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TREASURY DEPARTMENT  
PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE

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HANDBOOK  
FOR THE  
SHIP'S MEDICINE CHEST

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SECOND EDITION

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1904

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TREASURY DEPARTMENT.

Public Health and Marine-Hospital Service of the United States.

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# HANDBOOK

FOR THE

# SHIP'S MEDICINE CHEST,

BY

GEORGE W. STONER, M. D.,

Surgeon, U. S. Public Health and Marine-Hospital Service.

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PREPARED BY DIRECTION  
OF THE  
SURGEON-GENERAL.

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SECOND EDITION.

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WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1904.

VG463

A3

1904

64119

SURGEON-GENERAL,

U. S. PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

Document No. 2389.

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U. S. PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,  
NEW YORK, N. Y. (IMMIGRATION DEPOT),  
*September 15, 1904.*

To the SURGEON-GENERAL,  
*Public Health and Marine-Hospital Service,*  
*Washington, D. C.*

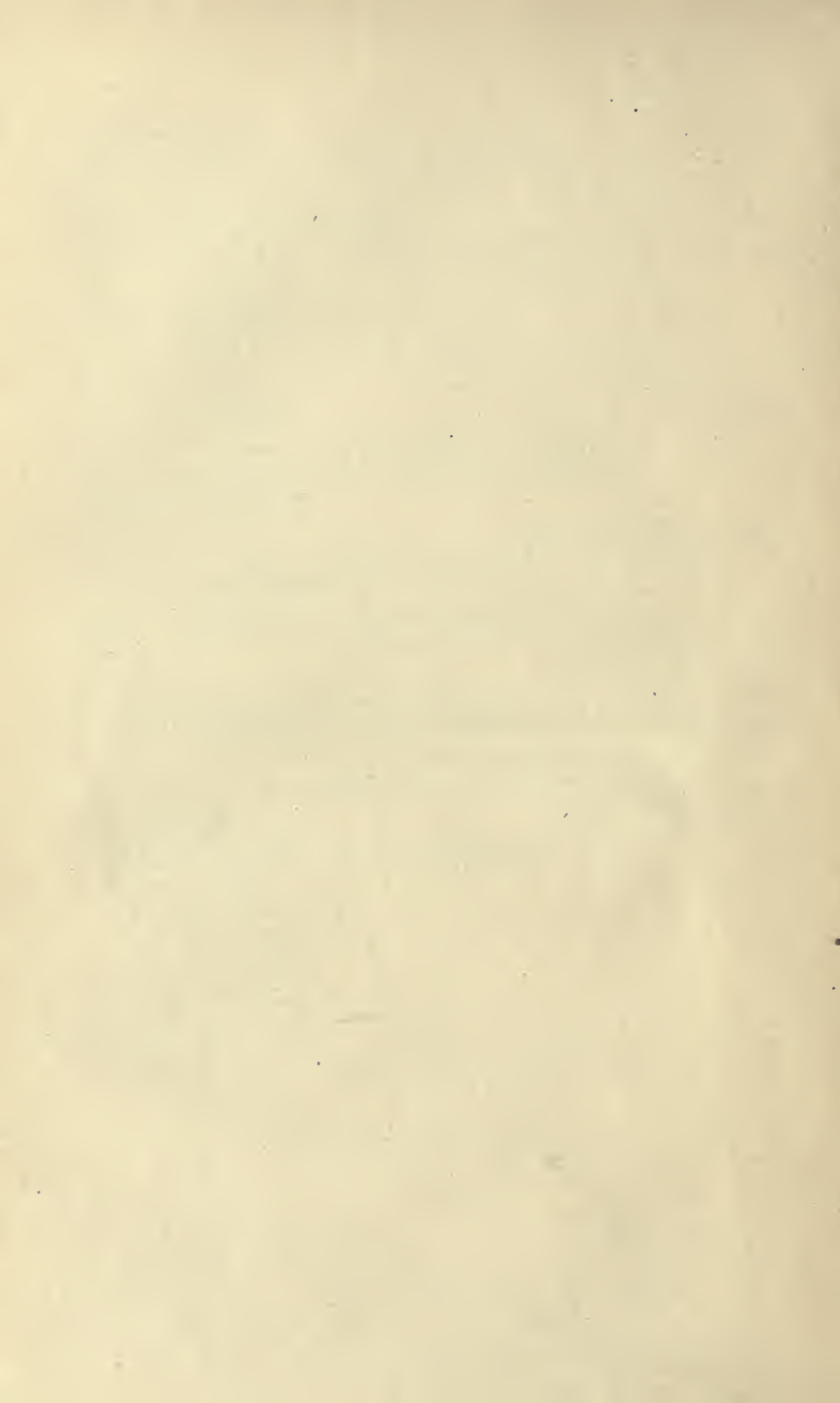
SIR: In compliance with your directions, I have prepared and beg leave to submit herewith a second edition of the Handbook for the Ship's Medicine Chest.

The article on yellow fever has been revised, new articles on the plague and on beriberi have been added, an extract from the United States Quarantine Regulations has been inserted, and the order of subjects of the handbook has been rearranged.

Respectfully submitted.

GEO. W. STONER,  
*Surgeon, Public Health and Marine-Hospital Service.*







## HANDBOOK FOR THE SHIP'S MEDICINE CHEST.

### THE MEDICINE CHEST.

#### SURGICAL INSTRUMENTS.

- |  |   |
|--|---|
| Catheters, rubber, assorted sizes, 6.                        | Scissors, straight, sharp-pointed, 1.                                     |
| Catheters, soft rubber, assorted sizes, 6.                   | Scissors, straight, blunt-pointed, 1.                                     |
| Catheters, silver, 2.  | Scissors, curved, blunt-pointed, 1.                                       |
| Forceps, artery, 4.  | Suturing materials:   |
| Forceps, dissecting, 2.                                      | Catgut, aseptic, assorted sizes, papers, 12.                              |
| Forceps, dressing, 2.  | Silk, assorted sizes, spools, 4.  |
| Knife, bistoury, straight, blunt point, 1.                   | Silkworm gut, box, 1.   |
| Knife, bistoury, curved, sharp point, 1.                     | Silver wire, 30 gm.   |
| Knife, bistoury, straight, blunt point, 1.                   | (The silk and catgut are also used as ligatures for tying blood vessels.) |
| Knives, scapel, 2.   | Tongue depressor, 1.  |
| Needles, surgeon's, straight and curved, assorted sizes, 12. | Trocar and cannula, curved, 1.  |
| Pins, safety, assorted sizes, boxes, 4.                      |   |
| Probes, silver, 2.   |   |

#### MISCELLANEOUS ARTICLES.

- |   |  |
|---|--|
| Adhesive plaster.                             | Hot-water bags, 2.                       |
| Absorbent cotton.                             | Ice bags, or ice caps, 2.                |
| Bandage, Esmarch's, 1.                        | Lint, 5 yards.                           |
| Bandages, flannel, assorted sizes, 12.        | Muslin, 20 yards.                        |
| Bandages, muslin, roller, assorted sizes, 48. | Oiled muslin, 5 yards.                   |
| Bandages, rubber, 2.                          | Oiled silk, 5 yards.                     |
| Bedpan, 1.                                    | Rubber sheets, 2.                        |
| Binder's board, sheets, 6.                    | Rubber tissue, 5 yards.                  |
| Droppers, medicine, 6.                        | Rubber tubing, assorted sizes, 10 yards. |
| Feeding cups, 2.                              | Sand bags, 4.                            |
| Flannel, 10 yards.                            | Splint,-double inclined plane, 1.        |
| Footbath, 1.                                  | Splints, molded, set, 1.                 |
| Fracture box, 1.                              | Suspensory bandages, 12.                 |
| Gauze, plain, aseptic, 10 yards.              | Syringes, Davidson's, 2.                 |
| Gauze, bichloride, 5 yards.                   | Syringe, fountain, 1.                    |
| Gauze, iodoform, 5 yards.                     | Syringes, glass, 12.                     |
| Glasses, graduate, 2.                         | Urinals, glass, 2.                       |
| Glasses, medicine, 4.                         | Weight and pulley, 1.                    |

## DRUGS AND MEDICINES.

Acid, carbolic.	Linseed oil.
Acid, nitric.	Iodoform.
Argonin.	Mustard.
Beef extract.	Olive oil.
Bismuth, subcarbonate.	Potassium citrate.
Black wash.	Rochelle salts.
Borax.	Seidlitz powders.
Blotting paper.	Sulphur ointment.
Calomel.	Sulphur, roll.
Carbolic soap.	Vaseline.
Castor oil.	Vichy salts.
Collodion.	Zinc acetate.
Epsom salts.	Zinc oxide.
Ipecac powdered.	Zinc-oxide ointment.
Linseed (flaxseed), ground.	Zinc sulphate.
Glycerin.	

## PILLS.

Anti-constipation.	Morphine sulphate, $\frac{1}{8}$ grain (0.01 gm.).
Blue mass, 5 grains (0.33 gm.).	Opium, U. S. P., 1 grain (0.06 gm.).
Calomel, 2 grains (0.13 gm.).	Opium and lead acetate, $\frac{1}{2}$ grain (0.03 gm.) opium, $1\frac{1}{2}$ grain (0.10 gm.) lead acetate.
Calomel, 5 grains (0.33 gm.).	Quinine, iron, and strychnine phosphate.
Camphor and opium, 2 grains (0.12 gm.) camphor, 1 grain (0.06 gm.) opium.	Quinine sulphate, 2 grains (0.13 gm.).
Cathartic, compound, U. S. P.	Quinine sulphate, 5 grains (0.33 gm.).
Copaiba mass, 3 grains (0.20 gm.).	
Mercurous iodide, $\frac{1}{4}$ grain (0.016 gm.).	

## COMPRESSED TABLETS.

Brown mixture and ammonium chloride.	Gargle.
Calomel and sodium bicarbonate, 1 grain (0.065 gm.) calomel, 1 grain (0.065 gm.) sodium bicarbonate.	Nausea.
Cathartic, vegetable.	Phenacetine, 5 grains (0.33 gm.).
Cocaine.	Potassium bromide, 10 grains (0.66 gm.).
Cough.	Potassium chlorate and borax, $2\frac{1}{2}$ grains (0.16 gm.) potassium chlorate, $2\frac{1}{2}$ grains (0.16 gm.) borax.
Diarrhea.	Potassium iodide, 5 grains (0.33 gm.).
Dover's powder, 5 grains (0.33 gm.).	

## HARD-FILLED CAPSULES.

Copaiba, 10 drops.	Santal oil, 10 drops.
Copaiba and santal (5 drops copaiba, 5 drops santal).	Santal oil, 5 drops.

## TABLET TRITURATES.

Aconite, tincture, 1 drop.	Morphine sulphate, $\frac{3}{8}$ grain (0.01 gm.).
Mercurous iodide, $\frac{1}{2}$ grain (0.03 gm.).	Opium powder, $\frac{1}{2}$ grain (0.03 gm.).

