arrest hæmorrage
TEMPORAL
FACIAL
SEVENTH CERVICAL VERTEBRA
CAROTID
COLLAR BONE (Clavicle)
SUBCLAVIAN
BREAST BONE (sternum)
RIBS
BRACHIAL
ARM BONE (humerus)
AORTA
FOURTH LUMBAR VERTEBRA
HAUNCH BONE (pelvis)
ILIAC
RADIAL
ULNA
ULNAR
RADIUS
FEMORAL
CARPUS
PALMAR ARCHES
METACARPUS
PHALANGES
COMMENCEMENT OF POPLITEAL
THIGH BONE (femur)
KNEE CAP (patella)
POPLITEAL
SHIN BONE (tibia)
ANTERIOR TIBIAL
BROOCH BONE (fibula)
POSTERIOR TIBIAL
TARSUS
METATARSUS
PHALANGES

FIG. 1

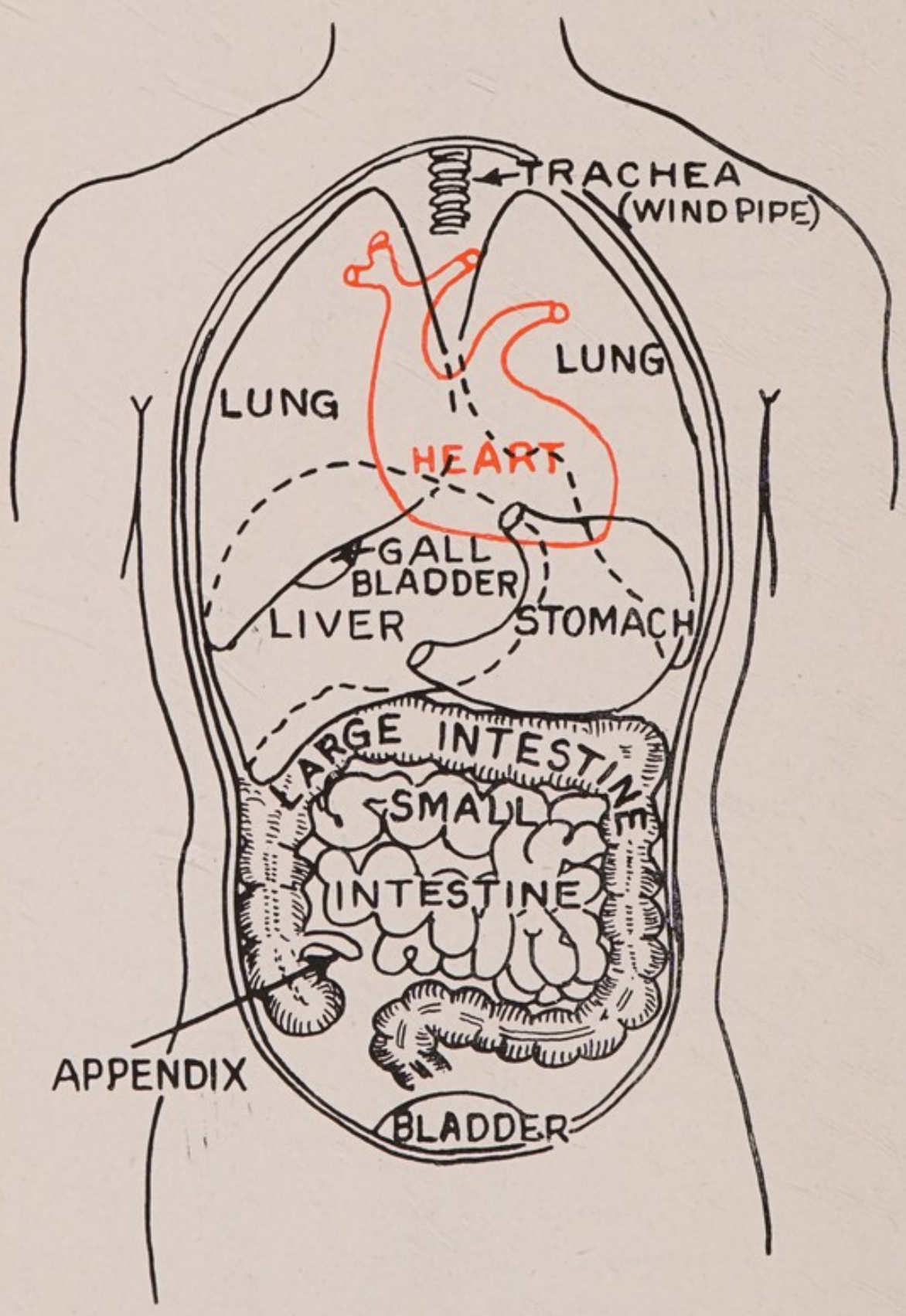

TRACHEA
(WIND PIPE)
LUNG
LUNG
HEART
GALL
BLADDER
LIVER
STOMACH
LARGE INTESTINE
SMALL
INTESTINE
APPENDIX
BLADDER

FIG. 2.

PREFACE

TO THE EIGHTEENTH EDITION

THE Ship Captain's Medical Guide was compiled many years ago by the late Dr. Harry Leach, Medical Officer of Health for the Port of London. It has been revised from time to time by Medical Inspectors of the Board of Trade, and the 17th edition which was edited by the late Dr. MacIntyre, was issued in 1929. Since that date the Guide has been reprinted several times with minor alterations.

In 1938 it was decided that the Guide should be completely revised, but war conditions made it impossible to proceed with this project.

Pending a complete revision of the Guide it has been decided to incorporate in this new edition information which has been issued in the form of Notices to Masters and material which has been taken from " First Aid in the Royal Navy 1943 ".

The Medical Scales have been omitted from this new edition of the Guide and are published separately ; a copy of the latest edition of the Medical Scales must be carried on ships in accordance with the Merchant Shipping Acts.

LIST OF SUBSTANTIAL REVISIONS

Chapter III on " Shock " is new and based on information taken from " First Aid in the Royal Navy 1943 ". It is probably the most important addition to this book and should be studied carefully.

Chapter V on " Circulation of the Blood, Treatment for Bleeding and Haemorrhage " has been radically amended and the new material is based principally on that contained in " First Aid in the Royal Navy 1943 ".

Chapter VII on " Inflammation and Suppuration " introduces new material on " Immersion foot and frostbite," and refers to treatment by sulphathiazole for cellulitis and whitlow.

Chapter VIII on " Fractures, Broken Bones and Dislocations " has been revised considerably. A description and illustrations of the " Neil Robertson Stretcher " and a new illustration of the human skeleton with the separate human bones, the latter taken from the " First Aid in the Royal Navy 1943," have been added.

Chapter IX on " Drowning and Suffocation " contains new material about the treatment for refrigerant gas casualties.

Chapter XI on " Fits " contains new information on the symptoms and treatment of " Apoplexy or Stroke ", and important new facts about Heat Exhaustion, Heat Stroke and Sunstroke.

Chapter XII on " Fevers." Important alterations have been made on the subject of Malaria prevention and treatment.

Chapter XIII on " Diseases of the Respiratory System." New information has been added on the treatment for sore throat (Quinsy or Tonsilitis), Bronchitis, Pleurisy, Pneumonia by sulphathiazole.

Chapter XVI on " Diseases of the Nervous System." Details about the treatment of Meningitis (Brain Fever) by sulphathiazole have been added.

Chapter XX on " Venereal Diseases " has been substantially amended to include the latest information on treatment, particularly by the use of sulphathiazole.

Chapter XXIII on " Doses and Directions for Use of Medicines " has been considerably revised.

CONTENTS

INTRODUCTORY REMARKS

ALL readers of this book will agree that the interests of owners as well as Masters of ships are most powerfully aided by sending every vessel to sea with a sound and healthy crew. Science has accomplished a great deal in diminishing the gross amount of manual labour now required on board ship, and the more general application of mechanical devices in the direction of anchor-raising appliances, boat-lowering gears, windlasses, winches, oil burning and motor engines, etc., coupled with the greatly diminished number of sailing ships, have all combined to reduce the number of hands required to ensure all proper speed and all possible precautionary means of safety. But, as no vessel can ever be entirely independent of her crew, it is eminently necessary that she sail with robust and healthy seamen; that, as far as is possible, the good men should not be called upon to do the work of the sickly as well as their own; and that all on the articles should have a chance of "starting fair."

Parliamentary legislation and the inclusion of seamen in the Workmen's Compensation Act have borne in upon owners the necessity for not employing men afloat who fall short of a reasonable standard of health, and all owners who belong to the Shipping Federation require their crews to be medically overhauled prior to signing articles. There are, however, many exceptions to this practice, and Masters would do well, therefore, to avail themselves of the provisions of the Merchant Shipping Act, 1894.

All Masters know to their cost the excessive inconvenience and serious losses that arise from shipping unhealthy men for a long voyage; men who, as soon as the ship is at sea, present themselves with bad and aching teeth, a rupture, large ulcer, big bubo, or a heart affection; who are laid up for days, weeks, or months, causing thereby additional labour to the rest of the watch, and eventually obtaining money from the owners that they have in no wise earned.

The adoption of Sections 203 and 204 will give a practical surety to the Master that his men are sound and healthy, to the crew that they are not likely to have to do more than their own individual share of labour, and to the owner that he stands a chance of getting a fair day's work out of every hand shipped.

It is now a duty to tell the reader that the following pages are written with the object of showing not only what to *do* in cases of accident and sickness, but what to *avoid*. Fortunately the tendency of the great majority of diseases is towards recovery, and medical men will tell you that in the exercise of their own profession much harm may be done by meddling and muddling.

Read this book beforehand and in your leisure ; it will repay you.

It is conceivable that moments of emergency might happen when everything depended upon promptitude of action, and life itself be ebbing away while the Master is frantically searching for appropriate directions.

Struggle hard and actively to *prevent* disease ; but, when you are called upon to *cure*, carefully adopt the directions given here, meagre as they may appear, and believe (as you may most assuredly do) that your own humble efforts to restore health and prolong life will receive safe and splendid backing from the wonderful hand of nature.

When in doubt, and in presence of unexpected illness, take and keep a record of the temperature and of the pulse rate every four hours, keep the patient in bed on a slop diet, watch him carefully and await developments.

If you decide to wireless for medical aid or advice read the instructions on wirelessing given at the end of the book.

CHAPTER I

PREVENTION OF DISEASE

CAUSES OF DISEASE

The majority of diseases are caused by germs, which are minute organisms—many thousands if clumped together would not occupy the space of a pin's head— which live in the air, water or soil. The vast majority of these minute organisms are not harmful to man, in fact, some of them are essential to healthy life, but there are others which prey on man, gaining an entry to his body either through the nose or mouth or other apertures, or through wounds or even minute and unnoticed cracks or abrasions of the skin.

The conveyance of these organisms from one person to another usually takes place directly through the medium of the air, of water, of food or by personal contact and indirectly through the medium of lice, vermin, flies, mosquitoes and such like.

A good example of an air-borne disease-producing germ is that which causes influenza and another is the smallpox germ. They spread through the air by means of dust or by minute drops of moisture that a man expels from his mouth and nose when he coughs or sneezes. If this fact is borne in mind, it is easy to realise how infection and epidemics of certain diseases are promoted by overcrowding, and by dirty and dust-laden air.

Enteric (typhoid) fever and cholera are two well-known examples of water-borne diseases. Persons suffering from these diseases may easily contaminate food or water, which, being consumed by others, passes on the infection. Hence the necessity at all times for safeguarding the water supply, for washing as well as for drinking, and especially when there is believed to be the slightest risk of its contamination by disease germs.

Two well-known diseases brought about by personal contact are syphilis and gonorrhoea.

A number of diseases are conveyed by what are termed intermediate hosts—the plague germ, for instance, is conveyed by the bites of fleas living on the rat—hence the stringent regulations for the destruction of rats on board ship and in ports. Typhus, an ever present menace in the devasted regions of Europe and elsewhere, is conveyed in a similar manner by lice. Malaria and yellow fever germs inhabit the salivary or spit glands of the mosquito and are injected into the blood when the mosquito bites or, rather, pierces the skin. Flies, on account of their disgusting habits, are very prone to convey disease germs from filth to food.

Unfortunately germs are not the only source of disease—there are other agents, and even these do not complete the list of man's enemies which merit attention here.

Higher than germs in the scale of living things come certain species of worms and other tiny moving creatures. Many of these cause disease in man and the following are the more common examples :— The hook worm (ankylostoma), found in the tropics, enters the bowel and attaches itself to the soft lining of the gut ; it lives by sucking the blood and when present in large numbers (they are less than $\frac{1}{8}$ in. long) they cause profound anaemia and debility from loss of blood.

Other common but less " ferocious " worms are the tape worm and the round worm, both living in soiled vegetables ; hence the need for careful attention to the washing of all fresh vegetables and fruit before consumption.

Another type of disease is produced by the lack of certain essential elements contained in fresh unpreserved foods. These elements called " vitamins " are vital to the health and proper nourishment of the body. There are four principal vitamins : Vitamin A (which is found in butter, animal margarine, milk, eggs, certain fish, such as herrings and certain fruit and vegetables such as tomatoes and fresh cabbage) has to do with the development of the body and its absence causes rickets in children.

Vitamin B, or rather a group of vitamins now known as the " B Complex ", is found in cereals such as barley, whole rice (not polished), oats, and in fruits such as tomatoes and nuts, and in vegetables, such as turnips, carrots and fresh peas. The absence of Vitamin B causes a nervous disease known as beri-beri, which is occasionally found among oriental crews.

Vitamin C, which might be called the sailor's vitamin, is perhaps the most delicate of all four vitamins and yet the most important. It is present in many fruits and vegetables. Its absence causes that once dreaded disease, scurvy, now fortunately almost a thing of the past. English ships were the first to carry an anti-scorbutic in the shape of lime juice, hence the name " lime juicer ".

Vitamin D has to do with the normal development of the body tissues and with the formation of the bone and with growth generally. It is promoted by the rays of the sun and is contained in quantities in food, particularly animal foods, such as milk, butter, cheese and oils, which have been obtained from animals living in the open air, Vitamin D can be manufactured artificially.

There is an important group of diseases of unknown origin which from their characteristics do not appear to be caused by germs or by deficiency of vitamins. Such diseases as tumours, including cancer, and a number of nervous diseases and mental disorders fall into this group.

Many diseases are more easily *prevented* than *cured*. This is a fact which cannot be too forcibly emphasised. The prevention of diseases plays a very important part in the practice of medicine, and in no place is it more important than on board ship. Conditions at sea are not so conducive to health as are those ashore. Opportunities for recreation and exercise, and for hygienic living are necessarily restricted. Living quarters are less commodious and there are fewer opportunities for obtaining fresh food. It behoves Masters of ships, therefore, to pay particular attention to the health and welfare of their crews not only as regards their personal hygiene but also as regards their living accommodation and the food they eat and drink.

When disease which is capable of communication to others breaks out on board ship, the Master has a two-fold responsibility—first and foremost, he must take measures to safeguard the health of the rest of the crew, and, secondly, he must endeavour to assist nature in the cure of the disease by judicious use of the remedies at hand. So important is prevention that no excuse need be made for repeated reference to it throughout the whole of this manual.

FOOD

Good wholesome food is necessary for the upkeep of the bodily functions, and the food should contain the necessary elements in their proper proportion. Neglect to observe either of these essentials is sure to lead to trouble sooner or later. Too much animal food, for instance, will, especially in hot climate, injure the digestion, derange the liver and cause a condition of the blood favourable to the development of many diseases.

There are two reasons why the tendency in the past has always been to give animal foods in place of cereals and vegetables and fruits. First because animal foods can be pickled or otherwise preserved and in that condition will keep for long periods and can be conveniently stowed, and secondly because there is an idea that animal foods are more strengthening and suitable for hard manual labour than " pappy " foods such as bread and vegetables and luxuries like

fruit. Nothing could be further from the truth. Cereals, vegetables and fruit, besides being essential to health, provide the elements of food on which a man can live and work indefinitely, which is an impossibility in the case of meat alone. If meat were the only food taken enormous quantities would have to be eaten to satisfy the bodily needs.

Reference has already been made to the value of foods of various kinds in relation to their vitamin content.

The Ministry of War Transport dietary scales have been drawn up with these requirements in mind and represent the widest variety of foodstuffs possible at sea that is consistent with good and strenuous living.

Masters would indeed be well advised to replace or supplement whenever possible every item of the dietary that is preserved in whatever form by fresh equivalents, particularly fresh vegetables and fresh fruit. Tomatoes, even if canned, are especially valuable, and because of their richness in vitamins should always be carried and given as often as possible.

Many of the more modern and better equipped vessels now carry refrigerating apparatus and consequently are able to preserve food in incomparably better condition than the less fortunate vessels which still rely on pickled and dried foods.

The following descriptions of various foodstuffs are given to assist the master in the choice of good quality food and in the detection of bad quality and unsuitable foods, especially when buying stores at ports abroad. In the United Kingdom, provisions that have been sealed by the Ministry of War Transport Inspectors can safely be purchased at any time during the period for which the seals hold good.

Meat.—Good meat should be firm, and elastic to the touch, not tough, moist but not wet, and, except in the case of pork, veal or lamb, bright red in colour. English and some Colonial meat has a marbled appearance from small layers of fat in the muscles. In foreign meat, particularly from tropical countries, there is generally an absence of fat due to poor pasturing. Meat has a fresh but not disagreeable smell and the fat should contain no watery juice or jelly and should be free from blood stains. The suet fat (round the kidneys on the inner side of the loins) should be hard and ivory white. The commencement of putrefaction is judged by the pale colour, odour and the consistence. Beware of any odour of disinfectant or preservative or indeed any unnatural odour on the surface of the meat, and in all cases, whether suspicious or not, push a skewer into the centre of the flesh in order to detect the presence of any smell on the tip of the skewer. Do not hesitate to reject meat if you are not entirely satisfied with its quality and appearance.

Good quality *chilled meat* or frozen meat if carefully prepared is nearly as nutritious as " prime fresh meat ". In chilled meat the fat is pink ; the outside of the meat will present a dead colour when compared with the lustre seen on the outside of good fresh meat. Chilled meat once thawed decomposes rapidly and should under no circumstances be replaced in the refrigerator. The secret of serving frozen meat in a palatable condition is to see that it is thoroughly thawed before cooking. For this purpose it should be hung until the flesh is quite soft and until moisture ceases to collect on the cold surface of the meat. It should then be cooked slowly.

How to detect Horse Flesh.—Horse flesh is a common article of food in many foreign countries and attempts are sometimes made to pass it off as beef. Providing the flesh is in good condition no harm can arise from eating it, but it is, of course, definitely inferior to beef. The carcase of a horse can hardly be mistaken for that of an ox. The neck is longer, and moreover the horse has 18 pairs of ribs while the ox has only 13. The flesh of the horse is dark compared with that of the ox and is greasy to the touch. The fat is yellow and the flesh generally is coarser and more stringy. Horse tongues are occasionally sold instead of ox tongues. The two are easily distinguishable. The base of the horse's tongue is smooth whereas that of the ox is rough and the tip of the horse's tongue is round and broad instead of pointed as in the ox. In regard to the choice of animals, beef takes first place in economy and price and nutritive value but is more liable to be affected with tuberculosis than is mutton. Where there is any doubt as to the quality of meat and the choice is offered, it is preferable to take mutton.

Pickled Meat.—It sometimes happens that casks of beef and pork which have been in a ship for 12 or 18 months and have become tainted receive a fresh veneer of pickle and are reshipped for another voyage. Meat which has only once been pickled generally contains a certain amount of blood which is apt to decompose in hot weather, and it is, therefore, important that all recently cured provisions, before being shipped for a long voyage, should be repickled. Casks of beef and pork should always be opened and repickled before starting on the homeward voyage. Signs of putrefaction can be detected by smell or by cutting up portions of the meat and boiling, when the steam will be found to have the unpleasant odour of putrefaction.

Fish.—To determine the quality of fish the following points should be noted :—

Freshness ; the flesh of fish should be firm to the touch, eyes and skin should be bright and glistening, the gills clean and bright red unless dulled by ice. There should be no trace of offensive smell. Remember that the flesh of fish putrefies rapidly, though some more rapidly than others, and that all fish when tainted is definitely dangerous to eat. The flesh of cod

should be very firm to the touch. Herrings are red about the head after capture, but in mackerel this redness denotes staleness. Skate must be thick and firm and the flesh pure white. Eels live long out of water and should be bought alive; dead eel goes bad sooner than most other fish.

TINNED FOOD.—Each tin should be carefully examined before being opened for use. The surfaces of a tin, the contents of which are sound, are generally concave, *i.e.*, tucked inwards. When the surfaces are bulged out and convex, suspect the presence of decomposition of the contents. Press the fingers against the surface and see if you can "wobble" the tin. A wobbly tin denotes loss of vacuum and calls for rejection. If you are suspicious immerse the tin in water and pierce a hole. If gas escapes from the hole then the contents have decomposed and are unfit for food. If on further opening the contents have a disagreeable odour or, unless in very hot weather, are liquefied, then it is better to reject them without further investigation.

VEGETABLES.—Fresh vegetables should never be cooked or eaten without first being thoroughly washed in clean running water on account of the risk of their contamination with sewage organisms or with certain parasites which are harmful to man. If you are at all doubtful about the origin of vegetables, including salad stuffs, bought abroad soak them in a solution made by adding one measureful of stabilised chloride of lime to five gallons of water and thoroughly washing in plain water afterwards or preferably have them boiled before serving.

CEREALS.—Certain kinds of flour, meal and grains are liable to invasion by weevils and other insects. These are not in themselves harmful, but they may render the food musty and unpalatable. Be on the look out for anything living in the meal and pass your finger through the meal to search for the webs of parasites.

WATER

Pure water should be bright, clear and almost colourless. It should be well aerated, that is, it should bubble freely when shaken, otherwise it has an insipid taste though it may not be harmful.

It is seldom that drinking water is found to be chemically impure, though at times it may contain lead or other harmful minerals. The real danger from water arises from the organisms it may contain. The appearance of a water is no indication of its germ content. A bright, clear, sparkling water may easily contain cholera, typhoid, dysentery or other deadly organisms. Do not, therefore, place any reliance on the appearance of the water which is offered to you. How then are you to test the safety and

suitability of a particular sample of water? Unfortunately there is no rough and ready method, and you must, therefore, make careful enquiries from persons who you consider are in a position to give you reliable information. The British Consul or your own agents are the sort of people to whom you should turn and you are strongly advised in your own interests and in the interests of your crew to seek their advice when taking aboard fresh water from sources hitherto unknown to you.

Let us assume, however, that you are quite satisfied as to the quality and safety of the water—are there any safeguards to be attended to before the water reaches your tanks? Indeed there are, and it is your duty to see that these safeguards are scrupulously observed by yourself or by those whom you have deputed for the work.

In the first place, a good water may easily be spoilt by being stored in a dirty tank. See that the tanks are clean and free from odour. If necessary, have them thoroughly scrubbed, flushed and then lime-washed.

Next pay attention to the delivery hose—see that it is clean, in good working order, and free from leaks. Watch how it is brought aboard and guard against its contamination by dock or harbour water. In many ports the sewage of the town is discharged straight into the harbour and can, and often does, grossly pollute the water round the berths. Refuse to accept a delivery hose that has fallen into the water while in the process of connecting up to your tanks.

In many ports the main delivery cocks are sunk into the dock edge or wharfside and these pits often contain foul water polluted by the surface washings of the surrounding parts. See that this condition is rectified before you connect up, and also be sure that there is no dirt in the vicinity of the filling pipe on deck.

In spite of all these precautions—and remember that defects of the kind mentioned above can happen in the best regulated ports—circumstances may be such as to compel you to take on water of which you are, to say the least, suspicious. In every case of this kind you are strongly advised to carry out the following procedure, and you may rest assured that, provided you follow it in every detail, you need have no further fear of disease arising from the water, however grossly polluted with germs it may have originally been :—

Method of Purifying Water by means of Purifying Powder (Stabilised Chloride of Lime)

The purifying powder when mixed with drinking water in a proportion of one part of the powder in 250,000 parts of water has the effect of destroying all organisms in the water, and the object, therefore, is to make a solution of this strength in the water in the tanks.

Proceed as follows :—

First estimate the quantity of water which you require to purify and note that if the tank is partly full before filling begins, enough powder must be added not only to sterilise the quantity of water that is being poured into the tank, but also any water that is already in the tank. Thus if the tank contains 1,500 gallons of water before filling and 3,000 gallons are taken in from the shore, sufficient powder must be added to purify 4,500 gallons.

The measure with which you are provided holds exactly 60 grains or one-eighth of an ounce, and this quantity is sufficient to purify 200 gallons of water. The following table will assist you to estimate the number of gallons of water in terms of cubic feet or tons :—

36 cubic feet of water—224 gallons—1 ton.
½ ton—112 gallons—18 cubic feet.
1,500 gallons—6.7 tons—240 cubic feet.

Each tank must be dealt with separately.

Having decided upon the quantity of powder you require for each tank, take the measure provided for the purpose and measure out the necessary amount of powder, pouring each measureful on to a piece of clean paper. Take the powder and pour it into the tank whilst filling is proceeding. The tank should be about quarter full when this is done. The water in the tanks must not be used for drinking until at least one hour has elapsed. If the water is used too soon, there may be a slight smell and the taste of chlorine in it. *You may rest assured that this smell and taste cannot exert any harmful effect whatever on anybody drinking the water.* The taste may persist if the water taken on board is muddy or cloudy, and if necessary you must warn persons drinking the water that no harm can arise from the taste. As a general rule, however, all taste and smell arising from the powder disappears within an hour or two of purifying.

Remember that it is safer to drink water which, even though it tastes slightly, is harmless, than to drink water which, though palatable, may contain harmful germs.

If at any time it is necessary to use boiler water for drinking purposes the boiler water should be treated in the way described above. The minute amount of powder added will not damage the boilers.

It is recommended that fresh water storage tanks should be lined with rosbonite, bituros, cement wash or other approved material. Tanks should be subjected to periodical inspection, cleaning and relining as necessary. When workmen are required to enter any freshwater tanks, care should be exercised that the men detailed for this work wear clean clothing and footwear, and are not suffering

from skin affections, diarrhoea, and have not had dysentery or typhoid fever. Particular attention should also be given to the general bodily cleanliness of all workers.

When it is necessary to purchase materials for purification of water from commercial sources in foreign ports, the following should be obtained :—

Chloride of Lime Chlorinated Lime Calx Chlorinator	British.
Calx Chlorinata	U.S.A.
Chlorure de Chaux Sel de Javelle	French.
Chlorkalk Calcaria Chlorata	German.
Calcium Hypochlorosum	Austrian and Russian.
Calcaria Chlorata	Belgian, Hungarian, Jap and Swiss.
Calx Chlorata	Danish, Norwegian and Swedish.
Cloruro di Calce	Italian.
Hipoclorito Calcico Clorurado	Spanish.
Hipoclorito de Calcio	Mexican.
Cal Chlorada	Portuguese.

VENTILATION

Pure Air is most important for the preservation of health. All human beings are constantly destroying the purity of the air by using up the oxygen in it, and throwing off from their lungs Carbonic Acid gas. Each person gives off 16 cubic feet of Carbonic Acid gas in 24 hours. The object of ventilation is to remove this gas and any other impurities in the air and to replace them with pure air. The proper ventilation of crew quarters is of the utmost importance, and, although in the construction of ships this now receives more attention than in the past, it is essential that ventilators should be kept in good order, free from hamper or obstruction, and not only a constant supply of fresh air maintained, but also proper facility for the escape of foul air. Draughts should be avoided, but not at the expense of free ventilation.

CLEANLINESS

Cleanliness is most necessary for the welfare of the crew. In addition to a daily cleaning out, crew spaces should be thoroughly cleansed, the partitions, sides, and bunks being washed three to four times a year, and the spaces should be repainted, preferably white, or a light colour, at least once every two years. Special attention should be paid to galleys and W.C.'s etc. Bilges should be cleaned out frequently and lime-washed at least once every year.

During the voyage, the crew's accommodation should be thoroughly cleaned out weekly ; galley, W.C.'s etc. daily, and some disinfectant may be used with advantage, but it should be borne in mind that it is not a sound principle to overcome a bad smell by the effect of a strong smelling disinfectant. The cause of the bad smell should first of all be eliminated by cleansing.

It is no less important that the men themselves should be scrupulously clean both as to their persons and their clothing. The crew should be encouraged to wash the whole of the body every day and to rub down with a coarse towel.

Dirty and negligent personal habits tend to produce verminous conditions and contagious skin diseases and generally predispose to ill-health in many directions. The underclothing should be frequently changed and washed. Men should never turn in in wet clothes.

It is strongly recommended that provision be made for the keeping of foodstuffs, damp clothes, etc., outside the sleeping quarters.

Bedding, blankets, etc., should be brought on deck for airing and ventilation.

All rats, insects—flies, mosquitoes, lice, bugs, etc.—should be ruthlessly destroyed.

PREVENTION OF INFECTIOUS DISEASES, DISINFECTION, ETC.

Special precautions must be taken in the event of any infectious disease breaking out or being likely to break out on board ship. Infectious diseases are caused by the introduction of poisons of the nature of living germs which enter the body from without. They are carried from an infected person to another person in different ways:—some by the air and clothing, some by food and drink which has become contaminated, others by being introduced into the blood by the bites of insects, etc.

The following infectious diseases are treated in this book .—

Chicken Pox ... ... Small Pox ... ... Scarlet Fever ... ... Measles ... ... German Measles ... ... Mumps ... ... Whooping Cough... ... Diphtheria ... ... Influenza ... . Cerebro Spinal Meningitis (Spotted Fever). Erysipelas ... ... Encephalitis Lethargica (Sleepy Sickness)	Communicated through infected air and clothing, chiefly by discharges from the nose and mouth.

Typhus Fever—Conveyed by lice which have already bitten persons suffering from the disease.

Enteric or Typhoid Fever Cholera ... ... Dysentery	Conveyed chiefly by water, milk or uncooked food which has become contaminated by discharges from a patient.
Malaria ... ... Dengue Fever ... ... Yellow Fever	Conveyed by mosquitoes which have bitten persons suffering from the disease.

Plague—Transmitted to man by the Cheops flea, which has acquired the plague germ by biting a rat suffering from this disease.

If any infectious disease breaks out, see that the directions in General Hints on Infectious Disease, page 112 are carried out, isolation of the case, cleanliness, ventilation and disinfection being the essential points to observe. The provision of hospital accommodation for the use of the crew on board ocean-going ships has been strongly recommended by the Ministry of War Transport, and in most modern ships it is now provided.

The Ministry of War Transport has intimated to owners that if such accommodation is suitably provided, and complies with the Ministry's regulations as to crew space, it can be certified as " Crew's hospital," and included with the deductions made on account of crew space from the gross tonnage of the vessel.

Disinfectants should be freely used. They may be used to sprinkle over the deck, to mix with the discharges, to purify soiled linen, and to cleanse the hands.

There are many disinfectants on the market, a large number of which are approved by the Ministry of War Transport.

One of the best and most economical forms of disinfectant for use aboard ship is " Sea water disinfectant," which is provided by the

use of a small plant for electrolysis of sea water. The principle of the disinfecting property obtained by electrolysis is the production in the sea water of free chlorine in solution. Chlorine is a powerful disinfectant, and is more effective when produced and used in this way. The original cost of the plant is not high, it is simple to work, takes up little space and provides a continual supply of disinfectant at no further cost.

When in ports where Malaria may be expected, a small quantity of paraffin, fuel oil, etc., should be poured into all bilges, boats, sanitary tanks, deck scuppers, etc., to prevent mosquitoes breeding there.

Everything that passes from the sick man, upwards or downwards, must be thrown overboard immediately and the utensils purified and disinfected. If the bed and bodyclothes are not burnt or thrown overboard they may be disinfected by keeping them in boiling water for not less than an hour, after which they should be laid out on deck exposed to the sun, if possible, to dry.

To disinfect the ship proceed as follows :—Put Sulphur, in the proportion of about half a pound to 500 cubic feet, in any convenient receptacle such as a mess tin, mix in a few shavings, sprinkle with a little spirit, and float the tin in half a bucket of water ; close all ports, hatches, ventilators, etc.—in fact every opening—set the Sulphur alight and keep the place closed up for four hours. Then open up thoroughly, bring out all moveable objects on deck, and scrub the decks, bulkheads, ceiling and all other woodwork with one of the approved disinfectants. Bedding and infected clothing should be hung up on lines and submitted to the above fumigating process. Sulphur fumigating candles may be used instead of ordinary sulphur. Formaldehyde or Formalin is another form of fumigation, which is very effective and is preferred by many to Sulphur. Various preparations of Formaldehyde are sold for this purpose with full directions issued with each package, but it should be understood that washing down with disinfectant is of far more real value than fumigating.

ISOLATION

Isolation is the method by which the Master safeguards the members of his crew and passengers from infection by a person suffering from an infectious disease. Isolation to be of any value must be carried out thoroughly and must be so arranged that not only the patient but everything that comes into contact with him is isolated away from the rest of the company. It is obviously of little value to isolate a patient and at the same time permit other members of the crew to use, for instance, a cup which the patient has used, without taking the precautionary measure of boiling the cup and any other utensil used by the patient to prevent the spreading of

infection. When in doubt as to whether a patient is suffering from an infectious disease or not, *always isolate*. No harm can arise from isolation, even if the disease is proved later on not to be infectious, but serious consequences may happen if isolation is not carried out and a doubtful disease turns out to be infectious. Furthermore, it is never too late to isolate.

Isolation on board ship is not the simple matter it is on shore, and the strictest precautions ought, therefore, to be taken.

WHERE TO ISOLATE

If it is possible to isolate the patient in a cabin, then this is probably the best place for his treatment and comfort. Before removing the patient, the cabin should be stripped of all unnecessary articles of furniture, clothing, books, pictures, mats, and such like. It will then be unnecessary to disinfect these articles at a later date.

Failing a spare cabin, another should be taken for the purpose without regard to the temporary inconvenience it may cause other members of the crew, bearing in mind, however, the need of removing, first of all, all movable articles of furniture and such like, which are not required for the use of the patient. Should this also be impossible, good isolation may be improvised by rigging a hatch tent over the after hatch, using the derricks as centre poles to spread tarpaulins over, which may be battened into hatch coamings. The ends should be closed in with tarpaulin, so arranged as to give the necessary ventilation. Extra tarpaulin should be at hand to spread in wet weather.

NURSING THE PATIENT

Having decided on the place of isolation, the Master must then determine how he is to attend to the needs of the patient. In mild cases of infectious disease, he may find it possible himself to attend the patient without undue interference with his duties, but if the patient is very ill in all probability he may have to obtain the assistance of some other member of the crew to give undivided attention to the case. Whatever is decided upon, the necessity for abstention from all unnecessary communication with other members of the crew and for scrupulous observance of his orders must be insisted upon. The sick nurse must, if possible, wear the minimum of unwashable clothes and should be provided with a suit of oilskins (especially when a very infectious type of case is being treated), and these should frequently be swabbed down with a disinfectant. The oilskins should be hung just inside the isolation compartment and should under no circumstances be taken outside the compartment. The sick nurse must be instructed to don the oilskin immediately

after entering the sick room on every occasion and to wash his hands in disinfectant before leaving the sick room and *after* taking off the oilskins. In this way infection is not conveyed by means of his hands to other members of the crew or to other articles when he is outside the sick berth.

THE PUBLIC HEALTH ACT

The Public Health Act of 1936 gave to the Government power to create Port Health Authorities in England and Wales, and Medical Officers of Health are now appointed at all ports, whose duties consist in preventing the importation of any infectious disease into the kingdom by shipping, and in looking after the health and accommodation of seamen and of all others living afloat while the vessel is in port.

It is the duty of the ship master on arrival to report to the officers of Customs any cases of sickness that exist, or any cases of sickness or death that have occurred during the voyage; to afford to the Port Medical Officer all facilities for the sanitary inspection of the vessel, and to follow out strictly his directions in all matters affecting the health of the crew and passengers.

CHAPTER II

DIAGNOSIS OF DISEASE

PULSE.
TEMPERATURE.
RESPIRATIONS.
STATE OF TONGUE.
PAIN.

The word "Diagnosis" means the distinguishing of one disease from another and forming an opinion regarding the nature of the disease. In order to arrive at a diagnosis the first thing to do is to investigate the patient's symptoms, noting whether the illness came on gradually or suddenly, and asking such questions as would be likely to give a clue to the cause, such as exposure to cold, overstrain, accidents, and such like.

There are many aids to diagnosis, and amongst the more important of these are :—

(1) Pulse ; (2) Temperature ; (3) Respirations ; (4) State of the tongue ; and (5) Pain.

PULSE

This is caused by the alternate dilatation and relaxation of the arteries by the blood, which is pumped through them at every beat of the heart. A convenient place to feel the pulse is at the wrist on the thumb side, but it may also be felt in the neck or on the temple, or anywhere where an artery lies near the surface. To take the pulse, place the finger tips on the artery. The thumb should not be used.

The number of beats per minute varies in health with the age but in a healthy adult it may be said to be normal if between 65 and, 80, a fair average pulse being about 72 to the minute.

The rate is increased by exercise, excitement, and fever.

A slow and strong pulse is suggestive of pressure on the brain.

A quick and strong pulse is suggestive of inflammation.

A quick and weak pulse is suggestive of fever and weakness.

A slow and weak pulse is suggestive of shock, depression, or jaundice.

An irregular or intermittent pulse is suggestive of heart disease, or indigestion, or tobacco poisoning.

In fever the pulse is usually increased by about ten beats for each rise of 1° temperature.

TEMPERATURE

The temperature of the body is an important factor in all diseases. It is raised in fevers and in inflammation, and is lowered in shock, depression and haemorrhage. The temperature is taken by an instrument called a Clinical Thermometer, which consists of a little glass tube with a fine bore, containing mercury, and graduated usually from 95° F. to 110° F. Each degree is subdivided into fifths by small

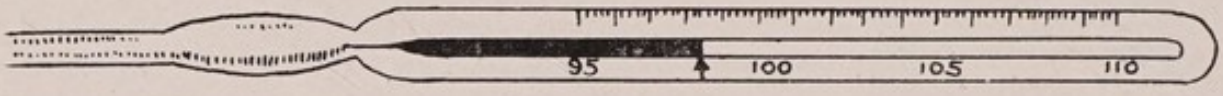


FIG. 3.

lines, and each fifth is equal to .2 of a degree. The normal temperature of the body, 98.4° F., is marked by a small arrow. Near the lower end and above the bulb of mercury there is a constriction as if pinched in, which serves to retain the mercury at the temperature indicated till it is shaken down.

Before taking a temperature, hold the thermometer in your right hand and shake it with a sharp jerk from the wrist until the mercury has gone down to about 96° F. or under. The best place to take the temperature is well under the tongue, with the lips closed, but not the teeth. It should remain there for three minutes at least, when it may be taken out and the temperature read off.

It is sometimes taken in the armpit, if the patient is restless or unconscious, but it takes a longer time, five minutes instead of three. When taken this way it is important to see that the thermometer is well into the armpit, and that it is not hampered by any clothing, the arm being brought across the chest. It is advisable to take the temperature at least twice a day, morning and evening, and, in cases of serious illness, at four hourly intervals, and to note it on the chart. Any elevation of temperature above 99.5° F. must be looked upon with suspicion. A temperature of 100° F. to 102° F. indicates moderate fever; above 103° F. high fever. In most fevers the temperature does not rise much above 104° F., and if above this the outlook becomes serious. Whenever the temperature is taken the pulse rate should also be recorded.

Loss of blood from any cause will reduce the temperature in proportion to the amount of blood lost; it may fall to 97°, or even 96°. The latter would indicate serious weakness.

As thermometers are sometimes bought on the Continent, and these are graduated on the Centigrade scale, it will be useful to give a table comparing the two systems :—

	Fahrenheit.	Centigrade.	
	110	43.3	
	109	42.8	
(as a rule) Fatal >	108	42.2	< Fatal (as a rule)
Dangerous fever >	107	41.7	< Dangerous fever
	106	41.1	
High fever >	105	40.6	< High fever
	104	40	
	103	39.4	
Moderate fever >	102	38.9	< Moderate fever
	101	38.3	
	100	37.8	
Healthy temperature >	99	37.2	< Healthy temperature
	98	36.7	
Weakness >	97	36.1	< Weakness
	96	35.6	
	95	35	

To convert Fahrenheit into Centigrade, deduct 32, multiply by 5, and divide by 9.

To convert Centigrade into Fahrenheit, multiply by 9, divide by 5, and add 32.

RESPIRATIONS

Respiration or breathing depends upon the expansion and contraction of the chest, causing the air to enter and leave the lungs. The movement of both sides of the chest should be similar; if there is more expansion on one side than the other it would suggest Pleurisy.

After bodily exercise or excitement the rate of breathing is increased, but a healthy person at rest should breathe about 15 to 18 times per minute.

Short and rapid breathing—30 to 50 per minute—would suggest pneumonia.

Shortness of breath on slight exertion would suggest heart disease, or over smoking.

Cough, difficulty of breathing, pains in the chest and expectoration are associated with diseases of the respiratory system.

THE TONGUE

A healthy tongue is red, firm, and moist. Many healthy people have a thin white furring at the back of the tongue, sometimes extending all over it.

A thick fur occurs in all fevers.

A furred tongue with red edges is seen in indigestion.

A pale broad tongue, sometimes showing teeth marks, suggests debility or anaemia.

A purplish tongue suggests bad circulation.

A tremulous tongue is seen in cases of extreme debility, or over-indulgence in alcohol.

Diminished power of movement, or if drawn to one side on being protruded, is found in some forms of paralysis.

PAIN

Pain is present in nearly all diseases, and is one of the most important factors—if not the most important—in the diagnosis of disease. Sometimes the pain is distant from the seat of trouble, as, for instance, when a pain in the back of the head is present in constipation, but usually the pain is felt in the area of skin just over the part of the body where the disease is located.

The following diagrams will be found useful in determining the nature of the disease from the seat of the pain, the shaded portions being the usual situations where pain is felt. These are not infallible, but may serve as a rough and ready guide when endeavouring to arrive at a diagnosis.

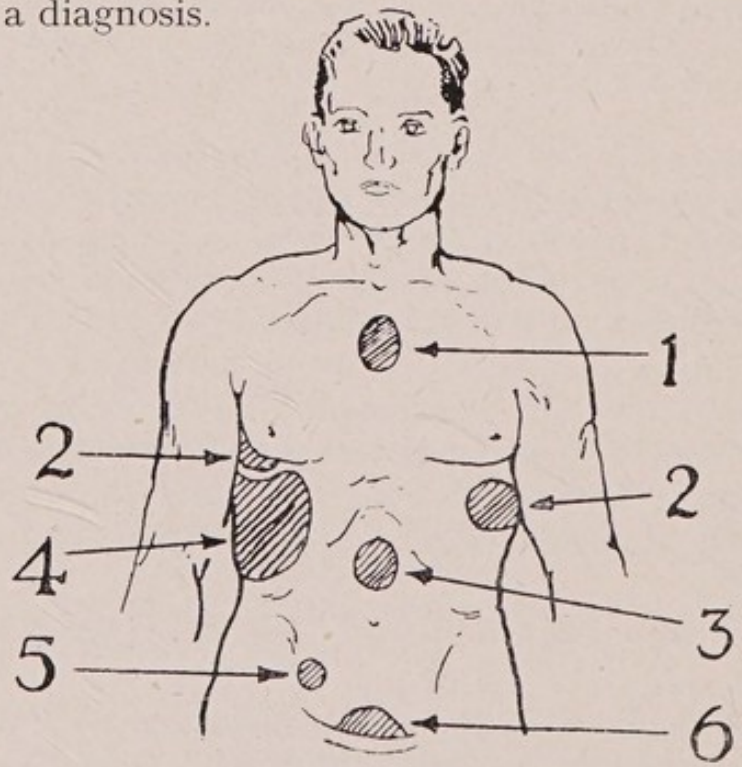


FIG. 4.

AREAS OF PAIN

1. Indigestion, Bronchitis.
2. Pleurisy.
3. Indigestion, Inflammation of the Stomach, Ulcer of the Stomach.
4. Diseases of the Liver, Gall Stones, Pneumonia, Pleurisy.
5. Appendicitis.
6. Bladder trouble.

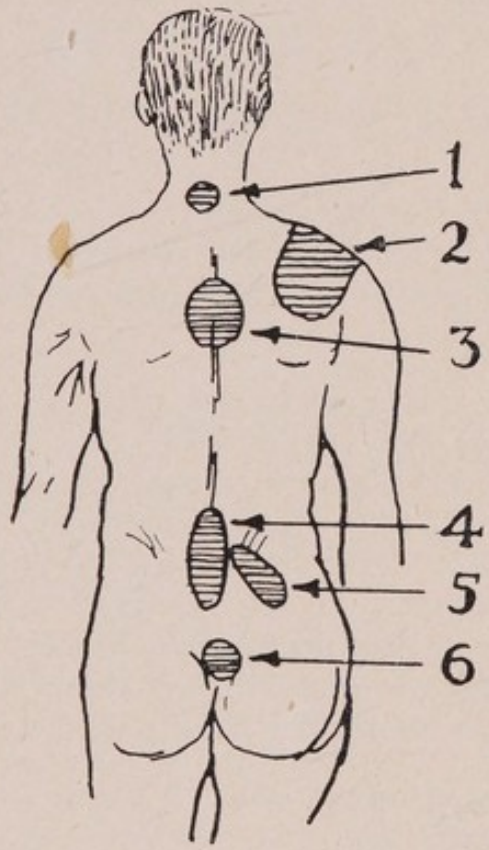


FIG. 5.

AREAS OF PAIN

1. Meningitis.
2. Rheumatism.
3. Indigestion, Flatulence, Disease of the Spine, Gastritis, Ulcer of the Stomach.
4. Lumbago, Kidney disease.
5. Stone in Kidney, Renal Colic.
6. Piles.

CHAPTER III

SHOCK: GENERAL NOTES ON HOW TO LOOK AFTER INJURED MEN

The subject of shock is explained now because it will often be necessary to mention it in the subsequent chapters. By learning about shock you will get to know the general rules of how to look after all casualties.

The term " shock " is used to describe the state in which you will find *anyone who has had an accident or injury*. It varies from a slight feeling of sickness and faintness to complete collapse, which is failure of strength—with or without loss of consciousness. The severity of the shock depends on the constitution of the injured man and the seriousness of the damage done to his body. The injury and the pain are its immediate causes. In men with painful conditions like fractures and burns, shock develops very rapidly and very seriously so that it becomes a grave danger to life.

However, in some circumstances, a man will often try to carry on even with very serious injuries. In such a case, where it is only a tough spirit which is keeping him going, as soon as there is a lull he may crack badly. Then shock is often far worse than if it had come on in the first place. Do not be misled by the endurance of such a man and, having seen him carry on for so long, think that he is in little need of first aid. On the contrary, you should in some cases urge him to stop his duties—for example, if he has bad bleeding. You must use your *common sense* and decide what to do according to the circumstances.

When shock is well marked in an injured man, you will usually see him lying quite still, taking very little notice of what is going on around him. His breathing will be slow and shallow, his whole body pale in colour, cold and clammy. He will tell you that he feels faint and thirsty ; he may vomit, and if the condition gets worse, he may become unconscious.

The body tends naturally to recover from shock, but there are several things which make it worse. These are :—loss of blood, exposure to cold and wet, severe pain, movement (such as attempts by the man to walk or by shipmates to manhandle him), mental worry, fear and thirst. The treatment of shock must therefore be directed towards minimising and, if possible, removing these things so as to assist the natural recovery which normally tries to take place.

These are the things that you must do :—

1. Stop all bad bleeding.
2. Lay the injured man on the deck with his head flat.
3. Loosen any tight clothing.
4. Get him warm.
5. Give him a drink.
6. Relieve his pain.
7. Cheer him up.

Learn these seven points by heart. You will see their meaning as you read on. It will help you to remember each point if they are separately explained.

1. Stop all Bad Bleeding

When a man is bleeding badly, *you must stop it at once*, because he will surely die if you do not. How to do this is fully described in Chapter V, but the fact that you must do it before anything else is stressed here because *bleeding makes shock much worse* even if it is not bad enough to endanger life.

2. Lay the Injured Man Flat

The bodily weakness which is part of the state of shock means that wounded men will often have collapsed on to the deck by the time that you are able to look after them. However, some particularly robust people are able to remain standing even with the most severe injuries, and you should get such men to lie down at once. Casualties are best treated where they fall, and this rule should be followed save in exceptional circumstances. For example, if a man is injured on the upper deck in foul weather, or where he will interfere with the work of others, it will be necessary to get him behind or under some shelter and out of the way of those who must continue to work the ship. If a man is injured in a compartment which is burning or flooding, he must obviously be taken to a safe place before anything else is attempted. Except in such emergencies, you should give first aid before moving him.

When you have got the injured man lying on the deck in a convenient place, you should raise his feet by resting them on a folded coat, upturned locker or whatever is available. Do not place his head on a pillow but see that it is flat and turned to one side. (The head is kept low because his faintness is due to his brain having insufficient blood flowing to it, and by lowering his head the blood will get there more easily). Provided that you have lowered the head you should not forcibly alter any position that the injured man has found for himself, because it is he who knows best what position causes him least pain. In manhandling an injured person and also when arranging blankets and assisting him in other ways, you must at all times use the very greatest possible *gentleness*. Remember that any unnecessary twinge of pain that you may give him will increase his shock.

3. Loosen Tight Clothing

It is necessary to loosen all tight clothing to allow a free circulation of blood and also to prevent any collar or belt impeding the movements of the chest and belly in ordinary breathing ; but *do not remove any more clothing than is necessary to carry out treatment,* as this not only disturbs the man, but also allows him to get cold and so increases shock. Men have died from exposure after having too many clothes cut away.

4. Get Him Warm

It has already been said that a shocked person is very cold, so every form of warmth that can be given will make his condition better. Covering the man with coats or blankets is a step that can nearly always be taken at once ; you should also place a blanket or cushion *under* the casualty, as he will never get warm lying on a cold deck. Hot water bottles should be obtained as soon as possible. It is important that bottles are well wrapped up and not too hot to touch. It is very easy to burn a shocked man and bottles should never be placed next to the skin, but always outside at least one layer of clothing or a blanket. The difficulty of providing an adequate amount of warmth, particularly in small ships, is one which may not be easy to overcome. There are even occasions in very cold or rough weather when, despite the seriousness of the shock, it is advisable to carry an injured person to a warm place in the ship. The very greatest *common sense* is needed in deciding when this course should be adopted; remember that the moving of an injured man is nearly always the worst thing that you can do and it is only on very rare occasions that it is justifiable. When you are in the tropics, there may be no need to give warmth to shocked men and you must be careful not to cause harm by overheating a man in these circumstances.

5. Give Him a Drink

Provided that the patient is not suspected of having any internal injury (make sure that he has no bruise or wound of his belly) and provided that he is conscious and all bleeding has been stopped, hot sweet drinks should be given to allay his thirst and to assist in getting him warm.

Drinks should only be given in sips (large quantities will almost certainly make him vomit) and hot sweet tea or black coffee are the best ; plain water, perhaps flavoured with meat extracts, or sweet fruit juices are also good. It is better to give cold water than nothing at all, except, as just said, if there is a wound in the belly, when to give fluid of any description is forbidden. Alcoholic drinks should not be given as they may increase bleeding.

6. Relieve His Pain

Morphia is needed by all men who are shocked and who have a lot of pain. In cases of shock with extreme pain morphia should be given. If the drug is administered orally *not more than two* tablets should be placed under the patient's tongue and allowed to dissolve. They will not take effect for 10 to 15 minutes. *One* tablet may be repeated, if necessary, *not less than* 3 *hours* after the first tablets have been given. If the drug is administered by injection, one ampoule syringeful should be given, and this injection may be repeated, if necessary, after an interval of 3 hours.

A note of the number of administered tablets or injections and the time of the administration should be made, and this must always accompany the patient when he is landed or otherwise removed from the care of the Master. This information should be, if possible, written on a label tied to the patient.

Next, you should relieve pain by giving first aid to the injury which is causing it. Remember that stopping the bleeding, laying the man down, loosening his clothing and getting him warm have only taken a moment or two, and you should find yourself treating whatever injury the man may have within a few minutes. Later chapters will describe in detail treatment for the many different kinds of injuries ; here it is only necessary to repeat that the utmost care must be taken to be gentle, whilst at the same time being quick, firm and precise in doing what is required. Pain can also be relieved by appropriate adjustment of the man's position with suitable support before, during and after dealing with the wound or injury, and by the avoidance of unnecessary handling or movement.

7. Cheer Him Up

Any man who has been injured and is suffering from shock, who is therefore cold and trembling, has, of course, been subjected to a frightening experience and it is an essential duty of all who help in his treatment to gain the confidence of the injured man, to cheer him up and when necessary to convince him that he is all right so that he does not think of " chucking his hand in." Remember that a casualty is wondering what has happened, whether he is going to live or die and whether, if he lives, he is going to be scarred or mutilated for life. His thoughts are turning in a lonely little personal world of fear, no matter how brave a man he may be. All this mental worry serves to increase his shock and it can be lessened very much by a sympathetic shipmate. Talk to him, be natural to him in such a way that he will realise that he is in good hands. And while talking near injured men, never whisper. Although you

want to avoid extra noises, do not hush your own voice so that casualties cannot hear. If you do, they will at once think you are talking about them and may be anxious to know what you are saying. Give him a cigarette, even if you have to light it for him, and then to hold it for him. The small puffs taken will often greatly help towards getting him back to normal. If he is very weak or has had morphia, there is still no harm in his having a smoke, provided you help him and take care that he does not burn himself.

The hope that comes to him with friendly words can perhaps only be realised by those who have themselves been casualties, but it is assuredly a wonderful way of assisting his strength and preventing shock becoming worse. When you have finished bandaging or whatever you may have had to do, get someone else to be beside him all the time, who can continue to talk with him and make him comfortable by wiping his face and eyes and giving him sips of fluid to moisten his dry lips. Loud noises will upset shocked men and it is important that this should be prevented. Ears should be plugged with cotton wool or covered by means of a bandage.

The scope of the treatment for shock is very wide, as you can see from the number of things that you have read in this chapter. Remember that every injured man is going to suffer from shock to some extent and that you will have to bear in mind all the points for preventing or treating shock every time you deal with any casualty, besides treating whatever particular injury may have caused the shock. If you are single-handed, you must do all you can and the most important things first.

As a rule the moving of an injured man should be delayed until the return of colour and warmth to his face and the disappearance of the beads of cold sweat show that you have effectively done all that was necessary for his shock.

SUMMARY

You should do these things as soon as possible :—

1. **Stop bleeding.**
2. **Lay the injured man flat.**
3. **Loosen tight clothing.**
4. **Get him warm.**
5. **Give him drinks.**
6. **Relieve his pain.**
7. **Cheer him up.**

CHAPTER IV

BANDAGING

THE TRIANGULAR BANDAGE is a triangular piece of linen or calico (*see* fig. 6). The size is 54 inches at the base and 38 inches at the side.

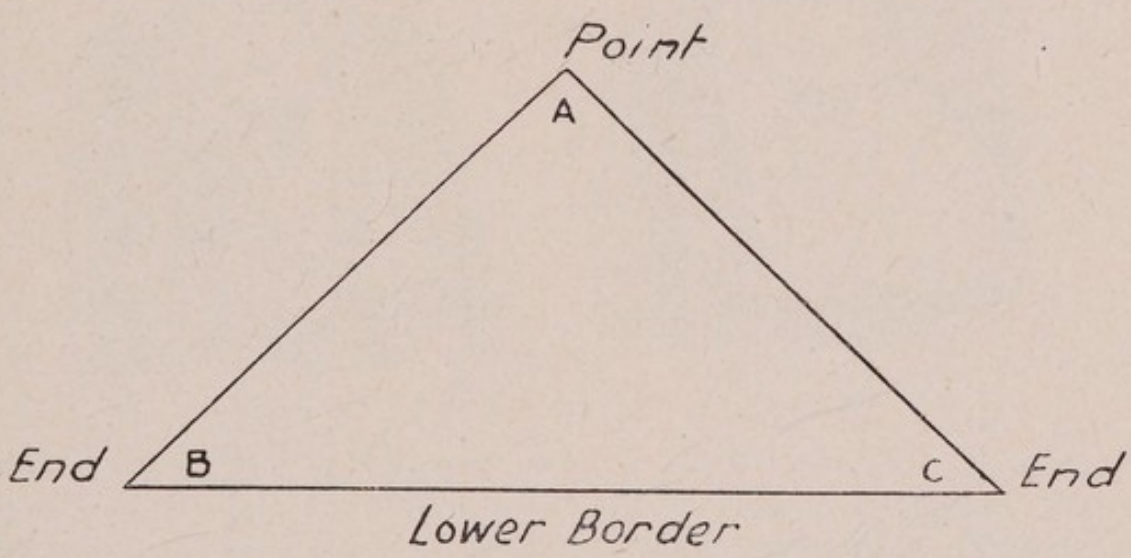


FIG. 6.

It may be either larger or smaller as may be convenient. It is used for a variety of purposes: for stopping bleeding, covering dressings, fixing splints, or for slings. It may be applied either folded or unfolded. To fold it, bring the point A to the lower border and then fold into two—this is the broad bandage. If folded again, it will make a narrow bandage. The bandage should always be fastened with pins or tied with a reef-knot. There are no fewer than twenty-two ways of applying it, but some only are given here. The directions for applying the bandage are those of the St. John Ambulance Association.

LARGE ARM-SLING (fig. 7).—Spread out a bandage, put one end over the sound shoulder, let the other hang down in front of the chest; carry the point behind the elbow of the injured arm, and bend the arm forward over the middle of the bandage; then carry the second end over the shoulder of the injured side and tie to the other end; bring the point forward and pin to the front of the bandage. This is used in fracture of the collar bone.

SMALL ARM-SLING (fig. 8).—Fold the bandage into the broad or narrow bandage; then place one end over the shoulder on the sound side; cross the arm over the middle of the bandage hanging down the chest, then bring the other end over the injured shoulder

and tie at the side of the neck. The broad bandage is used if it is intended to include the hand—the narrow if the arm is to be supported by the wrist.

FIG. 7.

FIG. 8.

FOR HEAD (fig. 9).—Fold a hem inwards, about 1½″ deep along the base of the bandage. Place bandage on the head so as the hem is close down to the eyebrows and the point hangs down at the back. Carry the two ends round the head above the ears and tie on the forehead, this secures the lower border of the bandage. Draw the point of the bandage downwards ; then turn it up and pin it to the bandage on the top of the head.

FIG. 9.

For Foot (fig. 10).—Spread out a bandage, place the foot on its centre with the toe towards the point, draw up the point over the instep, bring the two ends forward, cross and tie them either on the sole (if to keep a splint on) or round the ankle.

For Hand (fig. 11).—Spread out a bandage ; place the wrist on the border, with the fingers towards the point ; then bring the point over the wrist, pass the two ends over the wrist, cross and tie them.

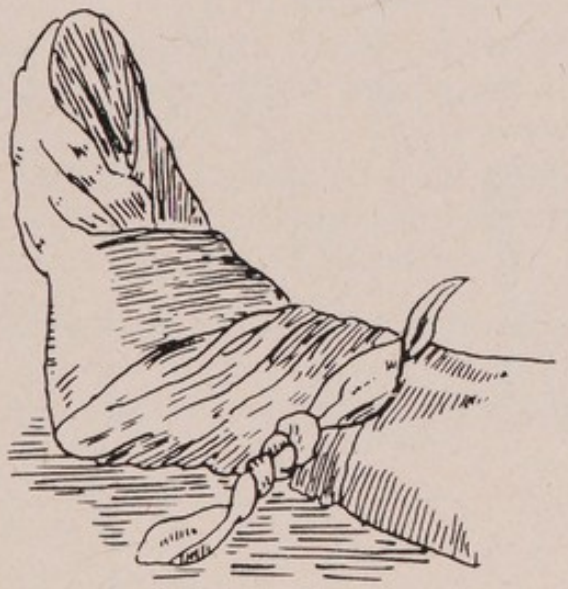


Fig. 10.

Fig. 11.

For Chest.—Place the middle of the bandage on the injured side, with the point over the shoulder ; carry the two ends round the waist and tie them, then draw the point over the shoulder and tie to one of the ends.

For Back.—As above, but begin by placing the bandage on the back.

To keep dressings on wounds a narrow-fold bandage is applied, and bound several times round the limb.

To keep splints in position, use two narrow-fold bandages, one on either side of the fracture.

To use as a tourniquet for stopping bleeding, *see* page 40.

Roller Bandages may be made from unbleached calico, flannel, linen, webbing, etc., and are used as supports to different parts of the body, as in applying pressure, for fixing splints, dressings, etc., and for allaying muscular action. In applying a roller bandage, the following simple rules should be observed :—

(1) Make a few turns on the limb to fix the bandage.

(2) Bandage from below and work upwards.

(3) Bandage from within outwards.

(4) Avoid all wrinkles.

(5) Each turn of the bandage should cover at least half the previous turn.

(6) The limb should be bandaged in the position in which it is intended to be kept. Do not bandage the limb and then bend it into position.

(7) The bandage should be kept fairly taut when winding it. It should not be wound round and then pulled tight; this is apt to move the dressing out of position.

(8) When two skin surfaces are to be bandaged in contact as when banadaging the arm across the chest, cotton wool or lint must be placed between them.

(9) The end of the bandage may be fixed by pinning it, by applying a piece of adhesive plaster over the end, or by slitting it, passing the ends round the limb and tying with a reef knot.