## LOZENGES.

Potassium chlorate, 2 grains (0.13 gm.).	Potassium chlorate and ammonium chloride.
--	---

## ESSENCES. ELIXIRS, TINCTURES, ETC.

Essence of peppermint.	Tincture of capsicum.
Elixir, aromatic.	Tincture of chloride of iron.
Elixir of calisaya.	Tincture of ginger.
Elixir calisaya, iron, quinine, and strychnia.	Tincture of iodine.
Paregoric.	Tincture of kino.
Sirup, hypophosphites with iron.	Tincture of myrrh.
Tincture of arnica.	Tincture of opium (laudanum).
Tincture of benzoin.	Turpentine.

## LIQUORS.

Brandy.	Champagne.
Whisky.	

## MIXTURES.

Hot drops.	Balsam copaiba mixture.
Sun cholera mixture.	Lead and opium wash.

## IMPORTANT MEASURES TO BE OBSERVED BY THE CAPTAIN OF THE SHIP.

The following is an extract from the Quarantine Regulations, issued by the Secretary of the Treasury upon the recommendation of the Surgeon-General of the Public Health and Marine-Hospital Service of the United States:

## REQUIREMENTS AT SEA.

The master of a vessel should observe the following measures on board his vessel:

(a) The water-closets, fore-castle, bilges, and similar portions of the vessel liable to harbor infection should be disinfected and frequently cleansed.

(b) Free ventilation and rigorous cleanliness should be maintained in all portions of the ship during the voyage and measures taken to destroy rats, mice, fleas, flies, roaches, mosquitoes, and other vermin.

(c) A patient sick of a communicable disease should be isolated and one member of the crew detailed for his care and comfort, who, if practicable, should be immune to the disease.

(d) Communication between the patient or his nurse and other persons on board should be reduced to a minimum.

(e) Used clothing, body linen, and bedding of the patient and nurse should be immersed at once in boiling water or in a disinfecting solution.

(f) The compartment from which the patient was removed should be disinfected and thoroughly cleansed. Articles liable to convey infection should remain in the compartments during the disinfection when gaseous disinfection is used.

(g) Any person suffering from malaria or yellow fever should be



kept under mosquito bars and the apartment in which he is confined closely screened with mosquito netting. All mosquitoes on board should be destroyed by burning Pyrethrum powder (Persian insect powder) or by fumigation with sulphur. Mosquito larvæ (wigglers or wiggle tails) should be destroyed in water barrels, casks, and other collections of water about the vessel by the use of petroleum (kerosene). Where this is not practicable, use mosquito netting to prevent the exit of mosquitoes from such breeding places.

(h) In the case of plague special measures must be taken to destroy rats, mice, fleas, flies, ants, and other vermin on board.

(i) In the case of cholera, typhoid fever, or dysentery the drinking water should be boiled and the food thoroughly cooked. The discharges from the patient should be immediately disinfected and thrown overboard.

An inspection of the vessel, including the steerage, should be made by the ship's physician once each day.

Should cholera, yellow fever, smallpox, typhus fever, plague, or any other communicable disease appear on board a ship while at sea, those who show symptoms of these diseases should be immediately isolated in a proper place. The ship's physician should then immediately notify the captain, who should note same in his log, and all of the effects liable to convey infection which have been exposed to infection should be destroyed or disinfected.

The hospital should be disinfected as soon as it becomes vacant.

The dead should be enveloped in a sheet saturated with one of the strong disinfecting solutions, without previous washing of the body, and at once buried at sea or placed in a coffin hermetically sealed.

A complete clinical record should be kept by the ship's surgeon of all cases of sickness on board and the record delivered to the quarantine officer at the port of arrival.

The following disinfecting solutions are recommended for use at sea:

*Formulae for strong disinfecting solutions.*

Bichloride of mercury (1:500) :	Parts.
Bichloride of mercury -----	1
Sea water -----	500
Mix.	
Carbolic acid (5 per cent) :	
Alcohol -----	50
Carbolic acid, pure -----	50
Mix.	
Then add fresh water -----	900

*Formulae for weak solutions.*

Bichloride of mercury (1:1,000) :	
Bichloride of mercury -----	1
Sea water -----	1,000



Carbolic acid (2.5 per cent) :	
Carbolic acid, pure -----	25
Fresh water -----	1,000
Formalin (5 per cent) :	
Formalin (or formol) -----	50
Water -----	950

It is suggested that a vessel should carry for every 100 passengers bichloride of mercury, 5 pounds; carbolic acid, 10 pounds; alcohol, 10 pounds, and formalin, 10 pounds.

#### YELLOW FEVER.

Yellow fever is an acute infectious disease of the Tropics, characterized by a febrile paroxysm, yellowness of the skin or conjunctiva (jaundice), albuminuria, suppression of urine, and bloody or black vomit. It is transmitted from one person to another through the bite of a species of mosquito, the *Stegomyia facciata*.

The disease is endemic in the West Indies, on the Mexican coast of the Gulf, in Central America, on the coast of Brazil, and West coast of Africa. It has frequently been carried to southern ports and to different places in the South Atlantic and Gulf States of this country, and occasionally to certain ports in Europe; but it has never gained a firm foothold in the old country except on the west coast of Africa, and is unknown in the Orient.

“Yellow fever is not endemic in Europe, nor does it naturally prevail anywhere in North America, yet it may be carried almost anywhere. Imported epidemics have occurred at ports of England, France, Spain, and Portugal, and nearly all of the ports on the Atlantic seaboard of the United States.” (Wyman.)

The specific cause or germ of yellow fever has not yet been determined, but the disease is communicated from one person to another through the bite of a species of mosquito, the *Stegomyia facciata*.

For the proof of this statement it is only necessary to refer to the conclusion of the United States Army yellow-fever commission of 1900-1901 (Doctors Reed, Carroll, Lazear, and Agramonte) as reported by the head of said commission, the late Walter Reed, major and surgeon, U. S. Army. To the brilliant work of this commission we are indebted for the demonstration of the fact, previously suggested by Doctor Finlay, of Habana, that—

The mosquito (*Stegomyia facciata*) serves as the intermediate host of the parasite of yellow fever.

Yellow fever is transmitted to the nonimmune individual by means of the bite of a mosquito that has fed previously on the blood of those sick with this disease.

Yellow fever is not conveyed by fomites, and hence disinfection of articles of clothing, bedding, or merchandise supposedly contaminated by contact with those sick with the disease is unnecessary.

A house (or ship) may be said to be infected with yellow fever only when there are present within its walls contaminated mosquitoes capable of conveying the parasite of the disease.

The spread of yellow fever can most effectually be controlled by measures directed to the destruction of the mosquitoes and protection of the sick against the bites of these insects.

The commission showed also that the mosquito, to become infected, must bite a yellow-fever patient during the first three or four days of his illness, and that an interval of about twelve days or more after this bite appears to be necessary before the mosquito is capable of communicating the disease to a person. After this interval the mosquito is permanently infected and can cause the development of the disease within five days after biting.

This conclusion as to the time elapsing from the infection of the mosquito to the time it becomes capable of communicating the disease to man is in accord with and fully confirms the extensive observations previously made by Surg. Henry R. Carter, of the U. S. Public Health and Marine-Hospital Service. Before it was known that the mosquito is the carrier of the disease Surgeon Carter proved "a period of extrinsic incubation" corresponding to the cycle of development of the disease in the mosquito.

In 1900 yellow fever raged throughout Cuba and was very severe in Habana. During this year and in this city (Habana) the commission made the scientific investigation and obtained the results which have revolutionized all theories as to the prevention and spread of yellow fever. Witness the fact reported January 9, 1902, by Maj. W. C. Gorgas, chief sanitary officer of Cuba, that, with the aid of a corps of men, working in accordance with the recommendations of the commission, the disease has been completely eradicated from the city of Habana.

The efficient maritime quarantine maintained by the U. S. Public Health and Marine-Hospital Service must also be taken into consideration, for while the disease was stamped out of the city by the measures referred to, it was *kept out* by similar measures directed to the cleansing of ships and to the isolation and protection of passengers arriving from other infected ports.

Formerly the hotbed of yellow fever and for upward of a hundred years the very center of infection, Habana is now free from the disease, not a single case of yellow fever having occurred there during the last three years; and all this as a result of the wholesale destruction of the mosquitoes and their breeding places, in the city and on board of ships, and the protection of the sick by means of properly constructed mosquito screens.

Yellow fever prevails chiefly in low countries along the coast, and seldom extends to regions above an elevation of 1,000 feet. It is

apt to be severe in the slums or badly drained sections of large cities. Filthy, dark, and ill-ventilated rooms in a house (or ship) seem to invite the disease. Heat and moisture or dampness favor its development; frost arrests it. The mosquito is inactive during cold or frosty weather. Or, quoting from Osler, "humidity and heat seem to be the proper coefficients for the preservation of the poison. The epidemics in the United States have always been in the summer and autumn months, disappearing rapidly with the onset of cold weather."

Strangers in yellow-fever districts are usually the first victims. The negro is said to be less susceptible than the white. This apparent immunity is probably due to the fact that the endemic regions of yellow fever are populated chiefly by black or dark-skinned races, who, as Guiteras has pointed out, have had the disease in childhood, precisely as Koch has shown that natives of highly malarious countries are apparently free from malarial fever because of repeated and persistent infection in early life. The immunity, then, of the negro may be said to be the same as that of the white—*an acquired immunity*. Nonimmunes of either race are probably equally susceptible; or if there be a difference it may apply to the relative thickness of the skin rather than to the color, or, possibly, to the predilection of the mosquito. Stendel, according to Scheube, "is inclined to think that the relative immunity of the negroes is to be attributed to the lively and quiet specific activity of their skin, distinctly evidenced by the odor."

In 1793 yellow fever prevailed extensively in Northern cities, particularly in Philadelphia, where out of a population of 40,000 (the number of inhabitants of the city at that time) more than 4,000 died. Epidemics occurred also in different parts of the United States during the early part of the last century; but for many years past no extensive outbreaks have occurred in this country except in the Southern States, where in 1853, 1867, 1873, 1878, 1897, 1898, and 1899 it prevailed in different degrees of severity. The most extensive epidemic occurred throughout the South in 1878. It was unusually severe in Alabama, Louisiana, and Mississippi, and caused about 16,000 deaths. The later epidemics were less severe. Localized outbreaks occurred at different times in nearly all the Southern States, but the disease was of milder type.

The disease is occasionally carried into northern latitudes by infected ships, but it seldom reaches port, being usually stopped at the quarantine station, where the sick are placed in hospital, the well detained for observation, and the ship and everything disinfected.