Spiral Bandage.—When the limb is of uniform thickness, apply the spiral bandage, each turn overlapping the preceding one to the extent of two-thirds of the width of the bandage (*see* fig. 12)

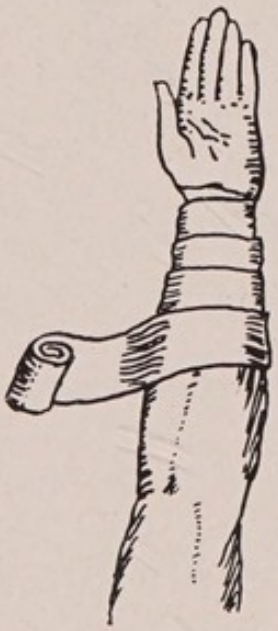


Fig. 12.

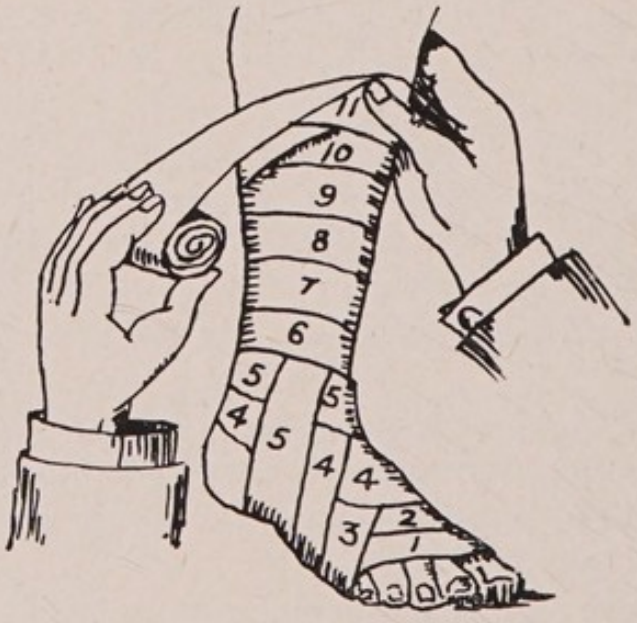


Fig. 13.

Reverse Spiral.—When the limb thickens, use the reverse spiral. To apply this properly, two or three turns of the simple spiral are applied, till it is seen that the bandage will no longer lie neatly. Then fix the upper part of the next layer with the thumb or forefinger of the other hand, and make a reverse by doubling the bandage on itself as shown in fig. 13.

FIGURE OF 8 BANDAGE.—For the joints use the figure of 8 bandage.* To apply this—suppose it is the ankle-joint, fig. 14—fix the bandage by a few spiral turns round the foot, then carry it in front of the joint, round the back of the ankle, and round the foot again by crossing in front of the first turn, thus forming a regular figure of 8. The turns are repeated till the joint is completely covered. This form of bandaging is sometimes called the spica, as shown in figs. 15 and 16.

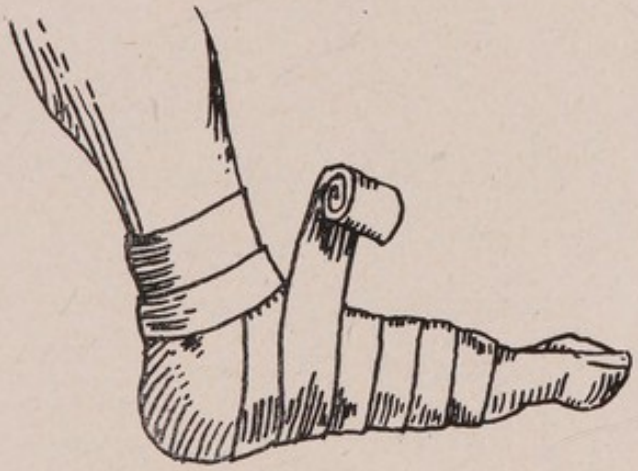


FIG. 14.

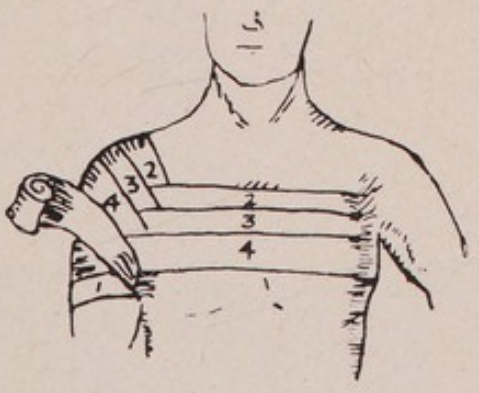


FIG. 15.

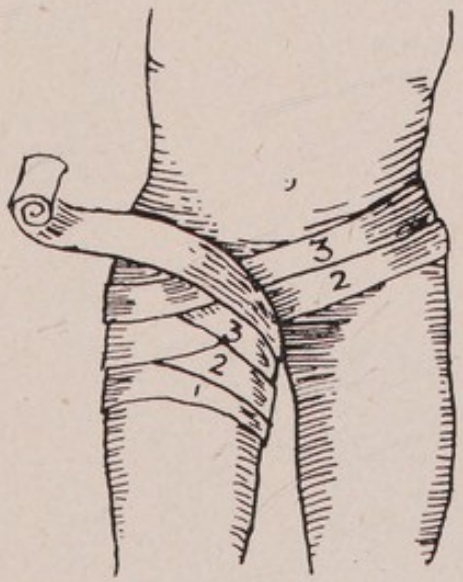


FIG. 16.

* Severe sprains of any of the joints may be treated by applying the figure of 8 bandage, after the swelling has been reduced by hot fomentations.

Many-tailed bandages are useful when a dressing has to be changed frequently or when it is difficult to apply a roller bandage without disturbing the limb, such as in cases of compound fracture or burns or extensive ulceration.

They may be made of calico or flannel or from an ordinary roller bandage. An easy method is to take a piece of material large enough to go round the part about one and a half times and to slit it on both sides into several tails (fig. 17).

Many-tailed Bandage.

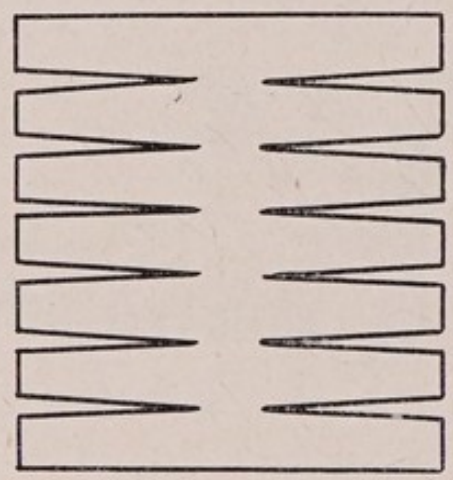


FIG. 17

To apply it, place it with the uncut part at the back of the part to be bandaged, bring forward singly, each side alternately and crossed over the dressing. The last turn is secured by a safety pin.

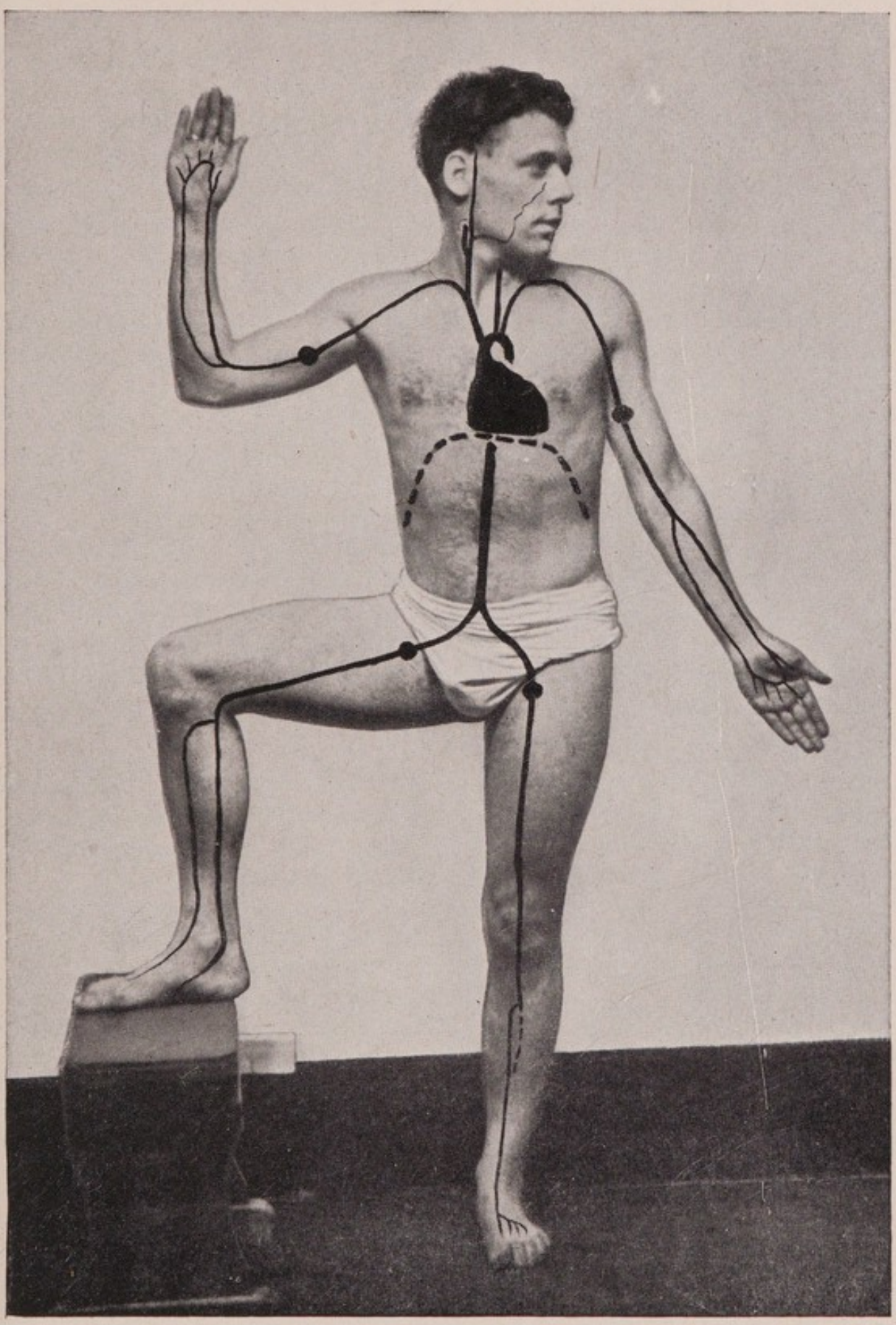


FIG. 18.—*The main arteries of the body.*

CHAPTER V

CIRCULATION OF THE BLOOD. TREATMENT FOR BLEEDING OR HAEMORRHAGE

1. Circulation of the Blood

Before you can understand the various kinds of bleeding for which you may have to give treatment, you must understand how the blood circulates throughout the body.

The *heart*, which lies behind the breast bone and the ribs of the left side of the chest, is a strong automatic muscular pump. The *blood* is forced by this pump into tubes, called *blood vessels*, which carry it to every internal organ and to every piece of flesh and bone in order to nourish and give heat to the whole body. The blood therefore is circulated in blood vessels just as steam is distributed throughout a ship in pipes. After having given up its nourishment, the blood returns to the heart to be refreshed just as steam uses up its force in the turbines and then returns to the boiler to be reheated.

The main tubes, or blood vessels, which carry the blood from the heart to the body are known as *arteries*.

Figure 18 shows that there are two main arteries running up to the head and one running from the heart to the end of each arm. There is also a very large artery running down just in front of the backbone which, after giving off branches to the contents of the belly, divides into two main arteries which travel down the legs. These main arteries give off many branches of all sizes which divide again and again into smaller vessels ; these smaller vessels finally divide into millions of vessels which are so small that they cannot be seen with the naked eye. These tiny tubes, known as *capillaries*, are found in every part of the body ; it is through their very thin walls that nourishment is given out from the blood to all parts while at the same time waste products are taken from these parts and drawn into the blood. These exchanges alter the colour of blood from bright red to a darker red.

The capillaries join one another to form small vessels which run from all parts of the body back towards the heart. These are called *veins*. Small veins join to form bigger veins which finally join together to form two very big veins (about an inch in diameter) which enter the heart.

In general, every artery carrying blood from the heart has beside it a vein carrying blood in the opposite direction back to the heart.

The heart at once pumps the impure blood which has been brought back to it away to the lungs, where the job of purifying it is carried out. Then the blood comes back to the heart again which pumps this newly purified fluid away to the body through the arteries. Thus you can see that the heart really consists of two pumps; one to drive pure blood round the body and the other to drive impure blood through the lungs.

Normally the heart beats about seventy times a minute and thereby a constant circulation of the blood is maintained.

We have mentioned three kinds of blood vessels and you should remember in what ways they are different.

An artery takes pure bright red blood from the heart to all parts of the body. It is a thick-walled tube rather like a wirebound hosepipe. The blood in it is still under the high pressure given to it by the force of the heart.

A capillary is a minute tube which connects the smallest arteries with the smallest veins; it cannot be seen with the naked eye.

A vein takes impure dark red blood from all parts of the body to the heart. It is a thin-walled flabby tube; when empty it collapses like a canvas firehose. The blood in it is under very little pressure, because the tiny capillaries have cushioned off the heart's force.

2. Kinds of Bleeding

Bleeding occurs when any of the blood vessels described above are either punctured, torn or cut.

A small scratch or graze such as you may cause while shaving only bleeds very slightly; this kind of very slow *oozing* of blood comes from the *capillaries*, many thousands of which will have been cut by the length of your razor blade as it damaged the skin surface. It is of no importance in such cases because it soon stops by the formation of a scab consisting of congealed blood.

All cuts or wounds which are deeper than mere scratches bleed according to how much flesh is damaged. This kind of bleeding where you will see blood *welling up* to the surface and running over the edges of the wound in a *slow steady stream*, comes from the *small vessels*, both small arteries and veins, as well as from the countless capillaries which must also have been cut. This is usually called *venous* bleeding, but it should more correctly be named " small vessel " bleeding as it comes from more vessels than the veins alone. This is the *commonest kind*, and, although it may appear alarming, it has been the experience of the war that by itself it very seldom endangers the life of an injured man, provided that the correct treatment is given.

The only urgently serious kind of bleeding is that which occurs when a *main artery* (such as one of those shown in figure 18) is cut. Then blood is forced out in *spurts* with each beat of the heart and in less than two or three minutes a man may die. He will die because so much of his blood is lost (about two or three pints) that there is not enough left to circulate in his body. Fortunately, this kind of bleeding is *rare*.

There are three kinds of bleeding according to the kind of blood vessel which is cut :—

1. *Capillary bleeding*. Blood oozes away very slowly.
2. *Small vessel bleeding*.—Blood wells up into the wound and runs over its edges in a slow steady stream. It is dark red in colour.
3. *Main artery bleeding*.—Blood spurts out in jets from the wound and runs away in rapid and copious streams. It is bright red in colour.

Note 1.—When a cut artery is at the bottom of a large wound then you may not see actual jets of blood ; in such cases, however, the wound will be seen to be brimming with blood which is rapidly pouring away.

Note. 2—The fact that blood from an artery is bright red in colour is a helpful guide when you are in good daylight. Between decks however, you may not be able to see the colour and you must decide what kind of bleeding is taking place by the speed with which it flows.

3. The General Effects of Bleeding

The immediate effects of bleeding are those of shock (*see* Chapter III). If the bleeding continues and a large amount of blood is lost, SHOCK BECOMES WORSE. Thus the paleness, the coldness, the sweating and the thirst of the man all become more obvious ; but on a man with serious bleeding the effects of shock are altered in two ways :—

1. The breathing becomes hurried and laboured, with sighing, as a result of the effort ; the man may even " gasp for breath " because he is hungry for air. This is because there is too little blood to carry the vital oxygen round his body.
2. He is restless and may move his arms and legs aimlessly.

The gasping for breath and the restlessness—with paleness, coldness and thirst—are all apparent in a minute or two if there is a sudden loss of a large quantity of blood such as happens when a main artery is cut. These effects may take ten or fifteen minutes to develop with bleeding from small vessels.

Varieties.	Symptoms.	Treatment.
Capillary	Oozes from whole surface of wound.	Dressing : Bandage.
Venous	Continuous stream. Wells up. Dark red or purple in colour. **Not often dangerous.**	Raise limb. Dressing : Bandage.
Arterial	Spurts. Bright red. **Dangerous.**	Pressure above wound Pad and bandage Tourniquet. Ligature.

4. TREATMENT FOR BLEEDING

Bleeding from small vessels (the common kind of bleeding which occurs with all wounds).

1. LAY THE MAN DOWN.—The heart pumps with less strength, and therefore the blood escapes with less force and less quickly, when a man is lying down than when he is standing.

2. RAISE THE BLEEDING PART OF THE BODY.—This makes it more difficult for blood to escape as it now has to be pumped " uphill " from the heart. The only parts of the body which can be raised are the arms and legs. Should a fracture also be present, the affected limb must not be raised until after the broken bone has been fixed.

3. EXPOSE THE BLEEDING PLACE.—Open up, or cut, clothing to do this. Remove no more clothing than is necessary.

4. COMPLETELY COVER THE BLEEDING PLACE WITH A THICK PAD ; BANDAGE THE PAD FIRMLY IN POSITION.—A folded triangular bandage or handkerchief are good pads. When you have neither of these, you should make a pad by folding the cleanest piece of material that you can find.

Whatever you use as a pad must be large enough to cover the whole bleeding area completely.

5. CONTINUE THE TREATMENT FOR SHOCK, which you have already begun by laying the man down. (*See* Chapter III.) Remember : loosen tight clothing, get the man warm, give him a drink and cheer him up.

The pad and bandage may fairly quickly become soaked with blood, but none should now run away from the wound. If the pad does become very wet, it means that it is not pressing hard enou

in the right places to squash the bleeding vessels flat. Do NOT remove the first pad, but put on another pad (of cotton wool if you can find it, or waste or any other similar material) to cover the first one completely, and fix this with another bandage which is tighter.

Do not think that a spreading stain on a dressing must mean that you have failed to stop the bleeding. A small cupful of blood will soak a long way through pads, and a big wound usually contains at least as much blood as that. But if the pads become so soaked that blood drips or trickles from them, bleeding is still going on. The most likely reason is that the pads are not completely covering the bleeding places and pressing on them.

If the bleeding continues despite all that you have already done, and it is obvious that you cannot stop it with pads, then you should, *as a last resort*, put on a tourniquet as shown in the next section. This may very occasionally be necessary with large wounds in which a great number of small vessels have been cut; it may also be necessary if, in fact, a main artery has been cut, although you had not recognized this at first.

BLEEDING FROM THE MAIN VESSELS OF THE ARM OR LEG

The great loss of blood which occurs when the main artery of the arm or leg is cut will kill a man in a minute or two. Blood will be pouring or spurting out of the wound and you must *take immediate action*. You must act more quickly for this kind of bleeding than for any other injury. It is an occasion on which *a man's life is entirely in your hands*; it is a time when, if you neglect instant action, death is certain to follow.

All you have to know is the "pressure point" in the arm and in the leg, and how to put on a "tourniquet." (These are described in separate sections later in this Chapter).

1. PRESS ON THE PRESSURE POINT.—You will know when you are doing this properly as the bleeding will then considerably diminish or even stop.

2. GET A TOURNIQUET PUT ON.—Shout for help. Another man must put on the tourniquet while you keep your grip on the pressure point.

Thus the bleeding is stopped. The man's life is saved. Now you should cover the wound and give first aid for shock.

PRESSURE POINTS

A "pressure point" is a spot where you can press with your fingers against a bone so that you flatten out a main artery which lies between that bone and your fingers; thus blood cannot run along the artery and it ceases to escape into the wound further down the limb. This is somewhat similar to the emergency way of stopping loss of water from a lead pipe by beating it flat with a hammer a little distance away from the actual break in it.

The pressure point in the arm lies in the groove on the inner side of the biceps muscle. This is the muscle which you can so easily make stand out on your own arm when you want to show your strength. Figure 20 shows exactly where it is and how to place your fingers on it. Try to stop the blood running down a man's arm by pressing the spot indicated. You will know if you are correctly squashing the artery flat by a feeling of numbness which will develop in his hand almost at once.

The pressure point in the leg is right in the middle of the groin. Figure 22 shows how to find the spot and how to press your thumbs on it. Practice is recommended.

When pressing on the pressure points do not bend the end joints of either your fingers or thumb, but keep them straight. This is shown in the illustrations.

It is difficult to keep up the necessary pressure at these two points for more than a few minutes because your fingers will get tired very quickly. However, this is a sufficient time for someone else to get a tourniquet in position, and this is all that pressure points are used for.

METHOD OF APPLYING PRESSURE BY THE FINGERS

(1) Find the position of the artery and feel for its pulsation.
(2) Press the artery against bone and not against soft tissues.
(3) Use the thumbs for compression when possible.
(4) Compress the artery at the nearest compressible point on the side of the wound nearest the heart.

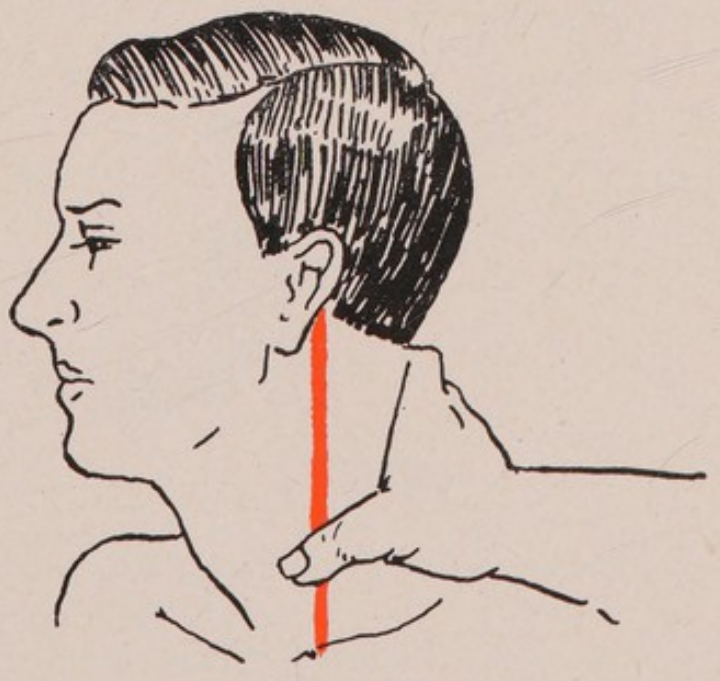


FIG. 19.
Compression of the Carotid Artery.

FIG. 20.

Compression of the Brachial Artery.

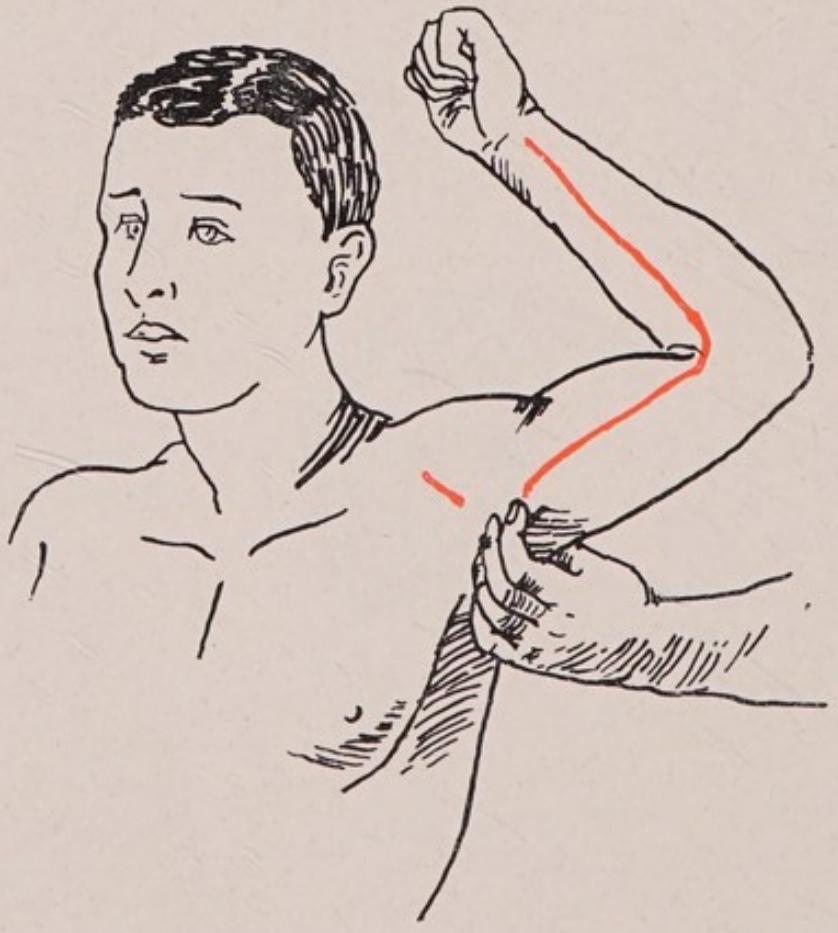


FIG. 21.

Compression of the Axillary Artery.

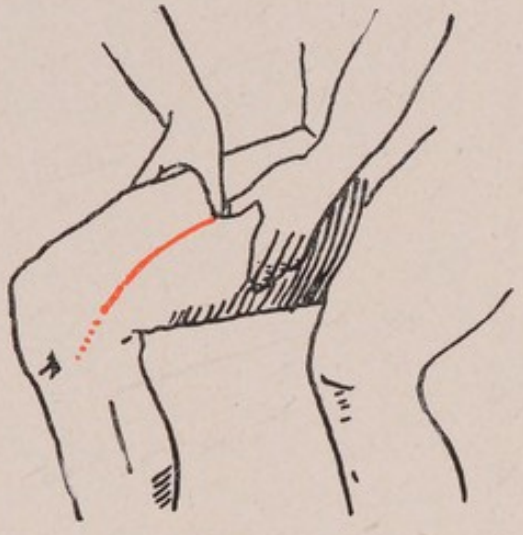


FIG. 22.

Compression of the Femoral Artery.

A pad and bandage are then fixed as in Fig. 23.

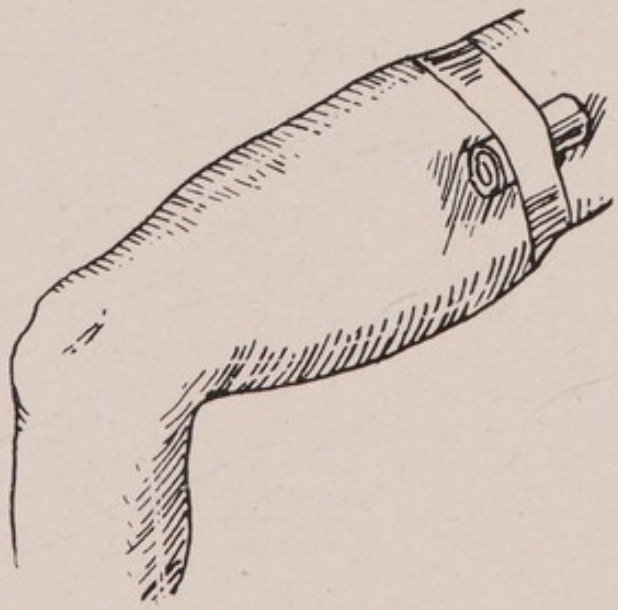


FIG. 23.

A pad for this purpose may be made by wrapping a cork or similar article in a piece of lint.

Other methods of arresting hæmorrhage are by

(*a*) Forced Flexion.

(*b*) Tourniquets.

FORCED FLEXION is only applied at the elbows and knee joints. A pad is placed in the bend of the joint, the limb is forcibly flexed or bent and fixed in this position by means of a bandage. This method is rather painful (figs. 24 and 25).

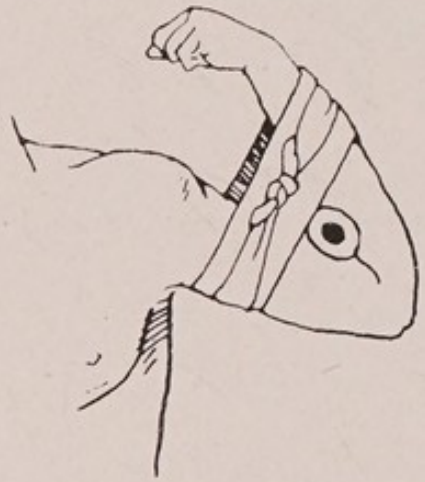


FIG. 24.

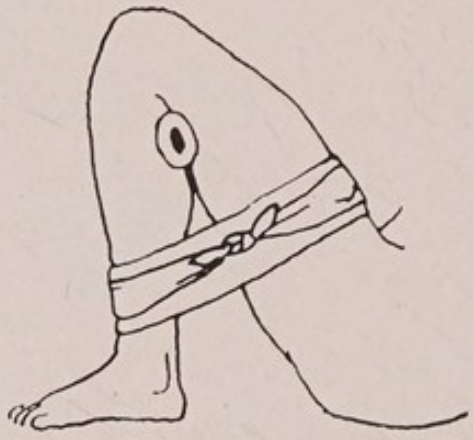


FIG. 25.

TOURNIQUETS

Any long piece of narrow and strong material which can be secured round either an arm or a leg in order to stop bleeding is known as a tourniquet. It presses all round the upper part of a limb with such force that every single blood vessel is squashed flat. Provided that it is tight enough and applied on the upper arm or thigh, a tourniquet never fails and the bleeding is absolutely certain to stop.

But there are two facts which it is essential to know about tourniquets. Every part of the body needs blood to live, and a limb can only live for about half an hour without fresh blood. If you leave an effective tourniquet on for an hour or two, the arm or leg will die : It will go rotten and gangrenous and will have to be amputated. Many limbs have had to be cut off because a tourniquet has been left on too long. The first fact, then, is that a tourniquet must not be used for a moment longer than necessary. When it must stay on for a long time, *it must always be loosened every half an hour to allow blood to flow into the limbs for about half a minute.* Some blood may escape when this is done, but other fresh blood will circulate in the limb and keep it alive.

The other fact is that the soft veins are squashed far more easily than the strong arteries. A tourniquet which is too loose will trap the blood flowing out of the limb by the veins and yet will not block the blood from being forced into the limb by the arteries. So there will be more blood in the limb and the wound will bleed worse than with no tourniquet at all. The second fact, then, is that until the tourniquet stops the bleeding, it is doing harm and must be tightened ; *if you cannot make it stop the bleeding, take it off.*

As a " tourniquet " you may use any of the following :

1. Triangular bandage folded narrow.
2. Strong handkerchief folded narrow like 1.
3. Any other strong strip of clothing such as a necktie, belt or pair of braces.
4. A length of rope or cord.
5. A piece of rubber tubing.

Remember that the great majority of types of bleeding can be controlled by pad and bandage and *do not require a tourniquet.* Even if a tourniquet is at first necessary to arrest violent haemorrhage, an attempt should be made, while the tourniquet is still on, to obtain sufficiently firm pressure by pad and bandage, to enable the tourniquet to be dispensed with.

How to use a Tourniquet

Place the " tourniquet " round the upper part of either the arm or the leg, higher than the wound, and secure it with a knot through which a stick or closed jack-knife has been placed, as shown in figure 26

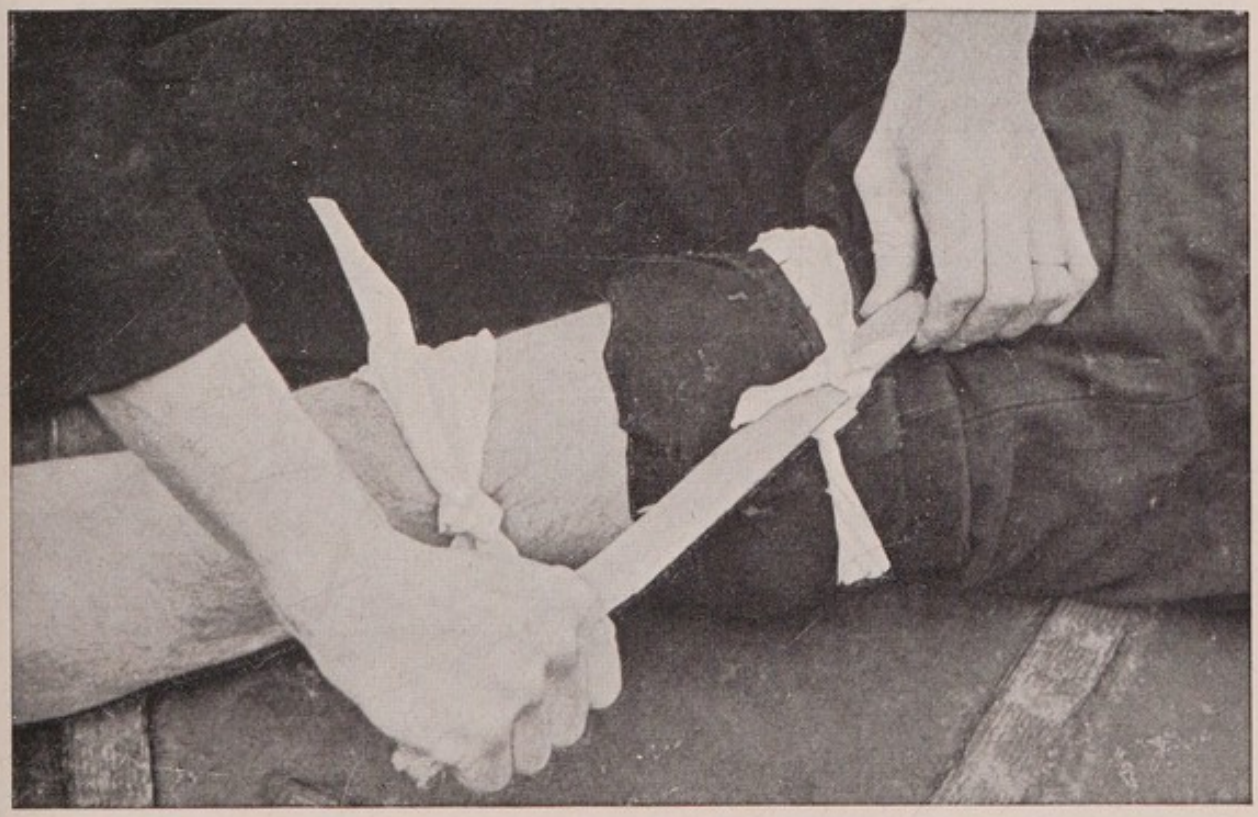


Fig. 26.—*Twisting a tourniquet tight.*

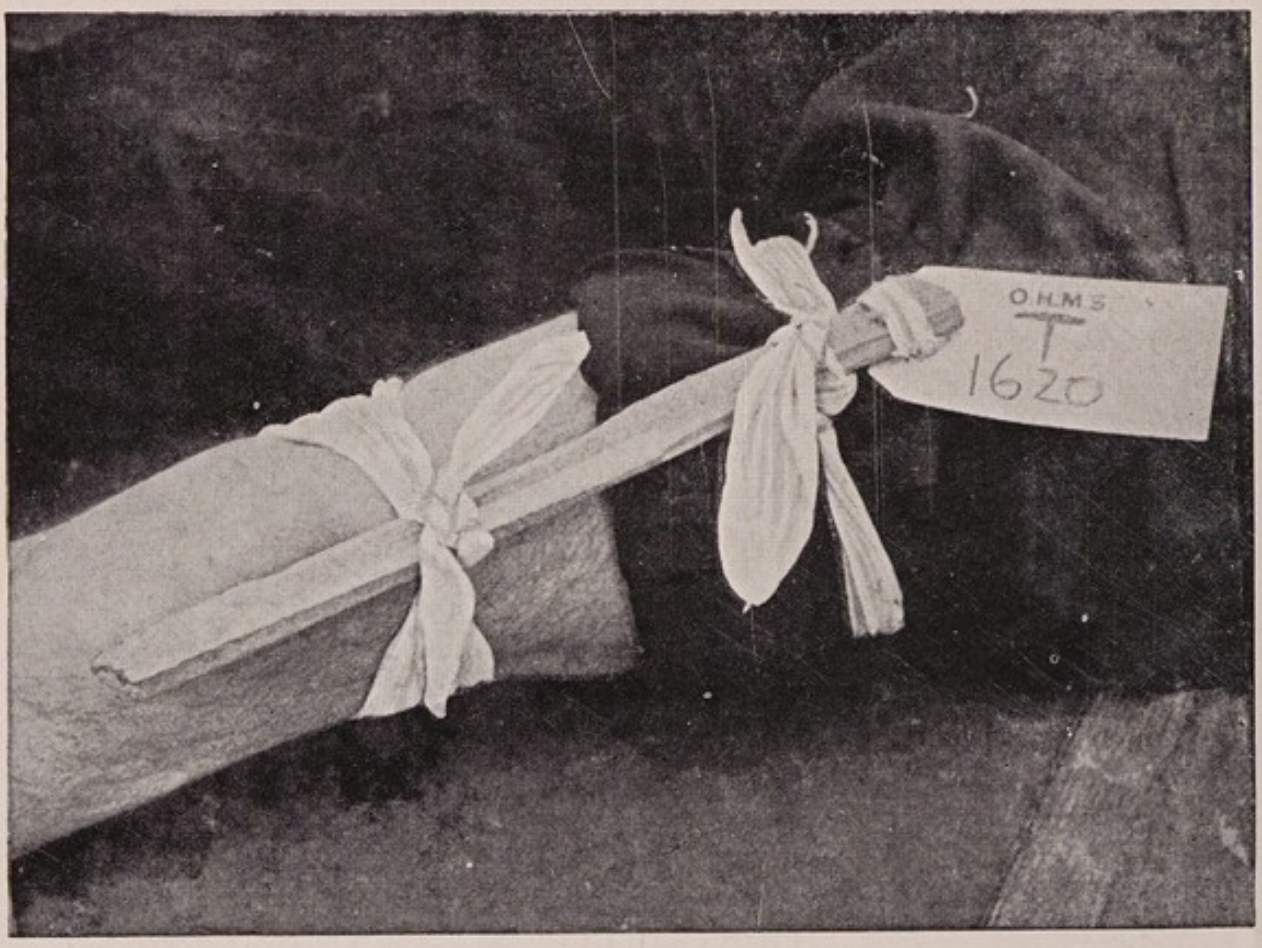


FIG. 27.—*A tourniquet secured tight.*

Note.—The stick is prevented from untwisting by its end being held in another bandage.

Now, using the stick as a lever "screw up" the knot to tighten the tourniquet; you should twist the stick until the bleeding stops and then no more. It is a rule that a tourniquet should be tight enough to stop bleeding, but no tighter. You can fix it in its tightened position by securing a second bandage round the limb and holding one end of the stick in this to prevent it untwisting.

You should put a tourniquet on over a man's clothes or over padding so that it does not pinch the skin.

After the tourniquet has been fixed in position, and the bleeding has stopped, you should cover the wound and treat for shock. When you have completed this, remember the rule: A TOURNIQUET MUST BE LOOSENED EVERY HALF AN HOUR. You may not be able to stay beside the man on whom you have put a tourniquet, so ATTACH A LABEL TO HIS CLOTHING SHOWING THE TIME IT WAS PUT ON.

After half an hour, the tourniquet is loosened to see whether the bleeding has now stopped by means of the pad alone. If it has, leave the tourniquet round the limb completely loose, but in readiness to tighten again if bleeding should begin again.

If it has not been stopped, tighten the tourniquet once more and leave it for another half-hour. Then test again to see whether the bleeding has stopped.

When to use a Tourniquet

Although you have learnt that tourniquets are *very seldom* necessary, you should remember the occasions (that have already been mentioned) on which you must make use of them. These are

1. Bleeding from a main vessel of either the arm or leg.
2. When bleeding which you have tried to stop with a pad and bandage continues to be bad.

In addition there is a third occasion on which you must use a tourniquet, i.e.,

3. When an arm or leg is totally torn off.

In such a case the tourniquet must be put on and left on without being loosened at any time. It must be put on as near the stump as possible.

The medical stores in most ships include a St. John tourniquet. This is just a canvas strap which includes a stick for twisting. It also has a pad which should be put over the pressure point, but this is not at all necessary. It is no more effective than a handkerchief and jack-knife.

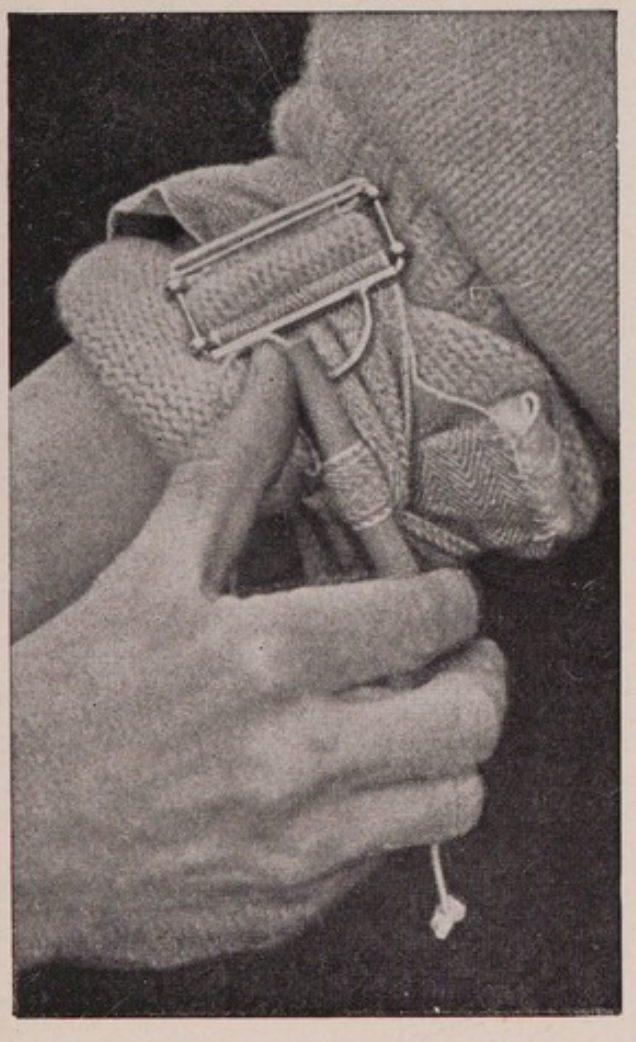


Fig. 28.
The St. John tourniquet.

After using a Tourniquet

When the tourniquet has controlled the bleeding an effort should be made to tie the artery as follows :—

All clothing, dressings and bandages should be removed and all blood clots washed away with wads of cotton wool wrung out in antiseptic lotion. When the wound has been completely exposed to

view look for the bleeding point. The end of a cut artery may be seen, and if the bleeding has not been completely stopped by the tourniquet, jets of blood may be seen coming from it corresponding to the beats of the heart. The artery forceps, the one with the catch on it (fig. 29), which has been disinfected either by placing for two or three minutes in boiling water or in antiseptic, must then be used to catch the bleeding end of the artery. To tie the artery, after clamping the forceps pull it slightly forward, and while the forceps is being held, pass a ligature of silk or other available material, previously disinfected, round the picked up artery beyond the forceps and tie firmly with a reef knot, cutting off the ligature ends about half an inch from the knot. Next, let go the forceps, ease up the

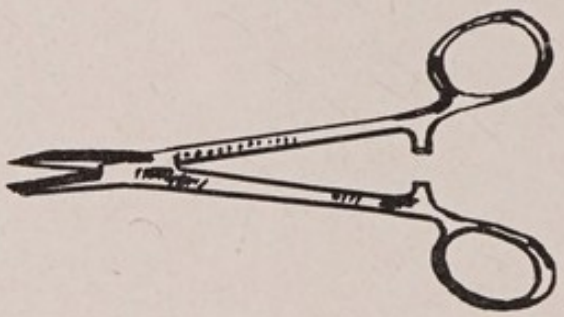


FIG. 29.
Artery Forceps.

tourniquet and see if the blood continues to spurt. If so, you have failed to secure the artery and must try again.

You may, and in the case of large arteries will certainly, have to tie up, both ends of the cut artery, since both will spout blood.

When the bleeding has been successfully stopped the wound should be dressed and bandaged.

In the case of a large artery in the leg or arm, a tourniquet should be left loosely round the limb so as to be readily available in case the bleeding should start afresh.

BLEEDING FROM A MAIN VESSEL IN THE HEAD OR NECK

In either case :—

1. Hold a pad very firmly on the bleeding spot at once.
2. Secure this pad with a bandage, when it is possible.

Obviously you must not tie a tight bandage round the neck. The pad, in this case, must continue to be held in place.

In addition, in the case of the scalp, if the bleeding does not stop with a pad and bandage, put a "tourniquet" round the head as shown in figure 30.

FIG. 30.—*A tight bandage round the head to stop bleeding from the scalp.*

In many cases this will stop the bleeding; but remember the rules for a tourniquet and use them here; if the bleeding does not stop, take it off; and test it after half an hour.

BLEEDING FROM A MAIN VESSEL IN THE PALM OF THE HAND

1. Place a big firm pad, in the shape of a ball, into the hand.
2. Tell the man to hold it.
3. Bandage the hand very firmly so that it looks like a small boxing glove.
4. Raise the hand and arm in a sling.

BLEEDING FROM A MAIN VESSEL OF THE BELLY OR CHEST

This is one of the causes of almost instant death.

It is impossible to stop severe bleeding coming from the very large and hidden arteries of these parts of the body. You cannot press them flat and the injured man will be dead almost as soon as you begin to give him first aid.

BLEEDING FROM THE ARMPIT

Place a pad in the armpit and bind the arm tightly to the body.

Bleeding from the Foot

If from the front, a pad and bandage should be tightly applied. If from the sole, a pad in the hollow and a tight bandage should be sufficient. The foot should be raised on a pillow above the body.

Bleeding from the Mouth

Ice or cold water held in the mouth usually stops it. If not, try very hot water. If this does not succeed try powdered alum.

Bleeding from Ruptured Varicose Veins

The patient should lie down with his leg held higher than the body when in most cases the bleeding will stop at once. Pressure with a pad of lint should be made on the bleeding part till the bleeding stops, after which a pad and bandage lightly applied should suffice provided you keep the man lying down with the leg raised well up. There should *never* be need to apply a tourniquet for bleeding from varicose veins.

Internal Bleeding

"Internal bleeding" is said to be taking place when bleeding occurs within the body with scarcely any, or no blood at all, being visible externally. This kind of bleeding comes from the vessels of the chest and belly which may be damaged by accidents in which the body is crushed. These same internal vessels may be damaged in wartime by bullets and small pieces of flying metal which penetrate deeply into the body while only causing a slight wound in the skin; also as a result of explosions in the water (as by depth charges) near men swimming in it.

You can recognize that a man has internal bleeding by seeing that he has the general effects of serious bleeding (see page 34) without your being able to discover any blood.

First Aid for this is as follows:

1. Treat for shock but do not put any hot water bottles near his chest or belly.

2. Do not give any fluids to drink.

If this kind of bleeding does not cease by natural means then it can only be stopped by a surgeon performing a very difficult operation, and this will not be possible. You should, however, give morphia, as this always helps to stop bleeding.

Vomiting Blood

The blood which is vomited may have been swallowed from an injury to the throat or mouth or it may come from some form of damage to the stomach. Except when it is the result of a serious wound of the belly it is not usually dangerous to life.

1. Treat it as a case of internal bleeding.

2. Give some small pieces of ice to suck, but nothing else.

As part of your treatment for shock remember to reassure the man that this kind of bleeding is not dangerous and that it will soon stop.

Coughing Blood

The blood which is coughed up may have trickled down the windpipe from an injury of the throat or it may come from some form of damage to the lungs. Except when it is the result of a serious wound of the chest it is not usually dangerous to life.

You should treat as for any other case of internal bleeding.

Bleeding from the Nose

If this is due to a blow on the nose the small bones of the nose may or may not be fractured. Treatment is the same in either case.

1. Sit the man on a bench or the deck, do not let him lie down.

2. Tell him to breathe through his mouth, and not to blow his nose.

3. Put a pad soaked in cold water over his nose and also on the back of his neck.

A fractured nose will bleed badly as a rule.

If the bleeding is not due to a blow but starts suddenly without obvious cause it can be controlled and may be stopped by the man pinching his nostrils and breathing through his mouth.

SUMMARY

1. THE COMMON KIND OF BLEEDING :—

This always occurs with all wounds. Blood wells up into the wound and flows over its edges in a steady stream.

1. Lay the man flat.
2. Expose the bleeding place.
3. Completely cover the bleeding place with a thick clean dry pad. Firmly bandage this pad into position.
4. Treat for shock (rest, warmth, drink, cheer).

If the bleeding does not stop, firmly secure a second pad on top of the first pad and bandage.

If the bleeding still does not stop, put on a tourniquet.

2. THE RARE KIND OF BLEEDING.

This occurs only when a main artery is cut. Blood sometimes spurts out of the wound in jets. Blood always pours over its edges in rapid and copious streams.

1. AT ONCE press on the pressure point.
2. Get a tourniquet put on.
3. Cover the wound with a thick clean dry pad. Very firmly bandage this pad into position, ease the tourniquet to see if you have successfully arrested the bleeding by means of the pad. If not, tighten the tourniquet and try again.
4. Treat for shock (rest, warmth, drink, cheer, morphia).

Loosen the tourniquet every half-an-hour.

Leave it off altogether as soon as possible.

CHAPTER VI

WOUNDS AND EXPLOSION INJURIES, BURNS AND SCALDS

KINDS OF WOUNDS

There are four different kinds of wounds which may occur at any time.

Cut (Incised).

This is a cut or clean split of the skin and the flesh beneath. It is often caused by broken glass, a slash with a knife, or a blow on the scalp with a blunt weapon. Its importance lies in the large amount of bleeding which may take place. In addition, incised wounds of deep flesh, for example the thigh or buttock, tend to gape widely open.

Torn (Lacerated).

This kind of wound has raggedly torn edges. It may be caused by moving machinery or flying metal splinters which tear the flesh. Lacerated wounds bleed less freely than incised wounds because when blood vessels are torn their lining curls inwards and lessens the escape of blood. Shock is usually severe even in the absence of bad bleeding, because much flesh may be damaged or completely torn away.

Bruised (Contused).

This is a wound with bruising of the flesh around it. It may be caused by a direct blow with something blunt, by sudden pressure, or by crushing. This kind of wound is usually not dangerous in itself, but when you see it on the head, chest or belly you should suspect serious injury of the brain or internal organs.

If shock is severe at first and continues to be so although you have given first aid, internal injury is probable.

A contused wound due to crushing (such as may be caused when a limb is pinned down under wreckage) does not usually cause severe shock at first, but some hours after the limb has been released shock often gets worse.

Stab (Punctured).

This kind of wound has only a small opening, but it may be very deep. It is often caused by a fall on a spike or a thrust with a knife. It usually bleeds very little, but the internal organs may be badly damaged.

Bullets drill a neat hole in the body and the wounds they cause, which bleed very little (unless, as rarely happens, a main artery is cut), are usually no larger than a stab with a pencil. They may easily be overlooked. Larger wounds (which are lacerated) are caused by bullets fired from a close range (a few hundred yards).

Metal fragments and bullets may remain embedded in wounds, or they may pass right through the thickness of the body or a limb ; that is, having made an opening in the skin (called the entry wound), they travel through the body and make another opening (called the exit wound) in the skin on the opposite side where they leave the body. Exit wounds are always larger than entry wounds.

Bullets usually cause an exit wound no larger than half-a-crown, but if a bullet strikes a bone, breaking it into many pieces, some of these pieces may be driven out of the body with the bullet, causing a larger wound. Therefore, an exit bullet wound which is larger than half-a-crown usually means that a bone has been broken.

It is important to remember that the point of entrance of bullets and splinters may be marked only by a very small tear in the clothing which gives no clue to the damage done to bones or internal organs. For example, during the operations in Norway in 1940 an officer was wounded by a bullet which entered his right ankle. It struck his shin bone, was deflected upwards, and then travelled up in the muscles of the back of his leg to reach his right thigh. Then it crossed to the other thigh and stopped near his left buttock. In another case a metal splinter entered the buttock and, by reason of its direction and the position of the man when hit, penetrated to the belly causing internal bleeding. Other splinters, as they travel through the body, may shatter bones, cut nerves or blood vessels and damage the internal organs. As you give first aid for a wound, try to decide whether the injured man has any evidence of internal damage. If he has, it may be even more important for you to give first aid for that than for the wound itself. A small puncture wound of the belly or chest is often more dangerous than a big laceration of a limb.

Explosions often throw men and fittings into a heap together, with the result that bruised wounds are frequently seen after such experiences. Also, men may be crushed or pinned in damaged compartments. It is a rule that men who have had bruised wounds from such causes should be looked at most carefully to exclude other injuries, such as fractures.

Another rule with casualties is *you must never take it for granted that the wound you first see is the only one present.* For example, do not overlook the small entry wound of a bullet or splinter, and give first aid only to the larger exit wound. Also you should try to discover whether there are other injuries in other parts of the body. In such cases, as always with first aid, you must use your

common sense, combined with the extra knowledge that this book gives you, to decide what to do. But always remember this : Stop the worst bleeding before all else and then stop all other bleeding. Then give first aid for shock.

WHY WOUNDS ARE DANGEROUS

The immediate dangers from wounds are :

1. *Bleeding.*
2. *Shock.*

You have already read about these in chapters III and V and you should remember that each may be slight or extremely severe. If you are not absolutely certain of the first aid for shock, look again at the Summary on page 24.

The third danger which always exists with all wounds is :

3. *Poisoning* (*Sepsis*).

By this is meant the entry of germs into a wound. Germs (sometimes called microbes or bacteria) are always present in the air and in water. They exist on every object, they lie on the skin and hair of your body, they swarm in your clothes and are to be found in thousands on the fingers of everyone. Thus, however small and unimportant a wound may appear to be, germs are nearby and ready to enter it all the time. A small number of germs do actually enter every wound. They are pushed in from the skin and clothes by the object causing the wound. You cannot stop this. But you can and must prevent other germs getting into a wound after it has been inflicted. You can do this by keeping everything away from the wound (above all, keeping your own fingers away) until it is covered by a dressing. Fortunately, poisoning does not always take place as many germs are harmless to man ; also because the blood contains little living bodies (white cells) which attack germs and often destroy them before they can do any harm. However, if the army of invading germs is stronger than the defending white cells, then poisoning does take place.

A wound that has been poisoned has an unhealthy appearance and is painful, swollen, red and hot (like a boil). Later, pus is formed and discharged as " matter." In addition, the poison may spread from the wound into the blood which is circulating in the body, giving rise to what is called " blood poisoning." This spread of poison all over the body is very dangerous and may be fatal.

Mark the difference between the progress of a healthy or clean wound and an unhealthy or a dirty one. The former is almost painless. It heals quickly with very little scarring and the injured man soon returns to duty, perfectly fit. The latter is very painful and makes the man feel seedy and miserable. For weeks he remains on

the Sick List with the wound discharging matter. Even when the wound does heal, a large scar remains, which is not only unsightly but also may cause stiffness of joints.

Poisoning of wounds is therefore serious. This is the reason why one of the most important objects in treating a wound is to prevent germs entering it.

HEALING OF WOUNDS.—Wounds heal in two ways ; first, by what is called " first intention "—that is, quickly and without discharge ; secondly, by what is called " granulation," when new flesh grows from the surface of the wound accompanied by the formation of a varying amount of matter or discharge. When wounds heal by first intention it shows that they are clean or aseptic, that is, free from germs which cause inflammation and suppuration. In order that a wound may heal quickly it is necessary to keep it absolutely clean, and the present mode of treatment of wounds is partly Aseptic —that is, to prevent the introduction of germs to the wound and partly Antiseptic—that is, to destroy germs that have already found their way into the wound.

There are many substances known as antiseptics, and they are used by being applied to a wound and the surrounding skin with the object of destroying the germs.

The best and most convenient germ killer to use on wounds is Sulphanilamide, which is supplied in the Medicine Chest in the form of a powder ready for use. It may be applied by dusting it on from the sprinkler-top container in which it is supplied. While it stimulates the body to kill the germs it does not do any harm to the tissues. Other antiseptics are :—

(1) *Boric Acid Lotion.*—A mild antiseptic used for cleansing tender parts such as eyes, nostrils and mouth. Boric (pink) Lint is carried and is a useful way of using Boric Acid for small wounds, ulcers, abrasions, etc.

(2) *Dettol.*—A powerful antiseptic. To be used for cleansing the hands before treating wounds of any kind. One teaspoonful to a pint of water is a suitable strength. In absence of Iodine this strength of Dettol may be used for treatment of wounds.

(3) *Iodine.*—A strong antiseptic, may be applied all over a wound.

GENERAL TREATMENT OF WOUNDS.—(1) Stop the bleeding, if any. (2) Wash your hands and scrub them thoroughly with a nail brush, soap and hot water. After that rinse them in an antiseptic lotion such as Dettol, and do not dry them. Everything likely or intended to touch the wound must be disinfected. (3) The wound must be thoroughly cleansed with antiseptic lotion by squeezing over it a piece of cotton wool steeped in the lotion.

Turpentine is useful for removing from the skin grease and dirt such as are found in accidents due to machinery. If hairy, the skin

should be shaved for a distance of three inches round the wound. All dirt should be removed from the wound. All loose hairs, soap, etc., should be removed by sterile water—(that is, water which has been boiled and allowed to cool)—by squeezing it out of cotton wool over the part.

Sulphanilamide Powder should be dusted freely over the wound and about three inches of the surrounding skin. The wound is now ready for stitching if that should be considered necessary, after which it may be dressed and bandaged.

Stitching or Suturing of Wounds—General Indications.—If a wound is deep and gaping and the edges cannot be brought and kept together by strapping or bandaging, then it will be necessary to put in one or more stitches.

Never stitch up a dirty wound.—Methods of stitching :—You are supplied with small glass tubes containing a sterile hank or length of silk on which is threaded a surgical needle. This needle is shaped like a sailmaker's needle. To break the tube wrap it in a piece of cotton wool, lint or gauze and placing the thumbs against the " fracture scratch " on the tube, snap the tube as if it were a stick. Carefully draw out the needle and thread, handling it as little as possible.

Take your forceps, which have been previously placed for a few minutes in boiling water, grasp one edge of the wound with them and gently but firmly force the needle through the skin about a quarter of an inch away from the edge of the wound, directing the needle towards the wound. Then grip the skin on the opposite side of the wound and push the needle up from the wound side through the skin so that the point comes out a quarter of an inch away from the wound. Tie with a reef knot, using sufficient tension to bring the edges of the wound together.

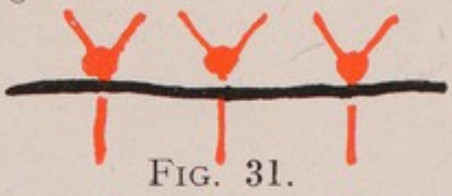


Fig. 31.

Repeat the process as many times as is necessary, one stitch for every three-quarters of an inch being usually sufficient.

Dust the surface freely with Sulphanilamide Powder, apply plain gauze cotton wool and a bandage.

Do not disturb the dressing for two days. If on removing the dressing after that period you find matter oozing from the wound do not hesitate to cut one or more of the stitches to release the matter. You will then have to adopt the general treatment of septic wounds.

If the wound is deep and a considerable amount of flesh as well as skin is cut, it will be necessary to insert the needle deeply down so

as to ensure that the sides of the wound are brought in apposition. If this is not done, pockets are liable to form of serum and blood and give rise to abscesses. A useful method of stitching for deep wounds is known as " Canadian stitching " or " Mattress stitching." It is a variation of the interrupted suture by which a good grip is got by the needle of the flesh on each side and, after emerging, it is passed through the opposite edges of the skin before being tied.

Fig. 32 gives the idea. If the edges of the skin are kept together, healing by first intention is more likely to take place.

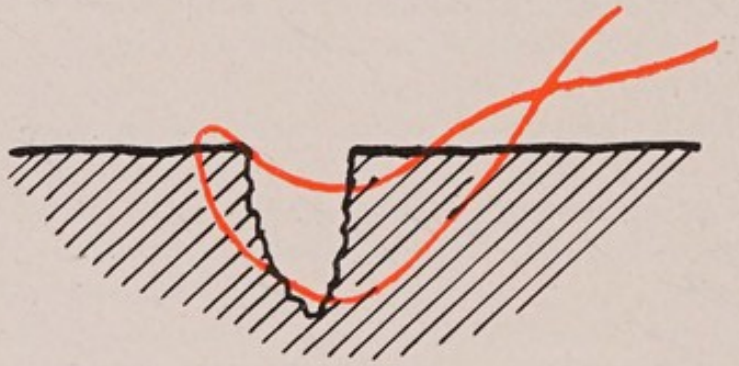


FIG. 32.

DRESSING OF WOUNDS.—The dressings commonly used include gauze, lint, cottonwool and bandages.

Gauze.—Plain white gauze is used for clean fresh wounds after the application of Sulphanilamide. It is also used for stuffing into a deep dirty wound or an abscess and for this purpose should first be soaked in Iodine, diluted to half strength by adding an equal part of water.

Lint is either plain white or Boric, which is pink coloured. Both are very useful dressings. The woolly side should not be put next the wound.

To dress a clean wound, after Sulphanilamide Powder has been applied place several layers of white gauze over the wound, cover with cottonwool, and secure by bandaging. If in a situation where it is difficult to keep it in place, a couple of strips of adhesive plaster over the cottonwool and stuck to the skin on each side will make bandaging easier. The part should be kept at rest by a sling, or splints or rest in bed.