*Symptoms.*—Yellow fever generally begins after an incubation period of three or four days; in 13 experimental cases it varied from forty-one hours to five days and seventeen hours. The onset is usually sudden. It frequently comes on at night or in the early morning, and



is generally, but not always, ushered in by a chill, which is followed by moderate or high fever— $101^{\circ}$  to  $105^{\circ}$  F. ( $38.3^{\circ}$  to  $40.5^{\circ}$  C.); hot skin, quick pulse (100 to 120 per minute); flushed face, and watery, brilliantly reddened eyes. The tongue is usually moist and coated, but soon becomes dry and pointed. Thirst is marked, the throat is sore, the stomach is irritable, and in most cases there is nausea and vomiting from the beginning. The bowels are constipated, the stools dark colored. The urine is acid, scanty, and apt to be albuminous, especially the evening urine. The presence of albumen on the first and second days indicates a severe case (Guiteras). The fever may last from a few hours to two or three days, but while the temperature keeps up the pulse steadily fails. Death may take place in this early or first stage of the disease. Usually this stage is followed by—

*The second stage*, or stage of calm, as it is called. During the stage of calm the fever goes down, the temperature drops in some cases below the normal, and the general symptoms subside. The skin may or may not be tinged. There is usually some yellowness of the eyes. In the milder cases this may be the beginning of convalescence.

In severe cases this stage of calm and apparent convalescence is followed, in twelve or twenty-four hours, by—

*The third stage*, or stage of febrile reaction, when the struggle for life begins. The temperature now rises again, and the symptoms of the first stage recur with increased severity, and other and more serious symptoms are developed. The jaundice deepens, the pulse drops in some cases to 40 or even to 30 per minute, vomiting increases; the vomited matter may be bile, blood, or altered blood (coffee-grounds black). The patient complains of severe abdominal pain. The stools are black and frequently of tarry consistence. The urine very scanty and albuminous. Bleeding may occur from the nose and from the mouth and gums. The strength rapidly fails, and the patient dies from exhaustion.

In some cases even when black vomit occurs a change for the better takes place and the patient gradually recovers, but if black vomit sets in early in the disease it is nearly always fatal. In the "walking cases" a man may be up and about, complaining of only slight ailment, and be suddenly taken with black vomit and die.

*Treatment.*—The milder and even the moderately severe cases may easily be mistaken for other diseases; but if a man is seized with an illness as above described, particularly if the ship is or has recently been in a yellow-fever district or where yellow fever is likely to prevail, he should be placed in a clean, well-ventilated room, as far removed as possibly from the healthy members of the crew, and have one good and constant attendant or nurse, who may, if convenient, occupy an adjoining room when not in actual attendance at the bedside, but who must be given to understand that his whole duty con-

sists in caring for the patient. The nurse should be supplied with everything required for the care of the patient, but all unnecessary articles should be removed from the room. Careful nursing in this disease is more than "half the battle;" but for the protection of the nurse himself and for all members of the crew the one thing that requires immediate attention is the screening of the patient's bed and the doors and windows of his room, so as to prevent the mosquitos from biting the sick person and communicating the disease to others.

Yellow fever is sometimes complicated with malarial fever, and such complications may be very serious. When near the coasts where these diseases prevail, it is a good plan to give each man on board a daily allowance of quinine, say 10 grains (0.65 gm.). The men should also be careful to keep their bowels regular and to be regular in their habits of eating and sleeping and avoid excitement, worry, or excessive fatigue. They must not be allowed to go ashore. Their beds and sleeping rooms should be properly *screened* with mosquito netting. This will not only be a protection against a possible malarial complication, but will place the body in the best condition to battle against an attack of yellow fever, and may prevent an attack of pernicious malaria, which in some of its forms is as serious and dangerous as yellow fever itself.

As soon as the attack of yellow fever begins, place the patient at rest in bed on a blanket, and immediately give him a hot footbath. The foot tub should be half full of warm water, to which a pound of mustard may be added. The patient's feet and legs are then placed in the water, and a quantity of very hot water is added, so as to make the bath as hot as he can stand it. The bath must be hot, and while it is going on the entire body of the patient should be covered with blankets, and he should drink hot tea. After the footbath is removed, the patient should be allowed to perspire for ten minutes. His body must then be quickly dried and wrapped in a fresh blanket. A 5-grain (0.33 gm.) dose of calomel should then be given, which may be followed in six hours by a tablespoonful of Rochelle salts in a glass of water, or in place of the calomel two compound cathartic pills may be given. If vomiting occur, a large mustard plaster should be placed over the region of the stomach and small pieces of ice in the patient's mouth.

The diet in yellow fever is very important. For the first day or two very little if anything is required. A little milk diluted with vichy water may be allowed every three hours. Later a little broth and very gradually, when the fever is reduced, other light and easily digestible articles may be given in small quantities at regular intervals.

If the fever continues high and the patient is restless, 5 grains (0.33



gm.) of phenacetin may afford relief, and, if necessary, a second dose may be given after an interval of three hours. Vichy or other alkaline mineral water should be given in small quantities frequently repeated. The bowels should then be kept open by means of rectal injections of warm, soapy water. A long tube attached to the syringe should be passed into the bowels as far as possible and at least a quart injected once or twice a day.

If black vomit occur, give 15 or 20 drops of tincture of chloride of iron in a little water every three hours. Apply mustard to the stomach, and give cold champagne and vichy, or brandy and ice water.

Used clothing, body linen, and bedding of the patient and nurse should be immersed at once in boiling water or in a disinfecting solution.

\* \* \* "All mosquitoes on board should be destroyed by burning pyrethrum powder (Persian insect powder) or by fumigation with sulphur. Mosquito larvæ (wigglers, or wiggle tails) should be destroyed in water barrels, casks, and other collections of water about the vessel by the use of petroleum (kerosene); where this is not practicable use mosquito netting to prevent the exit of mosquitoes from such breeding places." (U. S. Quarantine Regulations.)

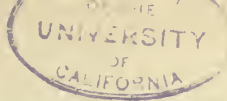
The sick room, as soon as it is vacated, also the room occupied by the nurse, should be thoroughly disinfected by burning sulphur, 2 pounds for every thousand cubic feet of air space, to destroy possibly infected mosquitoes.

The sulphur is placed in an iron pot, the pot is then set on two bricks in a tub containing a sufficient quantity of water to prevent the burning sulphur from running on the floor and setting fire to the ship. The windows and all crevices should be tightly closed. When everything is ready the nurse should then light the sulphur, leave the room and close the door. At the end of twelve hours the doors and windows should be thrown open. The walls and ceiling and all articles of furniture should then be washed down with a solution of bichloride of mercury (1 to 1,000) and the ship should be taken to the nearest quarantine station for thorough fumigation to destroy mosquitoes in other parts of the vessel.

#### MALARIAL FEVER.

Malarial fever is an endemic infectious disease, caused by a parasite of the blood. The disease is transmitted to man (inoculated) by the bite of certain kinds of mosquitos, of the genus *Anopheles*.

The parasite in the blood of persons sick with malarial fever was discovered in 1880 by Laveran, a French surgeon in Algiers. At first repudiated, the discovery was later confirmed by other French surgeons and by numerous Italian, British, German, and American investigators.



After the confirmation of the discovery of Laveran, the very important questions arose as to the origin of the malarial parasites and the means by which they enter the human body. The answers were soon forthcoming. Manson, Ross, and others demonstrated conclusively that the disease is propagated and transmitted from one person to another by a certain kind of mosquito.

“Doctor Manson took the advanced position that an intermediate host in the shape of a certain gnat or mosquito was necessary in transmitting the disease from man to man and was also an inevitable portion of the cycle of development of the parasite. No subject has been more carefully and elaborately worked out; in no research known to modern science have fanciful or theoretical deductions been the subject of more careful scrutiny; and to-day the ‘mosquito theory’ of the transmission of malaria is no longer a theory, but an accepted fact.”—(Geddings.)

Malarial fever is a disease of warm and temperate regions; very prevalent and of severe type in hot countries, especially along the seacoast and basins of rivers, but gradually declining in extent and virulence in proportion to the distance on either side from the equator. In the Tropics the disease is constantly prevalent. In the cooler, or temperate regions, as for example, along the coast of the Central Atlantic States, it is active only during summer and autumn. It is seldom developed at a lower temperature than 60° F. (15.5° C.), and even in the hot climates malaria is probably never contracted far away from land. The disease is said to be most frequently contracted during the night, just after sunset and just before sunrise being the most dangerous periods. It is therefore very important in infected localities not to permit the men to go ashore, nor to allow them to sleep on deck, if the vessel is lying near the land; or, if they must sleep on deck or other exposed places, to provide suitable protection by means of blankets and properly constructed mosquito bars. The protective measures already referred to under “yellow fever” are equally important in guarding against malaria.

There are different varieties and types of malarial intermittent fever: (1) Quotidian, when the paroxysm occurs every day; (2) tertian, when it occurs every other day; and (3) quartan, when it occurs every fourth day. The disease is popularly known as “fever and ague,” “chills and fever,” “the shakes,” etc. It is characterized by recurring paroxysms, consisting as a rule of three distinct stages: The cold, the hot, and the sweating stage. The attack may be sudden or it may be preceded by a feeling of uneasiness, a desire to stretch the limbs and yawn, headache, loss of appetite, and sometimes by vomiting. The chill may be of any degree of severity. Patients sometimes complain only of chilliness, or of a creeping sen-

sation of coldness over the back. More frequently the chill is well marked; the feeling of cold spreads all over the body, the teeth chatter, the patient shivers, and his whole body shakes. This *cold stage* may last from a few minutes to an hour, or longer.

The *hot stage* gradually comes on as the cold stage subsides, and soon there is a feeling of intense heat. The face becomes flushed, the pulse full or bounding, the headache continues, and the patient is in high fever. This stage may last from half an hour to four or five hours, when perspiration appears, first on the forehead and gradually over the entire body, and the *sweating stage* is fully established. With the appearance of perspiration the fever declines, the distressing symptoms gradually cease, the patient experiences a feeling of great relief, and soon falls into a refreshing sleep. The duration of the sweating stage varies from one to three hours. It may be very profuse or very slight. At the end of the sweating stage the patient may be greatly prostrated or may feel quite well, and able to be up and about until the beginning of the cold stage of the next fit, twenty-four, forty-eight, or seventy-two hours from the beginning of the first.

Besides the three varieties of regularly intermittent malarial fever, there are irregular forms of intermittents; also remittents, bilious remittents, typhoid remittents or typho-malarial, and a very severe type known as pernicious malarial fever.

In the irregular intermittent the paroxysms may be longer and recur at irregular intervals, the cold stage may be absent, the fever may come on gradually and decline to normal in the same manner.

When the attacks are prolonged, and when instead of declining to normal there may be only a slight fall in the temperature and slight sweating, the fever is called *remittent fever*.

When a remittent fever is accompanied by recurring attacks of bilious vomiting, constipation, or bilious diarrhea, and perhaps a yellowish tint of the skin and eyes, it is said to be *bilious remittent fever*.

When typhoid symptoms, such as dry tongue, low delirium, extreme prostration, etc., appear in conjunction with the ordinary symptoms of remittent or bilious remittent fever, the disease is called *typhoid remittent* or *typho-malarial fever*. This is really the coexistence of two diseases, typhoid fever and malarial fever.