If the skin round a wound looks red and angry with probably some swelling and throbbing pain, it shows that it has been infected with germs and that there is some amount of inflammation. Hot Boric fomentations should be applied four-hourly till all signs of inflammation are gone and then dressed with Boric lint wrung out of warm water, till the wound is healed.

If a dressing sticks to the wound it may be easily removed by being soaked with sterile water—water that has been boiled, or with Boric lotion.

INCISED or Clean-Cut wounds are made with sharp instruments. They usually gape and bleed freely. Unless they get poisoned, they heal readily by first intention.

Treatment.—Proceed as given under General Treatment of Wounds. The cut edges should be brought together and kept together, either by stitches or by strips of adhesive plaster placed at intervals across the cut. If the wound is a large one, the end of a strip of gauze must be inserted in the lower end so as to keep the edges apart and allow drainage for the fluids which accumulate in the wound. When the gauze becomes soiled a fresh piece is inserted and kept renewed till it remains dry, when it may be left off. If the wound be clean and the patient in good health, it is probable that in two or three days the edges will have united and the wound healed. As a rule it will be unnecessary to change the dressing for the first two or three days. If the wound becomes inflamed, plaster or stitches should be removed before fomentations are applied.

LACERATED OR RAGGED WOUNDS. These are generally caused by some blunt instrument and are often the result of machinery accidents. In these cases the flesh is more or less torn and the edges are ragged and unequal. There is usually much less bleeding than in clean-cut wounds, and often there is not much pain. They generally heal by granulation with the formation of mattery discharge. The process of healing may take some considerable time and an ugly scar is often left.

Treatment.—The wound must be very thoroughly cleaned as before directed, taking care that all dirt or foreign matter is carefully removed. The wound, after being treated with Sulphanilamide, is dressed with plain white gauze. Boric lint may be used instead of gauze for dressing, and should be wrung out in sterile water and spread over the wound.

PUNCTURED WOUNDS OR STABS.—These are produced by pointed instruments and are much more dangerous than clean cuts on account of their depth. Vital parts, such as arteries, may be injured ; the point of the weapon may be broken off and left in the wound ; these wounds are very likely to be followed by inflammation, fever and deep abscesses.

Treatment.—After washing out, Sulphanilamide Powder should be applied. With this simple treatment the wound will probably heal. If, however, it throbs and becomes hot and painful, hot Boric fomentations should be applied and changed every two or three hours. If the patient is feverish he must have a free purge—2 grains of Calomel followed in about six hours by half an ounce of Epsom salts in water, and a dose of the Sweating Mixture every four hours. When all discharge has ceased, the wound should be covered by some simple antiseptic dressing as before.

Wounds of Special Parts

The Scalp.—There is usually a good deal of bleeding which can be easily controlled by pressure. The hair must be shaved round the wound and stitches inserted if necessary.

The Face.—These wounds usually heal quickly, but in order to prevent a scar an effort should be made to bring the edges of the skin together. Fine stitching may be required.

The Eye.—A scratch on the eyeball may be followed by inflammation and probably loss of sight of the eye or in some cases a disfiguring scar. Boric lotion is the best application and must be used freely and frequently. Hold a piece of cotton wool soaked in the lotion,two inches over and above the eye and allow the lotion to run off the cotton wool into the open eye. Repeat this every hour. In the intervals leave the wet pad of cotton loose on the eye and cover with an eye shade. If there is a lot of pain put a bandage over the other eye as well. If the eyeball is pierced or burst follow the same treatment.

The Throat.—A cut throat is usually the result of attempted suicide with a razor. If it is deep and has cut through the blood vessels and windpipe it is a serious condition.

Treatment.—Endeavour to stop the bleeding by applying pressure. Raise the patient's head so that it bends forward to help to bring the edges of the wound together. Stitch if necessary and dress with Cotton Wool and bandage. The patient should not be left alone in case he tears off the dressing.

The Chest.—These are often due to stabs or bullets. Wounds of the heart are nearly always fatal. If the lungs are penetrated, frothy blood may issue from the wound and may be coughed up.

Treatment.—Lint or gauze should be placed immediately over the wound, covered with Cotton Wool and a broad bandage applied tightly round the chest so as to prevent as far as possible the movement of the ribs. The man must lie on the wounded side.

The Abdomen.—These are often fatal, as some vital part is generally wounded.

Treatment.—The wound should be dressed and the patient placed on the wounded side. If the bowel protrudes it must be washed with warm Boric lotion or warm solution of salt—a teaspoonful to the pint—and gently returned by pressure with the fingers and the wound closed by one or two stitches. A broad bandage must be applied so as to exercise a steady pressure over the whole surface. No opening medicine must on any account be given.

It may be necessary to give one or two tablets of morphia ($\frac{1}{4}$ gr.) to make the patient drowsy.

Cold water may be given or toast and water, until improvement sets in. Fluids should not, however, be given in perforating wounds of the abdomen.

GUN SHOT WOUNDS.—These wounds may be caused by rifle or revolver bullets or by shot from a sporting gun. They are usually of the nature of punctured wounds, although a shot-gun at a short distance may produce a large lacerated wound.

Treatment.—The general treatment should, as a rule, be the same as for other wounds. Shock or collapse usually occurs and is treated by laying the patient down with the head low and the feet raised, at the same time applying warmth to the body.

If the bullet or other foreign body can be felt it may be gently removed by the fingers or a pair of forceps.

JOINTS.—These are serious injuries, and stiffness of the wounded parts as well as severe pain and swelling often follow. A stiff joint frequently results.

Treatment.—If the joint has been definitely opened as shown by escape of the joint fluid, which is a clear fluid, then the best treatment is a continuous dripping of an antiseptic lotion over the wound. To do this hang the douche can filled with warm Boric lotion (two teaspoonfuls to the pint) about three feet above the bunk and so arrange the tube and pinch cock that the lotion drips into the wound at the rate of about one drop per second. This should continue for several hours at a time and though awkward to carry out may be the means of saving the joint and possibly the man's life. You should arrange to land or transfer the patient at the earliest opportunity.

INJURIES DUE TO EXPLOSIONS

When an explosion occurs there is a sudden and violent disturbance of the air ; first a powerful wave, or blast, of air radiates outwards ; then there is a rushing-in of air back towards where the explosion happened.

The blast of air may hurl men down and result in their being hit by tumbling wreckage. In addition to producing casualties in these ways, the blast of air itself may strike against the body with so great a force that severe and even fatal injuries are caused. These injuries, due entirely to the violent movements of the air near to explosions, are called " blast " injuries. The effects of blast are usually more severe in enclosed spaces (for example, between decks) than in the open.

It is rare for a man to have a blast injury alone—in many cases there will be external wounds and injuries as well, just as you would expect to find in men who have been near an explosion.

1. Blast Injury of the Lungs

The lungs are damaged in this way : the blast of air caused by an explosion strikes the chest, putting pressure on it, and at the same drives air down the throat into the lungs. Immediately following this the pressure is suddenly taken off the chest wall and air is sucked out of the lungs again by the wave of air rushing back towards the place of the explosion. As a result of these changes of pressure inside and outside the chest, the capillaries of the lungs are torn so that bleeding takes place inside the lungs.

A man affected by " blast " is very shocked, but because the damage to his lungs interferes with his breathing and also the purification of his blood, he usually has—

1. Quick shallow breathing, with difficulty in getting his breath.
2. A feeling of tightness, or pain, in his chest.
3. Blueness of the face.

In more serious cases men will be found unconscious with absent or only very feeble breathing ; they may have some frothy blood-stained saliva on their lips. Other men will be found dead—the blast of air alone will have killed them without their necessarily having been wounded in any way.

Treatment

1. Take the man into the fresh air, if this is possible.
2. Lay him down with his head and shoulders raised.
3. Keep him warm.
4. Loosen tight clothing.

By giving *complete rest* you will have done all that you can to help stop the capillaries bleeding inside the lungs. Should his breathing become more difficult or stop, there is nothing more that you can do.

2. The Effects of Explosions on the Brain

The soft substance of the brain may be very shaken within its bony box as a result of the violent air movements following explosions, so that some damage may be done to it ; there may also be mental shock.

As a result of these disturbances to the brain, men may be found sitting about, incapable of moving and not caring what is going on. These men, although often to all outward appearances uninjured and not unconscious, are in a dazed condition ; they have no energy or will to move. They are " knocked silly " for the moment and may behave very foolishly—for example, although there may be an easy way of escape from a sinking ship, they may be too dazed to take it. Or, if one of them should fall, he might drown in a few inches of oil or water because he has not got the sense to get up.

First Aid

When you see such men, you should help them by telling them what to do, even leading them by the hand to safety. They will accept help dumbly like children, they need to be led.

By knowing that this dazed condition may occur and by giving the first aid for it you may save many lives—for example, you may prevent men going down with their ship when they have not got the sense to abandon her.

Burns and Scalds

A burn is caused by dry heat, by a corrosive acid or alkali or by electric current.

A scald is caused by steam or a hot liquid. There are three recognised degrees of burns : (1) Simple reddening of the skin, (2) Blistering, and (3) Actual destruction of a portion of the body tissues. In accidents of this kind there will always be a certain amount of shock depending on the amount of skin area involved.

Treatment.—Shock.—For treatment of shock, follow the general principles laid down. (For Treatment of Shock see page 20.) It is of the utmost importance in severe cases to get the patient to bed quickly and to exclude the part as quickly as possible from contact from air, water and dirt, all of which tend to aggravate the shock and ultimately to cause the burn to become septic.

Treatment of the Burn.—First degree burns and scalds ; simple reddening of the skin.—In slight cases of this kind all that is required is some soothing application to the part. Smear the part with boric ointment, spread on a clean piece of lint which may be kept in place by a bandage. There will be some irritation and burning for a few hours, but this will pass off.

Second degree burns ; blistering of the skin.—In second degree burns the top layer of the skin is raised to form blisters which contain a clear thin fluid underneath the blister and the skin is reddened and inflamed. It is very important to prevent germs from getting into the blisters because these will cause the fluid to turn into matter. Take a clean needle, hold it in the flame for a few moments so as to sterilise the surface by burning any germs that may rest on it, then prick the blister in two or three places and allow the fluid to escape. The surface skin of the blister then collapses on to the skin underneath and forms a good protective covering. The next stage is to apply a burn dressing of suitable size to the part. The dressing can be left on for 24 hours, then remove, and if the burn is found to be clean and healthy-looking, a fresh dressing can be applied. If there is any sign of sepsis, which will be indicated by a discharge of matter, apply boric acid lint, moistened with boiled water, to the part which is septic.

Third degree burns.—In third degree burns the surface of the skin may be raw or in more severe cases the skin may be partially destroyed and it will be found that the clothing adheres to the burn. The first thing to do is to try and clean up the burnt part, avoiding at the same time as far as possible, long exposure to the air. One useful way of cleaning the part and, at the same time, alleviating the severe pain is to soak the burn with a solution of washing soda. If the site of the burn is on the leg or arm, steep the whole limb in a bath of washing soda, the strength of the washing soda should be about one handful of soda in three or four gallons of water. If the burn is on the body and there is a full length bath on board, there is no harm whatever in undressing the patient and putting him in the bath filled with the soda solution. Put two handfuls of washing soda in half a bathful of water. If there is no bath available, then you must do your best by soaking a wad of cotton wool in washing soda and applying it to the part.

Remove with a pair of forceps and scissors (which have been previously boiled) as much as possible of the charred and burnt material on the surface of the burn. Do this under the soda solution if you have been able to immerse the limb or the body. Do not tear anything away, but just cut away or remove all that comes away easily. Having satisfied yourself that you can do no more in this direction, then lightly dry the part with cotton wool wrung out in soda solution and then apply a burn dressing.

CHAPTER VII

INFLAMMATION AND SUPPURATION

ABSCESS.
CELLULITIS.
WHITLOW.
ULCERS.
GANGRENE.
IMMERSION FOOT.
FROSTBITE.

Inflammation of internal organs is dealt with under the various heads. Inflammation is always caused by bacteria. Suppuration is the formation of pus or matter and is preceded by inflammation, If suppuration takes place in a definite spot it is called an Abscess. if spread among the tissues it is called Cellulitis.

ABSCESS

This is a hot and painful swelling accompanied by redness of the skin and throbbing. It is very tender to touch. At first it is hard, but in time it makes its way to the surface of the skin becoming soft and the skin over it becoming thinner and thinner. Eventually the abscess bursts and discharges pus. While the abscess is forming there may be shivering, headache and feverishness which is usually proportional to the amount of inflammation.

Treatment.—A Kaolin poultice, changed every twelve hours, or a hot fomentation using Boric Lint, changed every four hours, should be applied to the swelling. When the swelling softens and the skin over it is red and thin, time will be gained and suffering saved by opening it with an abscess knife.

To open an abscess.—Clean the skin over the abscess with Iodine. Take an Abscess Knife, sterilize by placing in boiling water for three minutes, hold it with its back on the skin underneath the swelling and the sharp edge upwards, push it firmly and with decision into the abscess so as to reach the pus and then draw upwards to enlarge the opening and allow free drainage. When as much pus has flowed as will escape easily, assisted by very gentle squeezing, then introduce with the aid of a forceps or probe, a strip of gauze into the opening so as to prevent it closing and to allow the pus and serum to drain. A fomentation is then applied. After two or three hours the fomentation is removed and with pieces of cotton wool as much pus as can be removed without giving pain is pressed away. Fomentations are continued and the wound kept open as long as pus continues to discharge. After that an ordinary antiseptic dressing should be applied and the wound should heal up in a few days.

Besides local treatment, the bowels should be kept open. Calomel in 2 grain doses should be given every third day.

CELLULITIS

In this disease there is inflammation and suppuration spreading in the tissues under the skin. There is pain, tenderness and swelling of the skin, without any definite margin. The part becomes dusky and boggy and when pressed by a finger becomes dented. The condition may spread very rapidly, and there may be high fever and delirium.

Treatment.—Sulphathiazole should be given in the doses prescribed on page 207. The bowels should be kept well open and for this purpose Calomel is the best medicine ; 2 grains may be given every second or third day, followed in the mornings by Epsom Salts in warm water. Locally, hot fomentations should be applied and the affected limb should be immersed in a hot antiseptic bath for half an hour twice a day. If suppuration has occurred the tissues should be freely lanced so as to allow the pus to escape. The incisions made should be kept open by strips of gauze laid in them and the dressings should be frequently changed.

WHITLOW

This is an inflammation and suppuration occurring in a finger, characterised by great pain and swelling. The pain is deep seated and throbbing, the skin becoming red and shiny. It is most frequently caused by a scratch or puncture by a splinter of wood, bone or rusty metal running into the nail or finger.

Treatment.—Apply hot fomentations or a Kaolin poultice, keeping the hand raised in a sling. When the inflammation has continued for 24 to 36 hours a deep cut should be made in the finger with a perfectly clean aseptic abscess knife to allow the pent up matter to escape. In order to make this cut deep enough a good plan is to ask the man to lay his finger palm upwards on a table, the end of the knife is then pressed quickly and firmly into the end of the finger near the first joint, he is told to pull away his finger while firm pressure is kept on the blade of the knife. This will ensure a deep cut. Fomentations and dressings are then applied as for Abscess. At an early stage commence treatment with Sulphathiazole in the manner recommended on page 207.

ULCERS

These are of various kinds and may be described in general as raw open sores usually hollowed out lower than the surrounding skin. They may arise from boils, injuries, bad circulation and other reasons. There are also ulcers of a peculiar nature caused by Syphilis, Cancer, Tuberculosis and certain parasites.

Treatment.—The general treatment of ulcers consists in cleanliness, keeping the part at rest and if on a leg keeping the leg elevated on a pillow, and the application of remedies such as Boric fomentations. Goulard's lotion is a useful application in cases of ulcers due to varicose veins. Calamine Lotion is a good application.

GANGRENE

Gangrene or Mortification means the death of any part of the tissues of the body, and may arise from a variety of causes such as interference with the circulation by a tourniquet, weak circulation in old men, severe injury, burns and frost bite. There are two varieties, one dry and the other moist. Dry gangrene assumes a dark shrivelled appearance, the limb being cold and lifeless. In moist gangrene there is considerable swelling and pain. The skin is cold and gradually becomes black. There is an offensive smell.

Treatment.—The limb should be raised and kept warm and clean. Sulphanilamide powder should be used freely, also dry dressings with plenty of cotton wool. Amputation of the limb may be necessary.

IMMERSION FOOT AND FROSTBITE

Immersion (or trench) foot and Frostbite have not until recently been recognised as two distinct conditions requiring somewhat different methods of treatment.

IMMERSION FOOT

When the feet or legs are immersed for many hours in water (fresh water, salt water or liquid mud), at low temperatures (temperatures measuring 15 deg. C. (59 deg. F.) or lower) the skin and underlying tissues very gradually suffer damage, which is the greater the colder the water and the longer the immersion. Sea water sufficiently cold to injure is usual in the Atlantic (winter and summer) from latitude 50 deg. northwards.

Signs.—Immersion in water cold enough to damage is painful, but this pain is not usually severe and soon lessens. In half an hour the immersed part of the limb is red and numb and power in it is reduced. This numbness and weakness get worse, and in 3 hours the limb is a little swollen. The swelling increases with time, especially if the limb is hanging down. All these early signs of damage quickly disappear if immersion ends and the limb can be warmed (warming *must* be very gradual—see " Treatment " below). Signs of damage are more persistent and more serious after immersion has lasted for several days ; in such cases blisters or dark patches may appear on the skin and the skin may become broken. Only after long exposure in very cold water is recovery incomplete.

Prevention.—Make all efforts to avoid those discomforts and disabilities which may lead to the risk of more permanent damage. The damage comes out of coldness, and the chief source of coldness in boats is cold water. Avoid contact with water as far as you can. Keep your feet out of water by keeping the bottom of the boat as dry as possible or by raising the feet. Even if you are wearing sea-boots the less water touches these boots the better ; cold from the water will come through them. If your socks have become wet, wring them out, empty your boots and put them on again quickly ; if you carry dry socks put these on rather than the damp ones. Try frequently moving your feet and toes. Unless the sun is out do not bare your feet to rub them ; the exposure to the air will cool your feet more than the rubbing will warm them. If you rub them do it very gently. *Rubbing the skin when it has become swollen, numb or tender, will do more harm than good.* Greasing the feet is not much use. Keeping the upper parts of the body dry and warm is extremely important, because it also helps to keep the limbs warm. It is better to keep damp or wet clothes on the body under waterproof covering than to strip and wring out the clothes in a cold wind. Do not wear tight garters, boots or any tight clothing on the legs.

Treatment.—Treatment will begin at once after rescue from boat or raft. Lift the patient on board ; remove all clothes from the body, and wrap the body in warm blankets. Hot bottles may be placed against the body between the blankets, *but none should be allowed to come near the affected limbs.* These limbs should be handled only very gently and protected from weight of bed clothes ; and they should be kept cool, if necessary by exposure to the air ; *heating them in any way is harmful.* The patient should be kept in bed with feet raised on pillows and cool until all swelling has gone, and subsequently until he is able to walk without pain, or until he comes under medical supervision. Blisters, open sores or darkened areas of skin should be dusted with Sulphanilamide Powder and kept covered by clean dry cloths, which are to be removed gently and renewed if they become stained ; the part should be kept quite dry and no lotions, ointments or antiseptic except the powder above recommended applied.

FROST BITE

True frostbite is a condition in which the skin and sometimes deeper tissue becomes actually frozen. The damage is not caused directly by cold, but by minute crystals of ice which form within the skin. Frostbite only occurs on land when the ground is hard frozen, or covered with dry snow or ice. At sea it occurs very rarely unless the sea water is freezing. Frostbite is almost unknown unless the temperature of the air is as low as – 10 deg. C. (14 deg. F.), and is very frequent only if the temperature is much lower (—25 deg. to —30 deg. C. or —13 deg. to —22 deg. F.). Wind encourages and sunlight discourages frostbite at a given temperature.

Frostbite affects uncovered parts of the skin ; fingers, ears and nose when exposed are most prone to freeze and in this order. It affects parts that come in contact with very cold substances—the feet with ice or frozen ground, the fingers or mouth with cold metal.

Signs.—When skin freezes it usually becomes pale, the colour is yellowish-white, it looks unusually opaque, it becomes of wooden hardness ; this hardness is the only completely reliable and invariable sign of freezing. The patch of skin so affected is usually clearly marked off from the rest, both to sight and touch. The freezing usually happens in skin that is already tingling or numb with cold. The actual freezing occurs quite suddenly sometimes after a sudden abrupt stinging pain or local pricking ; it is also very apt to pass unnoticed. The frozen patch will enlarge if untreated, but the subject will not feel this. Skin once frozen remains quite unchanged until it thaws ; it will then react by a more or less violent inflammation, according to the extent and hardness of the freezing.

Reaction.—Directly after thawing the skin becomes bright red and hot. A short freeze is followed by itching and whealing of the skin, which disappears within a few hours ; a severe freeze causes death of the skin which comes away after blackening and leaves a hole (or ulcer) in the skin ; a very severe and extensive freeze will cause the death and consequent gangrene of the end of the limb affected (usually the toes).

Prevention.—Frostbite is avoided by keeping warm. In intense cold the clothing should be windproof and abundant ; thick gloves and ear protectors should be worn. Food should be abundant, fat and hot. The man should be in constant movement when out of doors ; the feet especially should never be still for long. The socks should be thick and always dry. Cramped positions should be avoided. There should be no tight clothing on the limbs. Metals should not be touched with bare skin or with the mouth.

The feet and all exposed skin should be kept greasy, by gently smearing the parts with oil (as supplied in ships making Arctic voyages and in all life-boats and emergency life-rafts) or vaseline and by refraining from washing frequently.

Beard and moustache should be clipped short or shaved away ; icicles will form on untrimmed beard from the moisture of the breath. When passing water the penis should be shielded from wind and afterwards carefully dried.

Men out of doors together should watch each others' faces for the first appearances of patches of frost ; early freezing can be detected by the man himself by wrinkling the face to find areas of stiffness. Any frozen area should be thawed at once by placing a bare warm hand on it.

Treatment.—Small frozen areas may be thawed rapidly by covering them with a warm hand ; they require no subsequent treatment.

Larger and more severe freezes, as when a whole foot is involved, should be thawed by placing the limb inside a companion's clothes. Rubbing with snow is dangerous. If it is possible, the part should be thawed by immersing it in tepid or cooler water. On thawing, the skin will at once soften and will quickly become pink or red. If pain is severe on thawing, cool the part a little with water, or by short contacts with snow. *It is important that after thawing warming up should be very gradual ; application to the affected part of hot water or bottles or exposure before fire is dangerous.*

Keep the part subsequently at absolute rest, the body well fed and warm, *but the damaged part relatively cool.* Put a light clean dressing, such as a wound dressing, over the damaged part and bandage very lightly ; the object is as much to protect the part as to keep it clean. If there are any blisters or broken skin powder them with Sulphanilamide Powder before applying the dressing. Blisters should not be opened unless a pair of perfectly clean scissors is available, which should preferably be dipped in boiling water before use.

It is to be noted that in frostbite the amount of dead skin and tissue that eventually separates away is generally much less than at first might seem possible.

CHAPTER VIII

FRACTURES OR BROKEN BONES AND DISLOCATIONS

1. THE SKELETON

The diagrams of the complete human skeleton and of the larger individual bones must be looked at carefully. Look again and try to retain in your mind's eye the shapes of the bones and their names. As you read this section and find that each bone is mentioned, look once more at the appropriate drawings and also feel through your own skin those parts of the bones which lie close under it. Try to imagine how your own bones are lying in your own body and see them through your flesh (as an X-ray photograph shows them).

The *head*, or skull, forms a case which contains and protects the brain. It consists of many bones firmly joined to one another, except for the lower *jaw* which moves at a joint just in front of the ear. The skull rests on the upper end of the *backbone* which is made up of a series of small bones like cotton reels placed on top of each other. Let us now follow the backbone down to the lower limbs and then return to the ribs and upper limbs. At the lower end of the backbone are the *hip bones*, one on either side, which together form a basin to support the contents of the belly. On the outer side of either hip bone is a cup-shaped socket into which the rounded head of the thigh bone fits. Thus the so-called " ball-and-socket " hip joint is formed. The *thigh bone* ends at the knee where it forms a hinge-like joint with the strong *shin bone* which can be easily felt under the skin. On the outer side of the shin bone is attached the slender *brooch bone*, so named because of its resemblance to the pin of a brooch. In front of the knee joint lies the *knee-cap*, the shape of which can be particularly easily felt on yourself. Its use is to take the rub of the thigh muscles off the front of the knee joint. At the ankle the foot is joined to the lower ends of both the shin and brooch bones by another hinge joint. The *foot* is made up of many small bones of peculiar shapes which it is not necessary for you to learn.

We will now return to the ribs and upper limbs ; on either side, *twelve ribs* are attached to the backbone. Each rib, with the exception of the two lowermost on either side, curves round the chest from the backbone behind to the *breast bone* in front. As you can see in the diagram, the lowermost ribs have no attachment to the breast bone in front. The ribs enclose the chest and protect the lungs, heart and other internal organs. When you take a deep breath you can feel the way in which your ribs move : slightly

upwards and outwards so as to expand your chest. The breast bone, flat and dagger-shaped, lies close under the skin of the front of the chest and to its upper end is attached a *collar bone* on either side. This bone (remember to feel its curved rod-like shape on yourself) goes out horizontally to the point of the shoulder and it acts like an outrigger in keeping the shoulder in position. The outer end of the collar bone joins with the *shoulder blade* which is a triangular bone lying at the upper and outer part of the back of the chest on either side. Each shoulder blade has a shallow socket into which fits the rounded upper end of the *arm bone*. At the elbow the arm bone forms another hinge-like joint with the two *forearm bones* and these join with the hand at the wrist. The *hand*, like the foot, is made up of many small bones, the shapes and names of which you need not learn.

It is worth while noticing that there is a general similarity of arrangement between the upper and lower limbs. Both are joined to the body by a ball-and-socket joint, then there is a single large bone, the lower end of which makes a hinge-like joint with two parallel bones ; these connect by another hinge-like joint to the hand and foot, both of which are composed of many small bones.

2. FRACTURES

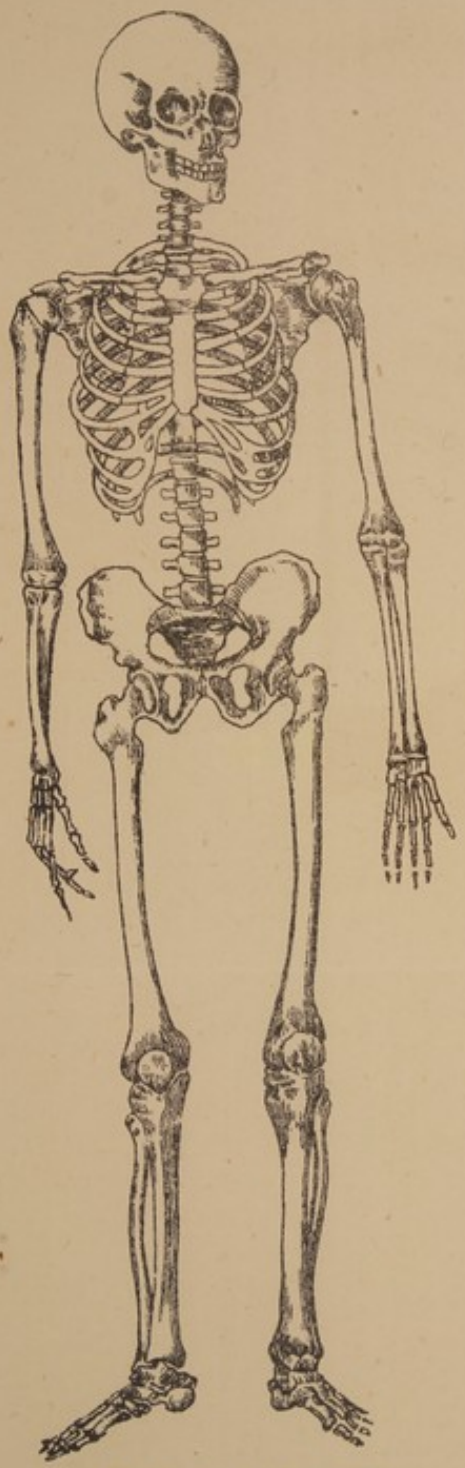
There are three kinds of fractures—simple, compound and comminuted.

A simple fracture is a broken bone with no wound of the skin.

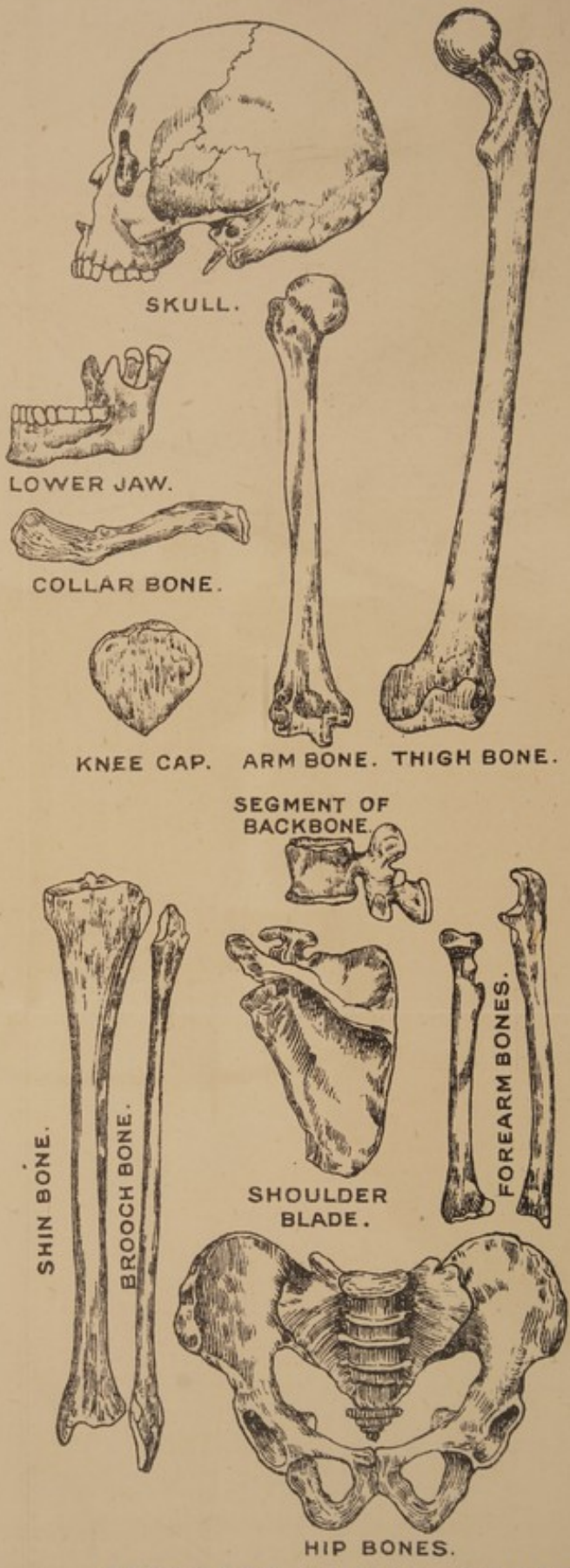
A compound fracture is when a wound leads from the skin to the broken bone.

A comminuted fracture is when the bone is broken in more than one place and may be either simple comminuted or compound comminuted.

Other varieties of fracture are Complicated Fracture when there is also another injury accompanying it, such as a dislocation or injury to an artery. Impacted Fracture when the broken end of a bone is driven into the other bone at the time of injury. Greenstick Fracture when the bone is not broken completely across. This form occurs most frequently in young persons. Fractures may be caused by direct violence when the bone is broken at the point where violence is applied, by indirect violence when the fracture occurs at a distance from the place where the violence was applied, and by muscular action when the bone is broken by the sudden contraction of a muscle. This is a frequent cause of fracture of the kneecap, occurring often when trying to recover from tripping over some obstacle or tripping when descending a stair.



HUMAN SKELETON.



SEPARATE HUMAN BONES.

FIG. 33.

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Malby & Sons, Lith.

General Indications of a Fracture

(1) History of injury.

(2) The patient complains of

(*a*) Pain.

(*b*) Loss of power.

(3) On looking at the injured place there will be seen

(*a*) Swelling.

(*b*) Deformity.

(4) On examination there will be found

(*a*) Unnatural Mobility: that is, joint movement at a place where there is no joint.

(*b*) Crepitus. A grating sensation caused when the broken bones rub against each other.

(*c*) In long bones there will be shortening of the limb caused by the muscles pulling the broken ends, so as to ride over each other.

Treatment.—The general principle of the treatment of fractures is to get the broken ends of the bones together and to keep them there, taking care, in the case of a limb, that the position of the limb is kept natural.

(1) If possible treat the fracture on the spot before attempting to move the patient.

(2) Dress any wound which may be present.

(3) Correct the deformity by pulling gently and steadily on the lower part of the limb.

(4) Fix the limb in the corrected position by means of splints and bandages.

(5) Treat any complications, such as Haemorrhage and shock.

(6) Relieve the patient of all muscular effort. If the fracture is of a bone of the upper limb, the arm must be supported in a sling. If of the lower limb, the patient must be carried on a stretcher.

(7) Be careful not to turn a simple fracture into a compound.

(8) Treat also for Shock. *See* Chapter III.

General Rules for the application of Splints

(1) The splints should be long enough to fix the joints immediately above and below the fracture.

(2) The splints must be padded.

(3) One bandage should be applied immediately above and another immediately below the seat of fracture, which must be left clear. Other bandages are applied near the end of the splints.

FRACTURES OF INDIVIDUAL BONES

FRACTURE OF THE SKULL.—Fractures of the skull may be of the Vault or top of the skull or of the Base—that part of the skull which is next the spinal column.

Fracture of the vault is usually caused by a blow on the head and frequently none of the signs of fracture can be discovered, but the patient may show signs of concussion or compression of the brain. Fracture of the Base is usually caused by indirect violence, by falling on the head or the feet or the buttocks and so causing a clashing of the end of the vertebral column at the neck against the base of the skull, resulting in a fracture. This is an extremely serious accident, owing to the liability to injury of the delicate and important structures which are situated at the base of the brain. The patient will become gradually or suddenly unconscious or death may occur at once. The signs of Fracture of the Base vary according to the actual position of the fracture, but usually there is bleeding from the nose and ears and blood may appear under the conjunctiva (the membrane which covers the eyeballs). There may be vomiting of blood owing to some blood from the nose having been swallowed.

Treatment.—The patient should be kept at rest with the head slightly raised. If there is bleeding from the nose or ears it should not be checked. If there is bleeding from a wound, it should be attended to and dressed. Cold should be applied to the head and warmth to the feet.

FRACTURE OF THE LOWER JAW.—Usually caused by a direct blow. On taking hold of the jaw with two hands the broken ends can be felt grating against each other, the gums will be torn and bleeding and the usual line of the teeth will be irregular. The patient dribbles blood and saliva from the mouth and talking is painful or even impossible. Eating is impossible.

Treatment.—The drooping part of the jaw should be raised until the upper and lower teeth are touching. It should then be fixed by a splint, moulded to the shape of the jaw. A piece of millboard, gutta percha or coarse tarred felt, shaped as fig. 34, is soaked in hot water, wrapped quickly in a towel or handkerchief, the centre part placed under the chin and the ends moulded whilst soft to the sides of the lower jaw. Each end of the splint should reach to the lowest part of the ear and before soaking it must be cut accordingly. It must be kept in place by a four-tailed bandage, fig. 35, the two front tails being tied over the back of the head and the hinder ones

in front of them (*see* fig. 36). A four-tailed bandage (fig. 35) is made by taking an ordinary roller bandage or piece of cotton material

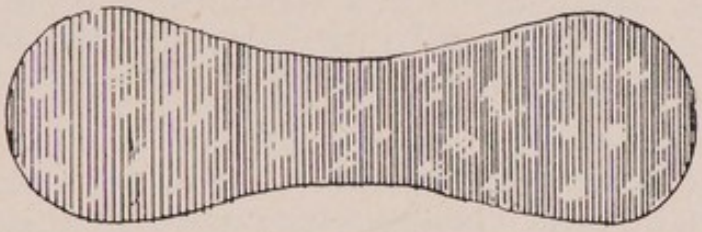


FIG. 34

FIG. 35

about 2 feet long and 3 or 4 inches wide and splitting each end having a piece of about 4 inches in the middle undivided. A small hole should be cut in the middle for the point of the chin to rest on. The

FIG. 36

mouth should be kept as clean as possible by frequent use of a mouth wash. (Salt water or Crimson Fluid, one tablet in a glass of warm water). Feeding of the patient is somewhat troublesome. For a fortnight or so, slop diet is necessary and may be given either by pouring the fluid, a little at a time, between the teeth and the cheek, or by a tube passed into the mouth where a tooth is missing.

FRACTURE OF THE SPINE.—A fracture of the Spine or Backbone is a serious injury and is nearly always accompanied by a dislocation of one or other of the bones of the back.

Owing to the spinal cord being compressed or torn there will be numbness or paralysis of movement and sensation below the level of the injury, the symptoms varying according to the part affected. If in the neck, death may be instantaneous or may occur within 24 hours. If lower down there may be paralysis of the legs and loss of power of the bladder and bowels.

Treatment.—Great care must be taken in moving the patient. He should not be allowed to move on his own and should be kept quite level, that is, his shoulders and head and legs should not be raised, in case his back might sag, thus increasing the damage. A good method is to get a blanket, roll it up lengthways for about half its width ; turn the patient very gently on his side, taking care to support the back ; place the roll against his back ; turn him gently to the other side and unroll the blanket. The patient will now be lying on the blanket. Obtain two stout poles and roll each in one side of the blanket until they are as close to the body as possible. The patient can now be lifted by grasping the poles and blanket at each side, when the body will remain at one level and not sag. The bed should be prepared by having boards placed under the springs, and a drawsheet and waterproof sheet should be provided. The patient should be kept as still as possible.

Fracture of Ribs.—This is a very common accident, between the fourth and eighth downwards being the most frequently broken. It is caused either by a blow or by the chest being crushed, when the rib breaks at the sharpest part of its curve. The patient complains of a sharp stabbing pain on drawing breath, and sometimes he may feel a grating sensation. This grating sensation may also be felt by placing the hand over the injured place. Occasionally the lung is punctured or lacerated by the broken end, in which case there will usually be spitting of blood.

Treatment.—If there is no spitting of blood and it may be presumed that the lung is not damaged, a flannel bandage should be wound firmly round the chest as high as the arms will allow, and the arm of the injured side should be placed in a broad sling. It is better, however, especially if the lung is damaged, to strap the chest. Cut strips of adhesive plaster a little longer than half-way round the chest and stick them on from the middle in front to the middle behind, beginning from below upwards. Each strip should overlap the one below it and be put on when the breath is out. This strapping should extend from the bottom of the ribs to an inch or two from the arm pit. A bandage is then put on to cover the whole chest and is kept on for about three weeks.

Fracture of Breastbone or Sternum.—This is a very uncommon fracture.

Treatment is on the same lines as for Ribs.

FRACTURE OF COLLAR BONE OR CLAVICLE.—This is one of the commonest fractures met with. It is usually caused by a fall on the shoulder or on the outstretched hand.

There is pain and drooping of the shoulder. The patient is unable to lift his arm, and usually the broken end may be seen and felt.

Treatment.—The first thing to do is to support the arm. A pad of cotton is then placed in the armpit and the shoulder is braced backwards and raised.

To fix it the best method is what is known as Sayre's method in which three strips of adhesive plaster 3 inches wide are required. The end of one piece is looped round the upper arm, on the affected side, with the non-adhesive side next the skin of the arm, the loop being formed by stitching or pinning. The elbow is forced well back and the strapping is brought round the back with the adhesive side next the skin and finishing at the front of the chest. The forearm is now placed across the chest with the fingers pointing to the opposite shoulder. The second piece of strapping commences at the back of the sound shoulder, passes diagonally across the back over the point of the elbow and along the back of the forearm and finishes over the sound shoulder. A slit should be made for the point of the elbow. The third piece is passed round the chest and over the elbow and the whole is covered with a bandage. Bandages may be used instead of the plaster, bearing in mind three main points : raising the arm by supporting the elbow, bracing the shoulder back and fixing with the fingers pointing to the sound shoulder (fig. 37).

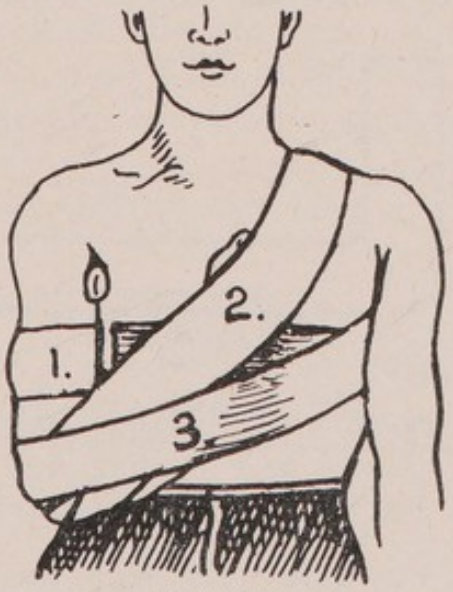


FIG. 37

FRACTURE OF THE SCAPULA OR SHOULDER BLADE.—This is not a common fracture and is usually due to direct violence. The bone is somewhat irregular in shape and it may be very difficult to locate

the exact position of the fracture. If in doubt as to whether there is a fracture, it is better to presume there is, and treat as such, if some of the general signs of fracture are present.

Treatment.—As for fracture of the Clavicle.

Fracture of the Humerus or Upper Arm Bone.—This is a common fracture and is usually caused by direct violence. The fracture may occur at any part of the bone, but there is always inability to move the arm and deformity with grating of the ends of the bone.

Treatment.—This varies with the position of the fracture.

(1) If at the upper end, place a piece of lint between the arm and the side, fix the arm to the side by means of a broad bandage and put the forearm in a small sling.

(2) If in the middle of the bone, reduce the deformity by pulling on the arm and manipulating the ends of the bones into apposition. Apply two splints, one reaching from the point of the shoulder to just below the elbow and fix by two bandages. Place the forearm in a small sling allowing the elbow to hang down. Be careful that the upper end of the inner splint does not press the artery in the armpit.

(3) If at the lower end, the signs are often difficult to distinguish on account of the swelling and the nearness to the elbow joint which on rare occasions may be dislocated. The splint for this fracture should be in the form of a square, one part long enough to reach from the armpit to below the elbow, the other long enough to reach from beyond the elbow to the finger tips (fig. 38). Fix with

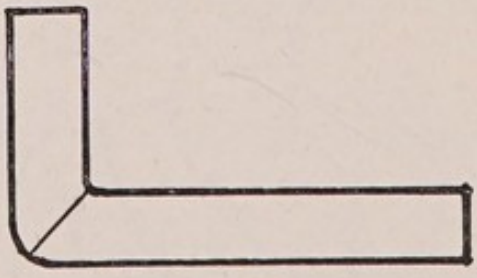


Fig. 38

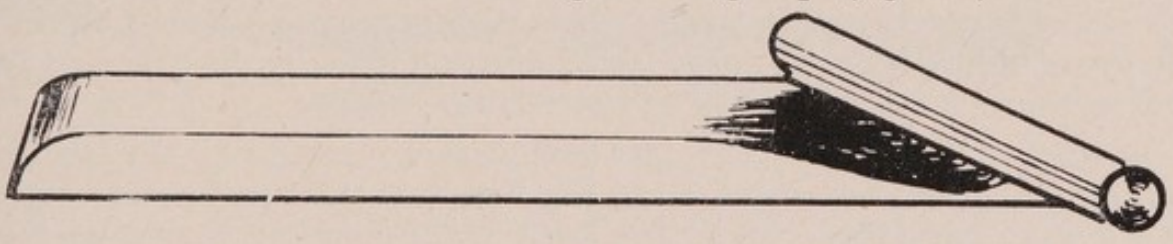
bandages around the upper arm, the forearm, wrist and hand, taking care that the thumb points to the chin, and place in a broad arm sling. Cold water dressings may be applied to the swollen joint.

Fracture of the Forearm (between the elbow joint and wrist joint).—The commonest form is what is known as "Colles' Fracture" and usually occurs about an inch from the wrist in the Radius, the bone on the thumb side. It is caused, in the majority of cases, by a fall on the outstretched hand. There are the ordinary signs of fracture, except when the broken ends get impacted when

there will be no unnatural mobility nor crepitus. The deformity is usually very distinct, the hand being displaced backwards and towards the thumb side. It often leaves deformity and stiffness of the wrist.

Treatment.—Grasp the patient's hand on the affected side as though shaking hands with him and try to pull the broken bone into place. After getting the parts into as natural a position as possible apply splints which must be well padded.

A good form of splint for this fracture is called Carr's splint and can easily be made by taking a piece of wood reaching from the elbow to the palm of the hand and nailing a piece of rod diagonally across the end of it for the fingers to grasp (fig. 39). A small



CARR'S SPLINT

FIG. 39

splint should be applied to the back of the arm; both splints should be fixed by a round turn of plaster at each end, bandages should be applied, and the arm adjusted as comfortably as possible in a wide sling. After the first week the fingers should be bent and rubbed gently to prevent stiffness. After three weeks the splints should be removed and the arm should be gently rubbed with oil or liniment to remove the stiffness of the joint and fingers.

FRACTURE OF THE MIDDLE OF THE FOREARM is often of both bones.

Treatment consists of applying straight splints to the back and front of the arm and supporting the arm in a large arm sling.

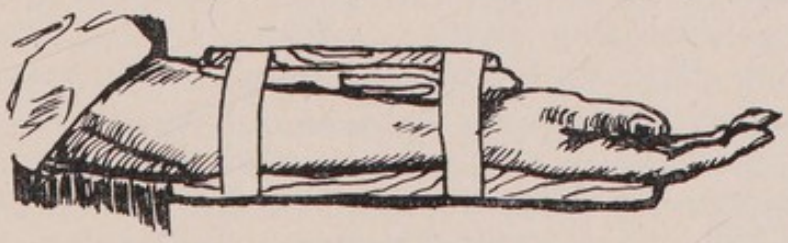


FIG. 40

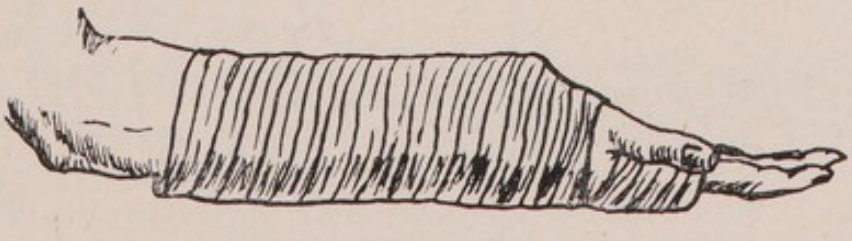


FIG. 41

FRACTURE OF THE BONES OF THE WRIST, HAND AND FINGERS.—These are often compound and must be treated according to the nature of the fracture, but a good plan is to apply a splint reaching from the elbow to the tips of the fingers and support in a broad sling. A fracture of a finger alone may be treated by a splint reaching from the palm of the hand to beyond the tip of the finger.

FRACTURE OF THE PELVIS OR HAUNCH BONE.—The bones of the pelvis may be fractured by a blow or a crush. A fracture in this part is frequently complicated by injury to the bladder and other structures in the vicinity. Blood may be passed in the urine. Pain, inability to stand and crepitus are the usual signs. If after a severe injury in the neighbourhood, there is no sign of damage to the lower limbs, but the patient is unable to stand or even to move his lower limbs without great difficulty and pain it may be assumed that a fracture of the pelvis has occurred.

Treatment.—Exercise the greatest care in handling the patient. Handle in a similar manner as for Fracture of the Spine. Apply two broad bandages round the hips tight enough to support the parts, but not so tight as to press the broken bone further inwards. Place the patient's legs in the position he feels most comfortable. It may be necessary to pass a catheter. If the urine comes away clear it will show that there is very likely no injury to the bladder and the catheter may be removed, but if blood comes away, the catheter should be allowed to remain and be tied in.

FRACTURE OF THE FEMUR OR THIGH BONE.—This may occur at any part of the bone and must always be considered as a serious accident. Fracture of the neck of the bone—at the upper end—sometimes occurs in old men from very slight injury, such as slipping on deck, and may be very difficult to distinguish from a severe bruise of the hip, but if, when he is lying down, he cannot raise his heel from the deck it may be strongly suspected that he has a fracture. In fractures occurring at any other part of the bone there is usually little difficulty in deciding, as there will be the usual signs of fracture with shortening of the limb and turning out of the foot.

Treatment.—In cases of Fracture of the Femur it is difficult to get the bones into position without an anaesthetic, but steady strong pulling on the foot will often overcome the resistance of the muscles, and when the leg is in as natural a position as possible, a splint, well

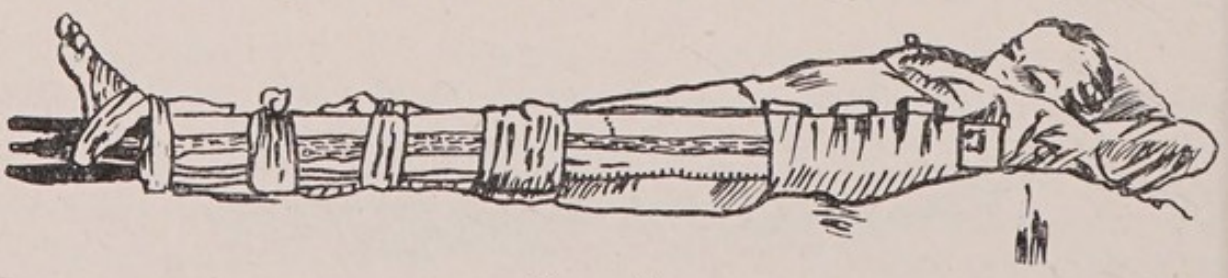


FIG. 42

padded with cotton wool or oakum should be placed on the outside of the leg and should be long enough to reach from the armpit to beyond the foot (fig. 42). It should be bandaged as in fig. 43, and it should be fixed in the best manner possible at the foot and ankle so as to maintain a steady stretching pull on the limb. This will immobilise the limb and reduce the pain until medical attention can be obtained.

Treatment for shock is essential (*Chapter* III).

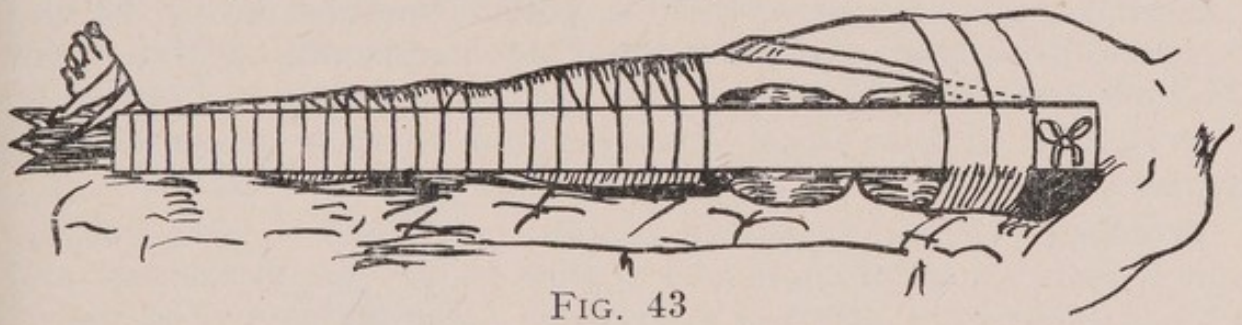


FIG. 43

FRACTURE OF THE PATELLA OR KNEE CAP.—There are two forms of this fracture, one caused by direct violence such as a blow and the other by muscular action such as happens when taking a false step. In the former the fracture will be irregular, while in the latter the bone will break across the middle and a gap will be found between the two fragments.

Treatment.—If caused by direct violence no attempt should be made to interfere with the broken bone itself. A well-padded splint should be applied to the back of the limb extending from the upper part of the thigh to the heel. The foot should be raised on a pillow and the shoulders also raised. Bandages should be applied above and below the knee, but not over the knee. Clean rags or lint soaked in Goulard's Lotion should be laid on the knee to allay the swelling and pain.

If caused by tripping over some obstacle or taking a false step when a distinct gap can be felt across the knee cap an effort should be made to bring the fragments together after the splint has been applied, and for this purpose two pieces of adhesive plaster about a foot long should be applied, one across above the upper fragment and drawn down on each side of the leg, the other across below the lower fragment and drawn upwards on each side of the thigh.

FRACTURE OF THE LEG.—Fracture of both bones of the leg frequently occurs and is often compound.

Treatment.—As the Tibia (Shin bone) lies very near the skin great care should be exercised in handling the leg, lest, if it has not already happened, the fracture become compound. Two splints should be applied, one to the outer side and one to the inner side of the leg extending from above the knee to beyond the foot. The leg should

be put in as comfortable a position as possible on pillows and, if there is much rolling of the ship, bags filled with sand should be placed on each side of the leg to steady it, or a cradle could be constructed so that it could be suspended.

FRACTURE OF THE ANKLE.—This is a fracture of the Fibula or Brooch Bone and is known as Pott's Fracture. The appearance is very similar to that of a dislocated ankle, the foot being displaced outwards.

Treatment.—The foot should be pulled steadily into a natural position and a splint placed on the inner side extending from above the knee to beyond the foot.

FRACTURE OF THE FOOT.—One or more of these bones may be fractured as the result of crushing or other form of violence.

Treatment.—These cases are usually compound. After bathing and dressing, a splint should be applied to the sole of the foot and kept in place by a figure of 8 bandage. The leg should be placed on a pillow to keep it from resting on the heel.

3. DISLOCATIONS OR PUTTING OUT OF JOINTS

A bone is said to be dislocated when the head of the bone is displaced from the socket in which it normally lies. It may be due to direct or indirect violence. There is often a fracture of the bone near the end that is dislocated, in which case great care must be taken in treating it. The general symptoms of Dislocation are (1) Pain, (2) Loss of power of motion of the limb, (3) Deformity showing either shortening or sometimes lengthening of the limb, with unnatural shape of the joint, (4) Swelling, (5) Fixity and rigidity of the joint.

The pain in dislocations is very severe, often causing faintness and vomiting. When a fracture is present, the bone is more freely moveable than natural, and there will be other signs of fracture, whereas a dislocated bone is less moveable.

General Treatment of Dislocations.—If the dislocation is simple, that is, if there is no fracture present, it may sometimes be easily repaired if taken in hand at once. If, however, there are signs of fracture, no attempt should be made to reduce the dislocation. In such a case the limb should be treated as for a fracture and put in as comfortable a position as possible until medical assistance can be obtained.

DISLOCATION OF PARTICULAR JOINTS.—The joints most likely to be put out at sea are :—

(1) Shoulder,
(2) Elbow,
(3) Fingers,
(4) Hip,
(5) Ankle,
(6) Lower Jaw.

These accidents are sometimes easily repaired if taken in hand at once.

In all injuries of this kind, compare the sound limb with that which is hurt.

(1) SHOULDER.—There is a flattening of the shoulder, which is observed by comparing it with the sound side; a hollow is seen where a rounded surface should exist. The elbow sticks out from the side, and the patient supports it with the other hand to ease the pain, which is frequently great and attended by numbness of the fingers. Upon inserting your hand into the patient's armpit a round hard lump, which is the head of the displaced bone, may be felt.

FIG. 44

Treatment.—Put the patient on his back, take off your boot, press your heel well into the armpit, grasp the patient by the hand and at the elbow, pull steadily in the direction of the middle line of the body, using the heel as a fulcrum, and the bone will probably slip into the socket with a snap. If the man be very muscular, a clove-hitch may be taken round the arm just above the elbow to aid a steady pull.

Another Method.—Place the patient on a low bench and whilst standing behind the injured shoulder pull the arm steadily upwards, the head of the bone should slip into its socket position. When this is accomplished place the arm in a sling and in thirty-six hours' time commence massage and gentle movements.

(2) ELBOW.—The arm is bent more or less at an angle, and cannot be straightened, and the bones are both felt and seen sticking out at the back part of the joint.

Treatment.—The patient having been seated, one man must take hold of the middle of the upper half of his arm, and another of his wrist. They must pull against each other, and a third should grasp the elbow with his two hands, his forefingers in front and his thumbs

behind, with which he must press on the swelling downwards and forwards. After pulling some little time, bend the arm suddenly, and to the patient unexpectedly, and the bones will slip into their proper places.

Sometimes only one bone is out of place and thrown forwards in which case the arm cannot be bent to a right angle or completely straightened, and the palm of the hand is turned towards the body.

Treatment.—Pull in the same way as before indicated, and suddenly bend the elbow. The arm must be kept quiet in a sling for two or three weeks.

(3) FINGERS.—This injury is easily detected by the sticking out of the ends of the bones. It is repaired by fixing the displaced bone by a clove-hitch, and pulling steadily until the ends slip into place. This accident must be repaired at once, or great difficulty will afterwards be found in its management.

(4) HIP.—The injured limb is from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches shorter than the other, and the toe points inwards. The foot cannot be turned out, and any attempt to do so gives great pain ; this is also experienced in separating the legs.

Treatment.—This dislocation is very difficult and painful to reduce without an anaesthetic. Lay the patient upon his back on a mattress. Get someone to assist you to steady the patient by pressing upon the hip bones. Next lift up the leg by grasping it above the ankle with the right hand, and under the knee with the left hand. In this way you bend the thigh upon the belly. Next bend the knee at a right angle to the thigh, then by holding the knee steady you must carry the ankle and foot away from the middle line of the body, which will have the desired effect of rolling the knee inwards. In this position you must next drag the thigh upwards, lifting him in fact by it, which will bring the displaced bone into its right position, then without slacking up at all, carry the foot towards the middle line of the body, thus bending out, this will cause the head of the bone to slip with a snap into its socket.

Briefly summarised, the above movements are " Lift up," " Bend up," " Bend out," " Roll out."

Note.—This accident is often difficult to discover, and you must therefore observe great caution in practising the above plan of treatment. If unsuccessful, do not persevere, but nurse the patient carefully until you arrive in port.

(5) ANKLE.—The lower end of the bone can be seen as a hard swelling, and felt against the skin on the inner side of the ankle ; there is a hollow on the outer side, and the sole of the foot is turned upwards and outwards.

Treatment.—Pull steadily until the foot is straight. A splint must then be placed on the inner side of the leg, reaching above the knee and below the ankle.

(6) Dislocation of the Lower Jaw.—Caused by a blow on the chin when the mouth is open, and also sometimes produced by excessive yawning. The displacement may be easily recognised as the patient is unable to close his mouth.

Treatment.—Pad your thumbs well by twisting folds of lint round them. Seat the patient facing you, place your thumbs, protected as described from the risk of being bitten, behind the last lower back teeth and press steadily downwards from inside the mouth while raising the chin at the same time with your palms, and the jaw will slip suddenly backwards into position.

Caution.—The bone will return to its place so forcibly that the thumbs may be severely hurt unless care is taken to guard them as detailed above.

4. SPRAINS

A Sprain is caused by a sudden wrenching or twisting of a joint resulting in overstretching and sometimes tearing of the ligament and tissues around the joint.

Symptoms.—(1) Pain which sometimes may be so intense as to cause fainting and vomiting and to suggest a fracture or dislocation or both.

(2) Inability to use the joint.

(3) Swelling and discoloration due to bleeding under the skin.

The swelling may be very extensive and make it difficult to determine whether a fracture may be present. Frequently a small piece of bone is broken off with the torn ligament.

Treatment.—The joint should be put in as comfortable a position as possible and should be kept at rest with splints and bandages which should not be too tight at first. Application of cold water is useful to ease the pain. Goulard's lotion is useful as an application. After two or three days the splints should be removed and the joint gently stroked from below upwards for several minutes and the splints and bandages re-applied for two or three more days when they may be left off. In severe sprains it may be necessary to keep the splints and bandages on for two or three weeks.

5. BRUISES

Bruises are so well known as hardly to require description, a "black-eye" being a familiar example. The discoloration is due to the rupture of small blood vessels under the skin causing effusion of blood into the skin and the tissues underneath. A slight bruise need not give rise to any anxiety, and the swelling and discoloration will subside in the course of a week or ten days. Severe bruises are sometimes accompanied by rupture of larger blood vessels, which, when occurring in the deeper tissues under the skin, give rise to much swelling, the discoloration being delayed for twenty-four hours or longer. Bruises of the head frequently give rise to a lump or tumour

called a blood-tumour which may give rise to a suspicion that a fracture has occurred with depression of the bone, as, after a short period, there is a hardened margin with a softness towards the centre. If, however, firm pressure is made with a finger on the hardened part and it is found that the surface of the bone underneath is uninterrupted it may be assumed that there is no fracture, particularly if there are no other signs of fracture.

Treatment.—The part should be rested and cold water or ice, if available, applied. Lint, soaked in Goulard's lotion makes a very soothing application.

6. CARRYING PATIENTS

A Neil Robertson stretcher is now carried as part of the medical outfit of a merchant ship and should be used to remove an injured man, but if for any reason the stretcher is not available and where the patient is unable to walk he may be carried by any of the following methods :—

(1) The four-handed seat (fig. 45) is made by two bearers, each grasping his own forearm and that of his fellow about its middle. It is called by schoolboys the sedan-chair. The patient sits on the hands and places one arm round the neck of each bearer.