*Pernicious malarial fever*, as the name indicates, is a very fatal disease. It occurs chiefly in hot climates, but is occasionally met with in temperate regions. It may be preceded by an apparently mild attack of intermittent fever, or the patient may be taken suddenly with intense headache, high fever, wild or perhaps muttering delirium, rapidly passing into unconsciousness, and death may occur within a few hours from the beginning of the attack.



In another form of the disease the attack begins with extreme coldness of the surface of the body, with vomiting, or with severe diarrhea or dysentery, and the patient may die from collapse.

There is also a hemorrhagic form in which bleeding may occur from the nose, mouth, or gums. The urine may be bloody or quite dark in color, in some cases almost black. In tropical Africa and other hot countries where the disease prevails it is known as "black-water fever."

Hemorrhages, however, may occur in any severe or prolonged form of malarial infection, and bloody urine (malarial hematuria) is not infrequently met with.

*Treatment.*—Quinine is the remedy, and quinine also acts as a preventive. In going to a malarial region, treatment should be commenced several days before arriving at port. To each man on board should be given at least 10 grains (0.6 gm.) of quinine daily for a period of one week. The allowance may then be reduced to 5 grains (0.3 gm.) or even to 3 grains (0.2 gm.) a day. The bowels should be kept freely open.

If a chill occur, the patient should at once be wrapped in blankets and given hot drinks. During the hot stage, cold drinks, lemonade, etc., may be given. As soon as the sweating stage begins, 10 or 15 grains (0.6 gm. to 1 gm.) of quinine should be given, and thereafter 5 grains (0.3 gm.) every six hours, for two or three days, and then continued in smaller doses, say 3 grains (0.2 gm.) three times daily, for the next two weeks.

If the chill is severe, or if the surface of the body is very cold, hot-water bottles or heated bricks or stones wrapped in cloth or in a separate piece of blanket should be placed to the feet. Mustard plasters may also be applied to the extremities and over the region of the heart, and hot stimulating drinks should be given.

If vomiting occurs, a mustard plaster may also be placed over the region of the stomach, above the navel, and cracked ice may be given by the mouth. Headache may be relieved by cold applications.

If the hot stage is severe, a tepid bath may be given in a tub or by means of a sponge. If the temperature is very high, 105° or 106° F. (40.5° or 41.1° C.), a cold bath should be given.

For extreme pain or restlessness, a pill of morphine sulphate one-sixth grain (0.01 gm.), or 12 drops of tincture of opium (laudanum), or 10 grains (0.6 gm.) of Dover's powder may be given, and if necessary repeated in three hours.

In bilious, remittant, and other severe types of malarial fever the treatment should be more active. No time should be lost in giving the quinine; 10 or 15 or 20 grains (0.6 gm. to 1.3 gm.) should be given immediately, and along with this, if the bowels are not freely open, 5 or 10 grains (0.3 gm. to 0.6 gm.) of calomel. After the

bowels move, the quinine should be continued in 5-grain (0.3 gm.) doses every four or five hours.

If there is much vomiting and if the medicine is not retained, an emetic of lukewarm water or powdered ipecac should be given, and after waiting a little while the quinine and, if necessary, the calomel may be tried again. Mustard plaster to the region of the stomach, cracked ice in the mouth, sips of very hot water, or a little champagne may have a good effect on the vomiting. If, notwithstanding these measures, the vomiting continues and the medicine is immediately rejected, the rectum should be washed out with an injection of warm water, and then at least 30 grains (2 gm.) of quinine in 2 or 3 ounces of water should be injected into the rectum. When the stomach is settled 5-grain (0.3 gm.) doses of quinine may be given again by the mouth.

The best method of giving quinine for rapid effect and perhaps the best means of saving life in the severe pernicious forms of malarial fever is to give the quinine hypodermically (injected under the skin by means of a hypodermic syringe). But this method is out of the question except in the hands of an experienced person, and even then it is apt to produce abscesses.

The symptoms and signs of typical malarial intermittent fever are so striking that they can hardly be mistaken for anything else. It must not be forgotten, however, that there are typical and irregular forms of malarial fever, and that they may be mistaken for other diseases, such as tubercle (consumption) of the lungs, abscess of the lungs or of the liver or any part of the body, or the result of the passing of a catheter, all of which produce chills or chilliness and fever.

Some forms of remittent or continued remittent malarial fever may be difficult to distinguish from typhoid fever, and if the patient is suffering from the poison of malarial fever and typhoid fever at the same time he will have typho-malarial fever. The bilious remittent type may be mistaken for yellow fever.

Quinine is the remedy for any form of malarial fever. If the fever does not yield to full doses of quinine, it is probably not malarial. At any rate this is the most practical method for determining the question as to whether the fever is malarial or not. In the hospital or laboratory the diagnosis is made by microscopical examination of the blood.

The diet in any form of acute fever should be light, liquid, and nourishing, and if there is much prostration stimulants will be required. Solid food should not be allowed. After the fever has subsided a tonic should be given (a teaspoonful of elixir of iron, quinine, and strychnia three times a day, or 10 drops of the tincture of chloride of iron in a wineglassful of water three times daily).



## SMALLPOX.

Smallpox is an acute, contagious, self-limited disease, characterized by an initial fever and successive stages of eruption. It spreads rapidly among persons unprotected by vaccination. It may be communicated by the breath, by exhalations from the skin, by clothing, or by anything that has been in contact with a person suffering from the disease. It is very contagious during the latter stage of eruption, and especially during the period of convalescence when the dried pus scales become detached from the skin and in the form of dry powder or dust settle on everything about the room or compartment, and may be conveyed not only to all parts of the ship, but to any part of the world to which the ship is bound.

After a period of incubation of from eight to fourteen days, occasionally longer, the disease begins suddenly, usually with a chill, always with severe pain in the back and loins, intense headache, and high fever. Vomiting occurs in many cases. The bowels may or may not be constipated.

About the end of the third day or on the fourth day a papular eruption appears on the forehead, and frequently on the lips and the wrists, occasionally in the mouth and throat, and gradually extends to other parts of the body. The eruption begins as a bright red dot or spot slightly elevated above the surrounding skin, enlarging until the second day, when it forms a papule. The papule is hard to the touch, feels like shot under the skin. As soon as the eruption appears the temperature begins to fall, and the distressing symptoms subside. On the fifth or sixth day a small vesicle, with a depression of the center, appears on the top of each papule. The vesicles gradually become distended, the depressed centers rounded out, and about the eighth or ninth day the change is completed and the vesicles become pustules. They have a yellowish gray appearance and each pustule is surrounded by a red border. The skin between them is swollen, the eyes may be closed. During this change the temperature rises again, secondary fever sets in, the chief symptoms return, and a day or two later another change begins. The pustules break, matter oozes out, crusts form, first on the face and then over other parts of the body following the order of the appearance of the eruption. The secondary fever may be quite high in the beginning, but gradually declines as the pustules change into crusts, and in favorable cases seldom lasts more than two or three days. The crusts then rapidly dry and fall off, leaving red spots on the skin, and here and there the characteristic pockmarks or pits. The healing of the pustules is usually attended by troublesome itching.

In some cases a diffuse redness of the skin or red spots appear on the abdomen, or on the side of the chest, or on the inner surface of

the thighs as early as the second day, but the distinctive papular eruption makes its appearance as stated at the end of the third or on the fourth day, and nearly always begins on the forehead.

In the confluent form of smallpox the eruption may appear a day earlier and all the symptoms are more severe. The pustules run together and form large brownish scabs, chiefly on the face and head, but also on the hands and feet. The face and neck are greatly swollen, the eyes are closed, the features are distorted. The patient complains of tension and burning of the skin; there is much thirst. The eruption may also appear in the mouth and throat. The secondary fever is high. Delirium may be quite marked. In fatal cases the pulse becomes rapid and feeble, and death occurs about the tenth or eleventh day or later.

In favorable cases, about the eleventh or twelfth day the pustules begin to break. The matter dries and forms crusts which slowly fall off, leaving the skin quite red and in many cases dreadfully scarred and pitted.

The crusts begin to drop off about the fourteenth day, but the process of desquamation may not be completed until the end of the third or fourth week, and the fever may persist during that period. In some cases the entire skin of the hands is cast off like a glove, and the skin of the feet and toes may be shed in a similar manner. There is a milder form of smallpox called *varioid*, in which the symptoms are usually milder and of shorter duration. Varioid occurs in persons who have been vaccinated. Sometimes the eruption begins on the feet. In some cases it is confined to the feet and hands. Occasionally the eruption is extensive and the symptoms are severe.

The most severe type of smallpox is the *hemorrhagic* (bloody). It occurs in two forms. In one the case goes on in the usual way until about the ninth or tenth day, when blood makes its appearance in the pock. This form is sometimes called *black* smallpox. In the other form the eruption may be blood-colored from the second day, and bleeding may take place from the nose or mouth or from the rectum. The face is greatly swollen and the eyes are deeply bloodshot. Death occurs during the first week, sometimes as early as the second day.

Before the characteristic eruption appears it is frequently very difficult to determine the existence of smallpox. It is easily confounded with other eruptive diseases. The important points to remember are the intense pain in the back, the high fever, and bounding pulse, all of which precede the eruption, and that when the eruption appears the fever and all the severe symptoms subside. The temperature before the eruption may be up to  $105^{\circ}$  or  $106^{\circ}$  F. ( $40.5^{\circ}$  or  $41.1^{\circ}$  C.) When the eruption appears it begins to decline, and within twenty-four or thirty-six hours is down to about  $100^{\circ}$  F.

(37.7° C.) When the secondary fever sets in the temperature rises again.

*Treatment.*—The patient should be placed in a cool, well-ventilated room, and strictly isolated; and every person on board should be immediately vaccinated. No one should be allowed to come in contact with him except the nurse or attendant, and the nurse or attendant should not be allowed to come in contact with other members of the crew. While in immediate attendance on the sick he should wear overalls and jumper, and a head covering, to be removed when he leaves the room, and immediately put on again when he returns. Separate dishes and necessary utensils should be provided. The food should be placed at a convenient place near the door of the sick room where the nurse can come and get it. Nothing should be allowed in the room except the articles absolutely necessary. The soiled clothing should be wrapped in a clean sheet (or in a sheet that has been dipped in a 2 per cent solution of carbolic acid and wrung out), and the bundle placed in a kettle of water and thoroughly boiled. If there is a sufficient supply of bedclothing on board, the soiled articles should be destroyed by fire (burned). The patient must be kept thoroughly clean. Good nursing is very important.

In the early stage, when the fever is high, place the patient in a cold bath, or give him a cold sponge bath, note the temperature of the body, and repeat the bath every three hours if the thermometer registers above 103° F. (39.4° C.). If the bowels are constipated, give small doses of Epsom or Rochelle salts every two or three hours. If diarrhea is troublesome, give teaspoonful doses of paregoric every two or three hours until it is checked.

For the severe pain in the back a tablet of morphine,  $\frac{1}{8}$  grain (0.01 gm.), may be given, and, if necessary, repeated in two hours. The food should be soft and nourishing and given at regular intervals. Cold drinks, lemonade, barley water, etc., may be freely given.

The pain and tension in the skin may be relieved by cold applications. A piece of lint, wet with a cold 2 per cent solution of carbolic acid, may be applied to the face and frequently renewed. Holes should be cut into the lint corresponding to the eyes, nose, and mouth, and oiled silk may be placed on top. When the pustules begin to form it is a good plan to touch each one with tincture of iodine (a camel's hair brush may be used for the purpose), and a day later to puncture them with the point of a needle. The needle should first be boiled, and the point should then be dipped in tincture of iodine before making the puncture. When crusts begin to form, olive oil or glycerin should be applied. If the hair is long it should be cut short early in the disease before the pustular stage begins. The eyes must be carefully cleansed several times a day, else blindness may follow.



A solution of borax, 5 grains to a fluid ounce of water (0.33 gm. to 30 c. c.), is a good eyewash. The mouth, throat, and nose also require attention. A saturated solution of chlorate of potassium may be used as a mouth wash and gargle.

When the crusts and scabs drop off they should be carefully gathered up and burned. The patient should then have a daily bath with carbolic soap and water. When the case is ended the room and all exposed articles must be disinfected by burning sulphur (4 pounds to every 1,000 cubic feet of air space).

If near port when the disease breaks out the ship should be taken direct to the quarantine station, where the patient may be taken care of and the ship disinfected.

#### CHOLERA (EPIDEMIC CHOLERA, ASIATIC CHOLERA).

Cholera is an infectious disease, caused by a specific organism, discovered in 1854 by Koch, of Berlin, Germany, and named *Comma bacillus*, because its shape, as seen under the microscope, is not unlike that of a comma.

Cholera is not endemic in any part of the world except Asia. Its home is in India, where in certain localities it has been endemic probably for centuries.

The first widespread epidemic is said to have occurred in that country in the year 1817. During the years 1830 and 1832 extensive epidemics occurred in different parts of Europe and there were recurrences of smaller epidemics up to 1838. In the year 1832 the disease was brought to the United States in emigrant ships from Great Britain via Quebec; also by ships entering at New York. In 1835-36 it again appeared in the United States; in 1846 there was another widespread epidemic in Europe. In 1848 it entered the United States through the port of New Orleans and overspread the Mississippi Valley and extended across the continent to California. In 1854 it was again introduced into the United States through the port of New York and a widespread epidemic was the result. In 1866 the disease was again epidemic in Europe, also in Arabia and Egypt, and during the same year and the year following, and again in 1873, smaller epidemics occurred in the United States. In 1883-84 an extensive epidemic prevailed in Europe, particularly in France and Italy. The last serious epidemic occurred in Europe in 1892 and 1893, chiefly in Hamburg, where it attacked nearly 18,000 persons, and more than 7,000 died within a period of three months. In 1892 a few cases were brought to New York Harbor, but there was no spread of the disease.

Every epidemic of cholera is probably due to a spread of the disease directly or indirectly from its home in India. It is apt to be

developed in the wake of moving masses of human beings. It follows the great lines of travel to different parts of the world. It is spread probably through the agency of the dejections from cholera patients, which contain the comma bacilli. These find their way into the water supply, or become attached to different articles of food and are then, in turn, introduced through the mouth into the systems of healthy persons. They may be conveyed in clothing, or in merchandise of different kinds. An infected ship may carry the disease from one end of the world to the other.

An attack of cholera may be of any degree of severity. The *symptoms* usually begin after a period of incubation of from two to five days. The mildest forms are called *choleraic diarrhea*. The stools are watery, rather large, and of yellowish color, and, in the absence of other symptoms of true cholera, may be mistaken for ordinary diarrhea, or the attack may begin with colicky pains, purging and vomiting as in cholera morbus.

All such symptoms occurring in persons who have been ashore at infected ports, or who have drunk water taken at such ports, should be regarded as extremely suspicious. Under ordinary circumstances, it is difficult to distinguish between severe cases of cholera morbus and genuine cholera. Cholera morbus is usually due to indigestible food or other irritating exciting cause, and while true cholera may not be ascribed to such a cause, persons with weak or irritable stomachs are more apt to be attacked by cholera than are healthy persons.

The majority of cases of cholera begin with looseness of the bowels, or an apparently simple diarrhea. After a day or two, or within an hour or two, the diarrhea may become very violent. The evacuations soon lose their yellowish color and assume the grayish-white appearance known as "rice-water stools." Severe cramps occur in the feet and calves of the legs, and sometimes in the hands and arms. Vomiting soon follows. There is a burning sensation in the stomach and the thirst is unquenchable. The urine is suppressed. Large quantities of fluid may gush from the mouth as well as from the rectum, the patient sinks into a condition of collapse. The skin becomes cold and covered with a clammy sweat. The tongue is coated and cold to the touch, the voice becomes very faint and husky, the breath icy. The whole body shrinks. The temperature in the mouth may fall from  $5^{\circ}$  to  $10^{\circ}$  below normal, while in the rectum it may rise several degrees above normal. The intellect usually remains clear until near the end.

In the very serious forms of cholera the patient may fall into collapse and die within an hour from the beginning of the attack.

In the milder forms, or if the patient survive the collapse of the severe forms, the symptoms gradually subside, the skin becomes warm, the pulse stronger, the urine is again passed, the stools become

more natural, and the patient recovers. But there may be a relapse or the reaction may be too severe and a low type of fever, called *cholera-typhoid*, may be developed and prove fatal within a few days.

*Treatment.*—During the prevalence of an epidemic of cholera, or while in the vicinity of ports on the Indian coast, where the disease is endemic, every case of mildest diarrhea, looseness of the bowels, or irritable stomach should receive the most careful attention, for the reason that, as already stated, cholera usually begins with such symptoms; and if the infection is brought on board, the men with bowel or stomach trouble of any kind are usually the first victims to the dread disease. Rest in bed, good ventilation, simple diet, and clean surroundings must be insisted upon from the very start. The drinking water must be boiled. The patient should be carefully isolated and everything brought into contact with him or contaminated by his excretions must be disinfected. The stools should be passed into a chamber containing a 5 per cent solution of carbolic acid, or a 10 per cent solution of chloride of lime. The linen and bedclothes should be disinfected by dry heat, or by steam, 212° F. (100° C.) or by boiling. The spoons, knives, plates, and utensils of any kind should be boiled immediately after they are used.

The medicinal treatment in the first stages of true cholera is about the same as for cholera morbus, already described. Opium (laudanum), or morphine, or "Hot Drops" are the remedies chiefly to be relied upon, but none of these medicines should be given during the stage of collapse.

Brandy and water, in small quantities at a time, hot coffee, and tea are valuable in this stage. Brandy and warm water, or coffee or tea should be injected into the rectum. Warm water should also be injected into the rectum through a long soft-rubber tube or large catheter attached to a Davidson or, preferably, a fountain syringe. A 1 or 2 per cent solution of tannic acid (tannin) is also recommended. One or two quarts may be slowly introduced. The patient should be wrapped in warm blankets and have hot-water bags, hot bottles, or hot bricks placed to his extremities and alongside his body (careful of course not to have them too hot, lest great harm be done by burning the skin).

A ship with cholera on board should go to the nearest quarantine station for treatment, not only for treatment of the sick, but also for the well, and above all for the treatment of the ship, so as to prevent further spread of the disease.

#### THE PLAGUE.

Plague, the most dangerous of all infectious diseases, is caused by a specific micro-organism (the bacillus pestis bubonica) discovered in 1894 by Kitasato, a Japanese physician.



“Plague was known to the ancients, and at different times since the beginning of the Christian era hundreds of thousands of people of the Old World have been carried off by its ravages. It has probably always existed in the Orient, more especially in India, where it is now raging in terrible epidemic form.

“Plague is a disease of hot countries, but it may occur in any country or be carried to any country in any season of the year. The most widespread and disastrous epidemics occurred in Europe during the sixth, fourteenth, seventeenth, and eighteenth centuries, and since then epidemics of varying degrees of severity have occurred in different parts of the Old World—in Europe, Africa, and Asia. Of late years the disease has also appeared in South America and Mexico. It has never gained a foothold in the United States, except the localized epidemic in the Chinese quarter of San Francisco.”

The disease is commonly called *bubonic plague* for the reason that in the large majority of cases buboes (inflamed and enlarged lymphatic glands) form in the groins. But there is another and more fatal form of the disease, known as *septicæmic plague*, in which buboes are not apparent. Cases of this form run such a rapid course that the patient dies of *septicæmia* (blood poisoning) before the buboes appear.

There is also a very dangerous and fatal form of the disease recognized as pneumonic plague. This form begins not unlike that of a pneumonia; the sputum is very bloody, and contains multitudes of the bacilli.

Buboes occur in about 75 per cent of all cases, chiefly in the groin, but also in the armpit and neck and occasionally about the elbow and the knee joint. They are usually developed by the third or fourth day, sometimes within the first twenty-four hours; occasionally as late as the second week. They vary in size from a marble to a goose egg, and as a rule are very painful. Sometimes, after attaining a considerable size, the buboes are absorbed; more frequently they suppurate and break. Small boils or abscesses may form on different parts of the body. In some cases dark-colored spots (petechia) from slight hemorrhages form in or beneath the skin. Hemorrhages may also occur from the nose or mouth or from any mucous membrane.

The bacilli are found in the buboes, blood, and internal organs. They enter the body through the respiratory and digestive tracts, or by way of abrasions or small injuries of the skin. Many of the lower animals suffer equally with man. Rats are the chief carriers of the disease from house to house or from dock to ship. Most epidemics of human plague are preceded by wholesale deaths among the rats. The infection may be spread by fleas, flies, mosquitoes, and other insects, or by means of infected articles of clothing, bedding, etc., or by the food and drinking water taken at infected ports.

*Symptoms.*—The incubation period of the plague varies from two to ten days. Occasionally the onset of the actual disease is preceded by prodromal symptoms lasting from twelve to thirty-six hours, characterized by chilliness, headache, nausea, congestion of the eyes, nose-bleed, giddiness, an anxious and painful expression of the face, mental depression, and sometimes dull pain in the groin and armpits.

In most cases, however, bubonic plague begins suddenly with fever, which may or may not be preceded by a chill. The temperature rises rapidly and reaches its highest point, 105° or 106° F. (40.5° to 41.1° C.) on the second or third day. The pulse, at first full, rapidly becomes small and weak, and the beats vary from one hundred to a hundred and fifty or more per minute. The tongue, at first moist and red or white coated, soon becomes dry and brown, and dark-colored crusts (*sordes*) may form on the teeth, lips, and nostrils. Delirium or coma is apt to set in. Prostration is extreme, and the patient may die in this early stage before the bubo attains any considerable size, or, as in the septicæmic form of the disease, without the appearance of the bubo at all.