FIG. 45

FIG. 46

(2) The two-handed seat (fig. 46) is made by two persons interlacing their hands in front, their other hands being placed round each other's shoulders, so as to support the patient behind ; he is carried in the semi-recumbent position.

(3) The sitting position, in which the opposite hands of the bearers are interlaced under the thighs and behind the loins, the patient putting his arms round their necks. This is rather a tiring performance.

(4) Turn the sleeves of a coat inside out and pass two poles through them, then button the coat ; this makes a good stretcher ; or two coats may be treated in a similar way to make a larger stretcher.

(5) A large piece of canvas or tarpaulin may be spread out, and two stout poles rolled up in the sides. A pair of oars will answer the same purpose as the poles.

Invalid's Sling Cot

If a helpless patient has to be transferred from the ship under circumstances which render it inconvenient or impossible to carry him down a gangway, arrangements must be made to sling him over the side by a derrick. A stretcher should not be used for this purpose unless it is strengthened by being lashed on a hatch cover or something similar.

Fig. 47 gives a rough idea of an apparatus used in hospital ships for transferring cot cases. A similar apparatus could be improvised from materials on board, if the necessity arose. This box is placed on deck and the patient, laid upon a mattress and pillow and covered with a blanket, is lifted into it, and snugly tucked in.

Care must be taken that the apparatus and gear are sufficiently strong to prevent any chance of giving way, and guys should be attached fore and aft to steady it when heaving up and swinging outboard.

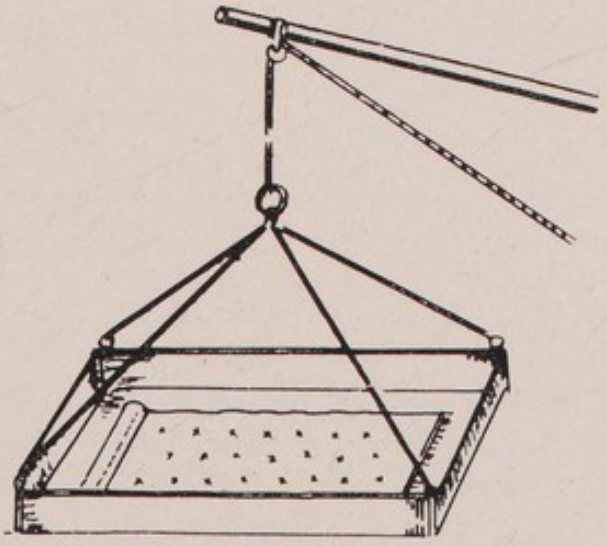


Fig. 47

The Neil Robertson Stretcher.

The Neil Robertson stretcher has been devised with the object of providing a simple apparatus for moving the injured safely from difficult places, where the ordinary stretcher with stiff poles would be useless. By means of this appliance the injured man is enveloped in a protecting but somewhat flexible case so that he takes up as little room as possible. The stretcher can be bent slightly in turning sharp corners in narrow passages as when being hoisted up the ladderways from the stokeholds or engine rooms.

The patient is wrapped up like a mummy so that he can be hoisted vertically or carried horizontally. This apparatus, being simple, light and cheap, has proved of great value not only on board ship but also in all places where an injured person has to be extricated from an awkward position.

The stretcher is made of stout canvas 65 inches long, cut in such a shape (*see* diagram) that there are—

A.—A portion for the head and neck 17 inches long and 12 inches broad.

B.—A portion for the chest 14 inches long and 42 inches broad;

C.—A portion for the small of the back 6½ inches long and 14 inches broad.

D.—A portion for the hips and lower limbs 27½ inches long and at the upper end 38 inches broad and at the lower end 25 inches broad.

The portion A takes the head and neck which are steadied by a canvas strap passing over the forehead. Thus, the head of an unconscious patient is prevented from dropping forward.

The portion B is wrapped round the chest, notches being cut on which the arm-pits rest. This part has three canvas straps which are used for fastening the stretcher round the chest.

The portion D folds round the hips and legs down to the ankles. It is secured by two canvas straps.

The whole stretcher is stiffened by bamboo slats which are sewn to the canvas.

A central backbone of stout rope passes along the under surface. This has two beckets passing out from it on either side which can be used as handles for carrying the patient or for securing tackles when he is slung horizontally. At the head the rope ends in a grommet which takes extra purchase from two brass eyelets let into the canvas. At the foot the rope ends in a galvanised iron ring which is secured to the stretcher by a span going to brass eyelets in the canvas. When more rigidity in the stretcher is required, as in moving those with injuries to the back, a couple of broom handles, slipped through the ropes underneath, will fulfil this purpose admirably.

The accompanying plan and photographs figs. 48 to 55 illustrate the general construction and uses of this stretcher far better than any words can describe.

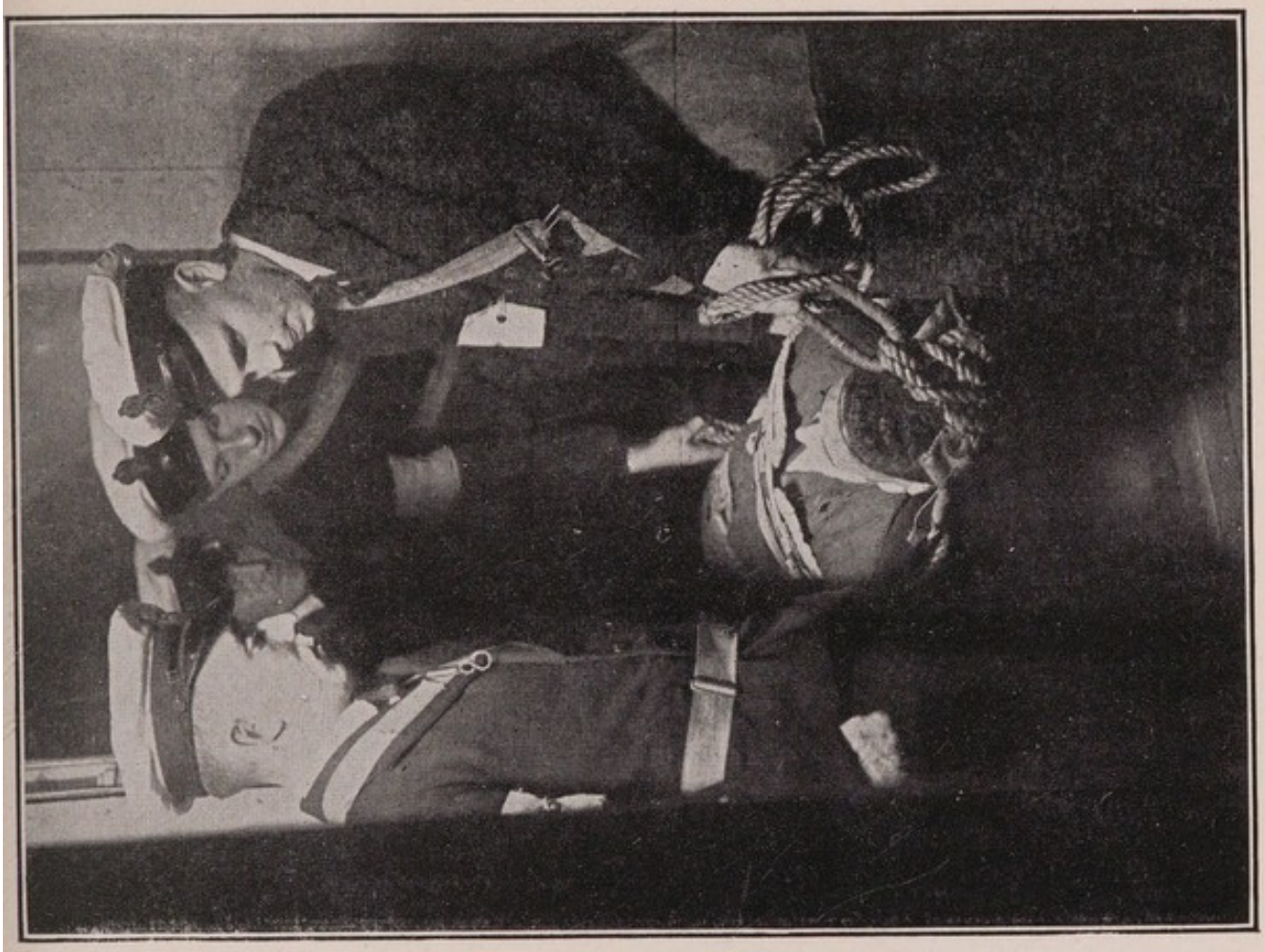


FIG. 48.—NEIL ROBERTSON STRETCHER IN STOKEHOLD

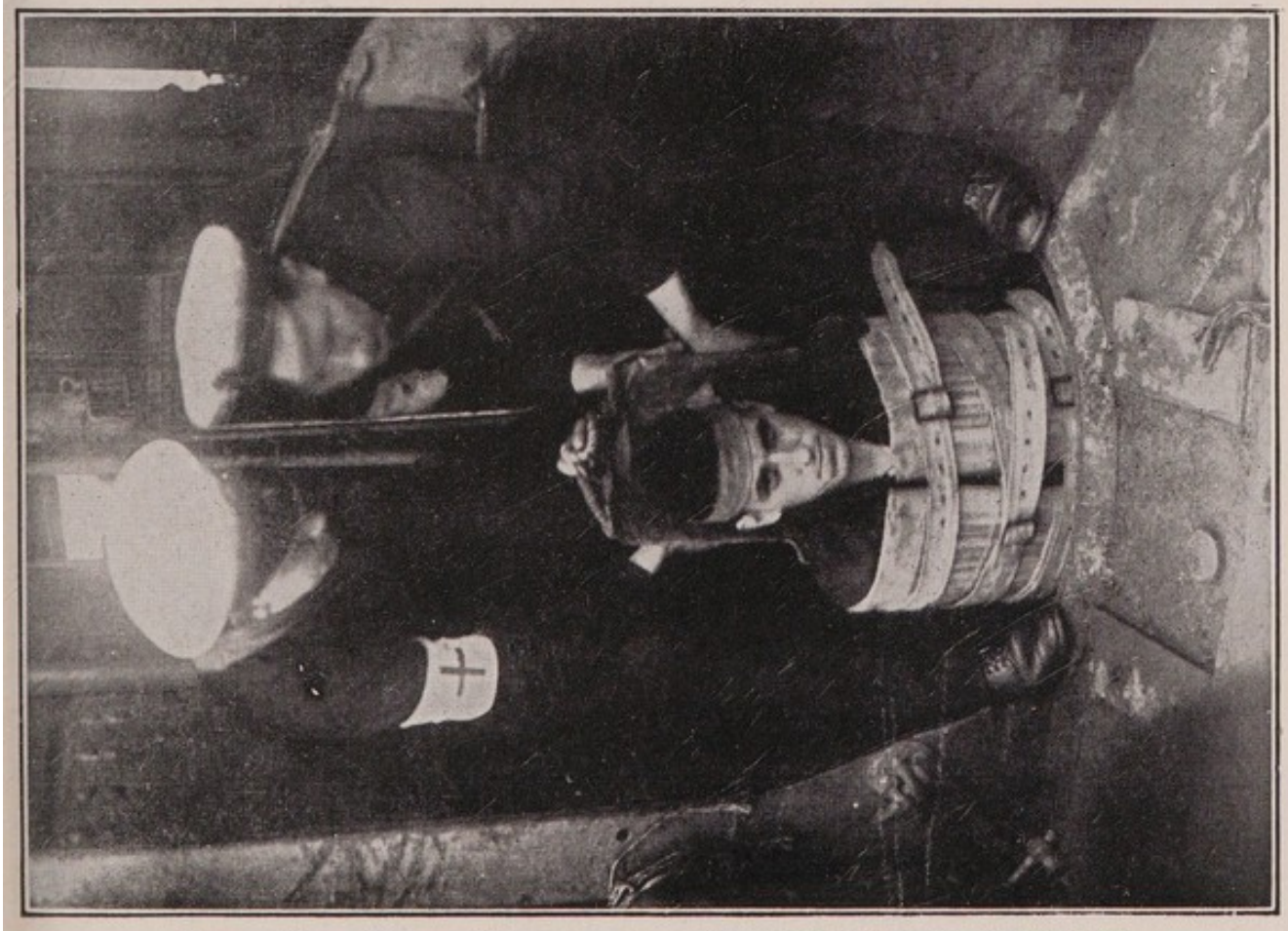


FIG. 49.—NEIL ROBERTSON STRETCHER IN TURRET

FIG. 50.—NEIL ROBERTSON STRETCHER IN TURRET

FIG. 51.—NEIL ROBERTSON STRETCHER IN TOPS

FIG. 52.—NEIL ROBERTSON STRETCHER ON DECK

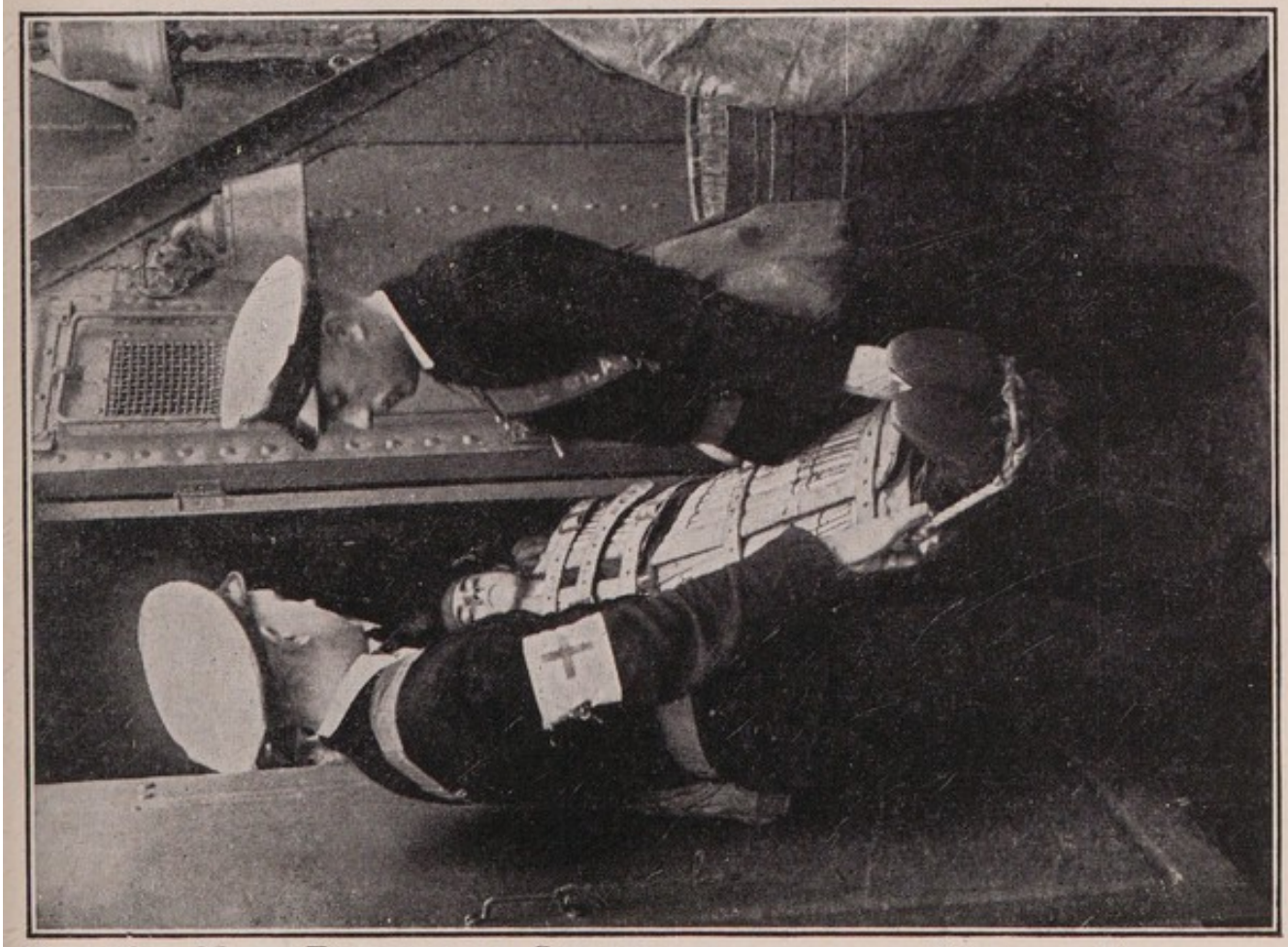


FIG 53.—NEIL ROBERTSON STRETCHER THROUGH NARROW DOORWAY

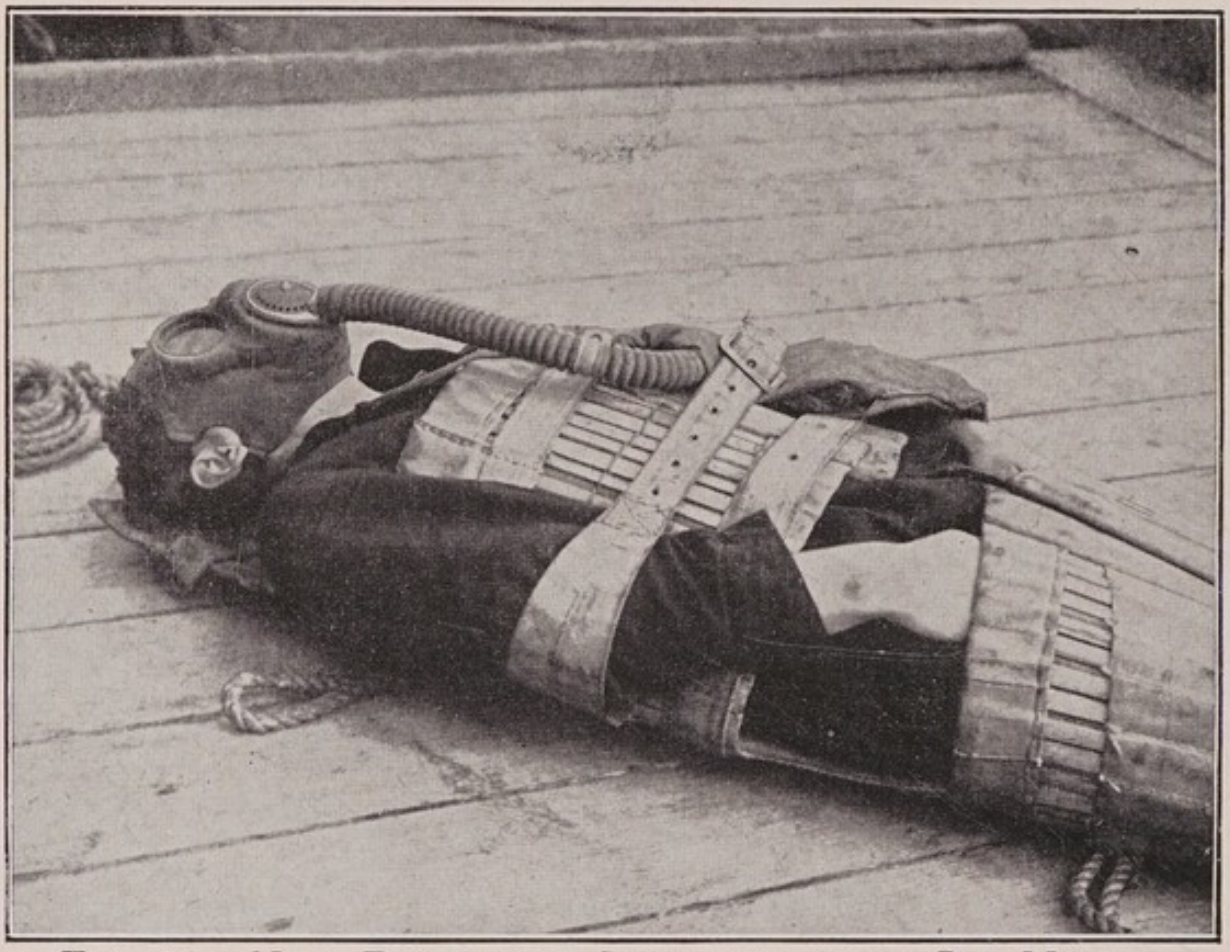


FIG. 54.—NEIL ROBERTSON STRETCHER WITH GAS MASK

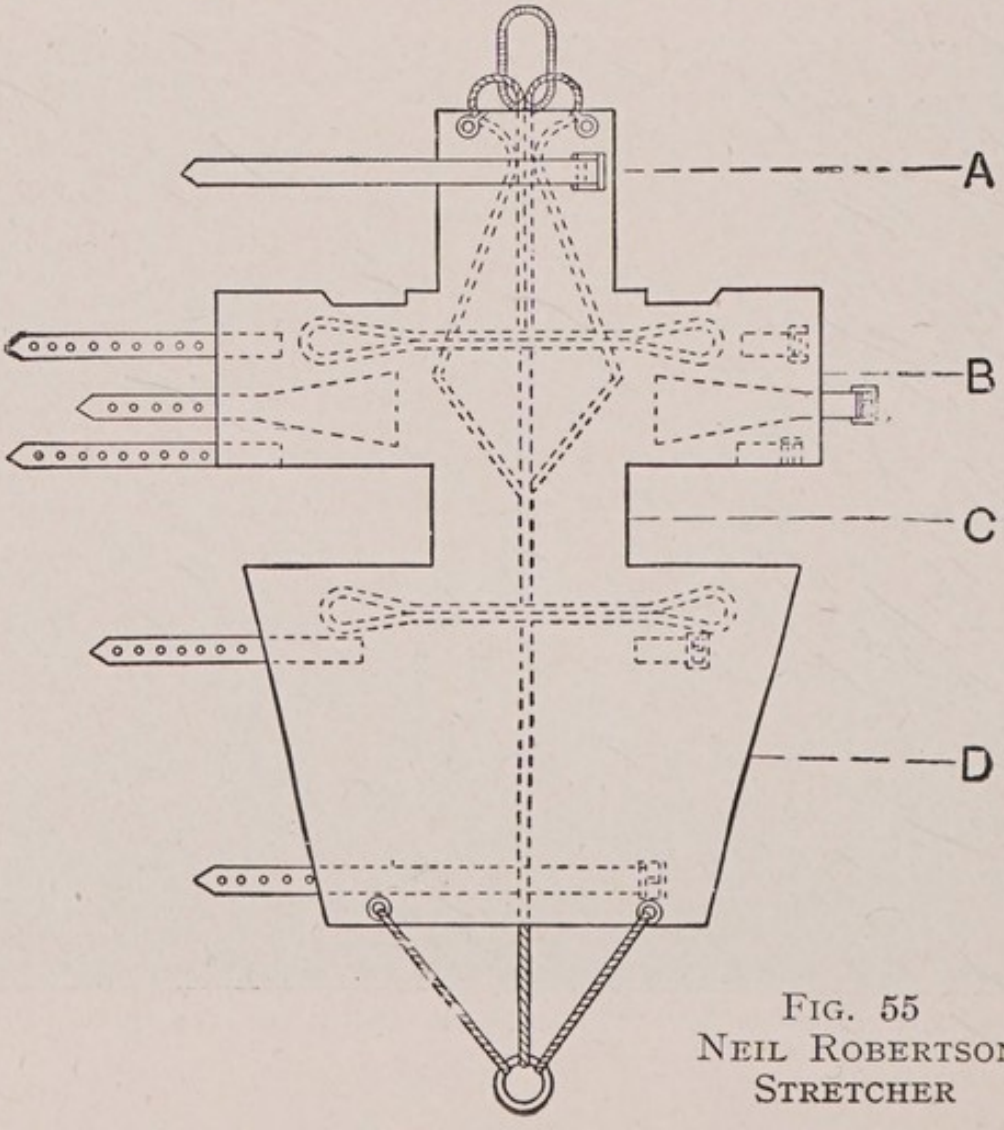


FIG. 55
NEIL ROBERTSON
STRETCHER

CHAPTER IX

DROWNING AND SUFFOCATION

DROWNING

When a person has been immersed for some time in water the body is cold, the face, hands and feet are swollen, the lips are blue and the face dusky with frothy liquid in the mouth and nostrils.

FIG. 56

Even though death may be thought to have taken place, no time should be lost in attempting restoration if the body has been recovered within a reasonable time, as many have recovered who have been totally immersed in water up to fifteen minutes.

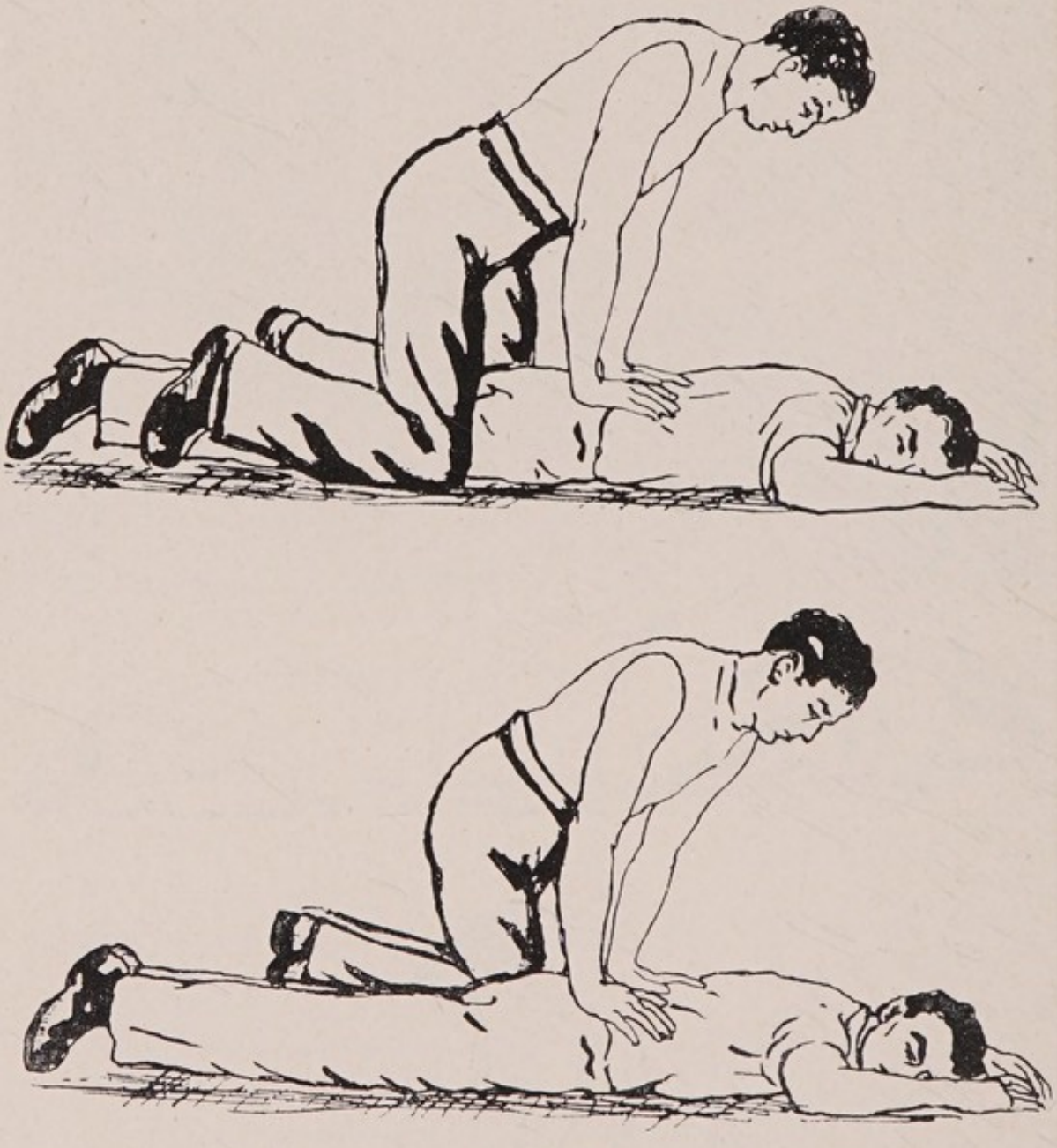


FIG. 57

Treatment.—Clear the mouth and nostrils of mud, weeds, froth, etc., and loosen all tight clothing. Turn the patient on his face, stand astride him, clasp your hands under his stomach and raise his body in order to try and drain him of water. See that the tongue is drawn forward. Do not waste more than a few seconds on these preparations and immediately commence artificial respiration which should be continued for at least an hour.

The Schafer Method of Restoration

Immediately after removal from the water, lay the patient face downward with the arms extended and the face turned to the side. Kneel astride or on one side of the patient (fig. 56 A, B.)

Place the hands on the small of the patient's back, one on each side, with the thumbs parallel and nearly touching (fig. 56).

Bend forward with the arms straight so as to allow the weight of the operator's body to fall on the wrists and thus make a steady, firm, downward pressure on the lower part of the back (the loins) as shown in fig. 57.

This part of the operation should occupy the time necessary to count—slowly—*one, two, three.*

Immediately after making the downward pressure, swing the body backwards so as to relax the pressure, but without lifting the hands from the patient's body (fig. 56). (This part of the operation should occupy the time necessary to count—slowly—*one, two*).

Repeat the forward and backward movements (that is, the pressure and the relaxation of pressure) without any marked pause between the movements.

The downward pressure forces the air out of the lungs and the relaxation of pressure causes the air to be drawn in again.

Continue the movements at the rate of about 12 per minute until natural respiration has recommenced.

When natural respiration is fairly resumed, cease the artificial movements. Watch the patient closely, and if natural respiration ceases, repeat the pressure and relaxation of pressure as before.

The movements of artificial respiration should be commenced the moment the patient is removed from the water.

When natural respiration has commenced, the patient should be allowed to lie in a natural position on one side, and treatment for the promotion of warmth and circulation may be proceeded with.

The movements of artificial respiration are of the first consequence. If the operator is single-handed, he must attend to these alone until natural breathing is restored. If other assistance is at hand, warm wrung-out flannels, hot bottles, etc., may be applied between the thighs, and to the armpits and feet ; but the movements of artificial respiration must not be interfered with.

After natural breathing is restored, the wet clothing may be removed and a dry covering substituted. This must be done without disturbing the patient, who should be allowed to lie quiet and watched for at least an hour and encouraged to sleep.

Treatment after Natural Breathing has been Restored.

Inject four tablespoonfuls of brandy, whisky, or gin in half a pint of warm water into the lower bowel.

To Promote Warmth and Circulation.—Rub the limbs upwards firmly, using handkerchiefs, flannels, etc. *By this measure blood is propelled along the veins to the heart—Circulation.* The rubbing must be continued under the blanket or dry covering. If possible bandage the lower limbs from the feet upwards to the hips with flannel bandages.

Apply hot flannels, bottles of hot water, heated bricks, etc., to the pit of the stomach, the armpits, between the thighs, and to the soles of the feet. If possible, place the patient in bed in an airy room.

On the appearance of restored animation, if the power of swallowing has returned, a small quantity of hot water, coffee, bovril, or other warm stimulant should be administered. The patient should be kept in bed and a disposition to sleep should be encouraged.

Suffocation

Commonly caused by breathing foul air containing a large excess of Carbonic Acid Gas or containing the very deadly Carbon Monoxide Gas or gases which are in common use as refrigerants.

Fatal accidents may occur during a fire in a confined space such as a ship's hold. Carbonic acid gas forms one of the principal products of combustion ; those who are overcome by the smoke may be suffering from the effects of this gas. Carbonic acid gas is also produced in large amount if the grain ferments in the holds of grain ships. The gas is heavy and accumulates in the lower part of the hold, in which it is produced, completely displacing the air ; it can be detected by lowering a lighted candle into the hold in which its presence is suspected ; if the candle is extinguished or burns dimly the gas is present in dangerous amount and the hold must not be entered until hatches, doors, etc., have been opened and a considerable time allowed for the gas to escape.

A person who enters an atmosphere heavily charged with Carbonic Acid Gas may collapse before he has time to escape and may die in a few minutes.

Carbon Monoxide is another gas which is produced by fires in confined spaces. It is the poisonous ingredient of ordinary coal gas and accidents occur from escapes of gas or from accumulation of the products of its combustion. Carbon Monoxide is a product of explosions and is present in the waste gases of gas, petrol and oil-driven engines ; stokeholds where such engines are used must be well ventilated at all times. Carbon Monoxide is lighter than Carbonic Acid Gas and escapes readily when ventilation is good ; it is a very poisonous gas, and a small amount in the air will soon produce difficulty in breathing and muscular weakness, passing gradually into unconsciousness.

Treatment.—The same treatment is required for persons overcome by either of these gases. Bring the patient at once into the fresh air. Draw forward the tongue and treat him by the directions given under the heading of Drowning, page 91. Artificial respiration should be started at once and oxygen should be given if a cylinder of oxygen is available. This remedy (Oxygen) is of especial importance in Carbon Monoxide poisoning. If oxygen is not available abundance of fresh air is necessary. Recovery is usually much slower in Carbon Monoxide than in Carbonic Acid cases and the patient requires complete rest for several days owing to the danger of heart failure.

Appearance of the Dead Body after Suffocation.—If a person is found dead in circumstances pointing to poisoning by Carbonic Acid Gas or Carbon Monoxide Gas the appearance of the dead body, unless it is very decomposed, enables the cause of death to be recognised. In Carbonic Acid cases the face and lips are livid and the hands and other parts of the body may have the same colour. In death from Carbon Monoxide the lips have a bright red colour and the face and usually other parts of the body have a bright pink colour.

Refrigerant Gas Casualties

(1) The following notes relate to the treatment of conditions which may be caused by the leakage of gases from refrigerating plants.

(2) The following gases are in common use as refrigerants in installations of all sizes :—

(*a*) Anhydrous Ammonia (Carbon Dioxide also present).

(*b*) Methyl Chloride.

(*c*) Freon (Dichlorodifluoromethane).

(3) *Anhydrous Ammonia* may be in the form of a liquid or a vapour.

(*a*) Liquid.—If ammonia has been swallowed some relief may be afforded by giving small and repeated doses of lime juice, lemon juice, diluted vinegar or white of egg.

The ammonia will cause intense corrosion of the mouth, throat and gullet with localised inflammation and swelling of the parts to an extent varying according to the quantities swallowed. This will lead to intense pain and collapse for which a dose of morphia or laudanum may be given. The patient should then be put to bed with blankets and hot water bottles.

Liquid ammonia splashed on the skin or clothing will cause burns of varying degrees of severity according to the concentration and the period of contact. These burns should be treated as ordinary burns but, before applying the prescribed dressing, the affected parts should be washed with diluted vinegar or lemon juice to neutralise the ammonia, and, while this is being prepared, the burn should be washed copiously with water in in order to wash away or dilute the concentrated ammonia liquor.

(*b*) *Vapour.*—Breathing ammonia vapour will cause intense irritation varying from a catching of the breath and smarting and watering of the eyes in low concentrations up to intense irritation and corrosion of the whole of the air passages, gasping for breath and collapse and death in the case of highly concentrated vapours.

The ordinary gas mask is of little use against ammonia, particularly in a substantial concentration.

The first thing to do is as rapidly as possible to get the man away from the ammonia fumes and out into fresh air, when, if the concentration has been low and the period of contact short, he should soon recover. He should then be put to bed, given warm coffee well diluted with milk, and treated for shock. If he has been badly affected, some relief may be afforded by giving small doses of weak vinegar or weak lemon juice, but the chief damage will be to the breathing passages, and little can be done to relieve the pain and swelling caused by the corrosive vapour, though the inhalation of steam from boiling water has been recommended.

(*c*) *Carbon Dioxide gas* is also present in addition to ammonia, and gassing due to this gas must be watched for.

Carbon Dioxide gas is completely neutral and has no smell and its effect is caused by the lack in the contaminated air of sufficient oxygen to support life. Consequently, if a man becomes faint or loses consciousness in a refrigerating plant where there is no evidence of escaping ammonia, he should at once be removed to fresh air. If he is unconscious artificial respiration should be resorted to and he should then be put to bed, given a hot drink and be treated for shock.

(4) *Methyl Chloride* is a colourless gas which compresses to a colourless liquid smelling like ether, with a sweet taste. It is a dangerous anaesthetic which may cause drowsiness, mental confusion, coma, nausea, vomiting, convulsions and death. It is also highly dangerous in low concentration owing to its explosive nature. On no account, therefore, should any naked light be exposed in the presence of the vapour, and electric motors should be stopped to avoid the risk of sparking. A heavy duty electric torch, switched on before approaching the escape, is the only safe light to use.

If a breakdown occurs in a plant using this gas a powerful ventilating draught of fresh air must be provided before repairs are attempted and approved breathing apparatus should be worn. The ordinary gas mask is quite useless.

The person affected by the gas should be removed to the fresh air at the first signs of faintness and sickness. If he has become unconscious and it is not too deep he should soon recover, but if his breath-

ing becomes feeble artificial respiration should be performed immediately. The man should afterwards be put to bed and kept warm. Hot coffee or tea may be given as soon as he is able to swallow.

(5) *Freon* is an inodorous and quite harmless gas except in a concentration high enough to deprive the man breathing it of sufficient oxygen. The chief danger is that signs of oxygen deficiency, *e.g.* faintness, staggering gait, collapse and unconsciousness, may arise before the man can be removed to a clean atmosphere.

Treatment is the same as for methyl chloride.

Choking

If choking is caused by pieces of food or a bone sticking in the throat, take hold of the nose with the left hand and keep the mouth open ; then draw the tongue forward, insert the forefinger of the right hand down the throat, and try and hook up the foreign body. Failing this, turn the patient upside down, and try again in that position. A few smart slaps between the shoulders may help to dislodge the obstruction.

A fish bone in the throat can often be dislodged by swallowing whole a large lump of soft bread.

CHAPTER X

POISONS

Poisons are substances which, when taken into the system, cause injury to the health or death. They are usually taken by the mouth and may result from accident, attempted suicide or attempted murder. For practical purposes they may be classified under two heads :—

(*a*) Those which corrode the lips and mouth, in which case NO emetic is to be given. These include Acids such as Sulphuric, Nitric, etc., and strong Alkali, such as Caustic Potash, Caustic Soda and Ammonia.

(*b*) Those which do not burn the lips and mouth, in which case an emetic is to be given at once. These include Mercurial and Lead Salts, Opium, Arsenic, Phosphorus and many others.

General Principles of Treatment.—It is of the utmost importance in all case of poisoning to act quickly. First find out the nature of the poison which the patient has swallowed. If an acid give alkaline drinks. If alkali give acid drinks. Although the treatment varies according to the nature of the poison taken, the main things to aim at are :—

1. *To remove as much as possible of the poison from the stomach.*
This may be done by :—

(*a*) EMETICS, which can only be given if the patient is able to swallow, but must never be given in the case of poisoning by Acids or Alkalies.

The best emetics are :—

(1) Mustard—a tablespoonful in a tumblerful of warm water.
(2) Salt—two tablespoonfuls in a tumblerful of warm water.
(3) Large draughts of warm sea water.
(4) Tickling the back of the throat.
(5) Sulphate of Zinc—half a teaspoonful in water.

SYNOPSIS OF POISONING

Poison.	Symptoms.	Treatment.
Acids (Nitric, Sulphuric or Hydrochloric).	Burning pains. Burning and cauterization of mouth vomiting dark masses.	Alkalies. e.g.—Chalk, whiting, washing soda. Weak soap and water. Milk, drink plenty. *No* emetic, *No* stomach tube.
Alcohol	Unconsciousness. Cold perspiration. Vomiting. Smells of Alcohol.	Emetics. Stomach tube. Cold douches. Fresh air.
Alkali (Caustic Soda, Caustic Potash, Ammonia).	Burning pain in mouth, throat and stomach. Eyes bloodshot. Difficult breathing. Smell of Ammonia.	Vinegar. Lime juice freely. White of egg. Oil. *No* emetic, *No* stomach tube.
Arsenic	Vomiting. Cramps in stomach. Dark diarrhoea. Loss of sight. Great distress.	Emetics. Stomach tube. Milk, white of egg. Antidote—Epsom salts.
Carbolic Acid, Lysol, Coal Tar preparations.	Pain in mouth and stomach. Burning of lips and mouth. Unconsciousness. Dark urine. Small pupils. Smells of Carbolic.	Oil. Milk, white of egg, Lime water, Epsom salts. Emetic. Stomach tube.
Corrosive Sublimate (Perchloride of Mercury)	Symptoms resembling Cholera	Emetics, White of egg, flour and water.

Poison.	Symptoms.	Treatment.
Gases	Unconsciousness	Fresh air. Artificial respiration. Ammonia to nostrils, except in case of poisoning by refrigerant gases.
Lead (White Lead, Red Lead, Sugar of Lead).	Colic. Pains in limbs. Cramp in legs	Emetics. Purges, Epsom salts. Warmth.
Opium (Laudanum, Morphia)	Unconsciousness. Deep stupor. Paralysis. Contracted pupils. Pallor.	Stomach tube. Emetics. Ice or cold water to head. Copious draughts of warm salt and water. Keep patient moving. Black coffee. Do not allow him to sleep. Antidote—Permanganate of potash solution.
Phosphorus (Matches, Rat poison).	Violent vomiting. Smell of garlic. Intense thirst.	Emetics. Stomach tube. Magnesia. *No* oils.
Ptomaine (Tainted food, stale fish, etc.).	Vomiting, Diarrhoea. Pains in stomach. Faintness.	Emetics. Stomach tube if vomiting not free. Purgative. Fomentations. Stimulant.
Tobacco	Heart failure. Collapse	Emetic. Strong coffee. Brandy. Rest on back.
Turpentine	Vomiting. Pains in stomach. Smell of Turpentine.	Emetic. Stomach tube. Epsom salts. Milk, eggs, barley water.

(*b*) The Stomach Tube.—This is a plain rubber tube, usually red, with a funnel attached. To introduce it, oil it well outside, depress the patient's tongue with the left forefinger, slip the tube gently over the tongue along the roof of the mouth, slowly downwards into the stomach, directing the patient to assist by making swallowing efforts. When 20 to 25 inches have passed, raise the free end above his head and by means of the funnel pour down a pint or so of warm water, then lower the funnel end over a bucket, when the water and contents of the stomach will flow out by siphonage. This is repeated several times until the fluid returns quite clear, when the tube is withdrawn.

2. *To administer an antidote*, which acts by neutralising the poison.

3. *To treat special symptoms—Collapse.*—Get patient to bed. Wrap him up well in blankets and put two hot water bottles in the bed. Give stimulants, the best of which is half a pint of warm, strong black coffee introduced into the rectum from the douche can and tube. For failing respiration, perform artificial respiration as for drowning. For pain, apply hot fomentations to the stomach and (except in the case of Laudanum or Opium poisoning) give fifteen drops of Laudanum.

For burning of the mouth give milk, white of egg, barley water, olive oil or gruel, and smear the burns with vaseline.

Treatment of Particular Poisons

Acids (Sulphuric, Oil of Vitriol, Nitric, Hydrochloric, Spirits of Salts).—Emetics and stomach tube must not be used. Give whiting, common chalk, washing soda, baking soda in plenty of water or soap suds. Follow up with oil, butter, grease, etc., to protect the coats of the gullet and stomach. Give 1 oz. of Castor Oil afterwards to open the bowels and repeat it the next day.

Carbolic Acid, Lysol or other Coal Tar Preparations.—Give a tablespoonful of Epsom Salts dissolved in a pint of warm water. In the case of this acid the stomach tube may be passed with care and the Epsom salts solution introduced through the funnel; this should be repeated until you can no longer discern the smell of Carbolic in the fluid from the stomach. Then give ½ pint of Olive Oil in a pint of warm water and let him have milk or white of egg in water. It is common in Carbolic poisoning to find collapse and death suddenly occur after signs of great improvement.

Alcohol Poisoning.—The condition known as drunkenness may occur in varying degrees. Excessive indulgence in Alcohol may amount to actual poisoning and danger to life. There will be in the early stages some excitement varying from a talkative condition to a condition of acute mania. Next comes a loss of control over the muscles and speech followed by stupor, drowsiness and unconciousness. Convulsions and delirium may be present.

Treatment.—If able to swallow give an emetic of 30 grains—half a teaspoonful—of Sulphate of Zinc or a tablespoonful of mustard in a tumblerful of water.

If unconscious, pass the stomach tube as directed and wash out the stomach with warm water several times.

Get everything clear about his neck and waist. See that there is plenty of fresh air allowed—he would be better on deck—and warmth round the body. If the breathing becomes difficult perform artificial respiration.

ARSENIC.—This poison is contained in many rat pastes, sheep washes, dyes, insect powders, etc. The symptoms of poisoning are intense pain in the stomach with vomiting followed by colic and diarrhoea.

Treatment.—Give an emetic at once and as soon as possible, wash out the stomach with the stomach tube, using milk, eggs, olive oil and Lime water if available.

ALKALIES (CAUSTIC SODA, CAUSTIC POTASH, AMMONIA).—Give abundance of weak vinegar and water or lime juice and water; later give milk, white of egg in water or a wineglassful of olive oil in a pint of warm water. After treatment is the same as for acids.

LEAD.—Compounds of Lead being constituents of paint, it frequently happens that lead poisoning arises after chipping paint, so that it is wise to wear a piece of gauze over the mouth and nose when on this job, especially in an enclosed space, so as to prevent inhalation of small particles of paint dust. Keeping the paint wet is also a wise precaution.

The symptoms of lead poisoning begin with severe twisting pains in the belly, which is not tender to touch; the pain, which is known as Lead Colic, being usually relieved by pressure.

The bowels are obstinately constipated, while the pains come on suddenly and recur at short intervals. After a varying time, usually in a few days, a blue line develops on the gums at the edge of the teeth, which, if found, is a sure sign of lead poisoning. It is probable that several of the crew will be affected at the same time. If such be the case, it is an indication that paint work should be knocked off.

Treatment.—Large doses of Epsom Salts dissolved in water should be given and continued every morning in doses sufficiently strong to keep the bowels freely open. Epsom Salts should be given in gradually diminishing doses for several days after the active symptoms of poisoning have passed away. For the Colic hot applications may be applied and, if severe, 15 drops of Tincture of Chloroform and Morphine may be given and repeated in four hours. In addition, quantities of lime juice or lemon juice should be given at frequent intervals. This treatment should be continued with entire

relief from all paint work until the patient is quite free from pain and all symptoms have disappeared. Slop diet is advisable and scrupulous washing of the hands and cleansing of the finger nails.

Food Poisoning.—This is sometimes called Ptomaine poisoning and arises from food which has become tainted or decomposed. It is most commonly associated with pork and meat pies, sausages and shell-fish, but other articles of food such as cheese, butter, fish and milk may give rise to it.

Food poisoning usually affects more than one person at the same time. The symptoms vary with the nature of the poison, but generally there are severe pains in the stomach with vomiting and diarrhoea which do not commence for some time after the poisonous food has been eaten ; it is sometimes hours before the symptoms commence. There may be headache, cold sweats, shivering and collapse.

Treatment.—If the vomiting is not free give an emetic of 30 grains of Sulphate of Zinc or a tablespoonful of Mustard in a glass of water. After that give 1 oz. of Castor Oil with 10 drops of Laudanum. If there are signs of collapse give small doses of brandy and keep the patient warm. Plenty of water may be given to drink.

Opium (Laudanum, Morphia).—The symptoms are, at first, mild excitement, followed by headache and giddiness and finally drowsiness and insensibility. The muscles become relaxed, the breathing slow and noisy, the skin cold and bathed in a cold perspiration, the lips blue and the pulse feeble. An important sign is the smallness of the pupils of the eyes—the pin point pupil.

Treatment.—If the patient is conscious give half a teaspoonful of Zinc Sulphate in a glass of water, make him drink large quantities of water and tickle his throat with a feather to promote vomiting. Pass the stomach tube as in previous directions and wash out the stomach several times with a solution of Permanganate of Potash—ten tablets crushed in a pint of water. The patient must be kept awake at any cost, by splashing his face with cold water, and he must be walked about until all symptoms of drowsiness have passed off. Give him strong coffee often, but in small quantities, and when he is thoroughly awakened let him have a short sleep of about half an hour : then give a dose of Castor Oil—1 oz.—and keep up the warmth of the body.

Note.—All Disinfectants and dangerous drugs must be stored separately from other medicines and kept under lock and key.

CHAPTER XI

FITS

DIAGNOSIS AND GENERAL TREATMENT
APOPLEXY OR STROKE.
SYNCOPE OR FAINTING.
EPILEPSY OR FALLING SICKNESS.
CONCUSSION OF THE BRAIN.
SUNSTROKE AND HEATSTROKE.
HEAT EXHAUSTION.
SHOCK OR COLLAPSE.
ELECTRIC SHOCK.

GENERAL TREATMENT OF FITS.

When you are called upon to treat a case of insensibility of which you do not know the cause, it is wise to proceed as follows :—

(1) Place the patient on his back with his head at the same level as his body.

(2) Loosen all clothing and allow him to have plenty of fresh air.

(3) Find out if there is an injury or bleeding and treat accordingly. A severe injury or bleeding would suggest Syncope or Shock. A head injury would suggest Concussion or Compression of the brain.

(4) Do not give anything by the mouth till he regains consciousness.

The following suggestions may be found useful :—

Convulsions might be Epilepsy.
Paralysis might be Apoplexy or Compression.
A Hot Skin might be Sunstroke, Apoplexy or Compression.
A Cold Skin might be Shock, Syncope, Concussion or Poisoning.
Dilated Pupils might be Shock or Alcohol Poisoning.
Unequal Pupils might be Apoplexy or Compression.
Slow Pulse might be Apoplexy or Compression.
Fast Pulse might be anything else.
Noisy Breathing might be Apoplexy, Compression, Epilepsy or Alcohol.
Difficult Breathing might be Sunstroke or Electric Shock.
Weak shallow Breathing might be Syncope, Shock or Concussion.

Note.—If the patient's condition does not correspond with any of the above symptoms the case may be one of Uraemia or Diabetic Coma which can be discovered by examination of the urine. Great exhaustion, deep natural sleep and starvation are points worth bearing in mind.

DIAGNOSES OF SUDDEN INSENSIBILITY

Onset.	Injury.	Convulsions.	Paralysis.	Skin.	Pupils.	Pulse.	Respiration	Diagnosis.
Sudden	Sometimes	Absent	No	Cold, pale and moist	Equal	Feeble and irregular	Quick and shallow	Syncope (Fainting)
Sudden	Yes	Absent	No	Cold and pale	Equal	Feeble and irregular	Shallow	Concussion (Stunning)
Sudden or Gradual	Yes	Sometimes	Yes	Hot and flushed	Unequal	Full and slow	Noisy	Compression of the Brain
Sudden	No	Yes	Yes, on one side	Flushed	Unequal	Full and slow	Noisy	Apoplexy (Stroke)
Sudden	No	Yes	No	Face bluish	Equal	Feeble and quick	Noisy	Epilepsy (Falling Sickness)
Sudden	No	Yes	No	Hot	Equal	Feeble and quick	Difficult	Sunstroke and Heatstroke
Gradual	No	Sometimes	No	Cold and pale	Dilated	Feeble and irregular	Noisy	Alcohol poisoning

Fits

This is a name given to any sudden cases of insensibility or unconsciousness, the commonest being Apoplexy and Epilepsy. Other forms are syncope or fainting, shock or collapse, heatstroke and sunstroke, concussion and compression of the brain, electric shock and hysteria.

Apoplexy or Stroke.—This is due to the bursting or stoppage of a blood vessel in the brain. This condition usually occurs in stout, florid people over middle age, whose arteries, from various causes, have become hard and therefore brittle. The attack is generally sudden and may be brought on by violent exertion, great excitement, overheating or anything tending to drive the blood to the head. The man usually falls down as if he were shot, the face, at first flushed, becomes purplish and livid, the pulse is full and slow and the breathing snoring, vomiting may occur. The condition of the limbs varies, legs and arms may be quite flaccid falling when raised up, or the leg and arm on one side may be more flaccid than those of the opposite side, sometimes the limbs on one or on both sides may take on a condition of rigidity.

The pupils of the eye are sometimes small at other times they may be enlarged or unequal. The temperature is often raised. An exceedingly high temperature is of bad significance.

The case may terminate fatally in a few hours or may linger on for days. The longer it continues without improvement the worse the outlook. In some cases however there may be a very gradual return to consciousness and in most of those cases it will be found that the patient is affected with paralysis of one side of the body.

Treatment.—Loosen everything about the neck. Place him carefully and gently in a lying-down position with the head raised and also turned to one side to prevent the tongue falling back and blocking up the throat. Do not on any account shake or attempt to rouse him.

Stimulants must never be given.

Apply warmth to the feet.

Give 2 grains of Calomel by mixing it in a little butter and placing it on the back of the tongue. Should vomiting occur help him as effectively and gently as possible, turning the head further to the side so as to prevent suffocation through the semi-ejected particles of food being drawn into the wind pipe and lungs. Oftentimes the patient may pass water involuntarily and great care must be taken to keep him dry and the skin intact by applying alcohol and dusting powder. Where urine is not voided involuntarily it will be necessary to pass a catheter using every care to do this aseptically.

If he is markedly restless a double dose of sedative mixture might be given provided it can be swallowed, failing which a tablet of Morphia or injection of omnopon is indicated, as rest is most important. When consciousness is restored give a dose of Epsom Salts and give light diet sparingly for some time afterwards.

SYNCOPE OR FAINTING.—This is due to sudden failure of the action of the heart causing a shortage of blood supply to the brain. It may arise from loss of blood, exhaustion, want of food, pain, emotion or mental shock. It also occurs in heart disease. The patient suddenly turns giddy and pale, objects seem to swim around, he staggers, loses consciousness and falls down. The pulse is feeble and irregular and the breathing quiet. The attack may last only a few minutes.

Treatment.—When a man complains of feeling faint the best thing to do is to let him sit down, legs apart, and bend his head forward as far as possible ; this position will quickly revive him, but this action should not be taken if he is already unconscious. A small quantity of brandy or whisky in a little water or half a teaspoonful of Aromatic Spirits of Ammonia may be given. Should he become uncconsious lay him down on his back without raising his head, bare the neck, and chest and flick these parts and also the face with a towel dipped in cold water. Apply smelling salts or ammonia to the nostrils. See that he gets plenty of fresh air. Chafing the hands and rubbing the lips with brandy have a good effect in slow recoveries. A burnt feather held smoking under the nose is a useful remedy. When consciousness returns give a few teaspoonfuls of brandy in water.

EPILEPSY OR FALLING SICKNESS.—This is really a disease of the nervous system, the cause of which is obscure. It usually begins in youth and is manifested by periodical sudden attacks called" Epileptic Fits ". When a fit is coming on the patient sometimes has a warning by feeling curious tingling sensations in the limbs and head, noises in the ears, specks before the eyes and giddiness. The fit itself comes on suddenly ; the patient utters a peculiar cry and falls down in convulsions. His whole body works and twists about. He foams at the mouth, his hands are clenched, his eyes roll and his face is distorted and livid. His jaw is set and if his tongue is protruded it will be bitten through. His breathing is suspended and for the moment he may appear at the point of death, but in a short time—usually two or three minutes—the convulsions cease and he awakes heavy and stupid with no recollection of what has taken place, and after half an hours' sleep he is himself again. In some cases, after the fit has passed, the patient may do things unconsciously such as stealing property or striking somebody. This is called the Post-Epileptic state. It should be remembered that fits resembling those seen in Epilepsy are not uncommon in some cases of Heat Stroke but in this event the history and high temperature should help to differentiate between the two conditions.

Treatment.—Nothing can be done to check the fit when once started, though much may be done to prevent the patient hurting himself. Pull him away from any immediate danger. Loosen all tight clothing round his neck and chest and see that he gets as much fresh air as possible. To prevent the tongue being bitten, put something solid between his teeth—a piece of wood, a spoon or anything that is convenient. Put a pillow under his head and do not restrain his movements so long as he does not bang himself about. If he has artificial teeth they should be removed, if possible. When the fit is over he should be put to bed and allowed to sleep. On account of the danger to others of the Post-Epileptic state he should be carefully watched until he has completely regained his self-possession . Between attacks, Bromide of Potassium is given in doses of 20 grains three times a day in half a tumbler of water to ward off or lessen the liability to fits. Men suffering from Epileptic fits should not be allowed to go to sea, so that when a crew is being signed on, a man who is known to have had these fits should be rejected. If one of the crew is found to be unfortunate enough to be a victim he should be replaced at the earliest opportunity. To employ a man who is known to suffer from this disease is asking for trouble, as he might fall from aloft or fall into machinery, or he might set the ship on fire by falling with a light into cargo or stores.

Concussion of the Brain.—This is commonly known as "stunning" and is due to a blow or a fall causing shaking of the brain substance. In slight cases there is sudden weakness and trembling of the limbs, noises in the ears and confusion of mind, but after the patient has rested for a short time he may pull himself together and have no ill-effects beyond a headache. In severe cases the patient falls down unconscious, his face is pale, his pulse is weak and his skin is cold. His breathing may be so weak that he looks as if he were dead. His eyes are shut, and if the eyelids are separated it will be found that the pupils are contracted. After a variable time he may begin to moan, and if he is roused and questioned loudly he will open his eyes, answer the question and shut his eyes again. This symptom may be taken as a sign that the skull is not fractured. Gradually the brain resumes its functions and vomiting may be taken as a favourable sign. During convalescence he will suffer from headache and for some time he may be irritable and drowsy. There is no paralysis and the pupils of the eyes remain equal.

Treatment.—The man should be kept quiet with the head low. He should be put between blankets and hot water bottle applied to his feet. Cold, in the form of ice or cold water cloths, should be applied to the head. The hands and feet should be rubbed briskly. Nothing should be given by the mouth until he recovers consciousness when 2 grains of Calomel should be given. A little brandy in water may be given. The diet should be limited to fluids such as soups, milk, etc., until the patient has recovered control of his movements.

Heat Exhaustion, Heat Stroke and Sunstroke

It used to be thought that sunstroke and heat-stroke were quite different—that some special power for evil lay in the sun's rays—but it is now thought that they are essentially the same and therefore that the treatment of the stoker who collapses after working in a hot stokehold and of the gunner who does the same after exposure to the tropical sun is identical. Mere heat is not the only factor. One can survive a temperature of 104°F. in the dry Egyptian desert and collapse in a temperature of 85°F. in the steamy atmosphere of the Persian Gulf. It is heat plus humidity (dampness of the air) which causes the condition, especially if there is stagnation of the air as well through lack of ventilation. Other predisposing causes are a lack of fluid intake—too little to drink—and unsuitable clothing or accommodation. Also, if a man is greatly fatigued or debilitated, if he is constipated or if he takes too much alcohol, he is likely to suffer from these complaints. Acclimatization is also important: for instance it has been found in steel foundries, where conditions may be very hot, that men who have been absent from work for a few days are more liable to heat-stroke on starting work again.

A distinction used to be drawn between heat exhaustion and heat-stroke but it is now thought that heat exhaustion is merely a mild form of heat-stroke. In heat exhaustion or, as it is sometimes called, heat prostration, the main symptoms are faintness and collapse. The temperature is below normal and the patient may be cold and clammy with sweat. It is usually sufficient to rest him in a shady, cool place, e.g., under a fan and, if necessary, to relieve the subsequent headache with aspirin or phenacetin. In heat-stroke proper, the patient may be drowsy or giddy, the skin is hot and dry the temperature is very high (103° to 108° F.). He may be unconscious, delirious or have convulsive fits. An early sign is a frequent desire to pass water.

Treatment.—The patient should be rubbed with ice or sprayed with cold water, or supported in a tub of cold water while several people rub the limbs and body. Then, when the temperature falls to 102° F. or if he shows signs of collapse, he should be dried and wrapped in a warm blanket. If he starts to sweat, the outlook is good. If his breathing fails, give artificial respiration. Afterwards he should be kept quiet in a dark, cool place.

Avoidance of Heat Exhaustion and Heat-stroke

"Prevention is better than cure." How can these conditions be prevented? (1) Avoid alcohol, at least until sundown. (2) Keep the bowels open, e.g., with occasional doses of Epsom salts. (3) Clothing should be light and loose, and, if possible, white or light-coloured. The bare skin should not be directly exposed to hot winds, e.g., a shirt and not a singlet should be worn. The head and back of the neck should be protected from the direct rays of the

sun in tropical climates, either by a topee or by wearing a cap back to front. Those exposed to the sun's glare should wear dark glasses. (4) Keep the skin as clean as possible. Excessive sweating causes skin disease unless regularly washed off. (5) Take the main meal of the day in the evening. (6) Drink plenty of water, to which is added salt, one teaspoonful to the pint. (7) Pay the greatest possible attention to ventilation. In the tropics, keep out the sun and air during the day and open up the crew spaces as far as possible at night.

SHOCK OR COLLAPSE.—This is a state of nervous depression following a severe injury, such as extensive burns and scalds, severe crushing, or wounds of the internal organs. It also arises from loss of blood, perforation of the stomach or intestines, corrosive poisons, etc. The symptoms may come on suddenly or gradually. There is great pallor of the face and restlessness, the pulse is weak and irregular, the breathing is feeble and gasping and the temperature is subnormal. The pupils are dilated. The patient, although weak, is usually conscious of what is going on around him. If his colour improves the pulse becomes stronger and the limbs feel warmer; it is a sign that he is pulling round.

Treatment.—(*See* Chapter III.)

ELECTRIC SHOCK.—This may be due to lightning or contact with an electric current and the effect is the same, the severity of the symptoms being in proportion to the strength of the current which passes through the body. About two-thirds of the cases struck by lightning prove fatal immediately. On the other hand, an electric shock may cause only temporary discomfort, which soon passes off. In severe cases the patient is rendered unconscious, and there may be convulsions, the breathing is interfered with or stopped altogether and the man may look as if he were dead.

Treatment.—The first thing to do is to see that the patient is removed as quickly as possible from contact with the current. This may be done by either switching off, or short circuiting the current, or removing the patient. In removing the patient great care must be taken to prevent the rescuer himself receiving a shock. To avoid this, he must stand on some non-conductor of electricity and also cover his hands with some non-conducting material. The best non-conductor for this purpose is india-rubber, and india-rubber gloves are usually available. A useful substitute is *dry* woollen clothing. When the man has been removed from the source of danger loosen the clothing and, if the breathing is stopped, start artificial respiration as for drowning. This should be persevered with. The rest of the treatment should be directed towards keeping the patient warm, giving stimulants if able to swallow, treating any burns that may be present and treating for shock (*see* Chapter III).

CHAPTER XII

FEVERS

FEVERS

1. *Those common in the British Isles* :—
   (*a*) *Those accompanied by a rash*—
      Chicken Pox or Varicella.
      Erysipelas.
      Scarlet Fever.
      Small Pox
      Measles or Morbilli.
      German Measles or Rubella.
      Typhus Fever.
      Enteric or Typhoid Fever.
   Cerebro-Spinal Meningitis (Spotted Fever).
   (*b*) *Those not accompanied by a rash*—
      Mumps.
      Whooping Cough.
      Diphtheria.
      Influenza.
   Encephalitis Lethargica (Sleepy Sickness).

2. *Those met with abroad* :—

Malta or Mediterranean Fever.
Malaria.
Cholera.
Dysentery.
Plague.
Yellow Fever.
Dengue.

By Fever is meant a state of hot skin with a rise in the temperature of the body, accompanied by signs of illness, these signs being usually a quick pulse, furred or dry tongue, very loose or very confined bowels and headache.

There are many varieties of fever, some being directly infectious, that is, liable to be conveyed directly from one person to another, while others are carried by insects, such as mosquitoes, and others again are conveyed by food or water, but it is believed that all fevers are caused by germs.

General Warning.—If the Master of a ship which does not carry a doctor visits any port in Asia, East or West Africa, Madagascar, Mauritius, East Indies, Central or South America, including the West Indies, and a case of fever which the Master cannot diagnose with certainty occurs shortly after the vessel leaves such a port, the Master would be well advised to suspect malaria (*as to which see page* 133) *and treat as such*, following carefully the instructions given. If the disease is actually malaria, the treatment should effect a cure ; if it is not malaria, the treatment will not harm.

The Incubation Period is the time between the date on which the disease was caught and the first appearance of the symptoms.

The Quarantine Period is the time that healthy people who have been in contact with a case of infectious disease should be isolated from others, usually two days longer than the maximum Incubation Period.

The Isolation Period is the time a person suffering from an infectious disease should be kept away from healthy persons until free from infection.

Some fevers are accompanied by a rash which appears at a definite period in the course of the disease.

A Papule or pimple is a small red solid elevation of the skin.

A Vesicle is a small collection of serum or clear fluid under the surface of the skin. A vesicle often changes into

A Pustule, which is a small collection of pus or matter under the surface of the skin. A pustule eventually dries up to form

A Scab, which is an irregular mass of dried serum or pus.

TABLE OF INFECTIOUS DISEASES

Disease.	Day of illness on which Rash appears.	Incubation Period.	Quarantine Period.	Isolation Period.
Chicken Pox	1st day	10 to 16 days	18 days	About 21 days.
Erysipelas	1st or 2nd day	1 to 5 days	7 days	Until temperature and skin are normal.
Scarlet Fever	2nd day	1 to 8 days	10 days	Until all throat and nasal symptoms have disappeared, but never less than 6 weeks.
Small Pox	3rd day	10 to 14 days	16 days	Until every scab has disappeared. Usually about 6 weeks.
Measles	4th day	10 to 14 days	21 days	21 days from the appearance of the rash.
German Measles	1st or 2nd day	7 to 18 days	20 days	21 days from the appearance of the rash.
Typhus Fever	5th day	5 to 12 days	14 days	4 weeks.
Enteric or Typhoid Fever ...	7th day	7 to 21 days	14 days	Variable. Until declared free from infection by Bacteriological Examination.
Mumps	No rash	10 to 22 days	24 days	About 3 weeks.
Whooping Cough	No rash	7 to 14 days	21 days	5 weeks.
Diphtheria	No rash	2 to 10 days	12 days	About 4 weeks.
Influenza	No rash	1 to 6 days	—	—
Plague	No rash	2 to 7 days	10 days	4 weeks.
Cholera	No rash	1 to 5 days	7 days	4 to 6 weeks.
Dysentery	No rash	1 to 7 days	10 days	3 to 4 weeks or more.

HINTS ON GENERAL TREATMENT OF INFECTIOUS DISEASES

1. As soon as a case is suspected of being infectious he should be at once isolated. If there is no isolation hospital available he should be isolated in a cabin by himself or in hot climates may be placed aft on deck or in a boat roofed in by a tarpaulin. The patient must have his own utensils and conveniences.

2. The quarters he has occupied must be disinfected, and the best way to do this, in the absence of fumigation, is to use all the fresh air and sunlight possible and wash down with a disinfectant, e.g., Dettol. All utensils and clothes can be disinfected by boiling. Articles of no value should be destroyed.

3. While the fever lasts the patient should be kept in bed on milk and slop diet.

4. If the fever is high, over 103° F., he should be sponged all over night and morning with tepid water.

5. At the onset a purgative may be given, but no other medicine need be given till a probable diagnosis has been made.

6. Always wash your hands after touching anything connected with the patient, and wash your hands before eating your own meals.

CHICKEN POX

This somewhat resembles a mild case of small pox, although the diseases have no connection. Chicken pox is a disease of childhood and seldom attacks adults, though Africans and Asiatics are very susceptible to it. It is a mild disease but very occasionally is severe. The rash usually appears on the first day of illness and consists of vesicles which dry and form scabs. Important points to note in trying to decide whether a case is one of Chicken Pox or Small Pox are :—

(1) In Chicken Pox the rash appears mostly on the body, whilst in Small Pox it appears mostly on the extremities, particularly wrists, ankles and face.

(2) In Chicken Pox the vesicles of the rash appear in crops —that is, when some spots are about at the scabbing stage others are starting to appear, while in Small Pox the spots of the rash are all in the same stage of development. There is usually only slight fever in Chicken Pox.

Treatment.—Low diet, cooling drinks, purgative, if required, and the Sweating Mixture three times a day. If in doubt regarding the diagnosis, be on the safe side and treat the disease as a case of probable Small Pox.

DIFFERENCE OF SYMPTOMS IN CHICKEN POX AND SMALL POX

The correct diagnosis of smallpox, particularly the recognition of the difference between the symptoms of smallpox and those of chicken pox, is so important that no apology is needed for inviting careful study of the following notes :—

(*i*) The majority of " missed " cases of smallpox arise from the fact that the possibility of smallpox has not been in the observer's mind. You should always ask yourself " Is this a case of small pox ? " when confronted with a fever accompanied by a rash of which the diagnosis is doubtful.

(*ii*) A well-developed case of smallpox is unmistakable, but in the early stages " Influenza with spots," measles, blood poisoning and chicken pox are perhaps the most common disguises of smallpox.

(*iii*) Prostration may occur and is suggestive ; on the other hand, a patient may be up and about throughout the disease with but a scanty rash, particularly if he has been successfully vaccinated just before exposure to infection, or at some time previously.

(*iv*) The characteristic pock rash occurs with great regularity on the fourteenth day after the date of infection and in this connection, it is to be remembered that the disease is infectious before the rash appears and contacts may have been exposed to infection for a considerable time.

(*v*) The sequence of events may be summarised by the following table which has been adapted by permission of the " Medical Officer " from Wanklyn's " Smallpox Notes for Medical Practitioners, 1920 " :—

Sunday, January 1st	...	Exposure to infection.
Friday, January 13th	...	Onset of illness with fever.
Sunday, January 15th	...	Appearance of papular rash—small red elevations or pocks which, at this stage, feel like hard " shot " embedded in the skin.
Tuesday, January 17th	...	Watery or mattery stage ; the pocks become beads containing clear fluid (vesicles).
Thursday, January 19th	...	The beads contain thick cloudy fluid or matter (i..e., pus).
Monday, January 23rd	...	Rash begins to dry, forming scabs.
Monday, January 30th	...	Drying stage finishes.

(*vi*) The distribution of the pock rash is the key to the diagnosis of smallpox and in order to appreciate this the patient should be completely stripped for examination. *Successful vaccination has no effect on the distribution of the rash. but it may alter its character.* It may not proceed beyond the vesicular or even the papular stage but in general the rash is uniform in character, i.e., the pocks are mainly at the same stage of development, though not all of the same size. The smallpox rash favours exposed or irritated surfaces, e.g., face, hands, feet and sites of injury or pressure The characteristics of the rash are perhaps best demonstrated by comparison with those of chickenpox.

Chickenpox.

(*a*) The abdomen and chest are covered as thickly as the face, or more thickly.

(*b*) The abdomen is covered equally with the back.

(*c*) Shoulders, loins, chest and abdomen are liable equally to be covered.

(*d*) The rash tends to avoid the limbs.

(*e*) The distribution on the limbs is away from the hands and feet.

(*f*) Prominences and depressions, protected and unprotected surfaces of skin are liable equally to be affected.

(*g*) The pocks are on the surface of the skin and do not involve the underlying tissues.

(*h*) The pocks frequently have an irregular outline; when they lie under a fold they are apt to be oval or elongated.

(*i*) On any given part of the body the pocks are often in different stages of development.

(*j*) The pocks of chickenpox seldom merge together in this manner but remain distinct one from another.

Smallpox.

(*a*) The rash is most abundant on the face and most scanty on the back, abdomen and chest.

(*b*) The rash is much more abundant on the back than on the abdomen.

(*c*) The rash is more abundant on the shoulders than across the loins, and on the chest than on the abdomen.

(*d*) The rash favours the limbs and, generally, the areas next to the face.

(*e*) Distribution on the limbs is towards the hands and feet.

(*f*) The rash favours prominences and surfaces exposed to irritation. It tends to avoid protected surfaces, folds of skin and depressions.

(*g*) The pocks are deep-seated and in the early stage feel like "shot" under the skin.

(*h*) The pocks are generally circular in outline.

(*i*) On any given part of the body the pocks are in the same stage of development.

(*j*) In severe cases the pocks may be so abundant, for instance, on the face, that they will tend to merge together. This is called "Confluent Smallpox" and the condition is always serious.

(*vii*) Other points of significance in the differential diagnosis are:—

Of all the common infectious diseases chickenpox is the one least likely to occur a second time. In this country a well vaccinated child under five years of age will not get smallpox;

under ten it is rare. Evidence of successful vaccination (i.e., " vaccination marks ") should be looked for. It is to be remembered that chickenpox in adults may be accompanied by severe constitutional symptoms and a profuse rash. Examination should not be confined to the patient but should also include his immediate associates, as confirmatory evidence may be found in what might otherwise have been " missed " cases. In any event, those who have been in contact with a smallpox case prior to its discovery must be closely watched with the table in paragraph (*v*) borne in mind.

SMALLPOX

A number of Merchant Seamen contract smallpox during shore leave in certain ports. Death may result, while those infected persons who survive may become permanently disfigured by the characteristic pock marks left by the disease. *Successful vaccination will prevent the great majority of these cases.*

To give complete protection against smallpox, vaccination should be performed every three years but, even at much longer intervals, it will prevent deaths and will reduce the risk of infection.

While it is impossible to keep Masters informed of the prevalence of smallpox in all ports except by notice of the issue of Quarantine Regulations, it may be said that ports in certain areas of the world are constantly liable to be infected. These areas are :

ASIA. East of the Suez Canal specially India, Ceylon, Indo-China and China.

AFRICA. Especially North and West Africa.

CENTRAL AMERICA. Gulf of Mexico, Caribbean area and the Pacific Coast.

EUROPE. Italy, Spain and Portugal.

Masters of ships calling at ports in these areas are urged to warn officers and crews of the danger of smallpox and of the value of vaccination. Masters should be aware of the vaccinal condition of all on board and be prepared, at all times, to arrange for their vaccination or re-vaccination.

The disease, after an incubation period of 10 to 14 days, manifests itself in the form of shivering and chills, fever, headache, vomiting and pain in the back, the latter being a constant symptom. The temperature usually rises to 103° or 104°, and the patient may become delirious. The smallpox rash in its various stages is described in para. (*vi*) on page 114. In uncomplicated cases the patient is usually

convalescent after the 17th or 18th day. As soon as the rash is fairly out, the temperature as a rule begins to come down and the acute symptoms of illness improve and may disappear altogether. When the pustular stage develops, there is usually a rise of temperature and a return of shivering and other signs of illness. This is the most dangerous period of the disease when complications may arise such as bronchitis, pneumonia, inflammation of the eyes and ears and septicaemia (blood poisoning). The severity of the disease depends principally on whether the patient has been properly vaccinated.

Treatment.—The patient must be isolated as effectively as possible and should only be attended by persons who have been vaccinated or who have previously had smallpox. The disease is extremely dangerous to the non-vaccinated. When the first symptoms appear give 2 grains of Calomel, followed in the morning by a dose of Epsom Salts. When the rash is well out give cooling drinks such as lemon juice and water. Water may be given freely. If the strength fails and the pulse flags, brandy or whisky may be given in doses of two tablespoonfuls every four hours. Free ventilation and disinfection but avoidance of draughts, are essential. The mouth must be kept clean and the eyes washed out with boric lotion. It is usual to cover the body with some oily substance such as Olive Oil or preferably Carbolic Oil. If the rash is out on the face a mask of lint with holes for the eyes, mouth and nose and soaked in the oil should be applied.

Vaccination.—In a successful vaccination, immunity against smallpox is established on the ninth day after vaccination. As the incubation period of smallpox is very constantly twelve days, it appears as if there were two to three days margin in which delay in vaccination might not be serious, but this must not be relied upon because the infection may be severe. It has been held that to be absolutely safe, the vaccination should have been done at least two weeks before first contact with infection. *The general experience has been, however, that vaccination successfully protects within twenty-four hours of first contact. The practical point is that to obtain the maximum effect in the control and suppression of smallpox, every endeavour should be made to secure the vaccination (or re-vaccination) of all on board before sailing for an infected port or at a port of call en route. If this has not been possible vaccination should be effected within twenty-four hours of arrival.*

Vaccination can be obtained free of charge on application to any office of the Shipping Federation in the United Kingdom, and, in most ports abroad, by Masters applying to the Port Health Authority through the British Consul or Shipping Agents.

Reaction to Vaccination.—Reaction to vaccination begins on the fourth day with a reddening at the site of vaccination ; on the fifth

or sixth day a pustule develops and the area of reddening and inflammation around it becomes very marked. By the eighth day the reaction is at its height—the pustule will have broken, the area around it will be much inflamed and the arm may be somewhat swollen. At about the tenth day a scab will have formed and the reaction will begin to subside. By the 16th or 18th day the scab will have fallen off leaving a pigmented scar.

In persons who have been previously vaccinated the vaccination may fail to " take ", though there may be a slight reddening and itching with even a slight blister-like vesicle at the site of vaccination. This may occur within 24-48 hours but will clear up by the fourth day. This is called an " immune " reaction, and shows that the person is immune and that a normal vaccination reaction will not take place.

If no reaction whatsoever occurs by the eighth day the vaccination must be repeated.

ERYSIPELAS

This is an acute contagious inflammatory condition of the skin due to infection by a germ which may enter through a wound, which, however, may be so small as to escape observation. It usually commences suddenly with chills or a shivering fit, headache and loss of appetite. The temperature is high—103° or 104°. The redness of the skin of the affected part is a prominent symptom. It spreads rapidly, produces much swelling of the part affected, and occurs most frequently on the face, scalp or legs. When the inflammation is spreading, the part of the skin affected may have a raised, sharply defined border, but when stationary or declining this gradually fades away into healthy skin beyond.

In mild cases it will die away in a few days leaving the skin dry and scaly. There may be some delirium at nights. In severe cases blisters may appear on the affected part and matter may form under the skin giving rise to a condition known as Cellulitis. Erysipelas is also known as " The Rose " and sometimes as " St. Anthony's Fire," on account of the tight burning sensation in the affected part.

Treatment.—Erysipelas being specially liable to attack others suffering with wounds of any kind the patient should be isolated and measures of disinfection carried out. He should be kept in bed while the temperature remains above normal. The edges of the affected part may be painted with iodine or a gauze dressing impregnated with a solution of Epsom Salts (one part in eight of water) may be applied to the inflamed area. In severe cases with marked constitutional symptoms Sulphathiazole should be given—3 tablets (each 0.5 gramme) 3 times a day for 3 days—2 tablets three times a day

for three days—1 tablet 3 times a day for seven days if necessary. The tablets should be given crushed and swallowed with a tumblerful of water.

The bowels should be kept open with calomel grs. 3. followed by Epsom Salts next morning.

The diet should be light and consist of broth and milk.

SCARLET FEVER

This disease may attack adults, though much less frequently than children. A second attack is uncommon. The incubation period varies from one to eight days, but is usually about three days. The onset is generally sudden and the temperature is usually high, often reaching 104° on the first day. With the fever the other prominent initial symptom is sore throat, which in most cases is very severe. The skin is hot and dry and burning to the touch. The rash appears on the second day and consists of tiny bright red spots set close together, which give the skin a scarlet hue. It usually appears first on the neck and spreads to the upper part of the chest, then to the arms, body and legs and sometimes, though rarely, to the face. After persisting for two or three days it gradually fades, The sore throat persists for several days and may cause great pain and discomfort. The tongue is at first covered with a white fur and has a peculiar strawberry-like appearance owing to the papillae showing through the white fur. Later on when the fur clears up the tongue becomes very red. The fever is usually high and lasts about a week. As the rash disappears the skin begins to peel, and this is most noticed at the parts of the body where the rash was most marked. It commences as a small white spot on the skin, in the centre of which appears a small hole, and from this hole the skin separates away in a circular patch. This " Pin hole " peeling is characteristic of Scarlet Fever. The scales which come away may be small or large. The last parts to peel are the parts of the skin which are thick, the palms of the hands and the soles of the feet. Scarlet Fever is very infectious, the chief sources of infection being the nose and throat. The infection is also present in the skin and in the urine. Complications which are liable to occur are (1) inflammation of the kidneys, (2) inflammation of the middle ear due to the spread of infection from the throat, (3) rheumatism, and (4) heart disease.

Treatment.—In slight cases all that is needed is to keep the patient in bed in a well-ventilated room—isolated of course—and give slop diet with plenty of water and cooling drinks such as weak lemon and water or weak lime juice and water. If the throat symptoms are bad put a hot fomentation round the neck and gargle, or swab out the back of the throat with Permanganate of Potash Solution 1 grain to a cupful of water. If heart weakness comes on give beef tea and a tablespoonful of brandy or a glass of port wine every few hours. If

dropsy comes on and the urine becomes scanty and high-coloured suggesting that the kidneys are inflamed—give plenty of barley water or very weak lime juice and water and milk diet, but no wine or spirits. Keep the bowels well open with Epsom Salts and give the Tonic Mixture three times a day in half a tumbler of water after food. When the skin is peeling rub over with olive or some other oil. Great care should be taken at this stage to prevent the patient getting a chill.

MEASLES

This disease is not very likely to occur among men. It commences like a common cold in the head with sneezing, running of the nose and eyes, headache, cough and slight fever, 101° to 103°, followed on the fourth day by the appearance of a mottled raspberry-coloured rash in blotches or half-circles which commences on the face and spreads downwards to the neck, chest and the other parts of the body. It begins to fade from the fifth to the seventh day and does not usually last more than about six days. With the fading of the rash the the temperature begins to come down, and after a week's illness all the symptoms may have disappeared, but the cough may remain for some time. The skin may peel off in fine scales. Measles is infectious as soon as the initial symptoms begin before the rash appears and for two or three weeks afterwards. Skin eruptions resembling the rash of Measles are caused by the action of certain medicines such as Copaiba and Iodide of Potash, but may be recognised by the absence of fever.

Treatment.—There is no special treatment required except to keep the patient in bed while there is any fever, keep the bowels moderately open, give the Sweating Mixture three times a day and slop diet. Care should be taken to guard against a chill as Bronchitis and Pneumonia are frequent complications.

GERMAN MEASLES (RUBELLA)

This is a disease which has features similar to both Scarlet Fever and Measles, and, although it is a mild disease, it is extremely infectious. It commences like Measles with running at the nose, headache, slight fever and sometimes sore throat. The temperature does not usually rise over 100° F. The rash comes out on the second or third day appearing first on the face and neck and spreading over the whole body. It is of a brighter colour than Measles while the individual spots are smaller and closer together, being more like a Scarlet Fever rash. It fades away in two to three days after which there may be a slight peeling of the skin which comes off in fine flakes.

Treatment.—Same as Measles.

DIFFERENCE OF SYMPTOMS IN MEASLES GERMAN MEASLES, AND SCARLET FEVER

——	Measles.	German measles.	Scarlet fever.
Symptoms...	Running nose, watery eyes, sneezing, cough, fever, sometimes followed by pneumonia and pleurisy.	Running nose, watery eyes, sneezing, sore throat, little fever.	Sore-throat, headache, chills, strawberry tongue, severe fever, swelling of glands of neck, often followed by dropsy.
Rash	On fourth day, raspberry coloured, like flea-bites, in half-circles, rough to the finger; lasts six to seven days.	On second day irregular patches of red spots close together, not in half-circles, rough to finger; lasts from five to ten days.	On second day as small red spots till the whole skin is of a bright scarlet tint, smooth to the finger; lasts about eight days.
Skin peels ...	In scales ...	In small flakes	In large flakes.
Temperature	101° to 103° ...	100°	104° to 105°.
After-effects	Lungs	None	Throat and kidneys.

TYPHUS FEVER

This disease has been known at different times under the names of Jail Fever, Camp Fever, and Ship Fever, as it used to be common in those places. It used to occur under conditions of overcrowding, bad ventilation and insanitary surroundings. It is now known to be carried by lice from one person to another, and since the 1914-1918 War very few cases have occurred in England or America which may be said to be due to the greater care now taken to destroy lice and to prevent overcrowding. Typhus Fever begins suddenly with headache, sickness, shivering and vomiting. Fever develops rapidly, the temperature rising to 104° F. or 105° F. There is great prostration, the patient becoming dull, stupid and confused in his mind. Delirium is common. The bowels are constipated, the tongue becomes dry and covered with a brown crust. About the fifth day of illness the rash appears on the front of the body and spreads to the back and limbs in the form of dark red or purple-coloured spots. The rash remains till the fever is over, which is about two weeks. At the end

of the first week the patient will become very light-headed and prostrate, and usually in the beginning of the second week he will become unconscious. The crisis or turn occurs about the fourteenth day, and, if favourable, the patient will fall into a sound sleep, and a gentle perspiration will break out over the body. When he awakes he will feel better and his mind will be clear. The temperature continues to fall, and by the middle of the third week the fever should be all gone, after which the patient gets well very quickly.

Treatment.—At once remove the patient to an isolated, well-ventilated place. Fresh air in abundance is necessary for these cases. The hair should be shaved off or cut very close, and every effort should be made to destroy all lice—especially body lice.—*see* page 181. All members of the crew should have their underclothing disinfected and a thorough cleaning up should be ordered. The patient should be given as much water as he can drink. His bowels should be kept open either by a purgative pill or by a dose of Castor Oil given at night. Strong soups, beef tea and oatmeal water should be given, as his strength must be maintained. At the end of the second week or sooner, if his pulse gets weak, he should be given an ounce of brandy every three or four hours, increasing it, if thought desirable, to every two hours. When the tongue becomes soft and less dry half the brandy may be knocked off. Lime juice or lemon juice may be given freely in the proportion of about 2 ozs. to a pint of water. Sometimes Pneumonia develops and should be treated as directed. During convalescence good nourishing food is required.

ENTERIC FEVER

(Also known as TYPHOID FEVER OR GASTRIC FEVER.)

This disease is caused by the Typhoid Bacillus, a germ which gets into the body in infected food or drink. Water, milk, shellfish and salads are the commonest sources of infection. It may be carried by flies and by infected hands. The disease attacks the wall of the small intestines causing ulceration, which may sometimes extend through the various layers forming the wall and cause perforation of the bowel.

It is useful to bear in mind that this is one of the chief dangers in the course of this disease.

The incubation period is commonly 10 to 15 days, but may be 7 to 21 days.

The onset is slow, very rarely abrupt, and commences with headache, loss of appetite, languor, diarrhoea (sometimes constipation), and general indisposition. Nose bleeding, bronchitis and dizziness are common early symptoms.

At the end of the first week the temperature will be high, the skin hot and dry, the tongue furred except at the edges and tip which are

clean, the abdomen distended and tender. The thermometer is a valuable guide to the diagnosis of this disease. During the first week the temperature gradually rises, the evening temperature being about 1° higher than the morning. Towards the end of the first week the temperature will be about 103° F. or 104° F. During the second week the evening temperature remains at from 102° F. according to the severity of the attack, the morning temperature being 1° to 2° lower. About the middle of the third week the temperature begins to fall, the drop being greatest in the morning, until at the end of the fourth week, in uncomplicated cases, it should go back to normal. The pulse rate is usually 100 to 110 during the first week, increasing to 120 or 130 towards the third week.

Constipation may occasionally be met with, but Diarrhoea, which is usually present, is likely to increase during the second week, the stools being of a yellowish, pea-soupy consistence and smelling very offensively. The stools are highly infectious.

The rash appears about the 7th day, usually at first on the abdomen, but later on the back and lower part of the chest. The spots are slightly raised flattened papules, which can be felt distinctly by the finger, of a rose-red colour and disappearing on pressure, returning when the pressure is relieved. They are usually few in number and come out in crops. Each spot lasts about 4 days, and the rash lasts about 14 days. Do not rely too much on the presence of the rash which is often hard to find and may be absent.

During the second week the patient becomes very weak, and the symptoms become aggravated. The headache ceases, but is replaced by drowsiness and mental dulness. The face looks heavy, the cheeks being slightly flushed and the eyes bright. He loses flesh, the lips and tongue are dry, and dirty, sometimes cracked. Towards the end of the second week and during the third week is the commonest time for complications to set in, the most dangerous being perforation of the bowel which manifests itself by sudden pain in the belly, usually on the right side, rapid drop in temperature and signs of shock. Other complications which may arise are Bronchitis, Pneumonia, Pleurisy and Haemorrhage from the bowel. During the third week he gets more exhausted and often lies in a state of stupor, muttering to himself and picking at the bedclothes.

Improvement is slow and often does not commence till the fourth week, when the motions become firmer, the tongue moist and the skin cooler. By the thirteenth day, in most cases, the fever is over, but the patient is left in a very weak state requiring great care.

Treatment.—The diet is most important—only slops should be given, such as milk and water half and half, with a teaspoonful of sugar added or white of egg water—the white of an egg whipped up in a pint of water or thin gruel. Chocolate may be sucked. Do not give solids until the temperature goes down to normal for at least

DIFFERENCE OF SYMPTOMS IN TYPHUS AND TYPHOID FEVER

——	Typhus fever.	Typhoid fever (Enteric fever).
Onset	Commences more or less suddenly, with flushed face, headache, and on the second day stupor. Temperature may rise suddenly to 103° on the first evening ,and may increase to 106°.	Begins gradually with chills, headache, pains in the limbs, and loose bowels Temperature rises steadily the evening temperature being 1° higher than the morning; during the second week it usually ranges from 102° to 105°, according to the severity of the attack.
Eruption ...	A purple rash appears about the fifth day and lasts till the end; the spots do not disappear on pressure. They are not crescentic like measles.	A few rose-coloured spots, which disappear on pressure, come out on seventh day. They appear in successive crops which last about four days.
Diarrhoea ...	Very uncommon—bowels generally confined.	Very common, stools like pea-soup; often bleeding from bowels.
Tongue ...	Nearly always dry, often covered with brown fur.	May be moist.
Organs affected.	Head and brain ...	Stomach and bowels.
Duration ...	From fourteen to twenty-one days.	From twenty-one days to two months, generally about four weeks.
Death	By stupor	By exhaustion or perforation of bowels.
Relapses ...	Rare	Common.
Convalescence.	Rapid	Slow.
Infection ...	By lice	Chiefly through the discharges from the bowels.
Strength ...	Weakness extreme on the fourth day—delirium sets in at the end of the first week.	Weakness not extreme till second week—delirium not common before the third week.

three days, and always feed in small quantities, half a cupful at a time, frequently, say ,every two hours, rather than large quantities less frequently. The patient can sip lemonade or weak lime juice as often as he wishes. Feed through a cup, with a spout or a small teapot if the former is not available.

If the temperature goes above 104° sponge the arms and legs with cool water night and morning.

The most important thing in the treatment of Enteric or Typhoid Fever is to prevent constipation, and for this purpose there is nothing better than Castor Oil, given as follows :—Put a teaspoonful of the oil in an empty medicine bottle. Fill the bottle half full of milk ; cork it and shake it violently. Let the patient drink the contents. Do this four times a day.

SPOTTED FEVER
(Cerebro-Spinal Meningitis.)

This is an acute infectious fever caused by a microbe, usually occurring in epidemics, and characterised by a purulent inflammation of the membranes surrounding the brain and spinal cord. The infection enters the system by the nose and mouth.

The onset is sudden, with headache, vomiting, backache and high fever, 102° F. to 104° F. A characteristic symptom of this disease is a stiffening of the muscles of the back of the neck which causes the head to be drawn backwards. There is a general irritability of the nervous system and squinting of the eyes, deafness, convulsions and unconsciousness are likely to occur. Sometimes a rash appears in the form of red spots on the neck and limbs.

Treatment.—In the absence of a doctor the following treatment should be carried out. Isolate the case in as well ventilated space as possible and at once commence treatment with Sulphathiazole (0.5 gramme) by giving 3 tablets three times a day for the first three days (9 tablets during 24 hours)—2 tablets three times a day for 3 days—(6 tablets in 24 hours)—and 1 tablet three times a day for seven days. Crush the tablets and let them be swallowed with a tumblerful of water. Whilst carrying out treatment with Sulphathiazole encourage the patient to drink between four and five pints of water daily.

The general treatment for fevers as described on page 112 should be followed.

MUMPS
(Epidemic Parotitis.)

This is an infectious disease, the chief symptom of which is swelling of the salivary glands situated under the ears. The disease sometimes attacks one or both testicles.

It commences with pain and stiffness on moving the lower jaw, accompanied by fever which may rise to 103° F. or 104° F., but usually is about 101° F. A slight swelling will be noticed just below the ear on one side which increases gradually until in a couple of days there is great enlargement of the neck and side of the cheek, the other side usually becomes affected within a day or two. The pain and swelling may be so great that the patient is unable to open his mouth. In an ordinary case, after persisting for about a week or ten days, the swelling gradually subsides and the patient rapidly gets well.

Treatment.—The patient should be kept in bed during the height of the disease. The bowels should be freely opened, and he should be given slop diet. Fomentations may be applied to the neck. An antiseptic mouth wash must be used frequently.

If the testicle should become affected it is usually sufficient to protect it with cotton wool and support it on a pillow, but if the pain is severe, hot fomentations may be applied

WHOOPING COUGH (PERTUSSIS)

This disease is common among children, but sometimes attacks adults. It commences like a common cold, the cough being severe. After a week or so, the peculiar " whoop " develops and occurs on inspiration after a few short sharp coughs.

Treatment.—There is no special treatment beyond keeping the patient warm during the acute stage, allowing plenty of fresh air and during convalescence giving a tonic.

DIPHTHERIA

This is an infectious disease caused by the Diphtheria germ and characterised by the formation of a membrane on the throat. It commences gradually with shivering, general feeling of indisposition, sore throat and some fever. The pain in the throat increases, the tonsils swell and a white patch appears on one of them which soon extends till the whole throat is covered with a membrane like wash leather. This will come off and leave a red bleeding surface which is soon covered up with a new membrane which smells offensively. There is usually considerable swelling in the neck from enlargement of the glands. Death may occur from exhaustion or suffocation. The fever lasts for one or two weeks.

Treatment.—The patient must be isolated, as Diphtheria is very contagious. Great care must be taken by those in attandance not to get any of the membrane or discharges on a sore spot or near the mouth or eyes, and special care must be taken that the patient does not cough in anybody's face. If this should happen the face and hands should be immediately washed in Boric Lotion or some disinfectant.

The principal treatment of Diphtheria is to inject into the body a substance called Diphtheria Antitoxin, but, although provided in ships which carry a doctor, its use under other conditions is impracticable.

The chief thing therefore is to support the strength of the patient by strong beef tea, port wine, milk, raw eggs and brandy, etc. Abundance of fresh air is essential. The air should be kept at a moderate temperature, and, if very dry, a boiling kettle should be kept in the room to keep the air moist.

The nose and throat should be kept clean by gargling, syringing or swabbing. The best gargle is Permanganate of Potash Solution, used frequently. For syringing use warm water or warm salt water. For swabbing, wrap a small piece of cotton wool round the end of a wooden spill, dip it in Permanganate of Potash Solution or Iodine. Use a fresh one every time. If the obstruction to the breathing becomes so great that death from suffocation is threatened, an operation called Tracheotomy must be performed which consists in making a hole in the windpipe in the front of the throat and putting in a short tube to keep the hole open through which the patient can breathe until the swelling in the throat subsides. The patient should be kept in bed for three weeks after the membrane has gone on account of the danger of heart failure and paralysis.

INFLUENZA

This is an acute infectious disease which occurs in epidemics and is said to be due to a germ called the Influenza Bacillus. It begins abruptly like a common cold, but the patient feels much more ill than with an ordinary catarrh. There are fits of shivering and aching in the limbs and back. There is a feeling of great depression and lowness of spirits and often shortness of breath and palpitation of the heart. Headache is usually severe and is often worse at the back of the eyeballs. The temperature may rise to 102° F. or 104° F., and the pulse is not usually as quick as might be expected from the temperature.

There is usually great thirst and restlessness at night. In some cases there is severe coughing, and Bronchitis or Pneumonia may develop, in others the heart may be affected giving rise to palpitation and difficulty of breathing, while in others again pains in the stomach with vomiting and diarrhoea may be the worst symptoms. In the majority of cases in about a week the temperature will fall and the acute symptoms will subside, but the patient is left very weak. He will continue to improve, but the appetite will remain poor for some days and the general weakness may continue for a considerable time. Relapses are apt to occur if the patient is not carefully nursed.

Treatment.—The patient should go to bed at once and remain there till the temperature becomes normal and has remained so for two or three days. Commence with Calomel (two grains) the first night and a dose of salts in the morning. Then give 10 grains of Aspirin every four hours till the temperature falls, when the Tonic Mixture should be given and continued for some time after the patient is better. The diet should be light and nutritious, such as arrowroot, beef tea, chicken broth, etc., and during convalescence a little port wine should be allowed. If there are signs of heart failure the best thing to give is brandy—a teaspoonful every two or three hours.

Isolation and disinfection must be attended to.

SLEEPY SICKNESS
Encephalitis Lethargica

This is an infectious disease, which usually begins with severe frontal headache, diarrhoea and vomiting. The headache is continuous. There may be no rise of temperature for the first few days, and the temperature seldom rises above 101° F. The pulse is fast. There is no rash. A characteristic feature is paralysis of certain nerves in the head, producing symptoms depending on which nerve or nerves are affected. Very often the eyes are affected, producing squint and double vision. There may also be a mask-like appearance of the face and difficulty of swallowing.

Another feature is that the patient sleeps during the day and is sleepless at night. This sleepiness in the daytime progresses, and the difficulty of rousing the patient increases.

Treatment.—The patient must be isolated and treated on the general lines of infectious diseases. No one should go within six feet of him without a damp towel or something similar tied over the nose and mouth. Great care must be taken to prevent the excreta contaminating anything, and disinfection must be strictly attended to.

The bowels should be opened by giving doses of ½ grain Calomel every half hour up to 4 doses followed 4 hours later by a dose of Epsom Salts.

Sulphathiazole in the doses recommended, page 207, should be commenced promptly.

The diet should consist mainly of fruit juices, milk and soups.

MALTA FEVER OR MEDITERRANEAN FEVER

This is a long continued fever which may last for a year or more and is caused by a definite germ. It occurs chiefly in the countries around the Mediterranean Sea. The infection is conveyed by goats milk, which should never be drunk unless boiled. The condition is a kind of blood poisoning. The patient has a temperature of 102° F. or 104° F. for a week or ten days, then the temperature remains normal for a week or so, after which the temperature remains up for a

week or two, and so on through the whole course of the illness. Other symptoms are anaemia, pains in the joints, constipation, profuse sweats, headache.

Treatment.—General treatment of fevers.

CHOLERA

This disease, which is very infectious and is due to the presence in the bowels of a microbe called the " Cholera Spirillum " or " Comma Bacillus," is characterised by purging, muscular cramps and rapid collapse. It is met with chiefly in India and on the coasts of China and Arabia. Infection generally occurs through drinking water or eating uncooked vegetables which have been contaminated with the discharges of a cholera patient.

The onset of the disease is usually abrupt and commences with severe Diarrhoea, followed by persistent vomiting and muscular cramps. There is progressive exhaustion, the temperature becomes subnormal and the pulse feeble, the skin being cold and clammy. The stools are at first yellow, but soon they become pale and watery and contain little white masses like rice, hence they are called the " rice-water " stools of cholera.

When the stage of collapse comes on the face becomes pinched, the eyes sunken and the skin wrinkled ; there is great restlessness and blueness of the face and partial or complete unconsciousness. This stage may last from two or three to 24 hours. Usually about 50 per cent. of the patients die.

In favourable cases a reaction sets in with the return of a better pulse, the body becomes warmer, the features lose their pinched shrunken look and their leaden colour, consciousness returns and, unless complications such as Pneumonia, Pleurisy or Nephritis occur, the patient may rapidly improve.

Firemen's cramp caused by drinking cold water when overheated often has similar symptoms.

Treatment.—In the absence of medical aid the best line of treatment for a shipmaster to adopt is : (1) to keep the patient warm, (2) to give water in unlimited quantities, and (3) at the commencement to give the Cramp Mixture every four hours.

If the disease is not checked, but goes on with increase of Diarrhoea and rice-water stools, the Cramp Mixture may be discontinued and attention given towards keeping the patient's strength up by giving brandy, one tablespoonful every two hours, hot coffee and, if available ice to suck. Water may be given freely all the time. For the cramps in the stomach external applications of heat should be made in the form of large poultices, hot fomentations or hot-water bottles, taking care that the skin of the patient is not burnt. Rubbing the limbs with liniment is useful for relieving the cramps.

Great care should be taken to isolate every suspicious case immediately. Special attention must be given to disinfection and to see that all discharges from the patient are destroyed. As the disease is spread by these discharges care must be taken that all water is boiled before being used, that no uncooked food be eaten and that dishes, etc., are washed only in water that has been boiled. The hands of everyone in touch with the patient must be carefully washed and disinfected. The same precautions are necessary as regards soiled clothing. The diet, during recovery, should be light and nutritious, milk puddings predominating.

DYSENTERY

This disease, which is due to organisms which cause inflammation and ulceration of the large intestine, occurs most frequently on the coasts of India, China and Africa. Infection is carried chiefly by polluted water. The symptoms commence with profuse Diarrhoea which soon shows the presence of blood in the discharge. There is a constant desire to go to stool and, in addition to blood, slimy mucus will be passed, resembling liquid jelly and smelling most offensively. The straining is very painful and the bowels may be opened from 10 to 60 times a day. Fever, if present, is usually slight, the temperature not usually going over 101° F. The disease may become chronic in a mild form and last for years. Abscess of the liver sometimes occurs.

Treatment.—On the first sign of Dysentery give a tablespoonful of Castor Oil. This should be repeated once every third day. The patient should be kept warm. Water should be given freely ; it is best to give an ounce of boiled water every ¼ or ½ hour. For the pain in the abdomen, heat should be applied in form of hot bottle. The diet is important and should consist of small amounts given every two or three hours ; in severe cases it should consist of milk diluted with water, chicken broth or whey given lukewarm ; in less severe cases, custards, egg flip and rice milk may be added, and as improvement occurs the amount of diet may be increased, but semi-fluid diet should be maintained for a week after the blood and mucus have disappeared from the stools. After which boiled fish or chicken may be given.

PLAGUE

This disease which is caused by a microbe called the " Bacillus Pestis " is carried by rat fleas. It occurs chiefly in India, China, Arabia and Egypt, but may be carried from port to port by the rats in a ship. It spreads with great rapidity and the mortality is high, about 50 to 90 per cent.—death usually occurring in two to five days. The two chief varieties of the disease are Pneumonic Plague and Bubonic Plague. In Pneumonic Plague the principal feature is a rapidly fatal form of Broncho Pneumonia. In this form the disease

may be communicated direct from man to man. In all other forms it is communicated by the bite of an infected rat flea.

In Bubonic Plague there are swellings in the armpits, groins and neck. There is another form which is one of general blood poisoning. the chief feature of which is rapid prostration, death usually occurring within 24 hours. The symptoms, common to all forms of Plague, are sudden onset, high fever—104° or 105°—rigors, headache, delirium and great prostration.

Treatment.—The man should be put to bed and isolated in the coolest and best ventilated place procurable. The body should be sponged frequently with Permanganate of Potash Solution. The bowels should be opened by 3 grains of Calomel followed in four hours by a dose of Epsom Salts. The buboes, when a soft spot appears, should be opened, the pus allowed to discharge, and a dressing of gauze applied.

When prostration sets in give stimulants—brandy or port wine—at frequent intervals. If the patient shows signs of recovering keep up the strength with nourishing diet—plenty of milk, broths, beef tea, etc. During convalescence give a good diet, lessen the stimulants and give the Tonic Mixture, three times a day and, as death from heart failure is liable to occur at this stage, avoid anything that may cause heart strain. Be very careful when attending a case that you have no scratches or cuts on your skin and take care to wash and disinfect your hands carefully. Disinfection by sulphur should be carried out, and all dead rats should be carefully removed by throwing overboard or burning in the furnace. These should not be handled with the bare hands, but picked up by tongs or shovel.

YELLOW FEVER

This disease exists only in countries where the temperature reaches at least 75° F. It occurs chiefly in the West Indies, in those parts of America bordering on the Gulf of Mexico, on the West Coast of Africa, and sometimes in Spain.

This is a very fatal disease, the death-rate averaging from 1 in 3 to 1 in 4 in severe cases.

The sole agent in spreading the disease is the female mosquito of what is known as the Stegomyia or " Tiger " species, which is easily recognisable by its silvery legs and silvery lyre-shaped marking on the back.

This mosquito is very plentiful in Yellow Fever localities and is perfectly harmless in itself until it has bitten a person suffering from Yellow Fever, when it abstracts the parasite of the disease. The mosquito, after a period of twelve days, is thereafter ripe for mischief and ready to transmit Yellow Fever to any persons it may happen to bite.

A remarkable fact is that to inoculate itself with the parasite of Yellow Fever the mosquito must bite the sick person within the first three days of his illness ; therefore, directly you have a case showing symptoms of Yellow Fever on board, proceed at once carefully to screen the patient under a mosquito net and take every precaution against the possibility of his receiving a fresh mosquito bite, always remembering that after the first few days your patient will become perfectly harmless as regards spreading infection.

Prevention.—Give a wide berth to towns in which the disease is epidemic ; there is not much risk in going about between the hours of 9 a.m. and 3 p.m., but at all other times of the day and night the mosquito, which is a worrying and persistent biter, is much to be dreaded. If Yellow Fever occurs at sea, make every effort, besides screening your patient as above, to clear out any mosquitoes that may have remained on board. The insect lays its eggs in any sort of stagnant fresh water, and especially the bilges, but no accumulation of water in any part of the ship is safe, all such should be carefully sought for and dried out. A teacupful of water in a dark cupboard is a prolific breeding ground.

The eggs are transformed into larvae termed " wrigglers ", which resemble very minute active worms, and these rise to the surface of the water containing them in order to breathe and soon fly away as full-grown mosquitoes. They can be promptly killed in the bilges by pouring in paraffin which forms a scum on the surface and smothers the wrigglers.

It must be remembered that you may have mosquitoes on board which, having bitten a Yellow Fever patient twelve days previously are actively infectious and ripe for causing a more or less general outbreak ; but usually, when a case occurs at sea, it is possible by taking the above precautions to make practically certain that the disease can spread no further.

The use of a mosquito net in all Yellow Fever districts is of the utmost importance ; it must be tucked carefully under the mattress, be free from holes, and have a deep band of calico fastened round it to protect the limbs.

If it is necessary to visit an infected locality at night, gloves and veils must be worn, otherwise Yellow Jack, with the likelihood of fatal consequences, is almost certain to be the result.

Symptoms.—From twenty-four hours to five days after being bitten by the " Tiger " the disease commences with chills and flushes of heat, which are followed by high fever, the temperature rising to 101° or 105° according to the severity of the attack. There are pains in the back and severe headache, and nausea and tenderness at the pit of the stomach. After a few days, vomiting begins, everything is thrown up without effort, and the vomited matter is tinged with bile or blood —black vomit. The pain in the stomach is increased and the bowels

are very confined. About the third or fourth day the skin becomes yellow and the eyes the same. The stools are deficient in bile and often black with blood. The mind may wander. On the fourth or fifth day the symptoms may improve and the patient feel relieved. This is called the period of calm and is sometimes the beginning of convalescence, the temperature falling to normal, and the pulse slowing from 120 or thereabouts at the onset to 30 or 40 per minute, but it is just at the time when the pulse rate falls that stimulants should be unsparingly administered for frequently the seeming improvement is short, the black vomit begins again, the skin becomes more yellow, extreme prostration sets in with violent pains in the calves of the legs, delirium, and death. The disease lasts from three days to a week, but death may take place in a few hours. To distinguish it from Malarial fevers, *see* page 143.

Treatment.—Commence with a strong dose of Castor Oil, which must not be repeated, and keep the bowels open by doses of Epsom Salts if the stomach will bear it.

Inject slowly by means of the enema at intervals of 12 hours two pints of warm water in which 1 drachm of table salt has been dissolved.

Wrap the patient in a blanket and give him hot mustard foot baths to relieve headache and congestion.

Sponge the body with cold water as long as the heat of skin continues ; but if the patient becomes cold, put him into a warm bath at a temperature of 100°. Mustard leaves should be applied over the stomach. The Sweating Mixture may be given three times a day, or if the vomiting is great, small doses of the Stomach Mixture may be administered. Keep the patient very clean, see that he makes water regularly, and use the catheter if necessary (page 169).

During the first three or four days do not urge food of any kind upon the patient. It is not required at this stage and will probably be rejected with loathing.

Nothing beyond perhaps very small quantities of arrowroot should be offered to him. Give him, however, abundance of cool drinking water, rendered alkaline by the addition of a small pinch of soda ; as thirst is intense, he should take five to six pints of this daily, a small wineglassful being given every 20 minutes ; weak lime juice and water is also permissible.

If the patient is very weak small quantities of brandy and water may be given frequently, well diluted.

During convalescence a good nutritious diet is essential, but solid food must be tried very cautiously. Remember that indiscretion in diet is a frequent cause of relapse, and relapses in Yellow Fever are very dangerous.

A daily allowance of wine or other form of stimulant will be needed, and the Tonic Mixture should be given three times a day.

DENGUE (DANDY FEVER—BREAK-BONE FEVER)

This is an infectious fever coming on suddenly, with pain in the head and eye-balls, and excruciating pains in the muscles and joints, which are swollen and painful. There is also sore throat and catarrh. with inflamed eyes. The temperature rises rapidly to 103° or 105°, and a rash somewhat resembling Scarlet Fever breaks out over the body. These symptoms last for one or two days, then the rash disappears and the fever subsides, and a remission ensues for two or three days. A recurrence of the fever takes place about the fourth day, followed sometimes by another rash, the colour of which is between Scarlet Fever and Measles, and it often appears first on the palms of the hands. On the seventh or eighth day the symptoms subside and the skin begins to peel; but swelling of the joints, especially of the smaller ones, may last for some weeks.

This disease is communicated by the same variety of mosquito that spreads Yellow Fever, and therefore patients should be screened under a mosquito net for a period of a week (*see* Yellow Fever, p. 131). The disease, which is not dangerous, occurs chiefly in tropical regions, notably in the West Indies, South America, and Egypt.

Treatment.—Give one dose of Calomel (3 grains) to start with, following this up in 4 hours with a Black Draught. In most cases, however, Opium will be required, and should be given in the form of a dose of 20 drops of Laudanum, to be repeated, if necessary, in 12 hours. The diet should be gruel, barley water, or milk during the attack, but in the stage of convalescence broths and beef tea, with a little wine or brandy, may be given. Also give the Tonic Mixture three times a day.

MALARIA

Malaria is the cause of much sickness and many deaths amongst the officers, crews and passengers of ships trading to Africa, Tropical America, India and the Far East. The great majority of cases landed occur among the officers and crews, and instances are on record in which, during homeward voyages from Africa or India, the disease attacked all except two or three of the whole ship's company. Ships have been delayed for days and even for weeks by outbreaks of malaria among the crews.

The risk of attacks of malaria can be very greatly reduced if proper precautions are taken and the disease can be cured if proper treatment is given.

The precautions advised relate to :—

(1) Avoidance of being bitten by mosquitoes—

(a) By wearing suitable clothing, particularly after sundown.

(b) By using a mosquito net at night.

(c) By the use of approved mosquito repellent.

(2) Prevention of malarial attacks by taking mepacrine (atrebrin ; quinacrine).

(1) Avoidance of Mosquito Bites

Malaria or ague fever is a recurrent fever which is caused by germs introduced into the blood by the bite of a mosquito called Anopheles, which can be recognised by peculiar spots on its wings and by the fact that it usually perches with its tail raised. This mosquito is most prevalent in marshy districts, as it breeds by laying its eggs in water ; hence it was formerly supposed that malaria arose from some poison peculiar to low-lying marshy land. It is now an established fact that the only way in which the disease is conveyed naturally is by the bite of an Anopheles mosquito which has previously sucked blood from a malaria patient or carrier. (Many of the natives in tropical countries, although they may not appear to suffer from the disease, are known to be carriers of it). Therefore, the best way to prevent malarial infection is to take measures to avoid being bitten by mosquitoes. For this purpose the following rules are applicable to ships and their crews :—

(*a*) Where practicable, select an anchorage as far as possible from the malarious shore. As the flight range of the mosquito often exceeds half a mile, anchor if possible, more than half a mile from the shore, especially in estuaries or rivers. It must be remembered that barges, etc., visiting the ship may bring mosquitoes to it, so that protective measures should never be diminished, whatever distance the ship is anchored from the shore.

(*b*) *Before sunset, make all crew's quarters, as far as possible, mosquito-proof* by covering sky-lights, portholes, ventilators and all other openings with mosquito wire screening (for size of mesh and gauge of wire, etc., see footnote (*a*)). Where doors have to be left open, the openings should be made mosquito-proof by wooden frames covered with mosquito wire screening and fitted in the doorways ; these should be made self-closing. If a carpenter is carried it should be his duty, under the Chief Officer, to cover all openings to all crew's quarters with mosquito wire screening *before* the ship enters a malarious region. It is essential that the necessary precautions should be taken immediately before entering a malarious port.

(*a*) The metal to be used for the mosquito wire screening should be either copper, bronze or monel metal, the last two being more resistant to sea atmosphere than copper. The gauge of the wire recommended is either S.W.G. 28 or 30 and the apertures of the gauze should be each 0.048 inch, this combination giving approx. 16 apertures to the inch.

(*c*) *From sunset until sunrise* keep all doors closed and as far as possible screen all lights which might attract mosquitoes. In the morning open all doors and, by sweeping and brushing, drive out all mosquitoes which have succeeded in entering during the night. Compartments can also be effectually cleared of mosquitoes by spraying with a fluid insecticide. (For list of recommended insecticide sprays and spraying instructions, *see* footnote (*b*)).

(*d*) Do not leave any curtains, clothing, etc., hanging up in cabins or sleeping quarters ; they attract mosquitoes, protect them during the daylight, and prevent the proper clearing of the compartment.

(*e*) If the cabins and sleeping quarters cannot be made mosquito-proof, supply every officer and member of the crew with a mosquito net and insist on its careful use while in the infected port or river. This method, however, unless care be taken, is less efficient than the method recommended in paragraph (*b*), since a sleeper's limbs may touch the netting and he may be bitten through it. Moreover, netting stretched over bunks is more liable to damage. Anyone who has a bed fitted with a satisfactory mosquito net may sleep on deck, but no one else should do so.

(*f*) It should be the duty of the officer on watch to see that the orders on keeping doors, etc., closed and on the careful use of mosquito nets and mosquito wire screening, are obeyed.

(*g*) There should be no uncovered pools of stagnant rain water about the ship, *e.g.*, in the boats, where mosquitoes might breed. The vessel should be kept thoroughly clean in the

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(*b*) (1) A mixture of 1 part of pyrocide 20 with 19 parts of kerosene oil (flash point not to be lower than 120° F. (48.9° C.)). To be stored in a tin in a cool dark place. An addition of 5 per cent. of oil of Citronella will improve the mixture.

(2) Fluol.

(3) Swoop.

(4) Shelltox.

(5) Flit.

(6) Deskito.

The Sprayer to be used with these preparations should give out a very fine cloud of spray, which should be thrown to all parts of the room, especially into dark corners and under settees. Remove and shake all clothing before spraying.

Insecticides containing kerosene are inflammable and when sprayed may be explosive, if they are sprayed in a confined space where there is a fire or flame ; no matches should be struck.

living quarters and throughout the ship ; special attention should be paid to latrines and bilges.

(*h*) There is greater risk of being bitten by malaria-infected mosquitoes on shore than on the ship, but mosquitoes frequently fly on board ships which lie alongside a wharf or trade up creeks and rivers. Both on ships and on shore the risk of being bitten is greatest between dusk and sunrise, when the particular mosquitoes concerned are most active. On shore, the danger is greatest in native dwellings, European rest houses, hotels, eating rooms, cafes, badly lighted warehouses, offices, sheds and lavatories. Men should be strongly discouraged from going ashore except on duty and *all should return to the ship before sundown*. Those who have to go on shore on duty should be instructed not to sit about, but to keep moving and to be watchful not to allow themselves to be bitten by mosquitoes. Clothing is a protection against mosquito bites and as far as possible, men should avoid going about after dusk with portions of the arms and legs exposed (*i.e.*, shorts, short-sleeved shirts or rolledup-sleeves and cellular shirts only, should not be worn after dusk or before dawn). Wearing two pairs of socks will often protect the ankles

(*i*) An anti-mosquito preparation (Dimethyl Phthalate) applied to the exposed portion of the body, neck, ears, wrists, arms ankles, etc.), is a useful protective measure. This preparation is included in the Medical Scales and is a colourless and odourless liquid. It should be used as follows—just before sunset a few drops of the liquid should be placed in the palm and be applied to the exposed portions of the body, avoiding the eyes, the forehead just above the eye brows and areas around the mouth. The liquid should also be applied to the clothing if mosquitoes are biting through it. As the effect of the repellant only lasts for about three hours, a further application should be made when the mosquitoes renew their attack. *Caution.*—Dimethyl Phthalate is a solvent for lacquer, paint, and plastic articles. It is essential, therefore, that it should not be brought into contact with spectacle frames, watch glasses, fountain pens, etc.

(*j*) On board ship it has occasionally happened that cases of malaria have been practically confined to members of the crew who slept in quarters on the side of the ship which was against the quay (or, when the ship was anchored at a distance from the shore, on the side where barges lay), this being therefore the side chiefly invaded by mosquitoes. Crews living on the decks nearest the level of the quay have seemed to suffer more than those on higher decks.

(2) Prevention by Taking Mepacrine (Atebrin, Quinacrine)

The fewer the bites the smaller is the risk of infection but even when the greatest care is exercised it will seldom be possible *entirely* to protect men from being bitten by mosquitoes either on shore or on the ship.

For this reason in all cases when a ship is bound for a malarious port, Ship Masters (in addition to taking all possible measures to prevent mosquito bites) should endeavour to lessen the effects of infection by giving mepacrine systematically to all the ship's company. There is a period of delay before mepacrine builds up protective properties; protective treatment with mepacrine should, therefore, *begin* 10 *days before* arrival at a malarious port. One tablet (0.1 gramme mepacrine) should be given to each member of the crew on each of seven days in the week and, as was the case with quinine, *it must be given during the vessel's stay in the area and continued for* 30 *days after leaving that area.*

It is important that the tablets should not be given on an empty stomach. They should always be given immediately after a meal and followed by a good drink of water, tea or coffee. *Successful results in protecting against malaria by taking mepacrine cannot be expected unless a responsible officer is prepared to devote personal attention to the details of administering the prophylactic doses.*

Some yellow discolouration of the skin may occur after mepacrine has been taken for a few weeks. This is not due to jaundice but to the dye element in the composition of the drug; the condition is not harmful and it will disappear after the drug has been discontinued. Very occasionally certain persons may show some stomach or intestinal upset shortly after starting mepacrine for the first week, expecially if it is taken on an empty stomach or with too little fluid. This is not serious, and usually disappears rapidly if the drug is continued.

In cases where your ship is diverted etc., it may not always be possible to start the preventive dosage 10 days before the arrival in a malarious area. A considerable degree of protection may be obtained, however, by beginning the dosage of mepacrine immediately it is known that a call is to be made at a malarious port or immediately upon arrival at such a port. If the period before arrival is less than 7 days, start with 2 tablets of mepacrine daily for 5 days and then continue with the routine 1 tablet a day.

Malarious Ports.—Ports on the west or east coasts of Africa between latitudes 20° N. and 20° S., in Madagascar and other islands in the Indian Ocean, and in the East Indies should be regarded as malarious.

In the case of other ports in the tropics and in the Mediterranean, unless Masters have definite knowledge that they are non-malarious,

enquiry should be made immediately of the Port Authorities on arrival to find out if the conditions in the port are such that preventive malaria treatment should be given, so that necessary preventive mepacrine treatment may be started without delay.

Taking mepacrine does not, of course, prevent a mosquito from injecting the malarial germs into the person whom it bites but mepacrine, if taken regularly every day, will kill large numbers of the germs and so prevent them increasing sufficiently to cause severe fever. The Master should warn the members of the crew who have had malaria or been exposed to malarial infection, that, if they should develop an attack of fever after leaving the ship, they should be careful to inform their doctor of the possibility of the attack being of a malarial character. If the vessel arrives at a port where the crew are to be discharged before 30 days have passed since the departure from the malarious area, the men should be given sufficient mepacrine tablets to enable them to complete the recommended treatment (*i.e.*, at the rate of one (0.1 gramme) tablet of mepacrine 7 days a week).

A strict observance of the precautions given above will save a large number of lives and will very greatly diminish the cases of sickness among the crew.

(3) Attacks of Fever

Sometimes in spite of all the above precautions a man may get an attack of malarial fever (which will usually appear from the ninth to the twenty-first day after any one of the days during which the ship stays in a malarious port, and in some cases may appear much later than twenty-one days after, especially if the mepacrine rationing of the crew has been stopped before the time advised above).

Description of Malarial Fever.—Malaria may occur either as (A) a relatively mild, benign, or intermittent fever, or as (B) a severe, malignant, or remittent fever. It is important, therefore, when taking the temperatures of a patient suspected of having malarial fever, to note whether these temperatures are of the *intermittent* or *remittent* type. A temperature is intermittent when it rises above and falls *to or below the normal* every 24 hours or less and it is remittent when it goes well above the normal and then drops *more than* 2 degrees but does *not* get back to the normal before rising again.

A. *Mild, Benign, or Intermittent Malarial Fever.*—This disease, which is sometimes called "ague," is characterised by attacks of fever which occur at regular intervals, *i.e.*, there may be either one attack daily, or one attack every second day, or one every third day, while the temperature falls to normal between the attacks. The patient may complain of passing attacks of chilliness, headache, and aching in his bones, with only a slight rise of temperature for some

days before the acute fever stage develops. Each acute attack may be marked by three distinct stages :—

(i) *The Cold (or Shivering Stage).*—In this stage the patient feels cold and trembles all over ; he has pains in the head and body ; the pulse is rapid and feeble, and frequently there is vomiting and yawning. At the same time as he feels cold his temperature is rising and may be as high as 104° F. or 105° F. This stage usually lasts from half-an-hour to an hour or longer.

(ii) *The Hot (or Fever) Stage.*—The feeling of cold decreases ; the skin becomes hot and dry ; the pulse is full and strong, and there is great thirst. The headache increases. The temperature will be high, probably 105° F., or higher. This stage lasts from one to four hours or longer.

(iii) *The Sweating Stage.*—This stage begins by perspiration appearing on the face, which soon becomes general all over the body and may be so profuse as to soak through the bedclothes. The headache and thirst disappear, the temperature comes down to normal, and the patient will probably fall into a deep sleep, after which he may feel quite well again until the next attack. This stage lasts about two hours.

The average total duration of the three stages of the attack is five or six hours, but in some cases it may last as long as twelve hours.

B. *Severe, Malignant, or Remittent Malarial Fever.*—This is the severe and more dangerous form of malarial fever. It is sometimes called " Jungle Fever " and includes Bilious Remittent Fever and Blackwater Fever, according to the variety and severity of the symptoms and the locality, but these are all due to the same cause, viz. : malarial poisoning. This type of fever is usually met with in the late summer and autumn seasons of the districts where it prevails. The symptoms are similar to those in the milder Benign or Intermittent Malarial Fever (Ague) but with these differences, viz. :—

(1) *The Cold (or Shivering) Stage* is very short, not so marked as to shaking and trembling, and may occasionally not be noticeable.