In some cases on the third or fourth day the temperature drops a degree or two, but generally rises again until about the fifth or sixth day, when it suddenly drops to normal or subnormal. Death may or may not take place in this stage. More frequently there is a sudden rise in the temperature immediately preceding death, and in favorable cases the temperature falls to the normal gradually.

About 70 per cent of all cases die within the first six days. Survival of the sixth day may therefore be regarded as a hopeful sign. In cases which tend to recovery the symptoms improve gradually. Convalescence is slow, and at the seat of the bubo an indolent sore may be left, which is very slow to heal.

*Treatment.*—Plague is a filth disease. A clean ship and personal cleanliness are therefore of the greatest importance.

If the disease breaks out the patient should be immediately isolated in a clean and well-ventilated compartment, and the ship should be thoroughly disinfected. All articles in the fore-castle or elsewhere on board and not absolutely necessary for use should be destroyed. Articles of clothing or bedding soiled by the discharges of the patient or which have been in close contact with the body should be burned or thrown overboard and sunk; other articles of clothing should be disinfected by steam 212° F. (100° C.) or by boiling, and always dried in the sunshine and open air. All rats and vermin of every kind should be destroyed. The discharges from the patient—urine, feces, vomit, or sputum—should be passed into bowls or pots containing a 5 per cent solution of carbolic acid or 10 per cent solution of chloride of lime or ordinary milk of lime.

The person detailed to wait on the patient should be free from

sores or scratches of any kind, and should exercise the most scrupulous care of his hands, and all articles brought into contact with the patient should be disinfected.

*Medicinal treatment.*—Constipation should be relieved by calomel, 5 grains (0.3 gm.), followed in five hours by a dose of Rochelle or Epsom salts. Stimulants should be given from the beginning; the food should be concentrated and nourishing. If diarrhea is persistent it may be relieved by salol in 5-grain (0.3 gm.) doses, given every three hours.

Ice or cold water should be applied to the aching head and the hot body sponged with cold or tepid water. In the earlier stage of the buboes the local application of ice is useful. Later on, if softened, they should be incised and dressed with iodoform gauze. Pain and restlessness may be relieved by morphine,  $\frac{1}{8}$  grain (0.01 gm.), repeated in two hours if necessary.

The ship should be taken to the nearest quarantine for necessary treatment, and especially to give the survivors the best chance for life.

#### BERIBERI (THE KAKKE OF JAPAN).

Beriberi is a form of multiple-neuritis (inflammation of nerves), characterized by numbness, tenderness, and œdema (dropsical swelling) of the legs and other parts of the body; by irritability of the heart, extreme weakness, and paralysis.

It occurs in epidemic form or as an endemic in most tropical and subtropical climates, and is not infrequently carried into temperate latitudes. It is not contagious in the ordinary sense of the term, but may be communicated from one person to another. Like other forms of infectious or epidemic disease, beriberi is apt to break out in overcrowded places, as, for example, in jails and asylums.

For the purpose of this article, however, beriberi is to be regarded as a ship disease, or rather as a disease developed in ship from germs taken on board at a tropical or subtropical port or elsewhere, through the medium of persons coming from infected or endemic districts, and cultivated by the artificial conditions of the forecabin.

Eleven cases, occurring among foreign seamen, were admitted to the Long Island College Hospital at this port (New York) during the year 1903, and the records of the U. S. Public Health and Marine-Hospital Service for the last ten or fifteen years show that sailors suffering from beriberi have been admitted to marine hospitals at different points on the Atlantic and Pacific coasts of the United States from vessels arriving from tropical or hot countries. The disease is frequently carried to the seaports of Great Britain by vessels trading to India, or is developed en route because of the peculiarly dirty and insanitary condition of the forecabin and its occupants—the lascars.



“They feel the cold of the English climate so much that on entering British seas they try to keep their quarters warm by lighting fires and stopping up all ventilators. By these means they create a hot, steamy, atmosphere and a sodden state of the place they live and sleep in, which is a very good imitation of the tropical conditions the germ of beriberi requires for its development. In other words, those lascar sailors create an incubator on a large scale, which, should it chance to contain a beriberi germ, quickly becomes extensively infected and lethal.” (Manson.)

Four forms of the disease are recognized—

(1) The mild or rudimentary form usually begins with a feeling of weakness and numbness of the extremities, with œdema of the shins and tenderness of the muscles, especially of the calves, uneasiness in the belly, shortness of breath, and palpitation of the heart. These symptoms may last only a few days or several weeks and then disappear, but recurrences are common.

(2) In the dry or atrophic form there is no œdema, but the other symptoms are marked and more rapidly developed. Instead of œdema and puffiness there is atrophy of the parts. The tendon reflexes are lost. The legs and arms and sometimes the face are paralyzed and painful. All the muscles of the body waste away. The patient presents a pitiful, shrunken appearance, suffers intense pain, is sensitive to the slightest touch, and may die from general exhaustion or, after lingering many months, gradually improve and get well.

(3) The wet or dropsical form begins with symptoms similar to those of the mild form, but the œdema soon extends over the entire body, watery effusions into the serous sacs take place; there is marked shortness of breath, frequently nausea and vomiting, and always weakness of the heart. Death may occur from heart failure or from paralysis of respiration. On the other hand, the dropsy may gradually or rapidly disappear and leave the patient in essentially the same condition as that described under the head of the dry or atrophic form.

(4) The most serious or dangerous form of beriberi is called the acute pernicious cardiac form. In this the general symptoms of the disease may be only slightly developed, but the cardiac (heart) symptoms are marked. The disease in this form usually lasts several days or weeks, but death may occur from heart failure within twenty-four hours from the onset.

The mortality in different epidemics varies from 3 to 60 per cent.

*Diagnosis.*—In tropical regions typical cases of beriberi are easily recognized, but as the incubation period varies from several weeks to as many months the first symptoms of the disease may not appear until the ship is far away from the tropical country, and then the

diagnosis may be somewhat difficult for the reason that some of the symptoms may be absent or those present so slightly developed as to be easily overlooked until the man suddenly becomes helpless or dies from paralysis of the heart. Careful examination of other members of the crew will then probably show symptoms of the disease, and the captain will be reminded that ship beriberi can be developed only in a damp, filthy, ill-ventilated or overcrowded forecabin, into which the seed (germ) was introduced weeks or months before. Pain and numbness of the legs and palpitation of the heart occurring in men of or from the Tropics should suggest the possibility of the presence of beriberi, and also the necessity for prompt action on the part of the captain.

*Treatment.*—"The first and most important thing to be attended to in the treatment of a case of beriberi is the removal of the patient from the building, camp, or ship in which the disease was contracted." (Manson.)

If the disease breaks out during the voyage all the men must be removed from the forecabin and made to sleep on deck, with their bodies properly clothed and, if necessary, protected by an awning.

All articles of clothing and bedding should be boiled, thoroughly washed, and dried in the open air. The forecabin should be disinfected by burning sulphur (see description of method, p. 16), thoroughly cleaned, and dried. All rotten planking and bilge water should be removed, and all woodwork should be scraped and painted. No one should be allowed to sleep in the forecabin until it is thoroughly dried and aired; overcrowding must be avoided. If the men have been eating rice in any quantity it should be stopped. (In Japan the cause of the disease is attributed to the excessive use of rice or bad rice and raw or spoiled fish.) Wheat flour and oatmeal should be used instead; also beans and fat meat, fresh meat, milk and eggs, and red wine—all in liberal quantities. The best thing the captain can do for the sick man himself (bearing in mind the possibility of heart failure and sudden death), is to relieve him from duty and allow him to rest in bed; or if not too sick, move about slowly in fresh air and sunshine.

In the beginning of the disease, especially if the muscles are painful, salicylate of soda, 1 gram (15 grains) three or four times a day is considered good treatment. For palpitation or irritability of the heart, tincture of *strophanthus*, 5 drops every four hours. If there are marked signs of heart failure inhalation of nitrite of amyl may be given—3 or 4 drops on a handkerchief and applied to the nostrils.

In dropsical cases the bowels should be kept open by the use of Epsom or Rochelle salts, a tablespoonful in a glass of water two or three times a day.



In the atrophic cases, after the subsidence of the pain, rubbing the muscles (massage) is of service.

For a tonic the elixir of iron, quinine, and strychnine may be used to advantage. One or 2 teaspoonfuls three times a day.

#### DYSENTERY.

Dysentery, or bloody flux, as it is sometimes called, is an affection—an inflammation and ulceration—of the mucous membrane of the large bowel. It occurs in different degrees of severity. It may be acute or chronic. There are different varieties. Its severest form is met with in tropical countries where it frequently occurs in widespread epidemics. Epidemics also occur in temperate regions. Sporadic cases may be found almost everywhere. The disease prevails in summer and autumn. It may attack an entire ship's crew.

Bad food, unripe fruit, impure drinking water, exposure to cold and dampness, while probably not in themselves the direct cause of dysentery, doubtless favor the operation of other causes.

*Symptoms.*—The onset may be sudden or gradual. There may, or may not, be chills or chilliness. There is usually some feverishness. The tongue is furred and moist, but soon becomes red and dry, or brownish and glazed.

The first stools may be like those of an ordinary diarrhea. After a day or two, or maybe within a few hours, these are replaced by small mucous stools frequently mixed with blood and small particles of fecal matter. Soon the evacuations consist of mucus alone, or of blood and mucus, or of a jelly-like matter and small white clumps of mucus. Later they may be shreddy, and brownish or greenish in color. Patient complains of cramps and "colicky" pains in his belly; a burning sensation in the rectum, with a feeling as if something must be expelled, and of a constant desire to go to stool. The evacuations may number from ten to twenty, or forty to fifty, or even a hundred or more a day, according to the severity of the case. The quantity of each may not exceed a teaspoonful.

In mild cases there is a gradual change to normal and patient may recover after a period of a week or ten days. Severer cases continue for several weeks or longer, and then recover, or become chronic and incurable, or death may occur from general weakness.

*Tropical dysentery*, the variety which occurs most frequently and in epidemic form in tropical or subtropical regions, but also occasionally in temperate climates, is said to be produced by a micro-organism which enters the system in drinking water.

The symptoms in this form of dysentery are similar to those already described. The burning sensation and bearing-down pain, however, are less marked. The stools are less frequent, but they

are larger and more watery; at times more like diarrhea than typical dysentery. The disease in favorable cases runs a course of from six to twelve weeks. Recovery is always slow. Death may occur from exhaustion, or from abscess of the liver, which is a common complication. In the most fatal epidemics the course of the disease is very rapid. Death sometimes occurs within a few hours.

*Treatment.*—Rest in bed. If possible, the patient should use the bedpan instead of the commode or closet, so as to insure the greatest amount of rest, which is very important. Stop all solid food. Give 2 tablespoonfuls (30 c. c.) of castor oil and 15 drops of laudanum in one dose, and if necessary repeat the dose in six hours, or give smaller doses at intervals of four hours. After the bowels have been thoroughly cleared out, a pill of opium (or opium and camphor), or opium and acetate of lead, should be given every three hours. Hot applications should be placed on the abdomen. The bearing-down pain and the burning sensation may be relieved by washing out the rectum with a pint of warm water and by injecting 2 ounces of thin starch containing 25 or 30 drops of laudanum.