(2) *The Hot or Fever Stage* is more prolonged, lasting six to twelve hours or longer.

(3) *The Sweating Stage* is as a rule less intense, often much less.

(4) *The period* between each attack (*i.e.* between temperature having fallen to rising again) is shorter.

After the short chilly stage, the hot stage begins with violent headache, pains in the limbs, hot skin, very often vomiting and sometimes diarrhoea, high temperature (often up to 105° F. or higher) and depression. The high temperature, after lasting as stated above, then falls, the skin becomes moist and the most urgent symptoms

abate. This fall in the temperature may sometimes reach to or below the normal (98.4° F.), *i.e.*, it intermits, but very often does not, only falling 3° or 4°, *i.e.*, it is remittent, and the fever does not always, therefore, pass away as it does between each attack of benign malarial fever (ague). After remaining down for a short period (from two to twelve hours), the temperature may rise again in another attack and these attacks may recur for a period of from one to three weeks if proper treatment be not given. The course of the temperature in the malignant form of malaria is as a rule not so regular as it is in the milder, benign form (ague).

Masters of ships should especially note that because a patient does not show the typical signs of ague, viz. :—great shivering, followed by the fever stage and then intense sweating, it does *not* follow that it is not a case of malarial fever. When there is any doubt, mepacrine should be given for a few days and the effects observed.

Compared with the milder benign form of malaria *there is a greater tendency in this severe malignant type, to the sudden development of one or other of the following dangerous pernicious symptoms,* which may carry off the patient with great suddenness, viz. :—

(1) Excessively high temperature ; this may suddenly run up to 108° F. or even 110° F.
(2) Coma, or delirium followed by coma.
(3) Heart failure, which may follow some sudden exertion.
(4) Severe abdominal symptoms, as shown by severe distress in the stomach region, with a tender abdomen and incessant vomiting, or there may be numerous motions resembling dysentery or cholera. Collapse may follow on, sometimes with a low temperature.

The Master is warned to keep a good look out for the above symptoms, and the patient's temperature must be closely watched and must be taken often even though the patient is delirious or unconscious. (*See also* under "Treatment," (4) (below) for advice about the taking of temperatures.)

Other types of severe malarial fever are (*a*) Bilious Remittent Fever, which is characterised by a remittent temperature, bilious vomiting, distress in the stomach region and jaundice ; and (*b*) Blackwater Fever, in which the urine is red or porter-coloured ; there may also be jaundice and the patient is often in a state of delirium which, in fatal cases, passes into coma and death. *Blackwater Fever is not likely to be met with in the crews of ships,* as it attacks mainly those who have resided for some time in very malarious districts and have become chronic malaria subjects.

(4) Treatment of Malarial Fever

If a person develops malarial fever, he should be *put to bed* in the ship's hospital, if she has one, and *at once* be given 3 tablets (0.3

grammes) of mepacrine. This dose is given once again after 4 hours. On the next day give 2 tablets (0.2 grammes) three times at intervals of 6 hours. For the next 5 days, 1 tablet (0.1 grammes) is given thrice daily. This completes the full course of a total of 27 tablets (2.7 grammes).

It is advisable to see that the bowels are freely opened early in the attack. This is done with Epsom Salts, or in very constipated cases with calomel (2-3 grains) followed by salts three or four hours later. If found necessary during the course of the treatment, small doses of Epsom salts should be given in the morning to ensure that the bowels are acting freely.

The fever may recur (*i.e.*, relapse) from two to three weeks after the first bout of malarial fever has been cured. These relapses should be watched for and treated as in the first illness. They are very unlikely to occur if the preventive mepacrine treatment mentioned above is continued until the home port is reached, or longer if the period is less than 30 days (*see* section 2).

In severe cases of malarial fever, vomiting may sometimes be so frequent that the patient does not retain any of the mepacrine long enough for it to be effective. In such cases the correct treatment is to administer quinine intravenously or mepacrine intramuscularly, but this cannot be done unless there is a qualified doctor on board, Half a teaspoonful of bicarbonate of soda taken in warm water (or, if this is not available, one tablespoonful of the stomach mixture), and repeated at intervals of half-an-hour or so, is sometimes useful in stopping the vomiting, as is also the application of hot fomentations or a mustard leaf to the pit of the stomach ; or a combination of these two methods may be tried. If there is clean ice on board, small lumps of this may be sucked, in between the giving of the doses of bicarbonate or stomach mixture. If these fail, then try a dose of 5 minims of laudanum, repeated at half-hourly intervals for not more than four doses. These various measures should be tried over a period of at least 12 hours, a small dose of mepacrine being given immediately on the cessation of each vomiting attack. These doses are continued until the patient has retained at least 6 tablets of mepacrine in 24 hours. If the patient continues persistently to vomit immediately after each dose, so that it is clear that none of the drug could have been absorbed, then mepacrine (if it cannot be administered intramuscularly or intravenously) must be administered by the lower bowel (per rectum).* For this method of treatment, the lower bowel should first be cleared out effectively by a simple enema (*see* page 210, under the heading " Syringe, Higginsons ", and page 211 under the heading " To use the Douche Can "). When

* In these circumstances the purgation recommended above should be withheld, temporarily, until the patient is able to take the drug by the mouth.

this has acted a solution of 3 tablets (0.3 grammes) mepacrine is injected into the lower bowel, and repeated after 3 hours, *if* treatment cannot be continued by the mouth. The solution is made by dissolving the tablets in about an ounce of warm water. To inject this, it is drawn up into a syringe of appropriate size, a rubber catheter is fixed to the nozzle of the syringe, and is lubricated on the outside with vaseline. The catheter is gently inserted into the anus, and the solution injected slowly about 6 or 8 inches up the bowel. (Make sure that all the solution is injected). Retention should be assured by an attendant keeping the buttocks pressed together. If any dose is not retained, it should be repeated at once. The same treatment should be used for patients who are unconscious.

Alternatively—if no suitable syringe is available the douche can may be adapted for use. This is used in the same way as in giving an enema (*see* pages 210, 211). The rubber catheter is stretched over the glass nozzle and inserted as described above into the anus. The mepacrine may be dissolved in half a pint of warm water, poured into the douche can which is then raised and the solution allowed to trickle slowly into the rectum.

The *total* amount of mepacrine given during the first 24 hours should be 6 tablets, whether given by the mouth, by the bowel or by both methods.

If the patient's temperature does not show signs of responding to mepacrine inside 24 hours, the treatment may be reinforced by giving 10 grains of quinine thrice daily in addition. The quinine should *always be given in solution*, made by breaking up the tablets and dissolving them in a wineglassful of water acidulated with vinegar or lemon juice.

During the cold stage give hot drinks, wrap the patient in warm blankets and apply hot-water bottles to his feet. When the hot stage begins, the body should be sponged with tepid vinegar and water. The temperature should be taken at frequent intervals, at least once every watch during the fever stage of the attack, and more often if the temperature is high. If the patient's temperature rises above 104° F., it should be brought down to 102° F. by *tepid* sponging, which should be repeated as often as the fever again rises to a high level. On such occasions the temperature should be taken every 10 minutes. If the temperature *rises to over* 105° *F.* the patient should be treated as for heat-stroke (*see* page 107), until the fever falls *to* 102° *F.* Even if the patient is delirious or unconscious, the temperature must be taken, by placing the thermometer either in the armpit or in the groin.

If the patient should show signs of blueness or collapse or very feeble pulse at any time, a dose of brandy should be given. *The sick man should not be allowed out of bed to go to attend to the calls of nature, either during an attack or until he has recovered his strength after an*

attack : instead, use bedpan. Such persons often have weak hearts and, if allowed up too soon, may collapse after slight exertion and die suddenly. As much water, lemon and water, or any other form of pleasant drink should be given as the patient can be made to take. These drinks should contain plenty of sugar. Barley water flavoured with lemon juice and with much sugar is very palatable and beneficial. During the fever stage of the disease the patient should be given a fluid diet—milk, good beef-tea, broth, arrowroot, etc.

General Warning.—If the Master of a ship which does not carry a doctor visits any port in Asia, East or West Africa or Central or South America, including the West Indies, and a case of fever which the Master cannot diagnose with certainty occurs shortly after the vessel leaves such a port, the Master would be well advised to suspect malaria and administer mepacrine, following carefully the instructions given above. If the disease is actually malaria, the mepacrine should effect a cure ; if it is not malaria, the drug will not harm.

DIFFERENCE OF SYMPTOMS IN MALARIAL REMITTENT FEVERS, AND YELLOW FEVER

	Mild, Benign or Intermittent fever	Severe, Malignant or Remittent fever	Yellow fever.
Remission	Threedistinctstages —cold, hot, and sweating — with regular remissions.	Remissions only partial, generally in the morning, cold stage short.	No remissions, fever continuous.
Black vomit	None	Only in bad cases	Very common in severe cases.
Bleeding ...	None	Rare (in black-water fever from kidneys).	Very common from mouth, nose, ears,and bowels in severe cases.
Infection ...	Infectious only through mosquito bites.	Infectious only through mosquito bites.	Infectious only through mosquito bites.
Death ...	Rare	Rare before seventh day.	Common on third day.
Mepacrine	Specific	Specific	Little effect.
After effects.	Malarial cachexia (liver, kidneys, spleen).	Malarial cachexia (liver, kidneys, spleen).	None.
Relapses ...	Common	Common	Rare.

CHAPTER XIII

DISEASES OF THE RESPIRATORY SYSTEM

The Respiratory System consists of

THE NOSE

through which the breath enters the body and where the air is warmed before entering the lungs.

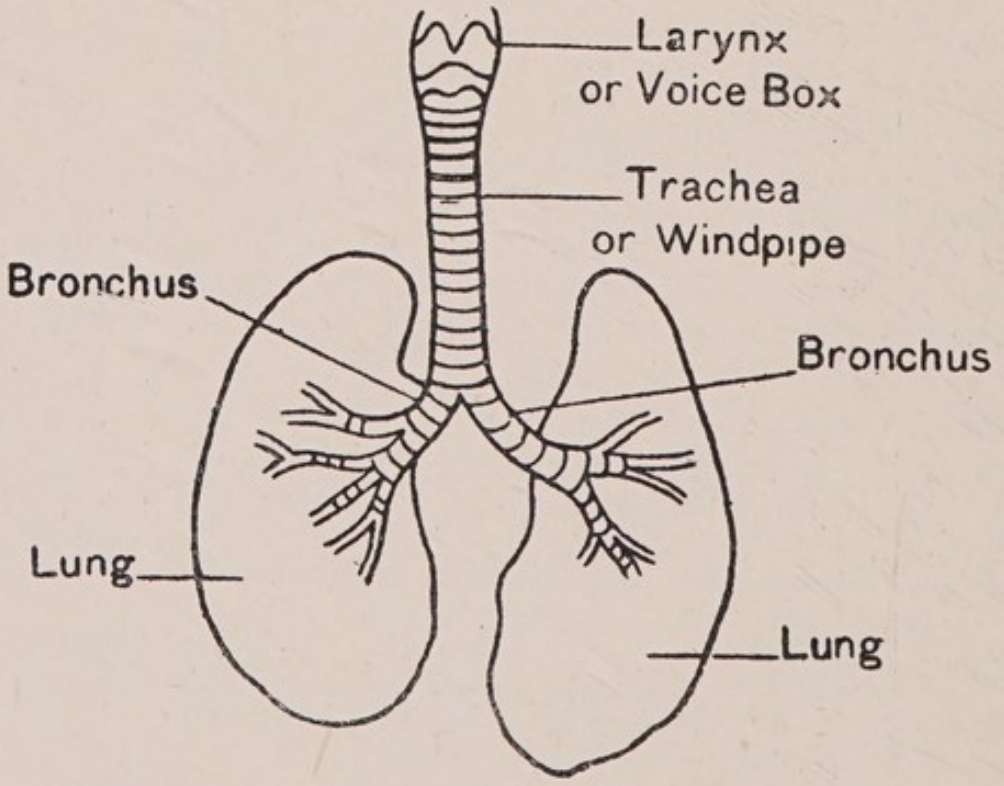

FIG. 58

THE PHARYNX

which is the cavity at the back of the mouth.

THE LARYNX

which is the organ for producing the voice.

THE TRACHEA OR WINDPIPE

which is a tube formed of rings of cartilage to keep it from collapsing and which divides into two

BRONCHI,

one for each lung. Each Bronchus is divided and sub-divided into numerous branches, the ends of the smallest branches being surrounded by little air cells, the whole forming the

LUNGS

which are two large spongy organs and, with the heart lying between them, occupy the whole of the Chest or Thorax. The lungs are surrounded by a delicate membrane called the

PLEURA

which is reflected backwards to line the inner surface of the chest wall so that two surfaces of Pleura are always rubbing against each other.

CATARRH OR COLD IN THE HEAD

This is a very common complaint and usually follows exposure to cold. The patient feels "out of sorts," perhaps chilly, has slight headache and sneezes frequently. The skin is dry and the nose "stuffed up." There may be some amount of sore throat and pains all over. There is usually a slight fever and the temperature may rise to 101°F. As these symptoms occur at the commencement of other complaints such as Influenza and Measles, if the temperature rises to 102° or 103° and if the symptoms get worse, caution should be exercised.

Treatment.—Many cases are so mild that the patients are able to be about and attend to their work, but if the temperature is 100° or over and the man looks ill he should be given 10 grains of Dover's Powder, a dose of Sweating Mixture, a hot drink and turned in. As it is "catching," the man should be isolated till the fever has gone.

SORE THROAT (LARYNGITIS)

This is simple inflammation of the throat without the swelling of the tonsil mentioned in Quinsy, although both conditions may be present at the same time. It is caused by exposure to cold and wet or may develop from over-use of the voice or from inhalation of irritating gases. There is generally a sense of tickling in the

throat with some heat and dryness and pain on swallowing and more or less hoarseness. There is a constant desire to cough, without anything being brought up, and the voice becomes altered. There is at first a huskiness and sometimes the voice may be completely lost. There is not usually any fever, and the general feeling of illness is not very severe, although in some cases there may be fever with severe painful cough and shortness and difficulty of breathing.

Treatment.—Smoking must be stopped, and in simple cases all that is required is to enjoin the man not to use his voice. Inhalations of Friar's Balsam give great relief. Put a teaspoonful of Friar's Balsam in a jug of boiling water and cause the patient to hold his mouth and nose over it with a towel over his head and inhale the vapour given off. This may be done every four hours till improvement takes place. Breathing through the nose should be advised.

In severe cases the man should be put in a warm cabin and ten grains of Dover's Powder given at night with a glass of hot grog. The bowels should be kept well opened.

An excellent household remedy consists of 20 drops of Friar's Balsam dropped upon a piece of soft bread or a lump of sugar and allowed to dissolve slowly in the mouth. This may be resorted to two or three times a day and will afford relief. When the acute symptoms have abated and the throat continues relaxed and troublesome let him take the Tonic Mixture three times a day and gargle the throat with Chlorate of Potash, 10 grains to the ounce of water, or ordinary sea water frequently. The gargle should always be warmed before use.

SORE THROAT (QUINSY OR TONSILLITIS)

It is convenient to group this disease here, although it is not really a respiratory disease, but an inflammation of the Tonsils which are fleshy lumps on either side of the back of the throat. It is supposed to have a close relation to Rheumatism as it occurs more frequently in rheumatic people. It is more common in young persons. Exposure to cold and wet and bad hygienic surroundings such as bad ventilation and foul gases are exciting causes. It usually commences by a chilly feeling and pains in the back and limbs. The fever rises rapidly and on the evening of the first day may rise to 103°. The patient complains of soreness of the throat and difficulty in swallowing. His speech is thick and he may have difficulty in opening his mouth. The tongue is furred, the breath heavy and foul and the urine is highly coloured. Examination of the throat by pressing down the tongue with the handle of a spoon and telling the man to say " AH " will show the swellings, which may extend to meet in the middle. The inflammation gradually goes down and usually within a week the fever subsides and the man feels all right again.

Sometimes, however, suppuration takes place and the man feels extremely ill. The temperature may rise to over 103° and the pulse may be from 110 to 120 per minute. There is no disease of a localised nature which makes a man feel so ill and gets well so quickly, for as soon as the abscess bursts, which should occur in two or three days, there is instant relief and the man will speedily get well.

Treatment.—Get the bowels freely moved with Castor Oil or other suitable purgative.

Gargle frequently with warm Saline Solution (1 teaspoonful of Salt to the pint) or with a solution of potassium permanganate, 1 grain tablet in a pint of warm water.

Give 10 grains Aspirin every four hours. The throat may be wrapped in flannel, and if the condition deteriorates with signs of an abscess forming, hot applications in the form of fomentations often give relief and help to hasten the bursting of the abscess.

In severe cases treatment with Sulphathiazole may be given as described on page 207.

Liquid Diet should be provided and during convalescence tonic mixture may be given.

BRONCHITIS

This commences with a severe cold with a feeling of soreness and tightness and a sensation of oppression on the chest. At first there is a dry hard cough which in a few days gets worse with an abundant white frothy, sometimes purulent, expectoration. In mild cases there is little fever, but in severe cases the temperature may rise to 101° or even 103°. This condition is known as "a cold on the chest," and is frequently an extension downwards of a sore throat. A simple case should be easily distinguished from Pneumonia and Pleurisy—see pages 149 and 150—and should get well in a healthy adult in a week or 10 days. If, however, the symptoms become very severe with high temperature up to 104° or 105°, with rapid breathing and blueness of the face you may suspect Pneumonia.

Treatment.—If the temperature is high and the man acutely ill he should be treated with Sulphathiazole in the way described on page 207.

The bowels should be opened by giving ½ grain Calomel every half hour up to 4 doses.

If there is much wheezing and rawness of the chest apply Kaolin poultice spread on lint and cover the spread with a thin layer of gauze.

In mild cases of bronchitis with little fever the use of the cough mixture 4 hourly will probably prove effective. When the cough

gets looser and there is a good deal of expectoration 2 drachms of aromatic Spirit of Ammonia may be added to a six ounce bottle of this mixture.

Slop diet should be given during the acute stage of the illness. Do not give solid food or attempt to overfeed in the first few days.

During convalescence an abundance of easily digested light nourishment is required. Tonic Mixture should be given three times a day.

For winter coughs there is nothing better than 30 drops of Friars Balsam given in a little gruel three times a day.

ASTHMA

This is a chest complaint which sometimes accompanies Bronchitis, but often occurs without any sign of inflammation or fever. The patient is usually attacked at night, waking up wheezing and gasping for breath. The face is pale and the expression anxious. He is unable to speak and in spite of the most strenuous efforts to breathe, very little air seems to enter the lungs. The asthmatic fit may last only a few minutes, but may be prolonged off and on for several hours. In severe cases the face becomes bluish and covered with sweat, the hands and feet become cold, and just as he seems at his worst the breathing becomes easier and often, after a fit of coughing, there is relief and he falls off to sleep. This relief may be temporary and attacks may occur at varying intervals. In the early stages of this disease the patient is usually free from it during the day, but in long-standing cases there is always a certain amount of Bronchitis and shortness of breath. The disease is aggravated by dust such as arises from grain cargo and coal and also by sudden changes of temperature such as coming out of a hot stokehold into the cold air. Although sometimes very distressing, this is not a dangerous disease.

Treatment.—A dose of Cough Mixture during an attack will often give relief. If necessary a second dose may be given in an hour, after which it may be repeated every four hours.

When a man is liable to attacks, he should always have a supply of nitre papers (strips of blotting paper soaked in a strong solution of Saltpetre and allowed to dry) convenient and burning one of them in the room before turning in will often ward off an attack. He should avoid having a heavy meal before turning in and should drink coffee rather than tea. Special cigarettes are manufactured for asthmatics and may be tried, but one kind may benefit one patient and another kind another patient. Tobacco smoke inhaled in some cases does as much good as these special cigarettes. Men subject to this complaint should avoid sailing in ships carrying grain.

PLEURISY

This disease is an inflammation of the membrane which encases the lungs. It usually sets in abruptly with a chill, followed by fever and a severe pain in the side. In some cases it comes on gradually. The pain in the side is the most distressing symptom and usually occurs under the nipple or the armpit. It is stabbing, sharp and severe and is aggravated by cough, and on taking a deep breath.

The temperature ranges from 101° to 103°. It may drop to normal at the end of a week or ten days or it may persist for several weeks. This is a serious complaint and requires rest and careful nursing as a great deal of fluid may collect round the lung compressing it and preventing the entrance of air and so causing shortness of breath. There is a danger of the fluid being converted into pus forming an abscess within the interior of the chest and requiring a serious surgical operation and the cutting out of a portion of a rib.

Treatment.—The patient should be kept in bed while the fever lasts and given a liquid diet.

The bowels should be opened with Calomel followed 5 or 6 hours later by Epsom Salts.

Sulphathiazole in doses prescribed on page 207 should be given.

If the patient is robust a tablespoonful of Epsom Salts in just sufficient water to dissolve it should be given every morning. This produces copious liquid discharges and helps to get rid of the accumulation of fluid in the chest by draining it through the bowel.

If the shortness of breath and pain in the side remain after a few days, preventing the patient from lying on the affected side, apply Kaolin poultice and cover with a good pad of cotton wool and a broad bandage.

PLEURODYNIA

This complaint is very like Pleurisy in its symptoms. A deep breath or coughing causes very intense pain, and breathing is difficult on the affected side. This is really a form of muscular Rheumatism and can be distinguished from Pleurisy by the fact that there is no fever, whereas in Pleurisy there is always some degree of fever.

Treatment.—Rest of the affected muscles is the first thing to aim at. This may be done by putting on several strips of plaster. The strips of plaster should be cut so as to reach right round the affected side to the middle line both behind and in front and should be close together or slightly overlap. Five or six strips should be enough. Medicinal treatment is the same as for Muscular Rheumatism. Persons subject to this affection should be warmly clothed and avoid, if possible, exposure to cold and damp.

PNEUMONIA (INFLAMMATION OF THE LUNGS)

This is an infectious disease, characterised by inflammation of the lungs and a fever that usually terminates abruptly. It is convenient to group it under Diseases of the Respiratory System as the symptoms are closely associated with this category.

As a rule the disease sets in abruptly with a severe chill. The patient may be taken suddenly in the midst of his work with a shivering and sense of impending illness. The temperature taken during the initial chill shows that the fever has already begun. Within a few hours pain in the side develops, often of an agonising character, a short, dry, painful cough begins and the breathing becomes increased in frequency. On the second or third day the appearance of the case becomes quite characteristic, the patient lies flat in bed, often on the affected side and is restless. The face is flushed, the breathing is hurried, and there is often a sort of grunt at the end of the expiration or letting out of the breath. The eyes are bright, the expression is anxious, and every time the patient coughs it catches him in the side. The sputum which he coughs up is tinged with blood—of a rusty appearance—and very tough. The temperature may rise to 104° or 105°. One of the principal symptoms of this disease is the increased rapidity of the breathing which early in the disease may be 30 per minute, later increasing to 40 and in some cases as much as 50 or more. Delirium is common. This is likely to be more pronounced in men of intemperate habits. About a week after the onset there usually occurs a sudden fall of the temperature and a great improvement. This is called the Crisis and may occur as early as the fifth day or be delayed to the tenth day. This crisis is a remarkable feature of Pneumonia. When the sudden fall of the fever comes the breathing becomes easier and the number of respirations may become almost normal, the pulse becomes slower and the patient passes from a condition of extreme danger and distress to one of comfort and comparative safety.

Treatment.—As Pneumonia is an infectious disease the man must be isolated. He must be given as much fresh pure air as possible. If the weather is dry and warm his bed should be placed out on deck aft. He should have a slop diet and water given freely. An occasional lemon water or lime juice in water may be given. The mouth and tongue should be cleaned several times a day with a little cotton wool wrapped round the first finger or round a small piece of wood and dipped into a mixture of equal parts of Glycerine and Lemon Juice, failing which, swabbing with warm water will suffice. Each application requires a fresh piece of cotton wool, which should be carefully wrapped up and thrown overboard.

At the outset of the disease give 3 tablets of Sulphathiazole (each 0.5 grm.) 3 times a day for 3 days—2 tablets 3 times a day for 3 days

then, if necessary, 1 tablet 3 times a day for 7 days. This treatment is likely to shorten the ordinary course of the disease very considerably and should lead to a successful issue.

Great care should be taken to keep the patient lying down in bed during the continuance of the illness and for several days afterwards sitting up or standing is apt to cause sudden death from heart failure. It is of the utmost importance to bear this well in mind.

During the illness attention must be paid to the condition of the bowel and small doses of calomel gr. $\frac{1}{8}$ may be given at half hourly intervals up to 1 grain if necessary, followed some four or five hours later by a dose of Epsom Salts.

If the patient shows signs of weakness and exhaustion brandy may be given in tablespoonful doses every two or three hours until his condition improves.

If there is pain there is nothing better than Kaolin poultice to relieve it and to arrest the spread of inflammation in the lungs. Apply the poultice all over the painful side of the chest covering it with a layer of cotton wool and broad bandage.

CONSUMPTION (TUBERCULOSIS OR PHTHISIS)

Consumption is a wasting disease in which the lungs and other affected organs are subjected to a destruction process caused by microscopic germs called Tubercle Bacilli.

A patient suffering from this disease spits in the street or some other public place, the sputum becomes dry and mixed with dust, but the Bacilli which it contains remain alive, the dust and Bacilli, which are invisible to the naked eye, float in the air and are inhaled by other people. This is the reason that this disease must be looked upon as a dangerous infectious disease. A great many people inhale Tubercle Bacilli into their lungs and suffer no harm because the white cells of their blood are in a healthy condition to attack and kill the Bacilli. Others, however, who may be in a weak state of health generally or may have a peculiar tendency to this disease are not so fortunate and so may become infected. Conditions which favour the growth of the Bacilli in the lungs are dirt, bad ventilation, overcrowding, absence of sunlight, poor feeding, exposure to cold and wet, alcoholism, and weakening diseases such as Syphilis, Diabetes, Pleurisy.

It usually begins with a cough, slight and dry at first but increasing in severity and going on month after month without any improvement. The cough becomes looser and the expectoration more profuse, and often the first alarming symptom is the coughing up of blood.

The patient gets thin and loses weight, his face becomes pale and as the disease progresses becomes bluish in colour, often with a

red flush on the cheek bones. As the disease becomes well established there is some fever, the temperature rising at night to 103° or higher. Night sweats are a prominent feature which weaken the patient by drenching perspirations after which the fever subsides towards morning. In many cases the voice becomes husky due to Tuberculosis of the Larynx or Throat.

Diarrhoea is often present, especially in advanced cases, and the disease which gradually destroys the substance of the lungs may, through the swallowing of matter containing the Bacilli, infect the bowels and other organs causing the patient to waste away and gradually sink.

Treatment.—As consumption is a dangerous infectious disease the patient should not be allowed to sleep in the forecastle or in a room with any other person. He should always spit in a covered cup or other utensil in which a Disinfectant solution has previously been placed. The sputum should never be allowed to become dry and the utensil should be frequently washed out with boiling water, taking care that every particle of the contents is thrown overboard or washed down the W.C. His personal clothing and sleeping gear, etc., should be boiled and washed separately. Boiling water kills the bacilli. As the great curative agent is fresh air and sunlight, he should have as much of both as he can obtain. He should sleep on deck whenever possible.

The patient's strength should be built up with plenty of suitable food. The diet should be generous and should include fatty substances, butter, beef dripping, plenty of milk, and the like. At the first opportunity Cod Liver Oil should be obtained and a tablespoonful given three times a day. Special symptoms should be treated as they occur.

CHAPTER XIV

DISEASES OF THE DIGESTIVE SYSTEM

The Digestive System consists of

The Mouth

through which food and drink enter the body and which contains the Teeth, the Tongue and the Salivary Glands, the latter supplying the saliva ;

The Pharynx

which is the cavity at the back of the mouth ;

The Oesophagus or Gullet

which is a muscular tube about 9 inches long connecting the Pharynx with

The Stomach

which is a hollow organ situated at the left side of the upper part of the abdomen, somewhat pear-shaped, with the larger end on the left and the narrow end on the right, leading into

THE DUODENUM

which is the first part of the small intestines.

The Small Intestines

are about 20 feet in length and are continuous with

The Large Intestines

which begin at the lower right-hand side of the abdomen at the point where the Appendix is, passing upwards on the right side and across below the stomach down on the left side to end in

The Rectum

which is the last part of the intestines and opens through

The Anus

which is the orifice through which the faeces or dung is discharged.

The above passage from the mouth to the anus is called the Alimentary Canal and is the most important part of the Digestive System, but there are other organs which are included in the Digestive System as accessories, and the principal of these are

The Liver

which is a large organ lying in the upper part of the abdomen on the right side and covered by the lower ribs. It has various functions, the chief of which is the secretion of Bile, which is a substance supplied for the digestion of the food. Bile is stored in

The Gall Bladder

which lies underneath the Liver and connects with the intestine by a duct called the Bile Duct.

The Pancreas or Sweetbread lies behind the stomach and supplies juices for the digestion of food and for other purposes.

TOOTHACHE

This is caused by a decaying tooth.

Treatment.—The tooth should be stopped, or if too far gone, removed on the first available opportunity. In the meantime, the teeth should be scrubbed with a tooth brush and a mouth wash of Permanganate of Potash used several times a day.

A piece of cotton wool dipped in Creosote and pressed into the cavity often gives relief. Two ounces of Black Draught should be given, also 10 grains of Aspirin which should be repeated in six hours.

GUMBOIL

This is an abscess in the gums caused by a decaying tooth.

Treatment.—The mouth should be frequently washed out with hot Permanganate of Potash Solution. When the abscess points, that is, when a soft spot is felt with the finger, it should be lanced with the point of an abscess knife directed towards the bone. Instant relief will follow the escape of pus. The mouth wash should be used several times afterwards.

TONGUE, AFFECTIONS OF

The chief diseases which affect the tongue are Cancer and Syphilis. There are also other chronic inflammatory conditions caused by excessive smoking or irritation from bad teeth.

Cancer of the Tongue is commonest in old men, although it may attack men of 40 or 45. It commences as a small hard, sometimes painful lump at the side or tip of the tongue which in time becomes ulcerated and causes swelling of the glands in the neck. As the only treatment for this condition is a surgical operation, little can be done on board ship beyond attending to the cleanliness of the mouth by the use of any mouth wash which may be convenient.

Syphilis causes ulcers which see (page 194).

Treatment.—Stop smoking. Permanganate of Potash makes a good mouth wash.

ACUTE INDIGESTION

Inflammation of the Stomach, otherwise called Acute Gastritis or Acute Indigestion, may be caused by eating too much or bolting the food or eating food which has begun to decompose, particularly in hot weather. Another common cause is the abuse of alcohol and is often seen after a drinking bout. Rarer causes are poisons such as Arsenic, Mercury, etc. In mild cases the symptoms are those of slight indigestion. There is an uncomfortable feeling in the stomach, with headache, depression, nausea and vomiting. There is usually no fever. The duration is not more than 24 hours. In severer cases the onset is sudden, and, in addition to the above symptoms, there may be fever, the temperature sometimes rising to 102°. The tongue is furred, the breath heavy and the vomiting is frequent, at first chiefly undigested food and subsequently mucus and bile-stained fluids. There is pain and sometimes tenderness on pressure over the stomach. The attack may last from one to three days.

Treatment.—Mild cases recover in 24 hour and require no treatment beyond a dose of Castor Oil.

In severer forms, if there is much discomfort, the vomiting should be helped by drinking warm water. A tablespoonful of Castor Oil should be given. If belching and acidity continue give the Stomach Mixture in water three times a day. The stomach should have a rest and it is well, especially in alcoholic cases, to cut off food for 24 hours and allow plenty of water, preferably with ice. It is better not to attempt to check the vomiting unless it is severe and prolonged. Recovery is usually complete, although repeated attacks may lead to Chronic Dyspepsia or Chronic Gastritis.

CHRONIC INDIGESTION OR DYSPEPSIA

This is also called Chronic Gastritis and is caused by errors of diet and also by the excessive use of Tobacco (especially chewing) and Alcohol. Bad teeth are sometimes a cause, as the food is not properly chewed. The symptoms are somewhat similar to those mentioned under Acute Indigestion, but are not so intense. A prominent symptom is that the pain comes on about half an hour after food and is relieved by vomiting. Pain is sometimes felt in the back between the shoulder blades. The tongue is dirty, and there is a bad taste in the mouth. The edges and tip of the tongue are usually very red. There is generally constipation.

Treatment.—There are several varieties of this complaint with special treatment for each, but the general principles to be adopted are to keep the bowels open, stop smoking and drinking and have the teeth attended to. The food must be eaten very slowly and chewed thoroughly, a small quantity at a time, and should be light and easily digested. Give the Stomach Mixture.

ULCER OF THE STOMACH OR GASTRIC ULCER

This is a not uncommon complaint and its effects may be serious. The symptoms which are characteristic are as follows :—

(1) Pain in the pit of the stomach occurring some two or three hours after food—the so-called "Hunger Pain." This pain is generally relieved by food.

(2) There is nearly always associated with it an irregularity of the bowels generally constipation.

Two things may happen : (1) The ulcer may eat into a blood vessel, or (2) the ulcer may eat through the stomach wall causing inflammation of the belly cavity known as Peritonitis.

Treatment.—The so-called Hunger Pain is quickly relieved by the Stomach Mixture, of which a double dose may be given.

Diet should consist of milk and gruel. Avoid meat extracts, pastry, potatoes and vegetables.

If Haemorrhage occurs as shown by the vomiting of bright blood or black "coffee grounds," or if black tarry motions are passed, treat as described on page 46 (Internal haemorrhage).

If a perforation occurs as shown by a sudden violent pain with signs of shock and collapse ; great tenderness and rigidity of the belly ; rapid pulse and sense of exhaustion, treat as for Peritonitis.

In cases of haemorrhage or perforation endeavour to land the patient at the earliest possible opportunity, and in the meantime try to get in touch with a surgeon.

CANCER OF THE STOMACH

This disease occurs in middle-aged or old men. It commences as a Chronic Dyspepsia and the patient rapidly loses flesh. Sometimes there is vomiting of blood. Later vomiting becomes a marked feature. Pain is constant and of a dragging, gnawing character. There is tenderness on pressure and sometimes a hard lump may be felt in the region of the stomach.

Treatment.—As this disease is incurable without operation, and even operation except in very early stages is unsatisfactory, all that can be aimed at is to make the patient as comfortable as possible. The diet should be light. Many patients do best on milk alone. When the pain becomes severe 20 drops of Laudanum should be given at night.

VOMITING

This is not a disease, but a symptom connected with many ailments and is simply the forcible return of the contents of the stomach through the Gullet. The principal conditions which give rise to vomiting are :—

(1) Irritation of the back of the throat and the action of emetics.

(2) Diseases of the Stomach, Liver, Intestines and Kidneys.

(3) Severe injuries, especially of the head.

(4) Disgusting sights, smells or tastes.

(5) At the beginning of acute illnesses such as Pneumonia or Scarlet Fever.

(6) Sea Sickness.

Treatment should be directed towards the cause.

Vomiting of Blood. *See under* Bleeding *or* Haemorrhage (Internal), Chapter V.

DIARRHOEA

This is a frequent complaint among sailors and is due to many causes. It is not a disease in itself, but a symptom, and a proper understanding of this fact will lead to a more efficient treatment of the condition. In other words, we should not aim at stopping the Diarrhoea, but at removing the cause. The condition consists of frequent loose motions which as a rule do not, except in Dysentery, contain blood. It may be due to a chill or to swallowing something which acts as an irritant or may indicate the commencement of serious illness such as Cholera or Dysentery. Under the heading of irritants may be included such causes as indigestible food, unripe fruits, badly cooked vegetables, shellfish, inferior tinned provisions, inferior wine or beer, changing from salt rations to fresh meat, dirty condition of or defective tinning of cooking utensils, bad water.

Treatment.—Diarrhoea must never be neglected, and especially in the tropics its presence calls for careful attention. If it comes on suddenly with a coated foul tongue and is apparently due to some injurious article of food or drink, it is to be regarded as Nature's method of getting rid of the offending material and instead of checking it, we should assist this process by giving Castor Oil. Give a full tablespoonful of Castor Oil followed by the Colic Mixture every four hours. An ounce of brandy in a little milk is sometimes useful in allaying the griping pains. While the Diarrhoea lasts, nothing more than milk and barley water should be taken, and as it diminishes the diet may be increased to soft-boiled eggs, toast, arrowroot, custard, dry biscuits, and the like.

CONSTIPATION (COSTIVENESS)

This condition is much more frequent and troublesome at sea than on shore. The causes are varied, such as constitutional weakness of the bowel, certain diseases like anaemia, liver and stomach troubles and acute fevers, but the most common cause is laziness or neglect in obeying the calls of nature, thereby developing a constipation habit.

Although some people may go for days or even weeks without having their bowels moved and still have fair health, yet it cannot be denied that a daily evacuation is a most important item for the maintenance of health. Constipation is nearly always associated with headache, loss of appetite and debility. The tongue is furred. It may give rise to piles, ulceration of the bowel and other conditions.

Treatment.—The habit should be cultivated of going to stool, whether successful or not, at a regular hour. The desire to go should always be obeyed. The diet should be light with plenty of fruit and vegetables. Oatmeal is good and brown bread better than white bread. A tumblerful of cold water should be taken on rising and a glass of hot water when turning in.

There are several opening medicines which may be given. Castor Oil is an excellent remedy, but does not suit some people, especially in the tropics. Black Draught is a favourite remedy on board ship and is very useful, but for obstinate cases, particularly if the liver is out of order, it is best to give Calomel in three doses of one grain each with an interval of an hour between each dose and four to eight hours afterwards give 2 ounces of Black Draught.

Sometimes all that is required is a Purging Pill. A piece of common soap shaped like a cone and about an inch long pushed into the lower bowel sometimes acts speedily. If the constipation still persists it may be necessary to give a simple enema of a pint of soapy warm water by means of Douche Can (*see* page 211).

OBSTRUCTION OF THE BOWELS

Obstruction of the bowels may be partial or complete. Partial obstruction is due to severe constipation or a growth in the bowel and the symptoms come on slowly. Acute obstruction is generally due to a strangulation of the bowel as in strangulated hernia or to a twist or kink in the bowel.

The patient complains at the early stage of colicky pains which increase and become continuous, and very intense vomiting starts and becomes persistent. At first food and water are vomited up but later bile and even dung may be vomited.

The face is pallid and anxious. There is continuous thirst and the skin is cold and clammy.

On examination the pulse will be found to be rapid and feeble and the abdomen full, rigid and tender to pressure.

No stool and no wind will be passed.

Aperients should not be given.

Treatment.—If due to a rupture, see treatment of strangulated hernia.

If due to some other unknown cause, give a large enema of soap and water (*see* page 211) with Laudanum, 15 drops, by the mouth repeated once in four hours.

Get into touch with a surgeon ashore or in another ship as soon as possible, and arrange to transfer or land the patient at the earliest opportunity. It may be possible to save his life by operation when two or even three days have elapsed.

HERNIA OR RUPTURE

A Hernia or Rupture is a protrusion of gut through a weak spot in the abdominal wall forming a rounded swelling under the skin caused by straining or great exertion such as hauling upon ropes, lifting heavy weights, etc. A Hernia may appear at the Navel or through a scar left after an operation, but the commonest form occurs in the Groin. A swelling—at first small—appears in the Groin which disappears when the man lies down, but reappears when he stands up or coughs ; there is little pain, but a feeling of dragging at the lower part of the body. In old cases the gut passes down into the scrotum or Bag. Usually the gut can be quite easily pressed back into the abdomen, but sometimes this is very difficult to do, and, if neglected, it is liable to get nipped and become strangulated—a very dangerous condition. In such a case the swelling in the groin is elastic and more or less painful to the touch, and the symptoms become those mentioned under Obstruction of the Bowels.

Treatment.—A small reducible Hernia may be treated with a truss which consists of a leather-covered pad attached to a leather-covered

steel band. The pad is for the purpose of placing over the Hernia and the band to pass round the body and keep gentle steady pressure on the pad. To apply it properly the patient must lie on his back, and when the swelling has been reduced the pad should be placed over it and the band carried round the body. The leather belt at the other end of the pad band is then buttoned to the front of the pad and a second strap which is attached to the middle of the truss behind is brought forward under the fork and attached to another button on the front of the pad. This keeps it in its place. It is important that the truss should fit well, and after being applied it should be tested by the man sitting on the edge of a bench and coughing to see that the Hernia does not come down again. The patient should be warned that he is never safe without his truss. It need not be worn in bed unless he has a cough, but should not be taken off till he lies down and should be carefully adjusted before getting on his feet. Should any difficulty arise in returning the gut it must be attended to at once in case it should become strangulated, and efforts must be made gently to return the portions of bowels, etc., that have descended, back into the cavity of the abdomen. The method employed is called Taxis and is performed thus :—

Let the patient lie down on his back with his hips a little raised. Bend the thigh up towards the belly to relax the parts as much as possible. Grasp the bulk of the swelling with one hand and the upper part or neck with the finger and thumb of the other. Draw the swelling a little downwards to disengage the neck, then press the swelling very steadily and gently upward, always following the direction in which it has come down. You will probably feel a gurgling sensation and with a quick upward rush the mass slips through the ring into the belly and the patient is safe again for the time. Sometimes, however, this does not happen and after trying for two or three minutes you must desist and get him into a hot bath—temperature about 100°F. Give him at once 30 drops of Laudanum (Tincture of Opium) and after 20 minutes in the hot bath apply Taxis as before and you will stand a better chance owing to the softening and relaxing of the parts from the combined effects of the hot bath and Opium.

Do not persist, however, for more than five minutes, after which get the patient dried and into bed. The next best thing to do is to apply snow or ice, if obtainable, which should be laid upon the swelling in a bag or bladder fashioned out of waterproof material and kept on for hours or days if need be. Sometimes under the constant application of cold the swelling becomes so reduced that the bowel is easily pushed back.

If cold applications are impossible to obtain, constant hot poultices should be used, but heat is not nearly as good as cold. When the swelling has been reduced a large pad of lint should be placed over

the spot and kept there by a figure-of-8 bandage passed around the body above the hips and round the upper part of the thigh—*see* Bandaging, page 29).

When the irritation caused by the manipulation has subsided, a truss should be fitted. Should the rupture unfortunately become strangulated nothing can be done except by a surgical operation, and if surgical assistance cannot be obtained in time the patient will die. The only thing to do is to relieve the pain by giving Opium—*see* Obstruction of the Bowels, page 159. Aperients should not be given.

PERITONITIS

This is an inflammation of the Peritoneum, the delicate membrane which, forming a reflected close sac, covers the intestines and the inside of the abdominal wall. The commonest causes are perforation of the stomach or intestines, rupture of an abscess of the appendix or liver or as a result of injury. It commences with a severe pain in the abdomen which may be accompanied by chilly feelings. The pain is general all over the abdomen and is aggravated by movements and pressure. The patient pulls up his knees to ease the tension. Breathing is shallow and the abdominal walls do not move with the breathing. The pulse is rapid—110 to 150 per minute. There is always vomiting which causes great pain. The abdomen gradually becomes distended and tense. The face is pinched, the eyes are sunken, the expression is anxious, and there develops a kind of wasted appearance.

In the worst cases death occurs in 36 to 48 hours ; more commonly death results in four or five days, or the attack may be prolonged to eight or ten days.

Treatment.—As the treatment consists of immediate operation, in the absence of surgical aid the only thing to do is to give 20 drops of Laudanum every three or four hours. As great thirst develops, sips of water may be given—nothing else.

PILES OR HAEMORRHOIDS

These consist of a collection of dilated veins at the lower end of the rectum and may be entirely within the Anus when they are called Internal Piles or Bleeding Piles, or partly outside the Anus (External or Blind Piles). The commonest cause is Constipation, although they may be caused by any condition which prevents a free flow of blood through the veins, such as Heart Disease, Cirrhosis of the Liver and Cancer.

There is a feeling of itching, heat and swelling about the Anus and a straining after stool as if there were something more to come Internal piles often bleed, but the outside variety as a rule give little trouble if they are kept scrupulously clean by a liberal and frequent sluicing with cold water.

Treatment.—The bowels must be kept open, and the best laxative to use for this condition is Castor Oil. The piles must be kept scrupulously clean by washing with cold water.

Pile ointment applied locally often gives great comfort.

Sometimes a pile is caught by the muscle which closes the Anus and cannot get back again. If this occurs, a bluish swelling is seen protruding which is painful, hot and tender. This swelling should be at once returned, which is easily done by coating it with oil or vaseline and pushing it up gently and firmly with the finger. An injection of cold water to which a little Alum has been added is very soothing and valuable.

APPENDICITIS

This disease is an inflammation of the Vermiform Appendix, a worm like structure attached to the bowel at the junction of the large and small intestines.

The onset is fairly sudden, and in the large proportion of cases the following symptoms are present :—

(1) Sudden pain in the abdomen, usually referred to the lower right side (S.W. corner).

(2) Fever of a moderate grade.

(3) Nausea, vomiting and constipation.

(4) Tenderness or pain on pressure in the appendix region.

Pain and tenderness in the appendix region are the most important points in determining this disease. The appendix region is situated half-way between the Umbilicus or Navel and the Anterior Superior Spine, a prominent point of the pelvis. If the fingers are pressed in at this point marked X in fig. 59, and there is tenderness at this point it may be assumed that there is appendicitis present. Make

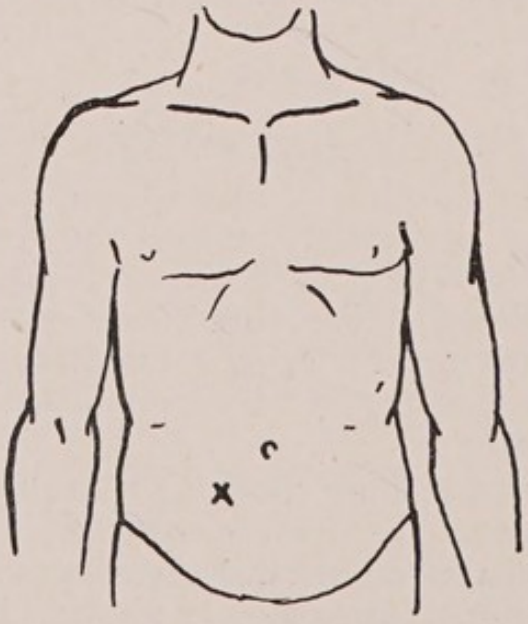

FIG. 59

sure that there is no rupture present. Appendicitis is by far the most common inflammatory condition in the abdomen, particularly in men under 30, and is not difficult to diagnose as a rule. It need not be assumed that if a man has Appendicitis he will die unless an operation is performed, because in the days when surgery was not so advanced as it is now a large proportion of cases recovered without operation. The third or fourth day will usually indicate the turn the disease is going to take. If the pain begins to lessen then and the temperature comes down, the tongue becomes cleaner, the vomiting ceases, the local tenderness becomes less marked and probably the bowels move, then it may be taken that the case is going on to recovery, and at the end of a week or ten days the man will be well again. If, however, by the end of the fourth day of illness the symptoms show no signs of abating and may indeed be increasing then serious developments may be anticipated, and in the absence of surgical aid the patient has a poor chance, as the abscess which is forming may burst into the peritoneal cavity, causing Peritonitis.

Treatment.—The only treatment until surgical advice can be obtained is absolute rest in bed (with the patient propped up and with the thighs resting on pillows), leaving the treatment, as it were, to nature. There are no medicines which are capable of controlling this disease. Rest in bed, no food, no purgatives, the use of an enema if necessary, are the wisest measures to adopt. Opium, in the form of Laudanum will relieve the pain, but should not be given if there is a prospect of surgical aid, as it would make the case more difficult for the surgeon. The painful part should be painted over with Iodine and if ice is available, an ice bag applied to the part will give some relief. The use of poultices is not advised. They certainly give some comfort, but are apt to help on the formation of an abscess.

No solid food must be allowed. Give milk or liquid nourishment only, in small quantities at frequent intervals, say, about 4 ozs. every two hours. If vomiting is persistent give sips of water only.

Purgatives must not be given until all the pain and tenderness have gone, and then—not before—a dose of Castor Oil should be given.

INTESTINAL WORMS

There are three common varieties of worms which live in the intestines—tape worms, round worms and thread worms, and they enter the body in infected food. The symptoms are itching of the anus, diarrhoea, indigestion, hunger and wasting.

Treatment.—The patient should abstain from food for a day and at night take 3 grains of Calomel followed in the morning by 2 ozs. of Black Draught. In the case of Tape Worm, if the head of the worm

SYNOPSIS OF ACUTE PAINS IN THE ABDOMEN

Name of Disease.	Onset	Fever.	Nature of Pain.	Tenderness
Acute Indigestion ...	Sudden	In mild cases, No In severe cases, Yes	Burning	Yes
Gastric Ulcer	Sudden	Not usually	Eased by food	Yes
Obstruction of the Bowels ...	Sudden	No	At first colicky then continuous	Yes
Strangulated Hernia ...	Sudden	No	Acute localised	Yes
Appendicitis	Sudden	Yes	Sharp and severe	Yes
Gall Stones	Sudden	Sometimes	Agonising paroxysmal	Yes
Peritonitis	May or may not be sudden	Yes—sometimes subnormal	Widespread. Increased by movement	Yes
Lead Colic	Paroxysms	No	Distributed. Paroxysmal Relieved by pressure.	No

does not come away, the worm will grow again. In the case of thread worms an enema of strong salt water is often effective. Medical advice should be sought on reaching port.

JAUNDICE

This is a term used to describe the yellow coloration of the eyes and the skin which occurs when bile is absorbed into the blood instead of passing into the intestine. It is not a disease of itself, but a sign of disease. The commonest cause is inflammation of the bile ducts, but it also occurs in obstruction of the bile ducts by gall stones, in Liver complaints and in Yellow Fever. The bowels are usually constipated, the motions are pale and resemble putty. There is nausea and loss of appetite. There is not usually any fever, in fact, the temperature may be subnormal and the pulse very slow.

Treatment.—As diseases of the liver are somewhat varied and intricate to the lay reader and a full description would be rather confusing, it is better to treat symptoms. Patients suffering from " liver " need a light and sparing diet. Salt meat, pickles, coffee and stimulants are all harmful. Vegetable and milk diet and keeping the bowels open are the best lines to go on. A Blue Pill or a dose of Calomel every other night followed by a Black Draught in the morning is the best medicinal treatment. In the case of obstruction by a gall stone, which will show itself by an agonising pain over the region of the liver, usually coming on suddenly, it is best to give a wineglassful of Olive Oil and 15 drop of Laudanum. A hot bath sometimes helps to ease the pain which disappears as soon as the gall stone has passed.

FIREMAN'S CRAMP (or HEAT CRAMP)

Heat--or fireman's cramp—is caused by loss of salt from the body through excessive sweat. *It may be entirely prevented if all drink provided for firemen and those working under conditions which make them sweat a great deal contains salt.* A " pinch " should be put into every glass or half-an-ounce (one level tablespoonful) per gallon ; it is not unpleasant. This mixture should also be given as treatment if cramp occurs. If the man is also suffering from heat exhaustion, treat for this condition as described on page 107.

CHAPTER XV

DISEASES OF THE KIDNEYS AND BLADDER

BRIGHT'S DISEASE

This is the most common form of Kidney disease likely to be met with. It is an inflammation of the kidneys, and is also known as Nephritis, which may be acute or chronic. It is caused by exposure to cold and wet and the excessive use of alcohol ; it also occurs after Scarlet Fever, Pneumonia and other diseases. There is headache, vomiting, and slight fever ; there is usually pain in the loins and a frequent desire to pass water. The water passed is in small quantities, is high-coloured and smoky or even red. It contains albumen, a substance like white of egg which can be tested by boiling a portion of the urine in a large spoon, when a cloudiness forms, which does not disappear on adding a few drops of vinegar.

There is swelling of the lower eyelids most noticeable in the morning and swelling of the ankles at night. There is usually some fever, the skin is hot and dry, and there is great thirst.

Treatment.—The patient should be kept in bed wearing flannel next the skin. The diet should be milk or gruel made of arrowroot or oatmeal and barley water. As the patient becomes convalescent, bread and butter, fresh vegetables and fruit may be given. All butcher meat must be prohibited. Water may be given freely, also lemonade and mineral waters. A useful drink is prepared by putting a teaspoonful of Cream of Tartar in a pint of boiling water, adding the juice of half a lemon and a little sugar. This should be taken when cold.

Medicinal treatment should be directed to relieving the kidneys of as much work as possible by promoting the action of the skin and bowels. The patient should be kept warm between blankets and perspiration encouraged. The bowels should be kept loose by daily doses of Epsom Salts, two teaspoonfuls in half a glass of water every morning, increasing the dose if necessary. If the urine is very scanty or suppressed it is well to encourage perspiration by wrapping the patient in a blanket wrung out in hot water and covered by another blanket over which is placed a waterproof sheet. Give the Sweating Mixture. Stimulants should not be given.

URAEMIA

This is a condition which may occur in diseases of the kidneys and is due to the absorption into the blood of certain poisons which in healthy kidneys are passed out in the urine. It is preceded by signs of a gradual decrease in the amount of urine passed, which may cease altogether.

It usually commences with headache, vomiting and difficulty of breathing, followed by twitchings of the muscles, convulsions, often delirium, then drowsiness and unconsciousness.

Treatment.—The general principle of treatment should be directed towards getting rid of the poison by the bowels and the skin, because the kidneys are out of action. Perspiration should be promoted by having the room at a warm temperature and wrapping the patient in a sheet wrung out in hot water. For the bowels, Epsom Salts is the best purgative given in two teaspoonful doses in a small amount of water, three times a day. Diet should be milk only during the acute stage, water and barley water should be given freely, also the Sweating Mixture every four hours.

STONE IN THE KIDNEY

Stone or Gravel forms in the kidney by the deposit of certain of the constituents of the urine. Stones are crystalline structures varying in size from finest sand to the size of a pea or larger.

Patients may go on passing gravel for years without having any trouble, but sometimes a larger stone forms, giving rise to uneasiness and pain in the back, with sometimes blood in the urine. When this stone enters the ureter—the small tube leading from the kidney to the bladder—it gives rise to Renal Colic which is characterised by agonising pain which starts in the flank of the affected side and shoots down to the groin, the testicle and the inner side of the thigh. In severe attacks nausea and vomiting follow and the patient is collapsed. Perspiration breaks out on the face and the pulse is feeble and quick. The symptoms persist for a variable time, from an hour to a day or more, with temporary relief alternating with paroxysms, but as soon as the stone enters the bladder instant relief is felt, only a dull ache being left behind.

Usually blood is passed in the urine and very often it only gives a smoky appearance to the urine, although sometimes it may be quite profuse.

Treatment.—Great relief may be experienced by a hot bath which is sometimes sufficient to relieve the spasm. When the pain is very intense 20 drops of Laudanum should be given and repeated, if necessary, in three hours.

Hot poultices or cloths wrung out in hot water and applied to the part often give great comfort. The patient may be given plenty of water or barley water or lemonade.

DIABETES

Although this is not a disease of the kidneys, it is convenient to deal with it here, as the principal symptom is connected with changes in the urine. It may be described as a constitutional disease characterised by the passage of large quantities of urine containing sugar. It is a somewhat complicated disease and is associated with derangements of the liver and of the Pancreas or Sweetbread.

It commences gradually, and the first thing that attracts attention is either increased thirst or the increased amount of urine passed. The patient loses flesh and complains of increasing weakness. The thirst is most intense an hour or two after meals. The digestion is usually good and the appetite is sometimes enormous.

The urine is pale and clear, with a sweet smell (like newly-mown hay), the specific gravity is high (from 1030 to 1045 or more) and, if tested, is found to contain sugar. The disease may last for years, the younger the patient the worse the outlook.

Treatment.—The treatment is chiefly a question of dieting. Sugar and starchy foods are not allowed. Saccharine is used instead of sugar to sweeten food, and gluten bread or almond biscuits instead of wheaten bread. The patient is not necessarily confined to bed, and, if careful about his diet, may go on quite comfortably.

The following tables give some idea of what is allowed and what is not :—

Allowed.	*Not allowed.*
Clear soup.	Sugar and starch in any form.
Fish, meat.	Bread, pastry, puddings.
Eggs, butter, cheese.	Rice, sago, tapioca, etc.
Green vegetables such as cabbage.	Root vegetables, such as potatoes, beetroot, carrots,
Strawberries, raspberries, gooseberries, oranges, lemons.	Peas, beans.
Tea, coffee, cocoa.	Fruits, except those named.
Milk in small quantities.	Beer, stout.

There is no medical treatment which can be carried out except under medical supervision. The bowels should be kept freely open, but purging should be avoided.

The patient should consult a doctor as soon as possible. Diabetics should not go to sea.

STOPPAGE OF URINE

In this condition a man is unable to pass his water. It is distinguished from suppression of urine by the fact that the bladder is full, but the urine cannot escape from the latter organ. It may arise from several causes, the commonest being Stricture, enlarged Prostate Gland, injury to the parts, a small stone lodging in the passage, holding the water too long, indulgence in drink, or exposure to cold and wet.

The patient has a great desire to pass water and on trying finds he cannot do so, the bladder becomes distended, the suffering becomes very great and, if not relieved, may result in bursting of the bladder.

Treatment.—The man should be made to sit in a bath as hot as he can bear it and while thus sitting should endeavour to pass water. He should be given 20 drops of Laudanum and an ounce of Castor Oil. If after an hour or so he is still unable to pass water, no time should be lost in attempting to introduce a catheter. The wire should be taken out of the catheter and the latter should be soaked in warm antiseptic solution for a few minutes, then dried and oiled freely—Olive Oil is the best. The patient should lie on his back with the head and shoulders slightly raised and the knees elevated and separated. Stand on the left side of the patient. Raise the penis in your left hand, gently introduce the catheter, held penwise in your right, and push it steadily and gently onwards into the bladder. When it has passed the entire length of the penis—about 8 inches—depress that organ with the catheter towards the thighs ; this enables the point of the instrument to glide under the arch of bone in front of the bladder.

On no account must force be used. If any obstacle is met with, overcome it by steady and moderate pressure and not by sudden force. The entrance of the instrument into the bladder is at once shown by a flow of urine. If after a quarter of an hour or so the catheter has not yet entered the bladder leave off for a time, repeat the hot bath and try a smaller catheter.

INFLAMMATION OF THE BLADDER

This may arise from exposure to cold, from injury, as a result of Gonorrhoea, or from an enlarged prostate gland at the base of the bladder. It may also arise from the irritation caused by a stone in the bladder or from the unskilful use of catheters. There is a frequent, somtimes a constant, desire to pass water, which is passed in small quantities and causes severe pain and straining. There may be some fever accompanied at first by shivering and later by mental depression and pain, with tenderness on pressure over the bladder.

In very severe cases the inflammation may extend to the kidneys.

Treatment.—Rest in bed is essential. The man should be given barley water to drink, as much as he likes, also imperial drink. Hot baths are soothing and hot fomentations over the bladder. The bowels must be kept open. Slop diet—milk, soups, and light puddings. Alcohol must be prohibited.

STONE IN THE BLADDER

This is due to a bad condition of the urine. It is usually the result of gravel or stone in the kidney. When a stone passes from the kidney into the bladder and remains there instead of passing out,

it becomes larger and larger and sooner or later makes its presence felt. There may be severe pain, aggravated by movement, and worse after passing water. There is usually a frequent desire to pass water, and itching and pain at the end of the penis is a common symptom.

Sometimes there is a sudden stoppage of the stream of urine on account of the stone having rolled against the end of the pipe, and there is often blood in the urine.

Treatment.—The only treatment is a surgical operation, but until this can be done it is well to give plenty of barley water and keep the bowels open. If the stone gets impacted in the pipe it will cause stoppage of urine, which see (page 168).

CHAPTER XVI

DISEASES OF THE NERVOUS SYSTEM

MENINGITIS (BRAIN FEVER)

This is an inflammation of the membranes surrounding the brain or Spinal Cord and may arise from several causes. One of the commonest causes is inflammation of the internal ear which may spread inwards to the brain. It may also arise from injuries to the head, from tuberculosis and from acute fevers. There is an infectious form called Cerebro-Spinal Meningitis, which is dealt with under Fevers.

The symptoms of Meningitis vary according to the part of the brain affected, but there is always violent headache. Vomiting is a common symptom in the early stages. Fever is present, but the temperature is not usually over 103°F. The pulse is usually slow and irregular. Delirium is early and most marked when the fever is high. There are often spasms and twitchings of the muscles and gritting of the teeth, and there may be convulsions. The patient usually becomes stupid and drowsy, finally becoming unconscious.

Treatment.—Keep the patient absolutely quiet and away from the light. The head should be shaved and ice applied. If ice is not available apply cold wet cloths to the head, changing frequently. Sulphathiazole should be given as indicated under Spotted Fever (Cerebro-Spinal Meningitis) (Chapter XII, p. 124). Get the bowels well open by giving 3 grains of Calomel followed four hours later by a dose of Black Draught or Epsom Salts.

PARALYSIS OR PALSY

This means loss of power of movement or function in any part of the body. It may arise as a result of injury or disease of the brain, spinal cord or nerves. There are three forms of Paralysis :—

(1) Hemiplegia or paralysis on one side of the body, due to injury or disease of the brain. Apoplexy or the bursting of a blood vessel on the brain being the commonest cause.