In place of the castor oil, sulphate of magnesium (Epsom salts) may be given in tablespoonful doses, repeated every two hours until a free and large action of the bowels results, and then the pill of opium, or opium and camphor, or opium and acetate of lead given every three hours. Or, instead of the opium pills, subnitrate or subcarbonate of bismuth may be given in 30 or 40 grain (2 gm. or 2.6 gm.) doses.

After two or three days, if the disease continues, the castor oil or the Epsom salts may be repeated, and after its effect is produced, the same line of treatment continued.

Or, in place of the oil and salts, 5 grains (0.33 gm.) of calomel may be given, and repeated, if necessary, in six hours.

The diet should be limited to the lightest articles, such as thin porridge, milk, and broths. And even in the lightest cases the patient should be kept warm in bed.

In tropical countries, or in the treatment of tropical dysentery, the remedy chiefly relied on is powdered ipecac. The patient is not allowed any food for three or four hours, then he is given 15 drops of laudanum, and this is followed in twenty minutes by a dose of from 20 to 60 grains (1.33 gm. to 4 gm.) of ipecac. To prevent vomiting the patient is placed flat on his back and kept very quiet for three or four hours. If vomiting occurs within an hour, the dose is repeated.

The best means of protection or prevention is to keep the body in sound condition. If the disease occurs among the ship's crew,

the healthy men should be very careful not to catch cold, and to avoid errors in eating and drinking. Sudden changes of temperature should be guarded against by a proper supply of clothing. The drinking water should be boiled.

#### SUNSTROKE.

The term sunstroke denotes a sudden attack of illness from exposure or prolonged exposure to the rays of the sun; but the same condition may be produced in hot weather by exposure to high temperature not in the direct rays of the sun, particularly if the person is engaged at hard work in close quarters. Stokers on steamships are sometimes affected by the heat of the furnace. Men debilitated from or addicted to the excessive use of stimulants are more apt to suffer than those of temperate habits.

Sunstroke occurs in two forms: *Heat stroke* (heat fever), in which the temperature of the body is very high, and *heat prostration* or *heat exhaustion*, in which the surface of the body is cool, sometimes considerably below normal. The difference is very important because of the different treatment required.

In severe cases of *heat stroke*, the patient may be stricken down in a state of unconsciousness and die instantly or within an hour or two. In other cases there may be intense headache, dizziness, marked restlessness, nausea and vomiting and hot "burning" skin. The thermometer may register 110° F. (43.3° C.). Pulse is full and may be slow or fast. Breathing is labored, may be sighing or rattling. Patient soon becomes unconscious, the stupor deepens and death may occur within twenty-four hours; or the temperature may drop, consciousness may return and the patient get well.

In *heat prostration*, as already stated, the surface of the body is cool, the pulse rapid and feeble, and there is a feeling of general weakness. There may be only slight faintness and nausea, and under prompt treatment patient may rapidly recover, or, on the other hand, there may be complete loss of consciousness and a rapid and fatal termination from exhaustion and heart failure.

*Treatment.*—In *heat stroke* (heat fever) the temperature of the body should be reduced as rapidly as possible. Remove the patient to the coolest and best ventilated part of the ship. Place him in a cold-water bath, add ice, rub the body with the blocks of ice, apply iced water with ice cap to his head; and keep up the treatment until the temperature, as shown by the thermometer in the rectum is reduced to 100° F. (37.7° C.). If the temperature rise again, repeat the treatment. If symptoms of exhaustion follow the reduction of the temperature, stimulants should be given—whisky or brandy and water in small quantities.

In *heat prostration*, with cool skin, weak and rapid pulse, stimu-



lants and friction are required. Give brandy or whisky, rub the surface of the body and the extremities, place hot water bottles to the feet, and cover the body with blankets. If the head is hot, apply cold water to the forehead. If vomiting occur, inject the stimulants into the rectum. Apply mustard over the region of the stomach. Mustard may also be applied to the feet.

#### DIARRHEA.

*Acute diarrhea* is caused by acute inflammation or by irritation of the intestines. It may occur as a complication in many different diseases. It is usually one of the symptoms of typhoid fever. It is not infrequently met with in severe cases of malaria. It is called *functional* or *simple diarrhea* when it occurs independently of any other appreciable disease. It may be caused by exposure to cold or by errors in diet. Diarrhea, or looseness of the bowels, is sometimes produced by the receipt of unexpected and exciting news, by a sudden fright, or by any strong mental emotion; intestinal digestion is arrested and diarrhea is the result.

In *simple diarrhea* there may or may not be griping and colicky pains. In the more severe forms the tongue is coated and there is some fever. Thirst is marked in proportion to the size and frequency of the thin or watery discharges. If the rectum is affected, there is a constant desire to go to stool, and a burning sensation and bearing-down pain, as in dysentery.

Diarrhea may last from a few hours to as many days, or longer. It may become chronic.

*Treatment.*—In all cases, *rest* and light diet. In the milder forms nothing further may be required. In the more severe forms it is a good plan to begin with a dose of 1 or 2 tablespoonfuls of castor oil, to which 10 or 12 drops of laudanum may be added, or in place of the oil and laudanum Epsom salts or Rochelle salts may be given. The diet should be limited to light articles, such as cornstarch, gruel, weak broths, soft-boiled eggs, milk, and thoroughly toasted bread. As a rule, in very acute cases, the less food and drink taken the better. The patient should rest in bed and keep his body warm.

After the bowels have been freely moved by the oil or salts, if the diarrhea or pain continue, give 2 teaspoonfuls of equal parts of paregoric and tincture of catechu, and, if necessary, repeat the dose after an interval of three or four hours. If nausea and vomiting occur, apply mustard to the region of the stomach, and give tablespoonful doses of equal parts of milk and lime water, or a little champagne and carbonated water.

In *chronic diarrhea* careful attention to diet is of the greatest importance. The treatment is about the same as for chronic dysentery.



## CHOLERA MORBUS (SPORADIC CHOLERA).

Cholera morbus is an affection of the stomach and intestines, attended by vomiting, purging, and cramps. It comes on suddenly, and may begin by vomiting or purging. It is usually met with during the hot months of summer. It is frequently caused by eating unripe and indigestible fruits and vegetables or decomposed or improperly cooked fish or shell fish, or salad mixtures. Drinking large quantities of iced water and sudden checking of the perspiration, or irritants of any kind, may set up the trouble. The disease usually begins suddenly, often at night, with vomiting, or after a feeling of uneasiness or nausea or a severe cramp. The contents of the stomach are first thrown up, then a slimy bilious matter, and later the vomited matter seems to be pure water. The stools are at first solid or semisolid, but they soon become more watery, lose their color, and sometimes appear not unlike the rice-water stools of genuine Asiatic cholera. The patient soon has a wasted look. His thirst is unquenchable. His skin may become cold and clammy and the pulse very weak. Cramps may occur in the feet and in the calves of the legs. The disease runs a rapid course. The acute symptoms may subside in a few hours. The attack seldom lasts more than twelve hours. Recovery is the rule, but treatment should be promptly applied.

*Treatment.*—Apply a large mustard plaster to the abdomen. Give 15 drops of tincture of opium (laudanum). If the dose is rejected (immediately vomited), try it again. If rejected a second time, then a morphine pill or tablet  $\frac{1}{8}$  grain (0.01 gm.) should be given. If the morphine pill is quickly rejected, it may be tried a second time by crushing or rubbing it into a powder and placing it on the back of the patient's tongue immediately after an act of vomiting. If the laudanum or morphia are not retained, then try a teaspoonful of "hot drops," or a teaspoonful of "Sun Cholera Mixture." If vomiting quickly occur, then inject into the rectum by means of a glass or rubber syringe about 40 drops of laudanum mixed with a little thin starch or a little water. The rectal injection should be given immediately after an evacuation, and the patient should be instructed to hold it as long as possible. In whatever way the remedy is given the dose should be repeated in about one hour if the vomiting and purging continue.

It must not be forgotten, however, that all these remedies contain opium and that if the patient is inclined to sleep or shows other constitutional effect of the drug the dose must not be repeated.

The nausea and thirst may be controlled by cracked ice placed in the mouth. Small quantities of carbonated water, or of iced champagne, may be allowed. If the thirst is very urgent, a tablespoonful

of iced water may be given at short intervals. Large quantities of water must not be allowed. If there is marked prostration, a little brandy and water or whisky and water should be given.

#### COLIC.

*Intestinal or spasmodic colic.*—These terms are applied to abdominal pain occurring in paroxysms of different degrees of severity. The pain is usually referred to the region of the navel or middle of the belly. It may be due to indigestible food, cold or acid drinks, poisons, gases, or any irritating substance. It is often preceded by obstinate constipation. Vomiting frequently occurs, and in malarious districts it is apt to be “bilious.”

Foods and drinks taken in excessive quantity are frequently the cause of indigestion.

Another variety of colic, called *lead colic* or *painter's colic*, is caused by lead poisoning. It is not uncommon in painters or workers in lead. It may be caused by drinking water taken from leaden pipes. An attack may be mild or exceedingly severe. It is usually attended by obstinate constipation and by contraction of the abdomen.

The severe paroxysmal pain attending the passage of a gallstone from the gall bladder to the intestine is called *biliary colic*. In biliary colic the pain is usually most marked in the region above the navel or about the stomach (epigastric region). The paroxysms begin and end suddenly. Severe nausea and vomiting occur. The skin and eyes may become yellow or of a yellowish hue (jaundiced), the same as in bilious colic. Gallstones may occasionally be found in the stools if carefully looked for. Some cases, however, are difficult to distinguish from ordinary intestinal colic.

The severe excruciating pain caused by the passage of a small rough stone or calculus or particles of sandy substance from the kidney through the ureter to the urinary bladder is called *nephritic colic*, *kidney colic*, or an attack of “the gravel.” The pain usually begins with a one-sided boring backache. Suddenly it increases in intensity and shoots down the loin to the hip and thigh, and the patient writhes in agony until the “stone” or particle, sometimes not larger than the head of a medium-sized pin, reaches the bladder, when the pain suddenly ceases. The paroxysm may last from half an hour to a number of hours, or one or two days. It may not recur for months or years; on the other hand there may be two or more paroxysms at comparatively short intervals.

Colicky pains are present in many different diseases. *Appendicitis* frequently begins with pain not unlike that of intestinal colic.

*Treatment.*—If the colic is due to indigestible food, or too much food of any kind, an emetic should be given.