(2) Paraplegia, or paralysis of the lower part of the body on both sides, is due to disease or injury of the spinal cord when the whole of the body below the injury is paralysed. There is loss of control over the bladder and rectum and bed sores are very apt to arise.

(3) Neuritis or nerve paralysis may be due to injury or disease of a nerve and may be caused by excessive use of alcohol, lead poisoning and cold.

Treatment.—The bowels must be regulated. Care should be taken to see that the patient is comfortable and, if in bed, kept as clean as possible. To prevent bed sores the back and hips and parts pressed upon when lying down should be rubbed with spirit twice a day.

DIVER'S PARALYSIS OR CAISSON DISEASE

This is an illness which affects divers and others who may have to work in sunk Caissons. When a diver is under water he is subjected to increased pressure and as the pressure increases a certain amount of the nitrogen gas in the air is absorbed by the blood, but so long as the pressure is maintained this causes no ill-effects. If, however, the pressure is rapidly diminished—if the diver is brought up too quickly—the nitrogen is liberated from the blood in the same way that the gas in soda water is released when the bottle is opened. The nitrogen collects in the heart and blood vessels and may cause instant death or the condition known as Diver's Paralysis. If the diver is brought up slowly and with stops at proper intervals, the nitrogen gas passes out through the lungs and causes no harm.

The symptoms of Caisson Disease come on from a few minutes to an hour after the diver has reached the surface. The usual symptoms are difficulty of breathing, deafness, pain in the stomach, faintness, paralysis of one side, pains in the muscles and joints and loss of consciousness.

Treatment.—The proper treatment is re-compression and releasing of the pressure very slowly. If the man is able to stand it, he should be sent down again to the depth he came up from and slowly brought to the surface with stops at regulation intervals. Otherwise hot fomentations, fresh air, rest, stimulants and gentle rubbing are advised.

INSANITY

As there are several different forms of Insanity it may be useful to give a short description of the principal ones :—

(1) MANIA.—The patient is excited. In the mild forms he may be only a bit elevated like a man who has had a few drinks. In other cases he may be noisy and wild and often indecent.

(2) MELANCHOLIA.—The patient is depressed. He has delusions and thinks himself unworthy. He may imagine that he has done some harm to somebody or that he has committed some crime. These cases sleep badly and are very liable to commit suicide.

(3) DELUSIONAL INSANITY.—The patients may be neither excited nor depressed. They have fixed delusions about something, usually of persecution. One man may think he is being persecuted and that all his shipmates are against him, another that he is being continually watched, another may have a fixed idea that there is an animal—a frog or a lizard—living in his stomach, while another may declare that his feet are made of glass.

(4) DEMENTIA.—This is simply loss of mental power and is usually found in old men who have suffered from some form of chronic disease. They have loss of memory and loss of thinking power. They are childish and easy to manage.

(5) GENERAL PARALYSIS OF THE INSANE.—This is a definite disease of the brain and is usually known as G.P.I. It is in nearly all cases the result of Syphilitic disease of the brain. Alcoholism is said to play a part by aggravating the condition.

The symptoms come on gradually, usually beginning with delusions of greatness. The patient may imagine he is some well-known person or that he is very rich or that he is the best boxer in the world, and becomes indignant if anyone refuses to believe him. Associated with these delusions, he soon begins to lose weight and become tremulous. He gradually develops signs of paralysis, becoming uncertain in his speech and staggering like a drunken man. When unable to walk, he is confined to bed and becomes quite helpless, usually dying from Pneumonia or some other acute disease. The disease calls for early medical attention.

(6) Other forms are associated with Alcoholic excess and Epilepsy and are dangerous to others, so that the patients must be carefully watched.

Treatment.—All insane patients should be treated with kindness and should not be teased or irritated.

They should not be given knives and forks. Their food should be cut up for them so that it can be eaten with a spoon. A man with a tendency to suicide should never be left out of sight and he and his bedding should be examined every day to see that he has no weapon concealed. Anything by which he might commit suicide must be removed. If a patient is very violent, do not use a strait-jacket if you can possibly avoid it. If restraint is required it is best to handcuff him with his hands behind his back. Sleeplessness may be treated by giving 30 grains of Bromide of Potassium in a wine-glassful of water at night, or a dose of the Sedative Mixture or of Paraldehyde.

CHAPTER XVII

DISEASES OF THE EYE AND EAR

STYE

This is a small boil which forms at the edge of the eyelid around an eyelash. It gives rise to considerable pain and discomfort and is often associated with Chronic Constipation.

Treatment.—Pull out the eyelash in the middle of the stye with a pair of tweezers, and wash three times a day with Boracic lotion—half a teaspoonful of Boracic Acid in a tumblerful of hot water. Smear a little Boracic Ointment or Vaseline along the edge of the lid at night. Be careful when it is discharging that none of the matter is allowed to touch the other eye. Give a dose of opening medicine.

CONJUNCTIVITIS OR OPHTHALMIA

This is inflammation of the conjunctiva—the membrane which covers the eyeball and the inside of the eye lids. There are several forms of this disease, but the simple form that is usually seen is caused by exposure to cold or dust, by injury from a foreign body such as a piece of coal or steel, and by overstraining the eyes. The eye looks bloodshot and watery. There is considerable pain and heat and a sensation as if sand were in the eye. The lids feel heavy and tend to stick together during sleep. There is often a slight yellow discharge of pus.

Treatment.—This consists of frequent bathing of the eye with warm Boracic lotion and smearing the edges of the lids at night with a trace of Vaseline. If a foreign body is present, it should be removed.

GONORRHOEAL CONJUNCTIVITIS OR OPHTHALMIA

This is caused by contact of the discharge from Gonorrhoea or Clap with the eye usually conveyed by the patient's own finger. It is a very dangerous form of inflammation, and if it does not

receive prompt attention, may result in partial or complete loss of sight in the eye. It may be distinguished from the simple form described above by the fact that all the symptoms are much more intense, and of course if the patient is suffering from or has recently suffered from Gonorrhoea the diagnosis will be easier.

Treatment.—Great care must be taken to prevent infection of the other eye. The hands must be thoroughly washed with soap and water and rinsed in an antiseptic lotion before and after attending to the case. Protect the sound eye by placing over it a double-folded pad of lint, kept in position by a strip of plaster, while attending to the other eye.

The eye should be bathed every two or three hours with the warm Boracic lotion. At night Vaseline should be smeared on the edge of the lids. Keep the bowels open with Black Draught. A course of sulphathiazole should be given as for gonorrhoea (see page 189).

FOREIGN BODIES IN THE EYE

A piece of grit, coal dust, a fly or an eyelash will sometimes lodge in the eye and cause great irritation. It may be under the upper eyelid or the lower eyelid or on the eyeball.

Treatment.—If, after the patient has blown his nose violently or dipped his face in clean water opening and closing the eye several times under the water, the foreign body is still there, seat him in a good light, draw down the lower eyelid with a finger, telling the man to look up, and carefully look for it. If it is under the upper lid, tell him to look towards his nose, hold a match or something similar over and across the lid, take hold of the eyelashes with the forefinger and thumb of the other hand and lift the lid upwards, at the same time pressing downwards and inwards with the match held in the other hand. This will expose the inner surface of the lid, when the foreign body can be seen and removed with the flattened rounded end of a match stick. If the foreign body is on the eyeball, tell the patient to look steadily at a fixed point, take a piece of clean blotting paper and gently touch the object. If it is loose it will adhere to the blotting paper, but if it is embedded and does not come away use the eye drops according to the directions and try the blotting paper again. If this does not succeed use the eye spud to remove it, taking great care not to injure the eyeball.

WAX IN THE EARS

Sometimes wax accumulates in the ears to such an extent as to cause deafness, buzzing and pain.

Treatment.—A drop or two of warm Olive Oil should be dropped into the ear at night to soften the wax, and next day it can be washed out with a warm solution of Soda—about a teaspoonful to a cupful of water, using the Douche Can and ear nozzle. If the wax is not removed on the first attempt, repeat the treatment next day.

FOREIGN BODIES IN THE EAR

Sometimes an earwig or other insect, a seed or some other object gets into the ear and causes great irritation.

Treatment.—If visible, the foreign body may be removed with a small tweezers, or the loop of a bent wire. If not, pour in a little warm Olive Oil in the hope of floating it out. If it still remains, wash out with warm water, using the Douche Can and ear nozzle.

INFLAMMATION OF THE MIDDLE EAR (OTITIS MEDIA)

This often follows Scarlet and other fevers. There is great pain and pus forms inside the drum of the ear, which usually perforates and allows the pus to escape from the ear.

Treatment.—Hot fomentations should be put on to ease the pain. When pus or matter comes, keep the parts clean. Do not plug with cotton wool, but place pieces of gauze over the ear to catch the discharge. Later wash out gently with warm Boric lotion.

CHAPTER XVIII.

DISEASES OF THE SKIN.

BOILS

A boil is due to inflammation of the skin round the root of a hair. It commences as a red tender spot which soon becomes pustular. The skin gives way and pus escapes. A slough or core separates in time, after which the boil heals. Sometimes boils come in crops one after the other.

Treatment.—If a boil is seen early it may sometimes be checked or aborted by pulling out the dead hair in the centre of it. This should be done at any stage if a hair can be seen.

Poulticing, except with Kaolin, should be avoided as it tends to spread the infection. The best local treatment is to wash the skin around it with a piece of lint or cotton wool dipped in Turpentine, then cut a piece of Boric Lint a little larger than the boil, wring it out in hot water and apply ; put a piece of waterproof tissue over it and bandage. If in a position difficult to apply a bandage, strips of adhesive plaster will keep the dressing in place. The dressing should be changed twice a day. Care must be taken not to allow any of the discharge to come in contact with any healthy skin around, or it will give rise to more boils.

Internally give 2 grains of Calomel followed in the morning by two teaspoonfuls of Epsom Salts in water. This should be repeated in two days.

SCABIES, OR "THE ITCH"

Scabies or "The Itch" is a superficial inflammation of the skin caused by the Itch Mite (Sarcoptes Scabiei).

Cause and Prevention.—"Itch" mites are minute parasites just visible to the naked eye. The female mite burrows under the skin, laying eggs at intervals as she advances. The effect is to cause intense

irritation of the skin which is usually most evident at night. The only visible signs are slight red elevations of the skin or short red lines visible in the skin, but these may become obscured owing to the victim scratching the affected parts before the cause is ascertained. The burrows are usually easily seen, however, as dirt accumulates in them.

Scabies is usually acquired by contact. In its early stages the disease may exist for some time without giving rise to much complaint, with the result that men berthed in the same cabin as the patient may also become infected. *It is, therefore, essential that the disease should be speedily recognised,* the patient isolated and his bedding and clothing cleansed. His room-mates should be instructed to soap themselves well in a very hot bath and to clean their quarters.

Regular baths and changes of underclothing will do much to prevent scabies. (Bathing facilities are available at many ports in U.K.)

Treatment.—Scabies does not yield to half measures, and every effort should be made to carry out fully the following treatment. The treatment should be given under supervision if possible to ensure that it is not scamped :—

(*a*) The patient should be given a hot bath in which he should soak for ten minutes (alternatively, five minutes under a hot shower-bath would suffice).

(*b*) He should then soap himself freely, using a rough flannel, but not a scrubbing brush, and rinse the soap off.

(*c*) He should then be thoroughly dried with a towel and remain in a warm place while Benzyl Benzoate emulsion is applied over the whole body from the neck downwards with a clean flat paint brush 1½ in. to 2 in. wide or with the palm of the hand. The application should be allowed to dry—this takes about ten minutes—after which the patient should dress, putting on clean underclothes.

(*d*) The above treatment should be repeated within a period of eight days.

Clothing.—Clothing, blankets and bedding need not be disinfected but should be washed and ironed. After washing and ironing, there is no risk of garments spreading scabies to anyone. If immediate washing is not convenient, ironing will make them safe without washing.

When it is possible either to wash or to iron the above articles, they need only be hung in a warm place for a few days, preferably before a fire or in the sunshine, when the "Itch Mite" on them will die.

When arriving in a U.K. port with a case of Scabies on board the Port Medical Officer, if informed by signal in good time, is available to give assistance in the treatment and necessary disinfection.

RINGWORM

This is a disease due to the growth of a fungus on the skin. There are several varieties of these fungi, producing different varieties of Ringworm. Ringworm of the head begins with a scurfiness and itching at some spot on the scalp. In a few days circles of minute pimples appear which turn into small vesicles, small elevations of the skin containing some clear fluid. These discharge their contents and form scabs. The disease spreads quickly and, if untreated, may involve the whole scalp. The disease attacks the roots of the hairs which die and break off close to the skin so that the parts affected become permanently bald.

Treatment.—The hair should be shaved round the part affected for about one inch, not shaving the part affected. As the fungus is deep down in the hair roots, an attempt should be made to pull out the dead broken off hairs with a pair of tweezers. The hair roots thus removed should be carefully destroyed as they are highly contagious. Iodine should be painted on or White Precipitate Ointment rubbed in. The part should not be washed with water, but cleaned round it with turpentine or spirit.

Ringworm of the body which is known in the East as Dhobi's Itch on account of its being spread by the mixing up of clothing at the " wash ", may affect any part of the body, and when attacking the beard is known as Barber's Itch.

It commences as a small itching scurfy spot which, enlarging at the circumference, soon shows a line of minute vesicles. This advances in circular or semi-circular patches and the skin over which the disease has passed gets well. There is intense itching, especially at night, and the scratching induced causes a cracked and scaly condition of the skin resembling Eczema.

Treatment.—As all Ringworms are highly contagious great care should be taken to avoid infection. The patient should be isolated and all clothing destroyed or disinfected. Iodine painted on twice daily or White Precipitate Ointment applied every night will usually effect a cure.

ECZEMA

This is a common skin disease characterised by a portion of the skin becoming red and inflamed and covered with minute vesicles which burst and discharge a thin fluid which dries and forms crusts on the skin. There is great irritation and burning and a constant desire to scratch. In old cases the skin may be dry and scaly. It is sometimes caused by excessive perspiration, but usually there is a constitutional tendency to it.

Treatment.—The parts affected should be kept dry. Washing with soap and water must be avoided. It is not an easy disease to cure even under medical supervision, so that the ship Captain must

not lose heart if his treatment does not appear to be successful. Begin by giving 2 grains of Calomel followed in the morning by two teaspoonfuls of Epsom Salts in water and repeat in two or three days. Locally soothing ointments such as Boric Acid Ointment or Vaseline should be applied. Calamine Lotion is a useful application.

CORNS

A corn is a thickening of the outer layer of the skin which grows inwards and causes pain by pressing on the nerves of the inner layer of the skin. Corns are caused by pressure of badly fitting boots and may be " hard " or " soft." Hard corns form on the upper or under surface of the toes and soft corns between the toes.

Treatment.—Easy fitting boots or shoes should be obtained so as to remove the pressure from the corn. The corn may be pared with a sharp knife, but the best method is to soak the foot in hot water to which a little soda may be added, and pick out the corn with a finger nail.

SHINGLES OR HERPES ZOSTER

This is a painful disease in which vesicles occur on the skin along the course of some nerve. It is most commonly found on one side of the chest and extends as a line of vesicles from the spine round the lower part of the chest to the middle line. The eruption is often preceded and is always accompanied by shooting pain and some feverishness. The skin feels tender along the course of a rib and on examination clear pearly looking vesicles or blebs are discovered varying in size from a pin's head to a pea.

These burst about the fourth day when scabbing takes place. The pain may continue long after the scabs have fallen off. On an average the disease lasts about 10 days. Herpes also occurs on the forehead and may give rise to considerable stinging pain and discomfort. A milder form of this complaint occurs around the mouth during a " bad cold " or an attack of Pneumonia. It frequently attacks the foreskin when the number of vesicles—sometimes 10 or 12—and the itching which accompanies it enables one to distinguish it from venereal disease.

Treatment.—The bowels should be regulated. Lint soaked in Calamine Lotion should be applied and kept wet by frequent sousing with the lotion. An alternative treatment is to dust freely with the Antiseptic Dusting Powder and to cover with plain lint.

NETTLE RASH OR URTICARIA

This is an eruption upon the skin which consists of raised weals resembling those caused by the stinging of a nettle, attended with itching, burning and tingling sensations. From the sudden manner

in which it sometimes occurs and when it is accompanied by vomiting and feverishness it often causes alarm, but it is not dangerous and in nearly every case is due to eating something which has disagreed with and deranged the stomach. Some people are more intolerant of certain articles of food than others, so that in some cases it may arise from eating shell-fish, in others mushrooms, pork, tinned food, strawberries or even drinking cold water when the body is heated, will provoke an attack. Nettle rash is also sometimes caused by certain medicines such as Copaiba, Quinine, Salicylate of Soda, etc.

Treatment.—Look for the cause and remove it. If there is a tendency to vomit, encourage it by giving copious draughts of hot water to wash out the stomach. Give a purgative—1 oz. of Castor Oil—and see that the bowels are kept well open.

The Stomach Mixture should be given three times a day. Calamine Lotion is a useful and soothing application to the skin.

LICE (PEDICULI)

There are three distinct varieties of louse each of which has its own particular location.

The head louse is found among the hairs of the head, the body louse lives on the skin of the body and is found on the underclothing, while the crab louse exists upon the hairy lower parts of the body, on the scrotum and its vicinity. The crab louse is the smallest of the three. The louse is very prolific, each female laying over 100 eggs in a fortnight, the eggs taking about ten days to hatch out. The eggs are called " nits " and are tiny whitish pear-shaped bodies which are found adhering to the hairs or to the underclothing, especially along seams and linings.

The presence of lice produces intense itching and irritation of the skin. They are now known to be the carriers of Typhus Fever in the same way as mosquitoes are carriers of Malaria. It is therefore most important that members of the crew should be warned to seek treatment at once if the presence of lice is discovered.

Treatment.—Head lice should be treated by cutting the hair short and rubbing in White Precipitate Ointment. Body lice may be destroyed by warm baths, using plenty of soap and hot water followed by a good application of White Precipitate Ointment. The under clothing should be changed and the infected underclothing disinfected. The nits may be got rid of by washing with vinegar and water. Crabs can be quickly disposed of by shaving the part affected and rubbing in Mercurial Ointment. The seats and woodwork of closets must be thoroughly scrubbed with some disinfectant every day in order to prevent the spread of crabs among other members of the crew.

CHAPS

When the skin cracks over the knuckles or on the back of the hand or elsewhere the part is said to be " chapped." Exposure to cold and salt water increases the irritation and sometimes the pain is considerable.

Treatment.—Frequent applications of vaseline and the wearing of gloves should be advised.

CHILBLAINS

This complaint is caused by sudden alternations of temperature such as applying warmth to the feet and hands when cold and damp and is more common in men whose circulation is poor. There may be some swelling and redness of the skin, and there is much irritation and itching.

Treatment.—After washing the feet or hands they should be thoroughly dried and rubbed briskly with a towel to promote the circulation. The part affected may be painted with Iodine.

PRICKLY HEAT

This is a complaint which often affects people on first entering hot latitudes and is more likely to occur in damp climates. It consists of closely packed tiny red pimples which eventually present little watery heads or vesicles. It usually affects the back, chest and neck. It causes a peculiar shivering followed by a pricking tingling sensation and sometimes there is intense itching and irritation. Although it is annoying, there is no danger attached to it, and it soon subsides.

Treatment.—Light diet and keeping the bowels well open are essential. Flannel or wool should not be worn next the skin. Calamine Lotion dabbed on with a piece of lint will be found soothing.

CHAPTER XIX

RHEUMATISM AND DISEASES OF THE HEART, ARTERIES, VEINS AND BLOOD

Acute Rheumatism or Rheumatic Fever
Muscular Rheumatism.
Heart Diseases.
Angina Pectoris.
Aneurysm.
Varicose Veins.
Anaemia.

Acute Rheumatism or Rheumatic Fever is an acute fever accompanied by painful swellings of the joints. It is convenient to include it in this chapter as it is so frequently associated with Heart Disease.

As a rule the disease comes on fairly suddenly, but it may be preceded by irregular pains in the joints, sore throat and a feeling of illness. The fever rises rapidly and with it one or more of the joints become painful. Within 24 hours from the onset the disease is fully manifest. The temperature ranges between 102° F. and 104° F. The pulse is usually above 100. There are the usual symptoms associated with an acute fever such as loss of appetite, thirst, constipation and high-coloured urine. The patient perspires freely, the sweat having a peculiar disagreeable sour odour. The joints most commonly affected are the knees, ankles, shoulders and wrists. They are hot, swollen, tender and extremely painful on movement. The disease attacks first one joint and then another, frequently getting less in one joint as the other gets worse, and may last from two to six weeks. Very frequently there is an inflammation of the inside of the heart leading to valvular disease. There is another form of rheumatism where the symptoms are less pronounced and the temperature rarely goes above 101° F.; there are fewer joints involved, but it may drag on for months.

Treatment.—The first essential is complete rest in bed, the main object of treatment being to bring the patient through the attack with as much rest for the heart as possible. The bed should be soft and smooth and the patient should wear flannel or wool and lie in blankets. Care should be taken to keep him warm and avoid chills. Milk diet is advised. Mineral waters, barley water, lemonade, oatmeal water and the like may be freely given. If milk is not well borne, soups may be allowed. The affected joints should be wrapped in cotton wool. If the pain is very severe, hot cloths wrung out of Carbonate of Soda solution, may be applied.

Internally, 10 grs. of Aspirin should be given every four hours, also the Sweating Mixture.

If there is sleeplessness 20 or 30 drops of laudanum may be given at night.

When the patient appears to be getting well give the Tonic Mixture three times a day after food. Vegetable and milk diet should be given during convalescence.

MUSCULAR RHEUMATISM

The Muscles being well protected by their covering of skin and fat are not very liable to be affected by maladies, but it should not be overlooked that errors of digestion, chills and penetrating wounds often affect them while weakness and wasting sometimes occur as a result of paralysis.

There are several conditions of the muscles which have been known under the name of Muscular Rheumatism, but which may be described as inflammation of the muscles associated with Rheumatism and arising from exposure to cold, etc. They are characterised by severe pain, fever and inability to use the muscles affected. The muscles of the neck are often affected, and this is called " Wry Neck," when the muscles of the back are attacked the condition is known as " Lumbago," the muscles connecting the ribs may also be affected causing severe pain on drawing the breath or sneezing or coughing —*see* Pleurodynia.

Treatment.—When pains in the muscles arise as a result of straining, in which case there may be some tearing of the muscle fibres the best treatment is rest by bandaging or strapping with plaster but the best treatment for inflammation or " Rheumatism of the muscles " is massage by rubbing and manipulating. The patient may object to being handled at first on account of the pain, but if the massage is started by gentle stroking and pressing and is gradually increased, he will soon be able to stand it quite well.

Other forms of treatment are rubbing with Liniment, Turkish Baths, Aspirin 10 grs. three times a day, Electric Battery, etc., but the best of all is massage or rubbing.

HEART DISEASES

Heart diseases are mostly difficult to discover. Many forms of heart disease cause practically no symptoms and the patient may live to old age. In others death occurs suddenly and without warning. Rheumatism is the commonest cause, other causes being Alcohol, Syphilis or overstrain. The symptoms vary considerably but in general they are shortness of breath with or without cough a bluish tinge of face and lips, throbbing and sometimes pain about the left breast with palpitation, and in the later stages, swelling of the ankles, feet and body, commonly called Dropsy which, however, often exists in diseases of the Liver and of the Kidneys.

Treatment.—This varies so much that no hard and fast rule can be laid down. Rest, suitable diet and regular action of the bowels are necessary. The patient must avoid sudden exertion and excitement or shocks. The diet should be light and easily digested, and care should be taken not to eat too quickly or too much, so as not to distend the stomach. If he has difficulty in breathing when lying down, he should be propped up with pillows. If there are signs of weakening of the heart action, brandy may be given at intervals of two or three hours, or the Tonic Mixture may be given three times a day.

ANGINA PECTORIS

This is a disease of the heart characterised by paroxysmal pain of varying degree associated with disease of the arteries supplying blood to the heart muscle.

The attacks come on suddenly with severe pain over the heart, often radiating to the left arm. There is a sense of constriction as if the heart were held in a vice. There is mental anxiety and sense of impending death. The face becomes ashy grey and a cold sweat breaks out. The attack may be over in a few seconds or may last for one or two minutes. Sudden death may occur.

Treatment.—As the attack occurs suddenly and is over so soon there is little time to provide any remedy, but if there are any signs of heart failure after the attack, give Brandy with a teaspoonful of Aromatic Spirits of Ammonia in a little water. Persons subject to these attacks should always carry in their vest pocket a few capsules of Amyl Nitrite, one of which should be broken and the contents inhaled on the first sign of an attack.

DISEASES OF THE ARTERIES

ANEURISM.—In this disease the walls of an artery are weakened by disease at one place : at this place the wall becomes thin and stretches causing a swelling or ballooning out of the artery. Syphilis is a common cause, other causes being overstrain and excessive use of alcohol. The artery oftenest affected is the Aorta, the main artery from the heart, although any artery may be the seat of the disease. The symptoms arising from Aneurism are mainly due to pressure on the neighbouring structures and vary considerably. There may be pain, difficulty of breathing and cough. Palpitation and throbbing on exertion is common. The swelling of an Aneurism may be sometimes seen as a pulsating tumour, the commonest positions being behind the breast bone or behind the knee.

Treatment.—As death may occur suddenly from Haemorrhage through bursting of an Aneurism, the main thing to aim at is rest and avoiding of strain and excitement. There is no medicinal treatment, but patients with Aneurism may go on quite comfortably if they go easy and avoid any undue strain.

DISEASES OF THE VEINS

VARICOSE VEINS.—This is a condition in which the veins just under the skin, usually of the leg, become enlarged and dilated.

They occur usually in people who have to stand a long time on their feet.

They appear as coils of distended veins showing dark purple under the skin, and diminishing in size when the limb is raised. They may be painful. As the veins become dilated, the valves of the veins do not act, consequently the veins of the lower part of the legs have to bear the weight of a long column of blood. This causes more dilation, and if no support is given the condition grows worse. The skin over Varicose Veins is liable to break down and form an ulcer which is difficult to heal. Varicose Veins are also liable to burst, when serious haemorrhage may occur.

Treatment.—In ordinary cases an elastic stocking or bandage is worn which gives support to the vein and prevents discomfort. If severe, operative treatment should be undertaken when available.

Ulcers should be treated like ordinary ulcers, but the patient should lie up and have the foot and leg raised on a pillow.

DISEASES OF THE BLOOD

ANAEMIA.—This may be described as a deficiency of red blood and may be due to a definite disease of the blood in which there is a deficiency of the red colouring matter or may be due to loss of blood from any cause or to any wasting disease such as Cancer or Tuberculosis, or to malaria, etc. It manifests itself by a peculiar pallor of the skin, shortness of breath and loss of strength. Palpitation, fainting fits and swelling of the ankles are also common.

Its presence may be determined by turning outwards and examining the lining membrance of the lower eyelid. This in health should be full blooded and of a lively scarlet tinge—departure from this into pallor denotes a condition of anaemia. Similarly compare with the lower eyelid of the healthiest subject on board and you will quickly note the difference in appearance.

This is as far as you can go.

Treatment.—The bowels must be kept open by a free daily evacuation. For this purpose Castor Oil should be taken at night or two teaspoonfuls of Epsom Salts in water every morning.

The Tonic Mixture should be given three times a day. Good, wholesome food is essential. Medical advice should be obtained on arrival in port.

CHAPTER XX

VENEREAL DISEASES

PREVENTION

These diseases may often be prevented by directing the men, if they go astray, to wash the parts immediately with soap and water, using plenty of soap, and as soon as possible thereafter—the sooner the better—to smear the end of the penis with calomel ointment in a strength of not less than 30 per cent, at the same time using a douche of permanganate of potash solution in the strength of one tablet (1 grain) to the pint of warm water. The Naval and Military Authorities of many countries recognise the advisability of providing preventive remedies, and it cannot be denied that when the men use these precautions the liability to disease is very much lessened, but they must be applied quickly, as every minute's delay increases the danger. Although it has been suggested that the provision of these remedies is apt to create a false feeling of security and so engender vice they are " life buoys " for use when the danger has been incurred, and it is hoped that individual ship captains will take a broad view of the case, knowing the dangers to which men render themselves liable when on shore. The adage, " Prevention is better than cure," is specially applicable to venereal diseases.

Prevention of Accidental Infection.—As these diseases are highly contagious great importance should be attached to the danger of accidental infection. Innocent men have been infected with syphilis by using cups previously used by men suffering from this disease. Cases have also arisen of gonorrhoea of the eyes being contracted by men using towels which had been previously used by men suffering from gonorrhoea.

When it is not convenient to have a case isolated and where the man has to remain in the living quarters he should be strictly enjoined not to use any of the utensils likely to be used by the other men. His cups, spoons, knives, forks, etc., should be kept separate. Bedding, towels, soap, razors, shaving brushes and all such articles should be kept strictly apart and care should be taken that none of the men have access to any of those articles which may also have been used by a man suffering from venereal disease.

Men suffering from venereal disease should not use Latrines or W.C.'s, which are used by other members of the crew. If they must do so, they should either not sit on the seat or else wipe it carefully afterwards with a disinfectant.

General Treatment

In recent years more attention has been given to the treatment of these diseases so that now there is hardly a port without a centre for free treatment of venereal disease. The addresses of these centres may be obtained from the Superintendent of the Mercantile Marine office in a British port or from the British Consul in a foreign port. The men should be sent to these clinics immediately on arrival. they will get properly treated and will receive instructions about carrying on the treatment and where to go to at their next port, so that they can be under continuous observation and relieve the Master of a good deal of trouble and anxiety.

The instructions below are intended for use only until arrival at a port where treatment can be taken in hand by specialists.

General Description.—Venereal Diseases may be classified under three heads : (1) Gonorrhoea or Clap, (2) Chancroid or Soft Chancre, and (3) Syphilis.

Each of these diseases is distinct from the other, alt hough two or all three may be present in one case.

GONORRHOEA OR CLAP

This is a specific disease caused by a germ called the Gonococcus and is manifested by an acute inflammation of the lining membrane of the urethra or pipe. It generally appears four to seven days after connection with a woman infected with this disease, but it may begin two days afterwards or be delayed to ten days or longer. It commences with itching at the orifice and a scalding pain on making water. The scalding pain increases and a discharge appears at first thin and milky, but as the disease progresses becoming thick and yellow, and in some cases having a greenish colour. In this stage the patient is often disturbed at night by painful erections called Chordee. Sometimes there is no itching, scalding or chordee, and the only symptoms are a slight irritation and a discharge. A case of gonorrhoea will, if neglected become chronic and continue for months, or years. Neglect is very likely also to lead to complications.

General Precautions.—The patient should, if possible, be isolated. Alcohol, tea, coffee, butcher meat, curry and all highly seasoned food should be prohibited. He should drink any amount of barley water or plain water. The bowels should be kept open by laxative pills. Salts should not be given. Strict cleanliness is essential and the discharge should be allowed to drip into a small bag worn for the purpose

and containing absorbent wool. For this purpose the toe end of a sock may be adapted by fitting two pieces of tape or string to it and tying round the waist. Cotton wool should not be wrapped round the end, as it becomes matted and keeps back the discharge. Gauze is best, and small strips may be cut for the purpose and kept in place by the foreskin. These should be frequently changed. Great care must be taken that no part of the discharge be allowed to get near the eyes of the patient or of anyone else. This is most important. The patient should always wash his hands after handling the parts for any purpose whatever. All dressings should be burnt.

Treatment.—(1) The latest and most effective treatment of Gonorrhoea is by the administration of Sulphathiazole, which is issued in half-gramme tablets.

The drug acts quickly and the discharge usually dries up in a few days but misuse may give rise to much trouble and the directions below, *should, therefore, be followed closely.*

(2) A careful examination of the genital organs should first be made to confirm that the man has in fact a discharge from the pipe due to a *recently* acquired infection.

Treatment with Sulphathiazole is *not* suitable for long-standing cases of chronic gonorrhoeal discharge which should be treated by irrigation as described below.

(3) The dose recommended for use on ships not carrying surgeons is six tablets each night and six each morning for five days running.

The tablets should be crushed up in the mouth and swallowed with a tumblerful of water. The dose should be followed by another tumblerful of water and between doses the patient should drink six tumblerfuls (roughly 2½ to 3 pints) of water or other soft drink. This is to effect a thorough flushing of the kidneys and bladder and is an essential part of the treatment. Alcohol in any form must not be taken for ten days after starting the treatment.

It is important that the full dose be taken in the presence of the ship's officer giving out the remedy as under-dosage due to the patient's neglect may cause failure of the treatment. Similar steps should be taken to ensure the copious drinking of water, weak tea, etc., referred to above.

(4) The amount of the dose should not be reduced as this may result in the germ getting used to the drug, in which event all future treatment of the patient with this class of remedy would probably fail.

(5) The drug can be taken without ill effects by most people but, in the rare event of any of the following symptoms appearing, the treatment should be stopped at once (except drinking the water, which should be continued) :—

(*a*) Severe pain in the loin and great reduction in urine.

(*b*) Itchy rash over most of the body.

(*c*) Severe sickness and vomiting.

(*d*) Severe headache and interference with vision.

(*e*) Fever and malaise.

(6) If the treatment has to be stopped because of any of these symptoms treatment by irrigation, as described below, should be started at once.

(7) (*a*) In the great majority of cases the discharge will cease on the third or fourth day of the treatment *but the full course of the 5 days' treatment must still be completed.*

(*b*) In a few cases some discharge may persist after the fifth day merely because of the irritation of the pipe caused by the drug itself. Such cases should clear up within 2 or 3 days, particularly if the man continues to drink plenty of water.

(*c*) Finally, there may be the rare case where the drug is shown to have been ineffective by the persistence of the discharge beyond the third or fourth day *after completion* of the course of tablets. In such cases irrigation should be started at once as stated in para. 6.

(8) The tablets should be kept under lock and key as their indiscriminate use by uninstructed persons wishing to treat themselves may have dangerous consequences.

(9) Although all signs of the disease may have disappeared every man who has been treated for gonorrhoea as above should at the first opportunity visit a V.D. Clinic to be properly tested for cure. This is important not only on the score of the gonorrhoea but to make sure that the man did not catch syphilis also.

Irrigation and douching are forms of treatment which, under efficient medical supervision, are of great value in the treatment of this disease, but if carelessly or inefficiently done may do more harm than good. They must be done with the greatest care and cleanliness or not at all.

Directions for Irrigating

(1) Hang the douche can at a height of three feet or rather less above the level of the penis.

(2) See that the spring clip on the rubber tubing is closed so as to nip the tubing.

(3) Fill the vessel with water as warm as the hand can bear comfortably. The warmer the water is the better, but take care not to have a scalding heat. The vessel holds two pints, so dissolve three (one grain) tablets of potassium permanganate by crushing them in a tumblerful of water and when *quite* dissolved add to the water in the vessel.

(4) Having fitted the nozzle to the tube, hold it up in the air until all the tubing is above the level of the bottom of the douche can ; then open the clip and gradually lower the tube until the pink solution begins to issue from the end of the nozzle. Then close the spring clip.

(5) Pass water.

(6) Whilst seated comfortably or standing, grip the rubber tubing between the thumb and index finger just behind the nozzle and open the clip. Then, by relaxing the finger and thumb, allow some of the solution first to flow over the end of the urethra (water pipe) and, having done this, insert the tip of the nozzle into the mouth of the urethra and allow the solution to flow in. When the urethra feels distended nip the rubber tubing again, withdraw the nozzle and allow the injected solution to flow out of the urethra. Repeat this about six times.

(7) Now again allow the solution to flow into the urethra, but this time when the urethra feels distended keep the nozzle in position in such a way that none of the solution escapes outwards and try to make water in an easy, natural way. This is in order to allow the solution to flow easily into the bladder. The fact of the flow being established may be recognised by a little thrill felt by the fingers of the left hand. If the manoeuvre is successful, in a little time there will be a real desire to pass water. Then nip the rubber tubing, take away the nozzle and pass out the solution as in urinating. Repeat the manoeuvre twice, making three in all.

(8) It is possible that the first attempt or two to get the solution to flow into the bladder may not be successful. In this case, after trying for 10 minutes or so postpone further attempts until the next sitting. Taking deep breaths often assists in the manoeuvre to get the solution to enter the bladder and sometimes raising the irrigator vessel succeeds, but it is a mistake to put the irrigator vessel too high. The level often given is five feet above the penis, but it is much the best to keep it as near to three feet as possible.

(9) After irrigating, detach the nozzle and sterilize it by boiling.

(10) Treatment is assisted if the patient wears a suspensory bandage for the testicles, even though they are not swollen ; it may be the means of preventing swelling of the testicles.

Complications Arising from Gonorrhoea

(1) Chordee or painful erections of the penis occur during sleep and may be very troublesome.

Treatment.—The patient should try to pass water. Cold, either in the form of ice or cold water, applied to the parts will relieve the condition. As a preventive 30 grs. of Bromide of Potassium should be taken in a wineglassful of water at bedtime.

(2) Epididymitis or swelled testicle is caused by a spread of the gonorrhoeal inflammation to the back part of the testicle and may occur at any time during the course of the disease. The patient complains of pain and swelling in the testicle. This increases and it may become two or three times its natural size. There is great tenderness, a feeling of sickness, pain in the loins, with furred tongue, constipation and fever. Sometimes, while this condition is acute, the discharge temporarily stops.

Treatment.—The patient should be laid up. The testicle should be supported on a cushion or pillow. A double fold of lint should be applied, kept constantly wet with the Goulard's Lotion. The bowels must be kept open, and, for the pain, 30 grs. of Bromide of Potassium should be given at night. Suspensory bandage should be worn for several weeks.

(3) Gleet.—This is a chronic form of Gonorrhoea and may persist for months after the acute symptoms have subsided. The discharge is thin, being sometimes clear and sometimes milky. It may be present continuously or may be so slight as to be only noticed in the mornings.

Treatment.—These cases are very difficult to cure, and the only thing to do on board ship is to carry on the irrigation treatment as for Gonorrhoea. The patient should be advised to seek skilled advice on reaching port, care being taken to see that he does not get into the hands of quacks.

(4) Gonorrhoeal Arthritis or Gonorrhoeal Rheumatism is a painful condition caused by the disease spreading to the joints. It chiefly affects the knee, the wrist, the ankle or the soles of the feet. There is usually some fever. Sometimes one or both eyes become inflamed.

Treatment.—When acute pain, tenderness and swelling arise in any of the joints during or subsequent to an attack of Gonorrhoea the man must be kept in bed and the joints affected wrapped in cotton wool. If there is still a discharge the irrigation treatment for Gonorrhoea should be continued and the man should be removed to hospital at the earliest opportunity.

(5) Gonorrhoeal Conjunctivitis is dealt with under Diseases of the Eye.

CHANCROID OR SOFT CHANCRE
(Sores on the Genital Organs)

This is a sore arising on the penis as the result of impure connection. A Soft Chancre may be single, but usually two or more will appear upon or around the end of the penis. A Soft Chancre is not followed by Syphilis and gets its name to distinguish if from a Hard Chancre, which is the first stage of Syphilis. A Soft Chancre appears a few days after infection, whereas a Hard Chancre appears about three or four weeks after infection. A Soft Chancre begins as a small pimple under the foreskin and is usually followed by two or three others which develop into small ulcers secreting yellowish matter. If the patient has a tight foreskin there will be considerable swelling and pus will escape from underneath the foreskin. Frequently a swelling (Bubo) appears in the groin.

Treatment.—(1) Sores on the genital organs may or may not be syphilitic. The distinction between the two can be made with certainty only by means of laboratory tests.

(2) In the event of a man developing a sore or sores on his genital organs sulphathiazole should be given on the same lines as explained for gonorrhoea (page 189) because these remedies generally cure the type of non-syphilitic sore called "soft chancre." The sores may also be dusted with sulphanilamide powder and a light protective dressing applied or they may be dressed with gauze soaked in a solution of common salt (one teaspoonful to a tumblerful of water). This solution can be used for washing the sores.

(3) It is very important that full tests for syphilis should be applied on arrival in port even though all signs may then have gone, and the last test should be made at least 3 months after the first appearance of the sore or sores.

OPENING A BUBO

It is necessary to make only a small opening about three-eighths of an inch long. Put the lancet into methylated spirit for half an hour and paint the swelling with iodine. Then at the end of the swelling nearest the penis and in a place where it is soft lay the lancet flat against the skin, handle towards the penis, and push in the point for a quarter of an inch, or until matter begins to ooze from the wound. Make a wick of gauze ¼ inch across and 3 inches long, and with a probe push it into the cavitiy for about 1½ inches. Apply gauze then a pad of wool and bandage.

SUMMARY OF TREATMENT

For Gonorrhoea or for Chancroid or Soft Chancre (Sores on the Genital Organs).—Six tablets immediately on reporting and six tablets twice a day for a total of five consecutive days—60 tablets in all. During the treatment at least five pints of water each day to flush out kidneys and bladder.

Note.—In all cases of Gonorrhoea or of Chancroid or Soft Chancre the man should report immediately to first available V.D. Clinic for examination and further tests. This is vital not only in the man's own interest but in that of his wife and children and all others concerned.

SYPHILIS

This is a serious disease usually caused by sexual intercourse with a woman suffering from the disease. It may however be conveyed in other ways such as kissing an infected person or by using a cup, glass or pipe previously used by an infected person, in which case a primary sore or Chancre may appear on the mouth. It may also be conveyed by using a shaving brush or razor previously used by an infected man. There are three recognised stages of this disease, the first being the Hard Chancre which shows itself two to eight weeks, usually about three or four weeks after infection, and if contracted in the usual way, begins as a small pimple on some part of the end of the penis. This pimple breaks down and forms an open sore round which the flesh is thickened and toughened ; this toughening, which may cause the surrounding parts to be as hard as gristle, gives the name Hard Chancre. Accompanying it, the glands in the groin become more or less enlarged and may be felt like rubbery lumps. These enlarged glands are not usually painful like the bubo and very rarely suppurate.

Secondary Syphilis.—This stage usually begins about six weeks after the Chancre has developed and, if not treated properly, may continue for a year or two. The Chancre may or may not have healed up, before the secondary symptoms commence. The signs and symptoms in the secondary stage vary from nothing particularly noticeable to rashes of various kinds covering the body, the limbs and the face, with moist sores on the purse or scrotum, between the scrotum and the upper parts of the thighs and between the buttocks ; falling of the hair especially at the back of the head ; sores in the mouth and possibly a general " out of sorts " feeling with mild fever and some headache. Of all these the rash, consisting of pink spots which do not itch and become more deeply coloured, is the commonest sign. A complaint of " piles " should rouse a suspicion and if moist grey warts are seen round about the back passage it is wise to enquire about any recent sore on the private parts ; in any case, even if there are no signs of a recent sore, it is safest to regard a patient with such warts as possibly suffering from syphilis and contagious. The saliva and the discharge from sores of patients in the secondary stage of syphilis are swarming with the germs of the disease, and if any of it falls on a crack in the skin or the lips of another person, he will almost certainly contract the disease. Special precautions should, therefore, be taken to prevent any chance of table and toilet articles used by the patient being used by other persons.

TERTIARY SYPHILIS.—This is the third stage and may follow on the secondary stage or be delayed for years. Usually with thorough treatment the third stage never appears, but if it does show itself, it may do so in several ways, the commonest being disease of the liver, of the spinal cord or of the brain giving rise to various symptoms such as paralysis or insanity.

Treatment of Syphilis.—This disease cannot be treated properly by other than medical men who have been specially trained. It is, therefore, essential that every case should as soon as possible be transferred to the care of a specialist. Meantime, any open sores such as those about the private parts and round the back passage should be dusted with sulphanilamide powder. If available, bathing slips should be worn by the patient.

NOTE.—Masters may obtain from any Mercantile Marine Office in this country a List of Treatment Centres for Venereal Diseases (List 7A) showing the hospitals and dispensaries at ports throughout the world where seamen can obtain treatment, which in most cases is free of cost.

CHAPTER XXI

VARIOUS AND UNCLASSIFIED DISEASES

BERI-BERI

This is a disease which at one time was fairly common on board ship, but is now seldom seen. It is due to the absence from the diet of the anti-neuritic vitamin B1. It is met with chiefly among natives whose staple diet is rice, and it has been observed that the disease develops when polished rice alone is used and is cured when unpolished rice is provided, the countries most affected being Japan, Brazil and the East Indies. It is not contagious from one man to another. There are several forms of the disease, but the commonest form begins gradually with fatigue, loss of appetite, dull pain at the pit of the stomach, headache, difficulty of breathing and palpitation with a sensation of numbness or heaviness in the legs usually without fever. Later there is difficulty in walking, shooting pains in the legs and tenderness of the calves. The pulse is quick. When dropsy is present it usually begins along the shin bones and extends upwards so that the whole body may become swollen. The urine is then diminished in quantity. When fever is present it is due to some complication such as Malaria or Dysentery. An attack may become dangerous to life if the paralysis extends to vital organs such as the heart.

Vomiting is a bad sign. Good signs are a return of the appetite and an increased flow of urine.

Treatment.—The patient should rest in bed and not be allowed even to sit up for two weeks, on account of the danger of heart failure. The diet should be corrected and the food, in small quantities at a time, should consist of meat, strong beef-tea, eggs, bread and butter and tea or coffee. Whenever possible, it is desirable that a pint of milk in the 24 hours and fresh green vegetables should be given. A large meal should not be given. The bowels should be kept open by a dose of Black Draught. Two tablespoonfuls of the tonic mixture should be given three times a day and each dose should be followed by a tablespoonful of brandy or whisky. Good ventilation, strict cleanliness, and plenty of sunshine, when possible, are essential.

SCURVY (SCORBUTUS)

This disease at one time was very common among sailors, especially on long voyages, on account of the absence of fresh meat and vegetables in the diet. Other factors also contributed, such as overcrowding, living in cold damp quarters, prolonged fatigue under depressing circumstances and mental depression. Nowadays, with a better victualling scale, the disease is somewhat rare.

The symptoms come on gradually with loss of weight, progressive weakness and anaemia. Soon the gums are noticed to be swollen and spongy and to bleed easily. The teeth may become loose and even fall out. The breath is foul and the tongue is swollen, but is usually red and not furred. Spots and blue blotches like bruises appear first on the legs and then on the arms and body. Slight pressure or injury easily produces a bruise, and old scars of wounds appear as if they were breaking out again.

The joints become swollen and stiff. The heart becomes weak and easily affected by sudden shocks, exertion or excitement. There is no fever, the temperature often being subnormal.

Treatment.—The prevention of Scurvy is much easier than its cure, but even in well-established cases the provision of fresh food, vegetables and fruit will soon effect a cure. If the ship is a long way from port and these are not available, the man's daily ration of Lime Juice should be doubled. Mashed potatoe mixed with milk is useful. If oranges or lemons are on board, the juice of two or three should be given daily. For the mouth condition, use a wash of weak Potassium permanganate, 1 Grain tablet to the pint of warm water. On account of the tendency to heart failure the man should be put off duty and rest in bed should be ordered if it appears necessary.

DELIRIUM TREMENS

This is caused by excessive drinking; it may develop in hard drinkers as the result of accidents of various kinds or in pneumonia, but usually occurs after a heavy drinking bout in men who are constant drinkers.

It is characterised by sleeplessness, loss of appetite, extreme restlessness, and delusions of various kinds. The patient imagines that he sees all kinds of creeping objects crawling about him—insects, rats, mice, snakes, devils, etc.—with the result that he is in a state of frantic terror. His hands incessantly tremble, the eyes are staring and unnatural, the pulse is weak and rapid, the tongue is coated and tremulous, and the skin is clammy and moist. This condition is dangerous and sometimes fatal, but if refreshing sleep can be procured the patient has every chance of recovery. It usually lasts from three to five days.

Treatment.—These patients are singularly given to suicide ; during the attack they must be regarded as insane and every precaution taken to prevent them committing suicide or doing harm to anyone else. The important thing to aim at in treatment is to promote sleep and for this purpose 2 drachms of Paraldehyde should be given in lime juice. Further doses may be given if necessary. The bowels should be kept open by a dose of Black Draught every morning. The strength must be kept up by soups, beef tea, milk, etc.

If the man is violent he may require two men to manage him. A sheet passed over the legs and hips and tucked tightly under the mattress will help to restrain his lower limbs. He should not be strapped in bed as this aggravates the delirium, and limited freedom should be allowed, taking care that he does not hurt himself. Violent restraint should be avoided.

Alcohol should be diminished slowly. Immediate and total withdrawal aggravates the condition.

FEIGNED DISEASES (MALINGERING)

Medical Officers in Public Institutions of all kinds, and penal establishments in particular, have continually to face and deal with cunningly simulated diseases, and every shipmaster at times encounters trouble in this respect.

It is a usual practice among Indian seamen once a voyage has commenced to complain of being sick and to claim " Dawa " and the privilege of a day's exemption from duty, and, to do them justice, they are usually content with a day, and come to time the following morning. If they restrict themselves to this you are fortunate and will be wise to concede the point. The systematic shirker and loafer intent on lying up pursues different tactics. " Pain in the back " is the usual complaint or " a sort of all-overishness " when there is any special work to be done.

These cases are difficult of detection even for trained medical observers. You have to take into consideration the temperature as shown by the clinical thermometer, the character of the man, his possible motives for simulating illness, and, not least of all, the opinion of his shipmates, who usually sympathise with genuine suffering. A man with a persistent backache—a favourite device—is not necessarily a malingerer. You cannot say he has not got a pain in his back. Rheumatism and Lumbago are common enough.

Should, however, he insist that the pain is worse when he is lying down or asleep, or supposing your lead pencil accidently slips from your hand and he springs forward and readily bends to pick it up, you may be pretty sure there is not much amiss.

Many of these cases are an excellent test of your powers of observation and knowledge of human nature. Moreover, a man of sound

physical power may honestly believe himself to be suffering acutely. Hysteria and overwrought nerves are by no means confined, as is commonly believed, to the weaker sex. Males are occasionally so affected, and then their morbid self-centred fancies run riot. In genuine shamming and shirking, rest in bed on slop diet, above all no tobacco and no companionship, will soon tire out a malingerer, though some men can do with a heap of such treatment. No hard and fast rule can be laid down for the captain's guidance. If in doubt, let the patient have the benefit of it, always bearing in mind that it is better to allow the malingerer to escape than to incur risk of dealing harshly with any man who is really sick.

CHAPTER XXII

SIGNS OF DEATH

Identification of a Dead Body

As many cases have occurred of persons supposed to be dead recovering, it is desirable to draw attention to the actual signs of death. These may be tabulated thus :—

(1) Cessation of Breathing.—A mirror held to the mouth and nose does not become dim, or a feather held to the nose is not stirred.

(2) Cessation of Circulation.—The pulse cannot be felt and the beating of the heart cannot be felt or heard. A string tied tightly round a finger will cause it to become blue in life, in death it will remain white.

(3) Alterations in Appearance.—The eyes become dull and sunken, and the skin pale.

(4) Coldness of the Body.—The temperature gradually falls to that of the air around, commencing with the hands and feet. In deaths from Fever the temperature sometimes continues to rise for a short time afterwards.

(5) Stiffening of the Body or Rigor Mortis.—This usually comes on three or four hours after death and lasts for two or three days.

(6) Post-Mortem Lividity or Staining.—In a dead body the blood will tend to fall by gravity to the most dependent parts so that if the body is lying on its back the skin there will become dull red or purple in patches resembling bruises.

(7) Commencement of Decomposition.—The first signs of putrefactive changes are usually seen in the vicinity of the intestines which will be manifested by a greenish colour of the skin of the abdomen. This will appear in two or three days after death and is a certain sign of death. The previous signs taken by themselves are not infallible, but when they are all taken together the evidence is such that there is little difficulty in coming to a decision.

IDENTIFICATION OF A DEAD BODY

When a dead body is found on board ship during a voyage, it is essential, in any case in which identity is in doubt, to examine the body before burial, and to make written notes of all appearances which can possibly assist in the subsequent identification.

The following are the chief data to be noted :—

I. Clothing, &c

The body must be stripped of all clothing ; this should be removed if possible without cutting or tearing, a brief description in writing being made of each article, any name or initials marked upon the clothing being noted.

All articles found in the clothing and upon the body must be removed and described in writing, papers found upon the body should be examined. The clothing must be thoroughly dried and then tied into a bundle in which a piece of camphor is placed. The wrapper must be clean, either stout paper, sail cloth, or other suitable material being used. The articles, papers, etc., found on the body should be made into a separate parcel. The packages should be labelled and placed in safety in a warm dry place. When the articles are handed to the police or other authority to whom the finding of the body is reported, the packages should be opened and their contents checked by the list which has been made, and a receipt should be obtained from the person to whom they are delivered.

II. The Body

The body, after it is stripped, should be thoroughly examined and the following data noted :—

1. Race.—White man, Negro, etc.

2. Sex.

3. Age.—Only a rough estimate of age is possible.

4. Height.—This should be measured with the body lying on its back on the floor with the legs fully extended ; the measurement should be made between two marks on the floor, one in a line with the top of the head, the other with the bottom of the heels.

5. Development of the Body.—Good muscular development, stout build, wasted, etc.

6. Inspection of the Face and Head.—The hair on the head should be described—colour, long or short—curly or straight, baldness, etc., the eyebrows should be described—colour, bushy or scanty, etc., and the distribution and character of any hair upon the face should be noted. The complexion—florid, sallow, sunburnt, etc., the colour of the eyes and the shape of

the nose. The mouth should be opened and the teeth examined and a note made as to whether they are sound, decayed, or missing (if the body is very decomposed some may have fallen out after death). Dental plates should be removed, cleaned and placed with the other articles kept for future examination.

7. INSPECTION OF THE WHOLE BODY should be made for :—

(*a*) *Birth marks* such as moles, etc.

(*b*) *Deformities*, e.g., missing fingers, deformities due to previous fractures such as the shin bone.

(*c*) *Scars of previous injury or disease.*—A scar may be in the form of a line, as is usual with those due to operations or other clean cuts ; or it may be broad or irregular in shape, e.g., the scars of vaccination, and the skin may be discoloured in the scars of ulcers such as those on the legs.

The exact position, size and general appearance of all scars should be noted.

(*d*) *Tattooed areas* should be noted as to position, size and general appearance, with special note of any tattooed letters or words.

(*e*) *Wounds and bruises.*—Note should be made of injuries which may explain the death ; their exact position on the body and their dimensions and depth should be observed and their characters described—whether clean cuts, ragged tears, or bullet wounds, noting in the last of these whether there is blackening of skin or clothing or singeing around the wounds. If a bullet wound is found, look carefully for a second wound by which the bullet left the body, and feel any unusual prominence on the surface of the body for a bullet lodged beneath the skin, noting its position.

Note if there is any bruising round the wounds or evidence of the escape of blood from the wounds by the presence of blood clots, the staining of surrounding skin and clothing by blood, or blood where the body was found ; this will help to distinguish injuries caused during life from those produced after death, e.g., by a fall of coal upon the body. Similarly, if a fractured bone is found, it should be noted whether there is bruising at the site of the fracture.

Care must be taken not to mistake for bruises stains which develop on the surface of the body a few hours after death. These are usually large, of a uniform bluish red colour, there is no swelling as is frequently the case in bruises, and no abrasion of the surface of the skin. These

stains are found on the surface of the body which was undermost in the position in which it lay after death, but the parts on which the body rests are not stained.

(*f*) *External indication of disease* should be noted, such as boils, ulcers, etc., or swellings on the legs produced by varicose veins.

9. Post-Mortem Phenomena.—Note should be made of any changes occurring after death which may help in the estimation of the time of death :—

1. Is the surface of the body cold to the touch ? or are parts covered by clothing warmer than uncovered areas ? This should be noted before the body is stripped by feeling the face and hands and then passing the hand over the surface of the trunk beneath the clothing.

2. Are the limbs flaccid or rigid (owing to death stiffening) ? This will be noted if attempts are made to bend the limbs. Rigidity may be destroyed in the arms if they have been forcibly pulled upon in the removal of the body from the place where it was found.

3. Is the body undergoing putrefaction ? The earliest change is a green or slate-coloured patch which forms on the lower part of the belly. This patch spreads to the rest of the belly and then over the whole trunk, up the neck to the head and along the limbs. The extent of the discoloration should be noted.

Later the body becomes swollen and bloated, the belly is tightly distended, and pressure upon the skin elsewhere produces a peculiar sensation due to the gases of putrefaction beneath it. The skin becomes moist and peels and bags of reddish or green fluid may form on the surface of the body. The odour by this time is very offensive. The pressure may force froth or fluid out of the mouth and nose or excrement from the anus ; the tongue may also protrude from the mouth. These changes should be noted and the presence of maggots on the body. When putrefaction has advanced to this extent some of the data required for identification cannot be obtained, the features being much altered by swelling and discoloration, the eyeballs bulging or collapsed, and the hair, teeth and nails becoming loose and easily detached.

Rats may gnaw the dead body producing effects which might be mistaken for those of disease or injury. The parts attacked are uncovered surfaces such as face and hands, the first parts to be destroyed being the ears, nose and fingers.

CHAPTER XXIII

DOSES, AND DIRECTIONS FOR USE OF MEDICINES

The doses of these medicines are calculated for men, so that half the quantity must in all cases be given to patients between ten and sixteen years of age. The names of all *outward* applications are printed in thick black type (as **Eye Drops,** etc.) to distinguish them from medicines that are to be taken internally.

One ounce of liquid is equal to 2 *table*-spoonfuls, and to 8 *tea*-spoonfuls ; 1 drachm of liquid is equal to 60 drops.

One drachm of any solid drug is equal to 60 grains ; 1 ounce of any solid drug is equal to 437½ grains.

Alum Powder.—A strong solution or the powder itself may be applied to stop slight bleeding such as occurs in slight cuts.

One drachm to a pint of warm water makes a useful gargle for sore throat. It may be given in doses of 10 grains every 2 or 3 hours in cases of bleeding from the stomach.

AROMATIC SOLUTION OF AMMONIA.
AROMATIC SPIRITS OF AMMONIA. } A useful stimulant. May be given in heart weakness or fainting.

Useful for coughs when a stimulant effect is desired.

Turns milky when mixed with water.

Dose.—For repeated administration, 20 to 40 minims in water ; for single dose, 60 to 90 minims in water.

ASPIRIN.—Useful for Headaches, Rheumatism, Muscular Rheumatism, Feverish colds, Neuralgia.

Direction.—One or two of the 5 grain tablets may be taken with water three times a day after food.

To relieve pain.—Three tablets may be taken as a first dose.

BLACK DRAUGHT.—A popular and useful board-ship purgative.

Dose.—1 to 2 ounces.

Boric Acid Crystals.—A useful safe antiseptic for wounds. As it is non-irritant it may be used full strength.

In strength of 10 grains to the ounce of water is useful for inflammation of the eyes and for any condition of the mouth requiring a mouth wash.

CALOMEL.—This is a most useful and valuable drug acting on the liver, the bowels and the blood. It is tasteless and may be placed on the tongue and swallowed with a draught of water. Useful in constipation, sluggish liver, jaundice, malaria, and many other conditions.

Dose.—½ to 5 grains. A dose of this drug split up into several small doses and taken at short intervals of ½ an hour or so is often found to have a better result than one large dose.

CASTOR OIL.—A well known, safe and useful purgative.

Dose.—1 to 8 drachms.

TINCTURE OF CHLOROFORM AND MORPHIA (CHLORODYNE).—This can be used for colic and persistent diarrhoea. May also be given to allay a dry hacking cough. Five drops given with a dose of Castor Oil sometimes prevents the griping caused by the oil.

Dose.—5 to 10 drops.

CREOSOTE.—A favoured remedy for toothache. Apply on a small piece of cotton wool just moistened with creosote, taking care to see that no excess of the substance runs on to the gum—if this happens swab the area with spirit (whisky or other spirit is suitable).

Permanganate of Potash Tablets.—These tablets consist of 1 grain of Permanganate of Potash. One tablet dissolved in a pint of warm water makes a very useful antiseptic lotion for such purposes as the cleansing of dirty wounds, mouth wash, gargle and injection in Gonorrhoea.

This lotion is similar to the preparation known as Crimson Fluid, when suitably diluted.

GLAUBER SALTS. } An excellent purgative best taken in the morning. Useful in constipation associated with liver disorder and rheumatism.
EPSOM SALTS. }

Dose.—30 grains to 2 drachms for repeated administration in a small quantity of water. For a single dose ½ to 1 oz. in 3 to 6 ozs. of water.

Eye Drops.—Used to alleviate pain in the eye. Instructions for use are on a label attached to the bottle.

FRIAR'S BALSAM.—An old and useful application for cuts and wounds. It is antiseptic.

The vapour from a mixture of a teaspoonful of Friar's Balsam in a pint of boiling water is very soothing when inhaled in cases of sore throat and bronchitis. Internally may be given for winter coughs.

Dose.—10 Drops to 1 Drachm.

Goulard's Extract.—This must never be used full strength. Diluted to the extent of one part in about 60 parts of water it makes a useful application for sprains, bruises and swelling of joints. It is applied by using a piece of lint, squeezing it out in the solution and applying over the part affected, covering it with a piece of waterproof cambric and bandaging.

This lotion is also useful for itching irritation of the skin.

It must never be used as an eye lotion.

Iodine, Solution of.—An antiseptic for use on wounds and injuries of any kind. It is a strong antiseptic and may be applied all over a wound and the surrounding skin. It may also be painted over swollen joints, sprains, bruises, etc.

LAUDANUM.—Laudanum is used principally for the relief of pain, for procuring sleep and for stopping diarrhoea. It must be used with caution, as it is poisonous in large doses.

Dose.—5 to 15 minims for repeated doses, 15 to 30 drops for a single administration. 30 minims contains $\frac{1}{3}$ grain Morphine.

CHLORATE OF POTASH.—These tablets are very useful in cases of sore throat, sore gums, or any form of ulceration in the mouth. One tablet is placed in the mouth and kept there till dissolved.

Not more than six should be taken in one day.

Care should be taken that this drug does not come in contact with safety matches or sulphur, as it would be liable to cause an explosion.

Washing Soda.—A lotion (10 grains to the ounce of water) is soothing to the skin in cases of irritation and insect bites and stings. Used for washing burns and scalds before applying dressings, also for washing out ears.

Kaolin Poultice.—This is supplied in tins and must be applied as hot as it can be borne by the skin. To heat it, place the tin in hot water until it reaches the desired heat. To use it, spread the paste thickly on a piece of plain lint or similar material of the size of the inflamed part, lay a piece of gauze over the paste and then lay this over the part, cover with a layer of cotton wool and bandage. Apply a further poultice after 24 hours. This is an excellent remedy for pneumonia, boils, carbuncles, pleurisy or any deep seated inflammation. It takes the place of the old fashioned Linseed Meal poultice.

MEPACRINE HYDROCHLORIDE.—Tablets 0.1 gramme. To be used in the prevention and treatment of Malaria. One tablet daily. To be taken after a meal followed by good draught of water. Vide Chapter XII.

Mustard Leaves.—To be used instead of a mustard poultice when a counter irritant is required. The leaf should be dipped in water before applying. It should be kept on long enough to produce a burning sensation and a uniform redness without blistering. Usually about twenty minutes is long enough. After removing, sponge the part with olive oil, apply some cotton wool and a bandage. Useful in sciatica, lumbago and, in the absence of Kaolin, in plueirsy and bronchitis.

GROUNDNUT OIL.
OLIVE OIL. } Useful in cases of poisoning by Carbolic Acid or Arsenic, when it may be administered freely. Used in cases of Gall stones. Externally, is used to smear over piles.

PILLS—BLUE PILL.—Useful as a purgative, especially if the liver is sluggish. Should be followed in the morning by a dose of Epsom Salts.

Dose.—One to two pills.

PURGING PILLS.—Useful in constipation.

Dose.—One to two pills.

CASCARA SAGRADA TABLETS. / VEGETABLE LAXATIVE TABLETS. } Useful for constipation where a gentle action of the bowels is wanted.

Dose.—One tablet night and morning.

PHENACETIN TABLETS.—Used in headache, neuralgia and pains such as are present in Rheumatism.

Dose.—One or two tablets powdered and taken with a hot drink and repeated in four hours if necessary.

POWDER, DOVER'S (*in 5 grain tablets*).—Two tablets with a hot drink on turning in, often given with good results on the first sign of a " cold " coming on. Causes sweating and procures rest and sleep.

Dose.—One to three tablets.

QUININE BISULPHATE OR DIHYDROCHLORIDE (*5 grain tablets*).—Used in the treatment of Malaria. Tablets are best given broken up or crushed and dissolved in a glass of water containing a little acid such as vinegar or lemon juice.

Dose.—1 to 10 grains.

SULPHATE OF ZINC.—Useful as an emetic. Also as a mouth wash or gargle.

Dose.—As an emetic—10 to 30 grains in a glass of water.

Strength of mouth wash or gargle—10 grains in a pint of water.

SULPHATHIAZOLE.—This is a particularly useful drug in the treatment of many acute germ infections, both local and general, *e.g.*, cellulitis, whitlow, spotted fever (cerebro-spinal meningitis), sleepy sickness (encephalitis lethargica), severe tonsilitis, acute bronchitis, pleurisy, pneumonia, meningitis (brain fever)—*see* reference to these diseases in the relevant chapters.

Dose.—3 tablets (0.5 gramme) 3 times a day for the first 3 days (9 tablets during each 24 hours)—then 2 tablets 3 times a day for 3 days (6 tablets during each 24 hours)—and, if necessary, 1 tablet 3 times a day for 7 days (3 tablets during each 24 hours). The tablets should be crushed and swallowed with a tumbler-full of water. Whilst treatment by sulphathiazole is being carried out it is important that the patient should be encouraged to drink from 4 to 5 pints of water daily.

Sulphur Rock.—Used for fumigating. For fumigating 1 to 2 lbs. of sulphur should be used for every 1,000 cubic foot of space. To fumigate proceed as follows :—Put the required quantity of sulphur in a mess tin or similar receptacle with a few shavings and a sprinkling of methylated spirit or other inflammable liquid, float in half a bucket of water, close all ports, scuttles, hatches and ventilators, and in fact every opening, and set the sulphur alight, keeping the place closed up for four hours. Then open up thoroughly, bring out all movable articles on deck and scrub the decks, bulkheads, ceiling and all other woodwork with a disinfectant.

Turpentine Liniment.—Used for rubbing on stiff joints.

Boric Acid Ointment.—A useful healing ointment. Should not be applied to discharging wounds or sores. To apply spread it sparingly on lint or gauze, covering with cotton wool and a bandage.

Benzyl Benzoate Application.—Used for scabies or itch. See Itch (Diseases of the Skin).

Calomel Ointment.—Useful in some forms of skin disease. In strength of 30 per cent. or over it kills the germ which causes syphilis ; it is therefore a good preventative of syphilis. Used by smearing on the parts.

Mercurial Ointment (Blue Butter).—A very useful remedy for crabs. Should be rubbed in sparingly. See Lice (Diseases of the skin).

Pile Ointment.—Used for piles. Should be smeared on after washing the parts with soap and water. Will not cure the piles, but is very soothing.

Vaseline or Soft Paraffin.—A useful application for burns of the face. It relieves inflamed skin and is used in erysipelas, useful for smearing instruments to keep them from rusting. May be used instead of oil in such cases as smearing catheters before they are used.

White Precipitate Ointment.—Useful in Ringworm, Head Lice, and other skin conditions.

DRUGS WHICH MUST BE KEPT IN A SEPARATE LOCKED LOCKER AND WHICH SHOULD BE USED ONLY ON MEDICAL ADVICE.

AMYL NITRITE CAPSULES.—This is a powerful drug which is used for the purpose of dilating the bloodvessels at or near to the surface of the body and thus relieving the heart. Its chief use is during attacks of Angina Pectoris.

Direction for use.—The glass capsule, which is surrounded by absorbent material, should be broken and the contents inhaled.

BROMIDE OF SODIUM OR POTASSIUM.—Acts as a sedative to the nerves ; is useful in sleeplessness and epilepsy.

Dose.—5 to 30 grains dissolved in a wineglassful of water, taken after food or at bedtime.

DIGITALIS TABLETS.—A powerful heart stimulant. Poisonous in large doses. Specially useful in certain forms of heart disease and in dropsy due to heart disease.

Dose.—One or two tablets as may be required.

PARALDEHYDE.—A powerful sleeping draught. which acts quickly, is safe and has no bad after effects. Its chief objection is its nasty taste. May be given in cases of mania or delirium tremens.

Dose.—½ to 2 drachms, which should be given in about a wineglassful of water with syrup or lime juice to cover the taste.

SULPHANILAMIDE POWDER.—To be used for burns of the body excluding the face and as a first application to wounds generally.

SURGICAL DRESSINGS, INSTRUMENTS, ETC

DIRECTIONS FOR USE

Bandages.—For uses see under the headings of Bandaging and wounds.

Lint, Plain White.—Used for dressing wounds. The woolly side must not be put next the wound.

Lint, Boric.—This is treated with Boric Acid and is usually coloured pink to distinguish it from plain lint. It is slightly antiseptic. Used for dressing wounds and for fomentations.

Lint, Picric.—This is treated with Picric Acid and is coloured Yellow. It is used for burns and scalds. Always damp before applying. It stains the skin yellow.

Gauze, Plain White.—Used for dressing wounds, especially in cases where there is much discharge.

Cotton Wool.—Used as a pad over other dressings.

Adhesive Plaster.—Used for keeping dressings in position and for strapping the chest in case of fractured ribs.

Safety Pins.—Used for keeping dressings in position.

Waterproof Cambric.—Used for covering over fomentations to keep them moist.

Bottles (6 oz.) Plain.—Plain bottles are used for giving a patient a supply of one of the mixtures. Must never be used for anything except what may be taken internally and must have a label giving directions and dose.

Bottles (2 oz.) Fluted.—These bottles are used for medicines which are *not* to be taken internally and must be supplied with a red poison label giving directions for use.

Corks.—Assorted to fit bottles.

Wooden Throat Spills.—To use, twist a small piece of cotton wool round one end. Used instead of a brush for painting throat, etc. To be thrown away after using.

Ointment Boxes.—May also be used as pill boxes.

Labels, Plain.—For direction for use of medicine to be taken internally.

Labels, Poison.—These are coloured red and are for directions for use of poisonous drugs or medicaments for external application.

Measure, 2-drachm Conical Glass, graduated drops and minims.—Used for measuring fluids.

Syringe, Higginsons.—This is used for giving an Enema or Injection by the Rectum in those vessels in which a douche can is not carried. Soapy Water is usually given and the usual amount is about a pint.

Directions for Use.—Take a piece of hard soap and stir it up in a pint of warm water until there is a good foaming lather. Then remove the soap. Take the syringe and see that it is in good order by passing some of the soapy water through. After seeing that it is full and no air in it, and seeing that the nozzle is oiled or vaselined, insert it in the back passage, or anus, the patient being on his left side with his knees drawn up. The enema should be given slowly and gently and forcible pumping avoided. Inject the whole pint.

Bed Pan.—This is used when the patient is too ill to go to the W.C.

Hot-Water Bottles, Rubber, with Flannel Cover.—When used they should not be filled up to the top.

Stomach Tube, Red Rubber with Funnel.—This is used to wash out the stomach, particularly in cases of poisoning. See Poisons (page 99).

Splints, Set.—See Fractures.

Stretcher.—Used for carrying a helpless patient.

Abscess Knife (Pagets' and Syme's).—For opening abscesses and buboes. See Abscess.

Dressing or Dissecting Forceps.—Has a variety of uses.

Eye Spud.—Used for removing pieces of steel or other foreign bodies from the eyeball.

Scalpel.

Scissors.

Tourniquet (St. John Pattern).—Used in severe arterial Haemorrhage. See Bleeding or Haemorrhage.

Soft Olivary Catheters.—Used for relieving the bladder in cases of retention of Urine, see page 169.

Spatula or Palette Knife.—Used for handling ointments.

Splinter Forceps.—Used for removing splinters.

Spencer Wells Artery Forceps. — Has a catch which locks when artery is grasped.

Silk and Needle in Sealed Tube.—To use, break the glass tube, when the needle and attached suture are ready for use for stitching.

Clinical Thermometer.—The use of the clinical thermometer is described under Diagnosis (see page 16).

Canvas Roll for Instruments.—The metal instruments should be kept in this canvas roll which can easily be sterilised by placing in boiling water for a few minutes.

Suspensory Bandage with Understrap.—This is very comforting appliance in cases of varicocele or varicose veins of the testicles. It is simple to adjust.

Trusses.—These are used in cases of Rupture or Hernia. They should fit comfortably. See Hernia (page 99).

Douche Can, 1 quart.—This consists of a can, having at the bottom a tap to which is attached a length of rubber tubing. Three nozzles are supplied, a metal one for irrigating the urethra or pipe, a vulcanite one for giving an enema and a metal one for the ears.

To use the Douche Can.

(*a*) With Permanganate of Potash Solution for washing out the urethra or pipe, see page 190.

(*b*) To give an enema. Pour a pint of hot water into the can. Put a piece of hard soap into the water and stir it about briskly until there is a good foaming lather. Remove the soap. Raise the douche can three feet above the patient. Open the pinch cock until the soapy water flows out, close the pinch cock. Lay the patient on his left side with his knees drawn up. Having oiled or vaselined the vulcanite nozzle insert it gently into the back passage directing it slightly backward. Open the pinch cock and gripping the tube with the fingers, allow the liquid to flow very slowly. Let the whole pint pass into the bowel taking 10 to 15 minutes.

(*c*) The douche can can be used to introduce hot coffee or weak brandy into the bowel—see page 99. (Collapse).

(*d*) The douche can may also be used to wash out the ears when a special ear nozzle is used. The can is filled with warm water in which a teaspoonful of Carbonate of Soda has been dissolved. It should be held as high as possible above the head of the patient.

The metal nozzles must be throoughly cleaned and placed in boiling water for five minutes before and after use.

Notes on the care and maintenance of surgical instruments.

Metal Instruments.—After use metal instruments should be rinsed in cold water and then scrubbed with soap in warm water. They should afterwards be boiled for at least five minutes, wiped dry

(special attention being paid to joints and serrations of forceps and scissors), and finally polished with a leather.

Rustless steel instruments should not require greasing, but instruments which are not of stainless metal should, before being placed in the instrument case, be wiped with a piece of rag moistened with liquid paraffin so as to leave a thin film of oil. No instrument should be touched with the naked hand while this is being done or a rust mark will eventually be formed wherever it has been touched. Gloves should be worn or the instruments should be held in a piece of lint.

Gum Elastic Catheters.—The catheters should be kept in the box provided. They should be sprinkled with French chalk to prevent sticking and should be kept in a cool place.

Before catheters are used the French chalk should be removed by careful wiping with cotton wool. The wires should then be removed and the catheters should be soaked for half an hour in Boric lotion (one teaspoonful of Boric Acid Crystals dissolved in a pint of water). On removal from the solution the moisture should be shaken off the catheters and a thin layer of vaseline should be applied with a piece of clean gauze before any attempt is made to pass them.

After the catheter has been used any remaining vaseline should be wiped off and mucus and debris should be dislodged by flushing through under a running tap. The catheters should then be hung up to dry. When quite dry they should be re-powdered with French chalk and returned to the box.

Stomach Tube.—This should be removed from its box and hung up to prevent kinking, in which state it cannot be passed satisfactorily Before the tube is used a thin layer of vaseline should be applied to its whole length with a piece of clean gauze. After use it should be flushed out under a running tap, wiped dry and hung up.

Measures.—Measures should always be thoroughly washed and dried before use. *To put away a measure without first washing it is a bad and dangerous practice.*

Clinical Thermometers.—As a precautionary measure a thermometer may be kept ready for use in a solution of Lysol (one teaspoonful to a pint of water), but it should be wiped dry before use. After use it should be well washed with soap and cold water.

Douche Can.—This should be well washed and dried before being put away and care should be taken to ensure that the rubber tubing is completely drained.

NOTE.—Tins containing " Staboclor " (stabilized chloride of lime) for water sterilization should not be kept in the same compartment as any metal instruments or utensil.

INVALID DIET

Beef-tea

Scrape or cut ½ lb. of lean beef as small as possible. Put it into an earthenware basin. Pour over it ½ pint of cold water, and cover it with paper bound tightly round the edges. Place inside a slow oven for an hour, add salt, and strain.

Gruel

Sprinkle into 1 quart of boiling water 3 tablespoonfuls of oatmeal and a pinch of salt. Simmer slowly for an hour, then strain off.

Oatmeal Porridge

Two quarts of water, ½ lb. of oatmeal, 1 teaspoonful of salt. Have the water boiling, add the salt, sprinkle the oatmeal into the water gradually ; stir well the whole time until all is added. Simmer for one hour.

Cunji Water for an Invalid

One quart of fresh water, 3 tablespoonfuls of rice, 1 teaspoonful of lime-juice, ½ teaspoonful of salt. Wash the rice and simmer it in the water for one hour. Strain the water off, skim off any scum that may form, add the salt, and leave it to cool. When cold, add the lime-juice.

Arrowroot or Cornflour

Put a dessertspoonful of arrowroot or cornflour in a tea-cup with a little cold water, thoroughly mix it, then pour in ½ pint of boiling water or milk, and stir till it thickens. Flavour with sugar and, perhaps, a glass of wine.

Barley Water

Wash a handful of pearl barley in cold water, then simmer it in 3 pints of water for an hour, and flavour with a little lime-juice and sugar.

Sago and Cerealine

Soak a teacupful of either in cold water for an hour, drain it off, and add a quart of fresh water. Let it simmer over a slow fire until it becomes a clear jelly, then sweeten with sugar, and flavour to taste.

Imperial Drink

Dissolve ½ oz. of Cream of Tartar in 1 quart of boiling water, and flavour with lime-juice and sugar. This is a very cooling drink in fevers.

N.B.—Cream of Tartar is not in the official list, but it is a useful addition and often carried.

Egg Flip

Take the yolks of 2 eggs and beat them well up with ½ pint of milk. A tablespoonful of brandy may be added if desired.

To Boil Rice

Put the rice into boiling water and boil for twenty minutes. Pour the rice into a colander, wash well with boiling water without breaking the rice. Place the colander over boiling water, cover with a cloth, and steam for half an hour.

Linseed-tea

Put 1 oz. of linseed and 1 pint of boiling water into a covered jar, and allow it to stand for an hour before the fire; then strain and flavour with a little sugar and lime-juice.

Toast Water

A crust of bread must be toasted till it is almost black, then cold water is poured on it and the whole allowed to stand.

Lime-juice Drink

Put 2 ozs. of lime-juice and 1 oz. of sugar into 1 pint of water. A little ice will improve it.

CHAPTER XXIV

MEDICAL ADVICE BY RADIO

It may happen that a case of injury or illness occurs on board which gives rise to much anxiety, and the Captain, having consulted the Medical Guide, feels that the case is somewhat beyond his medical resources. In such circumstances the question of wirelessing for medical advice will arise, but the degree of seriousness of a case which would determine this procedure must be a matter for the judgment of the Captain himself. It is most useful, however, for a Captain having no doctor on board to know that he can ask for medical advice by wireless, and he should not hesitate to use this means if he thinks it necessary or desirable, as such action will not only enable him to receive useful advice, and thus to a large extent ease his own responsibility, but will also give considerable moral comfort to the patient.

Medical advice may be requested either—

1. From a ship carrying a doctor, or
2. From a shore station.

When out of range of a shore station, and seeking advice from a ship with a doctor on board, the Captain, if he is not in touch with such a ship, should issue a call to " all ships " and, if necessary, should have recourse to the relay system, that is, the ship or ships within range should be requested to transmit the message until a ship with a doctor on board, or a coastal station, is reached, and the reply would be returned through the same channels.

Radio-medical consultation services have been organised in the United States and in most European countries, and are freely available to all ships, irrespective of nationality.

These wireless calls for medical aid or advice are given priority over all other communications, with the exception of those relating to calls from ships in distress. The messages must be sent in the name of the Captain, or if the Captain himself is ill and unable to send it, then in the name of the Officer in charge.

In order to get the best practical results the messages should contain sufficient definite information to enable the doctor who is consulted to have before him as clear and concise a statement as

possible of the case, in order to avoid having to send questions for further details. In view of the fact that advice by wireless is given without an opportunity for a personal examination of the patient, no responsibility whatsoever must be attached to the doctors who give their advice, either through errors in transmission or from any other cause.

A code suitable for use with the System is included in the Medical Section of the 1931 *International Code of Signals, Vol. II, pp.* 233-246.

INDEX

ILLUSTRATIONS

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MINISTRY OF TRANSPORT

THE SHIP CAPTAIN'S MEDICAL GUIDE, 1946

AMENDMENT No. 3

Pages 133-143 *delete section headed "Malaria" and insert the following :—*

MALARIA AMONG MERCHANT SEAMEN

Malaria is the cause of much sickness and many deaths amongst the officers, crews and passengers of ships trading in Africa, Tropical America, India and the Far East. The great majority of cases landed occur among the officers and crews and instances are on record in which, during homeward voyages from Africa or India, the disease attacked all except two or three of the whole ship's company. Ships have been delayed for days and even weeks by outbreaks of malaria among the crews.

The risk of attacks of malaria can be very greatly reduced if proper precautions are taken and the disease can be cured if proper treatment is given.

The precautions are :—

(1) Avoidance of being bitten by mosquitoes.
   (*a*) By wearing suitable clothing, particularly after sundown.
   (*b*) By using a mosquito net at night.
   (*c*) By the use of the approved mosquito repellent.

(2) Prevention of malarial attacks by taking "Paludrine" or mepacrine.

(1) AVOIDANCE OF MOSQUITO BITES

Malaria or ague fever is a recurrent fever which is caused by germs introduced into the blood by the bite of a mosquito called Anopheles, which can be recognised by peculiar spots on its wings and by the fact that it usually perches with its tail raised. This mosquito is most prevalent in marshy districts, as it breeds by laying its eggs in water ; hence it was formerly supposed that malaria arose from some poison peculiar to low-lying marshy land. It is now an established fact that the only way in which the disease is conveyed naturally is by the bite of an Anopheles mosquito which has previously sucked blood from a malarial patient or carrier. (Many of the natives in tropical countries, although they may not appear to suffer from the disease, are known to be carriers of it). Therefore the best way to prevent malarial

infection is to take measures to avoid being bitten by mosquitoes. For this purpose the following rules are applicable to ships and their crews :—

(*a*) Where practicable, select an anchorage as far as possible from the malarious shore. As the flight range of the mosquito often exceeds half a mile, anchor if possible, more than half a mile from the shore, especially in estuaries or rivers. It must be remembered that barges, etc., visiting the ship may bring mosquitoes to it, so that protective measures should never be diminished, whatever distance the ship is anchored from the shore.

(*b*) Before sunset, make all crew's quarters, as far as possible, mosquito-proof by covering sky-lights, portholes, ventilators and all other openings with mosquito wire screening (for size of mesh and gauge of wire, etc., see footnote (*a*)). Where doors have to be left open, the openings should be made mosquito-proof by wooden frames covered with mosquito wire screening and fitted in the doorways ; these should be made self-closing. If a carpenter is carried it should be his duty, under the Chief Officer, to cover all openings to all crew's quarters with mosquito wire screening **before** the ship enters a malarious region. It is essential that the necessary precautions should be taken immediately before entering a malarious region.

(*c*) From sunset until sunrise keep all doors closed and as far as possible screen all lights which might attract the mosquitoes. In the morning open all doors and, by sweeping and brushing, drive out all mosquitoes which have succeeded in entering during the night. Compartments can also be effectually cleared of mosquitoes by spraying with a fluid insecticide. (See footnote (*b*)).

(*d*) Do not leave any curtains, clothing, etc., hanging up in cabins or sleeping quarters ; they attract mosquitoes, protect them

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(*a*) The metal to be used for the mosquito wire screening should either be copper, bronze or monel metal, the last two being more resistant to sea atmosphere than copper. The gauge of the wire recommended is either S.W.G.28 or 30 and the apertures of the gauze should be each 0.048 inch, this combination giving approx. 16 apertures to the inch.

(*b*) There is a large number of efficient insecticides on the market. Any preparation should contain DDT or Gammexane and pyrethrum in a kerosene base or watery suspension.

The Sprayer to be used with these preparations should give out a very fine cloud of spray, which should be thrown to all parts of the room, especially into dark corners and under settees. Remove and shake all clothing before spraying.

Insecticides containing kerosene are inflammable ; they should not be used in a confined space where there is a fire or flame ; no matches should be struck.

during the daylight, and prevent the proper clearing of the compartment.

(*e*) If the cabins and sleeping quarters cannot be made mosquito-proof, supply every officer and member of the crew with a mosquito net and insist on its careful use while in the infected port or river. This method, however, unless care be taken, is less efficient than the method recommended in paragraph (*b*), since a sleeper's limbs may touch the netting and he may be bitten through it. Moreover, netting stretched over bunks is more liable to damage. Anyone who has a bed fitted with a satisfactory mosquito net may sleep on deck, but no one else should do so.

(*f*) It should be the duty of the officer on watch to see that the orders on keeping doors, etc., closed and on the careful use of mosquito nets and mosquito wire screening, are obeyed.

(*g*) There should be no uncovered pools of stagnant rain water about the ship, e.g., in the boats, where mosquitoes might breed. The vessel should be kept thoroughly clean in the living quarters and throughout the ship ; special attention should be paid to latrines and bilges.

(*h*) There is a greater risk of being bitten by malaria-infected mosquitoes on shore than on the ship, but mosquitoes frequently fly on board ships which lie alongside a wharf, or trade up creeks and rivers. Both on ships and on shore the risk of being bitten is greatest between dusk and sunrise, when the particular mosquitoes concerned are most active. On shore, the danger is greatest in native dwellings, European rest houses, hotels, eating rooms, cafes, badly lighted warehouses, offices, sheds and lavatories. Men should be strongly discouraged from going ashore except on duty and **all should return to the ship before sundown**. Those who have to go on shore on duty should be instructed not to sit about but to keep moving and to be watchful not to allow themselves to be bitten by mosquitoes. Clothing is a protection against mosquito bites and, as far as possible, men should avoid going about after dusk with any part of the arms and legs exposed, i.e., shorts, short sleeved shirts or rolled up sleeves and cellular shirts only, should not be worn after dusk or before dawn. Wearing two pairs of socks will often protect the ankles.

(*i*) An anti-mosquito preparation (dimethyl phthalate) applied to the exposed parts of the body (neck, ears, wrists, arms, ankles, etc.) is a useful protective measure. This preparation is included in the Medical Scales and is a colourless and odourless liquid. It should be used as follows—just before sunset a few drops of the liquid should be placed in the palm and applied to the

exposed parts of the body, avoiding the eyes, the forehead just above the eyebrows and areas around the mouth. The liquid should also be applied to the clothing if mosquitoes are biting through it. As the effects of the repellent only last for about three hours, a further application should be made when the mosquitoes renew their attack.

CAUTION.—Dimethyl phthalate is a solvent for lacquer, paint and plastic articles. It is essential, therefore, that it should **not** be brought into contact with spectacle frames, watch glasses, fountain pens, etc.

On board ship it has occasionally happened that cases of malaria have been practically confined to members of the crew who slept in quarters on the side of the ship which was against the quay (or, when a ship was anchored at a distance from the shore, on the side where barges lay), this being therefore the side chiefly invaded by mosquitoes. Crews living on the decks nearest the level of the quay have seemed to suffer more than those on higher decks.

(2) PREVENTION BY TAKING "PALUDRINE" OR MEPACRINE.

The fewer the bites the smaller is the risk of infection but even when the greatest care is exercised it will seldom be possible **entirely** to protect men from being bitten by mosquitoes either on shore or in the ship. For this reason in all cases when a ship is bound for a malarious port, Masters (in addition to taking all possible measures to prevent mosquito bites) should control infection by giving "Paludrine" or mepacrine or, if neither is available, quinine systematically to all the ship's company. "Paludrine" is the best preventive and will in future replace mepacrine in the Ships' Medical Scales; mepacrine is the next best, and then quinine (the small quantity of quinine provided in the Ships' Medical Scales is intended for **treatment** of an attack of malaria and **not** for prevention).

It must always be remembered that preventive treatment does not necessarily prevent a person contracting malarial infection. While the drug is being taken regularly in the doses described below attacks will be held in abeyance or the severity of attacks will be reduced, and the death rate from malaria will be very low. If, however, prevention by taking "Paludrine" or mepacrine be continued for one month after the last risk of acquiring malarial infection has passed, the vast majority of dangerous malignant infections will never develop though the milder type of infection may appear after the taking of "Paludrine" or mepacrine has stopped.

Persons who have become infected but have not developed symptoms during the time while the preventive drug was being taken, may develop malaria some days, weeks or months after the preventive treatment has

stopped. It is necessary, therefore, to watch for such attacks. All persons should be warned that they have been exposed to the chance of infection, and that, if they fall ill at a later date, they should inform their doctor that the ailment from which they are now suffering may be malaria.

NOTE. If mepacrine is used there is a period of delay before the drug builds up protective properties ; protective treatment with mepacrine should, therefore, **begin 10 days before** arrival at a malarious port.

" PALUDRINE."—" Paludrine " is much the best of the protective drugs and is now supplied in the ship's medical cabinet. " Paludrine " is put up in tablets containing 0.1 gramme of the drug.

One tablet (0.1 gramme) should be given under supervision to adults (or children over the age of 14 years*) every day while in a malarious area and this should be repeated daily for 30 days after leaving the area or until the ship reaches her home port, whichever is the less.

When taken for the prevention of malaria, " Paludrine " possesses certain advantages over mepacrine in that it (1) does not discolour the skin and is less likely to cause unpleasant symptoms, (2) need not be given until reaching a malarious port.

The tablets should be taken after food and washed down by a copious draught of water.

MEPACRINE.—**One tablet (0.1 gramme) should be given to each member of the crew on each of seven days in the week** and the preventive treatment should **start 10 days before** arrival at a malarious port in order to build up a sufficient concentration of the drug in the blood. The dose of one tablet per day should continue during the whole length of stay in the malarious area and be continued daily for 30 days after leaving that area. **Doses for children should be in the same proportion as described in the footnote (*) below.**

It is important that the tablets should not be given on an empty stomach. They should always be given after a meal and followed by a good drink of water, tea or coffee.

Some yellow discolouration of the skin may occur after mepacrine has been taken for a few weeks. This is not due to jaundice but to the dye element in the composition of the drug ; the condition is not harmful and it will disappear after the drug has been discontinued. Very occasionally certain persons may for the first week, show some stomach or intestinal upset shortly after starting mepacrine, especially if it is taken on an empty stomach or with too little fluid. This is not serious, and usually disappears rapidly if the drug is continued.

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* Children under 14 years of age must be given a reduced dose as follows :—

0 — 7 years	..	Quarter of a 0.1 gramme tablet
8 — 14 years	..	Half of a 0.1 gramme tablet
14 years and over		Adult dosage

If your ship is diverted, it may not always be possible to start the preventive dosage 10 days before the arrival in a malarious area. A considerable degree of protection may be obtained, however, by beginning the dosage of mepacrine immediately it is known that a call is to be made at a malarious port or immediately upon arrival at such a port. **If the period before arrival is less than 7 days, start with 2 tablets of mepacrine daily for 5 days and then continue with the routine 1 tablet daily.**

MALARIOUS PORTS. Ports on the west or east coasts of Africa between latitudes 20°N. and 20°S., in Madagascar and other islands in the Indian Ocean, and in the East Indies should be regarded as malarious.

In the case of other ports in the tropics and in the Mediterranean, unless Masters have definite knowledge that they are non-malarious, **enquiry should be made immediately of the Port Authorities on arrival to find out if the conditions in the port are such that preventive malaria treatment should be given, so that necessary preventive treatment may be started without delay.**

Taking " Paludrine " or mepacrine does not, of course, prevent a mosquito from injecting the malarial germs into the person whom it bites, but " Paludrine " or mepacrine, if taken regularly every day will kill large numbers of the germs and so prevent them increasing sufficiently to cause severe fever. The Master should warn the members of the crew who have had malaria or been exposed to malarial infection that, if they should develop an attack of fever after leaving the ship, they should be careful to inform their doctor of the possibility of the attack being of a malarial character. If the vessel arrives at a port where the crew are to be discharged before 30 days have passed since the departure from the malarious area, the men should be given sufficient " Paludrine " or mepacrine tablets to enable them to complete the recommended treatment (i.e., at the rate of one 0.1 gramme tablet of " Paludrine " or mepacrine 7 days a week).

A strict observance of the precautions given above will save a large number of lives and will very greatly diminish the cases of sickness among the crew.

(3) ATTACKS OF FEVER.

Sometimes in spite of all the above precautions a man may get an attack of malarial fever (which will usually appear from the ninth to the twenty-first day after any one of the days during which the ship stays in a malarious port, and in some cases may appear much later than twenty-one days after, especially if the " Paludrine " or mepacrine rationing of the crew has been stopped before the time advised above).

DESCRIPTION OF MALARIAL FEVER.—Malaria may occur either as (A) a relatively mild, benign, or intermittent fever, or as (B) a severe, malignant, or remittent fever. It is important, therefore, when taking the temperatures of a patient suspected of having malarial fever, to note whether these temperatures are of the **intermittent or remittent** type. A temperature is intermittent when it rises above and falls **to or below the normal** every 24 hours or less and it is remittent when it goes well above the normal and then drops **more than** 2 degrees but does **not** get down to the normal before rising again.

(A) Mild, Benign, or Intermittent Malarial Fever—This disease which is sometimes called " ague," is characterised by attacks of fever, which occur at regular intervals, i.e., there may be either one attack daily, or one attack every second day, or one every third day, while the temperature falls to normal between attacks. The patient may complain of passing attacks of chilliness, headache, and aching in his bones, with only a slight rise of temperature for some days before the acute fever stage develops. Each acute attack may be marked by three distinct stages :—

(i) The Cold (or Shivering) Stage—In this stage the patient feels cold and trembles all over ; he has pains in the head and body ; the pulse is rapid and feeble, and frequently there is vomiting and yawning. At the same time as he feels cold his temperature is rising and may be as high as 104°F. or 105°F. This stage usually lasts from half-an-hour to an hour or longer.

(ii) The Hot (or Fever) Stage—The feeling of cold decreases ; the skin becomes hot and dry, the pulse is full and strong, and there is great thirst. The headache increases. The temperature will be high, probably 105°F, or higher. This stage lasts from one to four hours or longer.

(iii) The Sweating Stage—This stage begins with perspiration appearing on the face, which soon becomes general all over the body and may be so profuse as to soak through the bedclothes. The headache and thirst disappear, the temperature comes down to normal, and the patient will probably fall into a deep sleep, after which he may feel quite well again until the next attack. This stage lasts about two hours.

The average total duration of the three stages of the attack is five or six hours, but in some cases it may last as long as twelve hours.

(B) Severe, Malignant, or Remittent Malarial Fever—This is the severe and more dangerous form of malarial fever. It is sometimes called " Jungle Fever " and includes Bilious Remittent Fever and Blackwater Fever, according to the variety and severity of the symptoms and the locality, but these are all due to the same cause, viz : malarial poisoning. This type of fever is usually met with in the late summer and

autumn seasons of the districts where it prevails. The symptoms are similar to those in the milder Benign or Intermittent Malarial Fever (Ague) but with these differences, viz :—

(1) The Cold (or Shivering) Stage is very short, not so marked as to shaking and trembling, and may occasionally not be noticeable.

(2) The Hot or Fever Stage is more prolonged, lasting six to twelve hours or longer.

(3) The Sweating Stage is as a rule less intense, often much less.

(4) The period between each attack (i.e. between temperature having fallen to rising again) is shorter.

After the short chilly stage, the hot stage begins with violent headache, pains in the limbs, hot skin, very often vomiting and sometimes diarrhoea, high temperature (often up to 105°F. or higher) and depression. The high temperature, after lasting as stated above, then falls, the skin becomes moist and the most urgent symptoms abate. This fall in the temperature may sometimes reach to or below the normal (98.4°F.), i.e., it intermits, but very often does not, only falling 3° or 4°, i.e., it is remittent, and the fever does not always, therefore, pass away as it does between each attack of benign malarial fever (Ague). After remaining down for a short period (from two to twelve hours) the temperature may rise again in another attack and these attacks may recur for a period of from one to three weeks if proper treatment is not given. The course of the temperature in the malignant form of malaria is as a rule not so regular as it is in the milder, benign form (Ague).

Masters of ships should especially note that because a patient does not show the typical signs of ague, viz :— great shivering, followed by the fever stage and then intense sweating, it does not follow that it is not a case of malarial fever. When there is any doubt, treatment for malaria should be given and the effects observed.

Compared with the milder benign form of malaria **there is a great tendency, in this severe malignant type, to the sudden development of one or other of the following dangerous symptoms**, which may carry off the patient with great suddenness, viz :—

(1) Excessively high temperature ; this may suddenly run up to 108°F, or even 110°F.

(2) Coma, or delirium followed by coma.

(3) Heart failure, which may follow some sudden exertion.

(4) Severe abdominal symptoms, as shown by severe distress in the stomach region, with a tender abdomen and incessant vomiting, or there may be numerous motions resembling dysentery or cholera. Collapse may follow on, sometimes with a low temperature.

The Master is warned to keep a good look out for the above symptoms, and the patient's temperature must be closely watched and must be taken often even though the patient is delirious or unconscious. (See also under " Treatment " (4) below, for advice about the taking of temperatures).

Other types of severe malarial fever are (*a*) Bilious Remittent Fever, which is characterised by a remittent temperature, bilious vomiting, distress in the stomach region and jaundice ; and (*b*) Blackwater Fever, in which the urine is red or porter-coloured ; there may also be jaundice and the patient is often in a state of delirium which, in fatal cases, passes into coma and death. **Blackwater Fever is not likely to be met with in the crews of ships**, as it attacks mainly those who have resided for some time in very malarious districts and have become chronic malaria subjects.

(4) TREATMENT OF MALARIAL FEVER.

If an adult person develops malarial fever, he should be **put to bed** in the ship's hospital, if she has one, and **at once** be given treatment by quinine and " Paludrine."

Recent experimental research has shown that the combined treatment of quinine and " Paludrine " not only has the effect of rapidly relieving the fever but has the ultimate effect of curing the attack completely and avoiding relapses which are liable to recur if quinine is given alone.

Consequently for the treatment of an acute attack give 2 tablets of quinine bisulphate or quinine dihydrochloride (5 grain tablets) twice daily for 3 days and in addition give 2 tablets of " Paludrine " (0.1 gramme tablets) 3 times daily for 10 days making a total of 12 tablets of quinine and 60 tablets of " Paludrine." Wash down the tablets on each occasion with a glass of water.

This treatment, if available, should be given in preference to mepacrine and in a case of actual malaria should cause a fall in temperature and relief of symptoms within 36 hours. Nevertheless the full course of treatment must be given.

The alternative treatment is by mepacrine as follows :

Give 3 tablets (0.1 gramme) of mepacrine immediately, repeat this in four hours and once again after 12 hours, making a total of 9 tablets in the first 24 hours. On the next day give 2 (0.1 gramme) tablets three times at intervals of 8 hours, making a total of 6 tablets in the second 24 hours. For the next 4 days, 1 tablet (0.1 gramme) is given thrice daily. This completes the full course of a total of 27 tablets.

It is advisable to see that the bowels are freely opened early in the attack. This is done with Epsom salts, or in very constipated cases with 4 to 6 calomel tablets followed by salts three or four hours later.

If found necessary during the course of the treatment, small doses of Epsom salts should be given in the morning to ensure that the bowels are acting freely.

Rarely, despite the treatment prescribed above, the fever may recur (i.e., relapse) from two to three weeks after the first bout of malarial fever has been cured. These relapses should be watched for and treated as in the first illness. They are very unlikely to recur if the preventive " Paludrine " or mepacrine treatment mentioned above is continued until the home port is reached, or longer if the period is less than 30 days. (See Section 2).

Sometimes, in severe cases, there is vomiting and the tablets swallowed may not be retained. If this occurs half a teaspoonful of sodium bicarbonate should be given to the patient in a little warm water (or, if this is not available, one teaspoonful of the stomach mixture) and repeated at intervals of half an hour or so ; this is sometimes useful in stopping the vomiting, as is also the application of hot fomentations to the pit of the stomach.

If there is clean ice on board, small lumps of this may be sucked in between the giving of the doses of sodium bicarbonate or stomach mixture. If these fail, then try a dose of 5 drops of laudanum in a teaspoonful of water repeated at half-hourly intervals for not more than four doses. These various measures should be tried over a period of at least 12 hours, a small dose of quinine and " Paludrine " or mepacrine being given immediately on the cessation of each vomiting attack. These doses are continued until the patient has retained at least 6 tablets of " Paludrine " or mepacrine in 24 hours.

During the cold stage give hot drinks, wrap the patient in warm blankets and apply hot-water bottles to his feet. When the hot stage begins, the body should be sponged with tepid water. The temperature should be taken at frequent intervals, at least once every watch during the fever stage of the attack, and more often if the temperature is high. If the patient's temperature rises above 104°F. it should be brought down to 102°F. by **tepid** sponging, which should be repeated as often as the fever again rises to a high level. On such occasions the temperature should be taken every 10 minutes. If the temperature **rises to over 105°F.** the patient should be treated as for heat-stroke until the fever **falls to 102°F.** Even if the patient is delirious, or unconscious, the temperature must be taken by placing the thermometer either in the armpit or in the groin.

If the patient should show signs of blueness or collapse or very feeble pulse at any time, a dose of brandy should be given. **The sick man should not be allowed out of bed to go to attend the calls of nature, during an attack or until he has recovered his strength after an attack ; instead, use bedpan.** Such persons often have weak hearts and, if

followed up too soon, may collapse after slight exertion and die suddenly As much water, lemon and water, or any other form of pleasant drink should be given as the patient can be made to take. These drinks should contain plenty of sugar. Barley water flavoured with lemon juice and with much sugar is very palatable and beneficial. During the fever stage of the disease the patient should be given a fluid diet—milk, beef-tea, broth, arrowroot, etc.

General Warning—If the Master of a ship which does not carry a doctor visits any port in Asia, East or West Africa or Central or South America, including the West Indies, and a case of fever which the Master cannot diagnose with certainty occurs shortly after the vessel leaves such a port, he would be well advised to suspect malaria and treat as such, following carefully the instructions given above. If the disease is actually malaria, the treatment will effect a cure ; if it is not malaria the drug will not do any harm.

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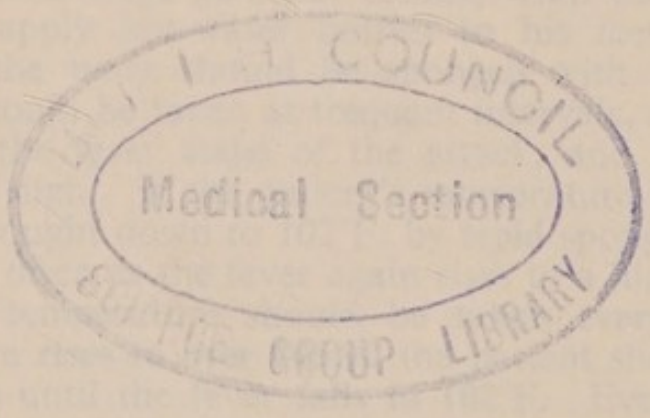

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MINISTRY OF TRANSPORT

THE SHIP CAPTAIN'S MEDICAL GUIDE 1946

AMENDMENT No. 2

(*This Amendment cancels Amendment No.* 1)

BURNS AND SCALDS AND CERTAIN TYPES OF WOUNDS

Considerable progress has been made in the treatment of burns and scalds and the following up-to-date notes are intended to assist masters in the care and treatment of burns and scalds of varying degrees, and also in the treatment of certain types of wounds.

A.—BURNS AND SCALDS

Pages 59-60 *delete section headed "Burns and Scalds" and insert the following :—*

A **burn** is caused by dry heat (which includes sunburn), by corrosive acid or alkali, by electric current or by friction. A **scald** is caused by moist heat such as steam or boiling liquids.

There are three recognised degrees of burns and scalds :—

(i) Simple reddening of the skin ;

(ii) Blistering ;

(iii) Actual destruction of a portion of the body's tissues varying from destruction of the skin and possibly the underlying fat to a more or less complete charring of the skin and underlying structures.

SHOCK

In severe burns and scalds of the second-degree and in burns and scalds of the third-degree there will always be a certain amount of shock depending on the extent of the damage and it is highly important that this shock should be promptly attended to.

To Reduce Shock.—Shock produces a marked loss of body warmth ; therefore, get the man into a bunk as soon as possible and cover all the parts that have **not** been burned with blankets and place hot water bottles or hot bricks wrapped in blankets at the feet and along the side of the body. On no account put blankets directly over the raw burned surface since this would at once cause an infection of the wound. Cover the burned parts with a clean towel or cloth wrung out of boiled water and cooled. You can then put the blanket over the towel. The wet towel in itself will to some degree relieve burning pain. You can give the man frequent sips of hot well-sugared tea or coffee. Do not let him drink too much at once since there will be a tendency to **vomit due to the shock.**

If the pain is very great or the shock severe, as shown by pallor, cold, clammy skin, anxious expression, sighing respiration, feeble rapid pulse, you should at once give an injection of morphia or alternatively, two ¼ grain tablets of morphia under the tongue where they will dissolve and be absorbed.

An injection of morphia (" Tubunic ampoules " of " Omnopon ") is much quicker and more sure in action than tablets. Full instructions for giving the injection are packed with the ampoules.

The effect of morphia is to reduce pain which itself is one of the principal causes of shock. The lessening of the pain will enable you to dress the wound much more expeditiously and thoroughly. Furthermore, the morphia will enable the man to get some sleep.

A further injection or two more tablets under the tongue can be given three hours later if you consider it necessary but no more should be given after that until at least twelve hours have elapsed when it may be repeated.

The use of brandy or whisky is not advisable since this tends to dilate the blood vessels and to open the pores of the skin with the result that there is a loss of heat which itself is one of the causes of shock.

CLEANLINESS

It is important to remember that the success of the treatment of burns depends on the avoidance, as far as possible, of the introduction of septic germs. Many burns, particularly the more serious ones, will go septic despite the most careful attention to cleanliness but in others scrupulous cleanliness will result in excellent healing with hardly any or, indeed, no septic infection at all. Consequently, in order to keep the dressing and wound as germ free as possible, **the most careful attention should be paid to the scrupulous cleanliness of all instruments and utensils employed and particularly of the hands.**

Before proceeding to the dressing always wash the hands thoroughly with soap and water paying particular attention to the nails which should be pared down and from which all dirt should be removed by scrubbing with a nail brush. Use two or three relays of water so that the last relay of water remains quite clean after washing. Even then, avoid as far as possible handling the dressings with the fingers but use forceps or scissors instead and be sure that these instruments have been sterilized by boiling them for two full minutes in clean water.

So important is the avoidance of every possibility of infecting the burned area that **before proceeding to apply the dressings you should cover your mouth and nose with a clean handkerchief folded double,**

knotting it round the back of the neck. By this means the germs which are projected some distance from the mouth and nose by coughing, or worse by sneezing or even merely by talking, will be trapped in the handkerchief and thus prevented from reaching the raw surface of the burn.

Cleaning up the Burn

In many cases the burned area will be contaminated by dirt, oil, grease, pieces of charred cloth, etc., and it is desirable to remove as much of this as possible in order to avoid infection.

But the cleaning-up process must not be overdone and, occasionally, it may do more harm than good, particularly if there is a large area of raw surface or if the dirt, charred material and such like, has become ingrained into the wound.

In such cases, especially if the shock is severe, it is better not to attempt to do much cleaning, which may only aggravate the condition ; the wound will in any case become septic under such conditions and much of the dirt will slough away and be removed with the first dressing.

Oil or grease contamination is often difficult to remove, but assistance can be obtained by using a solution of washing soda with the strength of one handful of soda in three gallons of water that has been boiled.

The method of cleaning is as follows :—The affected part should be cleaned with some soap and water applied by means of wads of cotton wool. To do this take a clean enamel bowl, pour in a small quantity of boiling water out of the kettle and add a piece of soap about the size of a walnut. Take a wad of cotton wool, put it into the water with a pair of forceps and stir the piece of soap with the wool round and round until you get a good lather. When the soapy water has cooled a little gently wash the burned part with the wad of wool held in the forceps. Use fresh pieces of wool as the pieces become dirty. In this way you can thoroughly cleanse the burn without touching anything with the fingers. Dry the part by dabbing it with a dry piece of wool held in the forceps.

BURN AND WOUND DRESSING

This is a preparation specially devised for use at sea and has many advantages. It consists of strips of gauze 7½ ins. long by 3½ ins. wide into which the cream is impregnated. There are 36 such strips contained in an aluminium box sealed by adhesive tape to exclude moisture, dust, etc., which might affect the composition and infect the dressing with germs. The strips of gauze are packed in a suitable non-toxic chemically inert wrapping which also helps to preserve them.

To use the dressing first remove the sealing strip, open the box, and then carefully open the wrapping with clean fingers. The strips are sticking together but are easily detached by taking a pair of forceps

or a knife point, or a pair of scissors, previously dipped in boiling water, and picking up one strip at the end (see diagram opposite.) You may perhaps pick up two strips together but this does not matter. Peel the strip off by means of the forceps and without touching it lay it on to the burned surface. Obviously, if one strip does not cover the area you will want a second, or even a third or fourth strip to cover the whole surface of the burn. On the other hand, if the strip is too big for the burn you might fold over the strip, thus making a double layer over the burn. In any case use enough strip or strips to leave a margin overlapping the edge of the burn by at least 1 in.

When the burn is completely covered with the impregnated dressing, first cover the latter with a thin layer of dry absorbent gauze, then a layer of cotton wool, and finally secure the whole in position with elastic adhesive plaster or suitable bandage.

Do your best to avoid handling the strip with your fingers more than you can help, thus keeping the strip free from all contamination.

Note.—Sulphanilamide, which is contained in the dressing, is not an antiseptic such as iodine, carbolic, Lysol, etc. It does not itself kill the germs but stimulates the body to kill them. If, therefore, germs gain access to the cream it only means more work for the body to do.

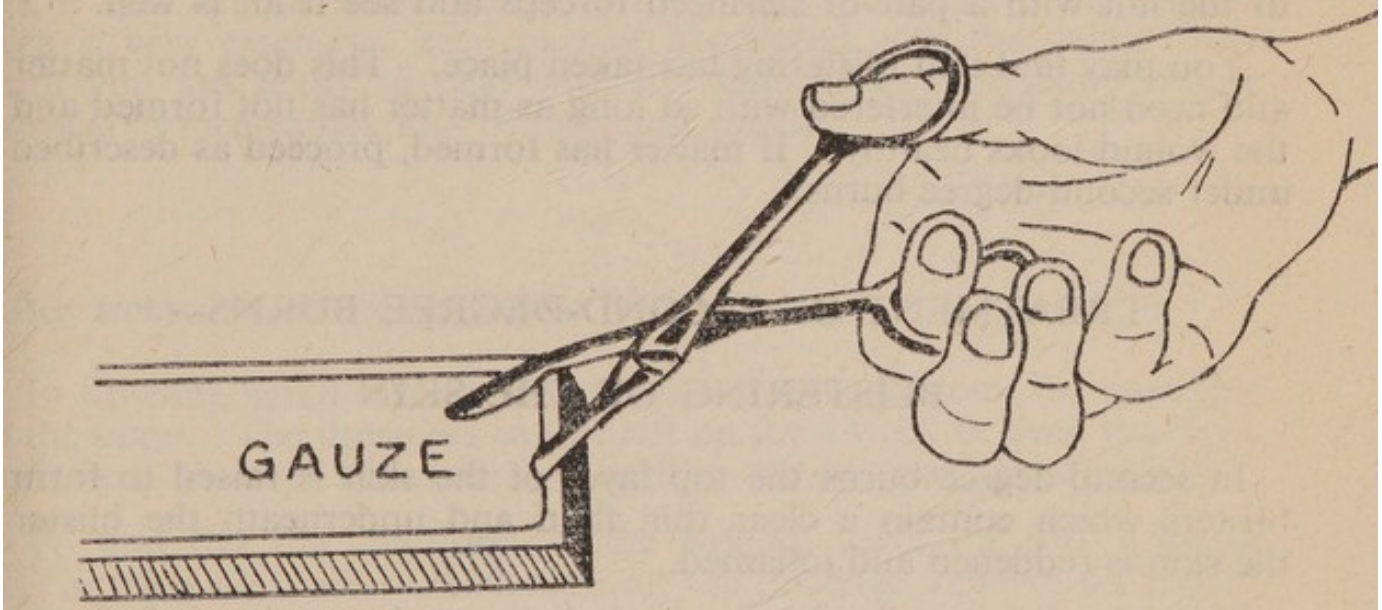
Consequently, it is of the greatest importance to avoid handling the gauze more than is necessary, and indeed, with care, no handling of the gauze with the fingers need take place at all. As soon as you have taken out the necessary amount of gauze to cover the burned surface **replace the lid of the box and reseal the box with the sticky strip in order to prevent the entry of dust and germs from the air. If it is not possible to re-use the strip, use 1 in. zinc oxide plaster from the medical stores to reseal the box.**

This type of burn and wound dressing is also provided in an alternative packing. This takes the form of an individual gauze dressing enclosed in a hermetically sealed envelope of non-reative material. Twenty-four dressings are enclosed in a carton. Full instructions for use are given on the carton.

TREATMENT OF FIRST-DEGREE BURNS—

REDDENING OF THE SKIN

This is the mildest form of burn or scald. There is no more than a reddening of the skin and the treatment is consequently simple. Nevertheless, blisters often form after an hour or so and in that case the burn becomes a second-degree burn and unless care is taken sepsis is likely to supervene.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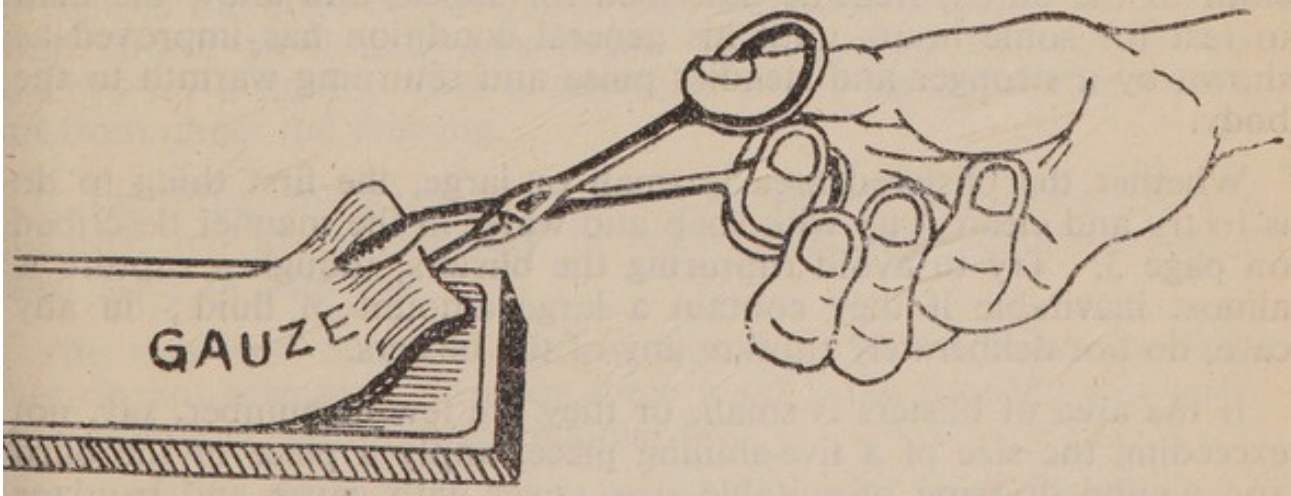
GAUZE

If no blisters have formed treat first degree burns with a simple gauze dressing of suitable size, so arranging it that the dressing overlaps the burned surface by at least 1 in.

This dressing can be left in place for several days (say, seven days) without interference, after which remove the bandage, lift up the edge of the lint with a pair of sterilized forceps and see if all is well.

You may find that blistering has taken place. This does not matter and need not be interfered with so long as matter has not formed and the wound looks healthy. If matter has formed, proceed as described under second-degree burns.

TREATMENT OF SECOND-DEGREE BURNS—

BLISTERING OF THE SKIN

In second-degree burns the top layer of the skin is raised to form blisters which contain a clear thin fluid and underneath the blister the skin is reddened and inflamed.

If the burn is at all extensive and the man shows signs of shock, first treat the shock as described above, and, if necessary, give morphia.

If the shock is very severe, due to extensive burns or scalds covering a large surface of the body, it may be better to apply a wet towel or cloth to the burns, treat as described for shock, and allow the man to rest for some hours until his general condition has improved as shown by a stronger and steadier pulse and returning warmth to the body.

Whether the blistered area is small or large, the first thing to do is to try and clean it up with soap and water in the manner described on page 3. Try to avoid rupturing the blisters, though a rupture is almost inevitable if they contain a large amount of fluid ; in any case, do not deliberately rupture any of the blisters.

If the area of blisters is small, or they are few in number, say, not exceeding the size of a five-shilling piece, apply a piece of the burn and wound dressing of suitable size, cover with gauze and bandage lightly but securely.

If the area of blistering is extensive you may have to use two or more pieces of the dressing. The general manner of application has been described above and need not be repeated.

First estimate the number of strips you will want, allowing plenty of margin for overlapping. If two or more strips are required see that they overlap each other when you apply them to the burn and that they overlap the outer edge of the burn area by at least an inch.

Having covered the area with the gauze, cover the gauze in turn with a fairly thick layer of cotton wool in such a manner that the cotton wool extends beyond the edge of the gauze by at least 1 in. then bandage with a roller bandage, applying the bandage securely but not too firmly.

Do not expose more blistered area than you can help. If the area is very extensive, keep part of it covered with the damp towel until you are ready to deal with it. Unnecessary exposure of the burned surface causes loss of heat and shock.

After treatment of second-degree burns

In dressing small blisters and more extensive blisters, the principle is the same. The dressings can be left on for a week or even ten days, so long as the area underneath is healthy and has not gone septic.

To find out the condition of the wound, leave the first dressing on for four days, after which take off the bandage, remove the cotton wool and lift up the edge of the gauze with a pair of forceps that have been sterilized for two minutes in boiling water.

If there is no matter oozing out from under the edge of the gauze —try this at several points in the dressing—all that is necessary is to replace the edge of the gauze that has been lifted, put on some fresh cotton wool and rebandage. The dressing can remain untouched for a further week unless there is any sign of matter oozing out from under the dressing.

If, on lifting the gauze, you find that matter has formed in any quantity, it will be necessary to remove the dressing and apply a fresh layer of dressing.

You may find that the dressing has stuck to the burn, in which case do not attempt to tear or force it off; the dressing can easily be removed in the following manner :—

Soak some wads of cotton wool held by a pair of sterilized forceps in water that has been boiled and allowed to cool until it is warm. Lift the cotton wool plug straight out of the water and allow a stream of water to trickle over the edge of the burn to which the gauze is sticking. Keep repeating this until a slight pull of the gauze releases it from the burn. Keep doing this until the whole gauze comes away quite easily without any bleeding.

Do not attempt to clean up the wound, but apply a fresh dressing, cover with cotton wool and bandage.

TREATMENT OF THIRD-DEGREE BURNS

Third-degree burns may be deep and penetrating or, alternatively, may cover large areas of the body, causing extensive injury and producing profound shock and collapse.

In all such cases give morphia and treat the shock first, covering the burned area with a clean towel or cloth wrung out in boiled water, as described above, and postpone the dressing for a few hours until the condition has improved.

In many cases it will be found that charred cloth and other dirt adheres to the burn ; the first thing to do is to try and clean up the burned part, avoiding at the same time, as far as possible, long exposure of the burned surface to the air, as this tends to increase the shock. You may have to clean and dress one part before exposing another part.

If the dirt, charred cloth, etc., is very ingrained it may be better not to attempt to clean up the burn, but rather to apply the dressing straight on to the wound. The wound is sure to go septic in such cases and the dirt will slough away and much of it will be removed with the first and second dressings.

If a certain amount of cleaning up can be done, the best method is a gentle but liberal use of soap and boiled water applied by means of plenty of cotton wool in the manner described on page 3.

Do not take too long over this process and **on no account should any violent rubbing or scraping be attempted,** since the process of cleansing is in itself extremely painful. Pieces of cloth, charred skin, etc., that are lying loose can be removed by means of sterilized forceps.

Having cleaned up the wound as best you can, proceed to apply the dressing, as described in second-degree burns.

After Treatment of Third-Degree Burns

Most burns of the third-degree go septic after two or three days, but you need not necessarily remove the dressing for a week, unless a considerable amount of matter is oozing out. If the dressing is stuck, soak it off in the manner previously described on page 7 and on no account attempt to force or tear it off. In all probability, particularly if there is much suppuration, the dressing will come away quite easily.

Do not attempt to clean up the suppurating surface, but apply a fresh dressing. Lay on a thick layer of cotton wool with a good margin over the gauze and then bandage gently but firmly. A firm bandage will often help to support the damaged tissues underneath.

You will have to exercise all your ingenuity in dealing with burns in awkward places such as on the face, and you will probably find it much easier to hold the dressing in place with a triangular bandage than with a roller bandage.

You may even have to prepare a mask for the face out of a triangular bandage, cutting holes for the mouth and eyes.

If areas of the scalp are involved, cut away as much hair as possible, which will make the dressing of the wound much easier, and will help to avoid suppuration. The same applies to other hairy parts of the body.

DIET

In severe burns the temperature will rise to 100 degrees or more for three or four days. This is due to the injury, and not to suppuration. The temperature as the result of suppuration will not come on till towards the end of the first week. There will also be a tendency to vomit in the early stages, and it is important, therefore, to keep the diet light and fluid. Hot drinks of well-sugared tea, hot milk, gruel and milk puddings are about all that the man is likely to be able to manage for the first week.

There is no harm in giving the man a dose of whisky or brandy in milk on the second or third day as a stimulant.

See that the bowels are opened and, if there is very severe shock, you will need to watch the bladder and see that water is being passed, otherwise the man may get a severely distended bladder, which greatly increases his discomfort. In such cases it will be necessary to use the catheter as described on page 169 of the Ship Captain's Medical Guide.

Finally, keep the man warm and quiet, especially during the first few days.

B.—WOUNDS

(*Page* 53, *second paragraph, add the following* :—)

The use of sulphanilamide powder is very satisfactory and will effect a simple and rapid healing, unless the wound is very dirty. The burn and wound dressing is equally useful for wounds, particularly surface wounds such as scrapes to which the ordinary dressing using sulphanilamide powder is liable to stick and be awkward to remove. In such case you might in preference, use the dressing which is less likely to stick to the wound. The burn and wound dressing would also be found useful in wounds of the face. The dressing should be applied to the wound in the manner prescribed for burns and scalds.

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