After the stomach is emptied give a little spirit (brandy or whisky) with 10 or 15 drops of tincture or essence of ginger or essence of peppermint, diluted with hot water. Apply a large mustard plaster or a hot poultice or cloths wrung out of hot water, or heat of any kind to the abdomen. (Local applications of hot water usually afford some relief in any variety of colic or wherever pain exists.) If the colicky pains persist, 10 or 12 drops of laudanum should be given by the mouth or a pill of morphine, grain (0.01 gm.), and repeated, if necessary, in two hours; or 30 or 40 drops of laudanum in a little water or starch may be injected into the rectum.

If the bowels were constipated when the attack began, an injection of soap and warm water should be given by the rectum, or small doses of Epsom salts or castor oil may be given by the mouth. The diet for a day or two should be light articles in small quantities at a time. The treatment for *lead colic* is about the same, except that the constipation should be relieved at once by full doses of Epsom salts or castor oil. Apply heat to the abdomen or place the patient in a warm bath. Pressure applied to the abdomen affords some relief. Remove the cause or remove the patient from the cause of the disease.

In *biliary colic*, the bowels should be freely moved, patient should be placed in a hot bath, and laudanum or morphia given to relieve pain.

In *nephritic* or *kidney colic*, hot baths and morphia are the remedies. A morphine pill,  $\frac{1}{2}$  grain (0.01 gm.), should be given, and repeated in one hour if the pain is not relieved, and the bath should be as hot as the patient can stand it. The best method of giving morphia in all cases of severe pain is by hypodermic injection (injection under the skin), and in many cases where the stomach is irritable and vomiting occurs this is the only way to obtain the desired effect. But hypodermic medication by inexperienced persons is not to be recommended.

#### SCURVY.

Scurvy is a disease produced by improper or unsuitable food. Many years ago it was of frequent occurrence among seafaring men on long voyages. Now it is a comparatively rare disease, thanks to better provisions and better methods in issuing food supplies. Occasionally, however, a ship comes in with scurvy on board. Two years ago twelve cases were admitted to the U. S. Marine Hospital at New York from one vessel.

*Symptoms.*—Swelling, sponginess, and bleeding of the gums. The teeth become loose and frequently drop out. The breath is foul, the tongue swollen. The skin becomes dry and scaly. Hemorrhages (small dark red spots) occur under the skin, first on the legs and then on the arms and other parts of the body. Bleeding from the nose



frequently occurs. Swelling about the ankles is common. The skin of the legs is frequently discolored in large blotches, and there is often a peculiar hardness or induration of the muscles of the calf of the leg. The complexion is frequently of greenish or dirty-yellow hue. The pulse is rapid and weak. There may or may not be slight fever. The bowels may be constipated or there may be a troublesome diarrhea.

In severe cases debility and emaciation are quite marked. The mind wanders, and occasionally there is wild delirium.

*Treatment.*—This consists almost wholly in a change of diet. Give fresh vegetables, fresh milk, fresh beef, oranges, lemons, limes, or lime juice. Begin with small quantities at short intervals, and increase the allowance as rapidly as the stomach can take care of it. Pickles, onions, sauerkraut, raw potatoes, and raw cabbage are valuable articles in the make-up of a varied diet.

Chlorate of potassium dissolved in water should be used as a mouth wash, and the gums should be frequently painted with tincture of myrrh. The skin should be kept in good condition by frequent bathing. The sleeping quarters should be clean and well ventilated.

#### SORE THROAT (TONSILITIS, QUINSY).

Sore throat is a common disease. It is usually the result of exposure to wet and cold. Talking, laughing, or shouting in a damp, cold atmosphere is sometimes the cause of it. It frequently occurs in persons predisposed to rheumatism. It may accompany or be an extension from an ordinary "cold in the head." Sometimes the inflammation is limited to the mucous membrane of the pharynx and soft palate; it is then known as *pharyngitis* or *acute catarrhal sore throat*. More frequently the tonsils are affected, and the inflammation is then called *tonsilitis*. When the inflammation is more deeply seated in the tonsil and tends to suppurate or form an abscess the term *quinsy* is applied. An attack of sore throat may last from two to ten days, or longer.

Symptoms of acute sore throat are chilliness and feverishness, pain or soreness on swallowing, dryness, or a tickling or scratching sensation in the throat.

There is apt to be a stiffness and some tenderness along the side of the neck. If one or both tonsils are involved, as they usually are to a greater or less extent, the symptoms are more severe. In marked cases examination shows redness and swelling of the parts affected—swollen tonsils (tonsilitis) and white or cream-colored spots may be seen on the surface of one or both tonsils. (This form of the disease is frequently mistaken for diphtheria.) There may be high fever and great prostration.

In the severest form of tonsilitis (quinsy) the tonsils are hard



and swollen to twice or three times their natural size, and the patient is unable to swallow or to open his mouth beyond a fraction of an inch. The saliva dribbles away; if suppuration occur the tonsil gradually softens until the abscess breaks. With the discharge of the pus the severe pain is relieved and the patient rapidly recovers. If the abscess is large, and if the pus is discharged in a backward direction, there is danger from suffocation, particularly if the abscess breaks during sleep. Fortunately the abscess usually points toward the mouth, and the pus runs out.

*Treatment.*—Persons who are subject to attacks of sore throat should keep their feet clean and dry and be very careful not to catch cold. If a case develop, give a gargle of salt water or chlorate of potassium and water (saturated solution) or borax and water, or dry borax may be applied to the tonsil. Dry bicarbonate of sodium (baking soda) is highly recommended as a local application, a small quantity to be applied every hour. Apply cold water or a light ice bag to the neck, or a thick piece of flannel saturated with ice water may be placed around the neck and covered with oiled silk or oiled muslin. Small pieces of ice placed in the mouth are usually agreeable. The bowels should be kept open by means of Epsom or Rochelle salts. If the fever is high and the pulse full, give one drop of tincture of aconite in a teaspoonful of water every hour. Give a Dover's powder at night.

If the cold applications to the neck do not give relief, or if they are not agreeable to the patient, apply hot water or poultices and give hot gargles, or let the patient gargle with hot tea. If the swelling is very great, he can not gargle. If near port, send for a surgeon.

When the swelling and acute symptoms begin to subside give 5 drops of the tincture of chloride of iron with 20 drops of glycerine in a teaspoonful of water every two hours. The diet should be liquid or soft, and nourishing.

#### ERYSIPELAS (ST. ANTHONY'S FIRE).

Erysipelas is an inflammation of the skin. It usually begins with a chill, followed by a high fever. It is a frequent complication of wounds, but is more frequently developed without any apparent injury. A large majority of cases begin on the face, usually on the nose, first as a small red spot, which is soon elevated above the surrounding skin, and gradually or rapidly spreads over the face and ears, and not infrequently over the entire hairy scalp; sometimes over the neck and chest, and occasionally down the back and to other parts of the body. The skin is painful, red, hot, and swollen, and blisters frequently form. The swelling is most marked about the eyes and ears, the eyes are closed, and the patient's features are changed and distorted to such a degree that the appearance once seen

will not soon be forgotten. The disease limited to the face and scalp usually runs its course in a few days or a week, but sometimes before the face is healed red spots appear on other parts of the body, and the case may be prolonged. Abscesses beneath the skin are not uncommon.

Besides the symptoms already mentioned there are headache, loss of appetite, coated tongue, frequently vomiting, and in some cases delirium and marked depression.

The outcome is usually favorable, but in drunkards or in persons debilitated from previous diseases death is sometimes the result.

*Treatment.*—Erysipelas is only slightly contagious, under ordinary circumstances; but persons suffering from wounds or scratches of the skin are very apt to be attacked. The patient should therefore be isolated—placed in a room by himself—and his attendant should be a healthy man and free from any skin injury.

Erysipelas being a self-limited disease, it is a common saying among physicians that the majority of ordinary or moderately severe cases would get well without any treatment. But this is probably true of many other diseases, and while it may be difficult, perhaps impossible, to limit the spread of the eruption or shorten the course of the disease in a given case of erysipelas, something may be done to relieve distressing symptoms and, particularly in feeble persons, to fortify the system against the attack. "Treat the patient rather than the disease" is good advice in more troubles than one.

The oldest and one of the best local applications for erysipelas is cold water, and if the fever is very high cold sponging of the entire body or a cold bath may afford considerable relief. Subnitrate or subcarbonate of bismuth may be dusted over, or vaseline may be applied to the skin. In feeble persons stimulants are required, and for the restlessness or sleeplessness a pill of morphine sulphate,  $\frac{1}{4}$  grain (0.01 gm.), or 12 drops of laudanum may be given and repeated, if necessary, in two hours.\* The tincture of the chloride of iron has been a popular remedy for a long time, and if given in moderate doses of 10 or 12 drops in water every three hours may do a great deal of good. Epsom or Rochelle salts may be given to keep the bowels open.

#### RHEUMATISM.

There are different forms of rheumatism and some of the forms have several different names. *Acute rheumatism*, *acute articular rheumatism*, *inflammatory rheumatism*, and *rheumatic fever* are terms applied to one and the same disease. A milder form of the affection is called *subacute rheumatism*. In this form the symptoms are less severe, but the disease is more prolonged. It may continue for a long time and become chronic. *Chronic rheumatism*, however, or the different affections and deformities of joints to which this



term is frequently applied may develop independently of any acute or subacute attack.

The term *muscular rheumatism* indicates an affection of the muscles as distinguished from joint affections. Lumbago and stiff neck are varieties of muscular rheumatism. The muscles, however, to a greater or less extent may be involved in any form of rheumatism.

Other conditions simulating rheumatism, occurring in connection with, or directly due to gonorrhoea, or to syphilis, are called gonorrhoeal rheumatism or syphilitic rheumatism, as the case may be.

*Acute rheumatism* (rheumatic fever) is a comparatively common disease in all climates within the temperate zone. It occurs chiefly during the winter and spring. Exposure to a cold, damp atmosphere is the most frequent exciting cause in persons predisposed to the disease.

It may or may not begin with a chill or with a sore throat. The larger joints are usually affected. Swelling, heat, redness, tenderness; and pain are the chief symptoms. The inflammation is apt to shift from one joint to another. The pain and fever are usually increased in proportion to the number of joints involved. The majority of cases are attended with profuse perspirations, scanty, highly acid urine, coated tongue, and constipation. The heart is frequently involved.

*Treatment.*—Wrap the joint in cotton or flannel; keep them very quiet—the slightest movement aggravates the pain. Flannel wrung out of hot water and applied to the joint sometimes affords relief. Chloroform liniment may be applied if the pain is severe, or cold applications may be applied if agreeable to the patient.

Place the patient in a good bed, between blankets, and let him wear flannel next to his skin. Change the flannel frequently and bathe the body with tepid water.

For internal medication give salicylate of sodium in doses of 10 to 15 grains (0.6 gm. to 1 gm.) every two hours until about eight doses are taken or the pain is relieved, then give it in smaller doses of from 3 to 5 grains (0.2 gm. to 0.3 gm.) every six hours. Dover's powder may be given at night to control pain and restlessness. Patient may be allowed to drink lemonade or pure water to satisfy his thirst.

The food should be soft and nourishing and given every three hours. Epsom or Rochelle salts should be given to keep the bowels open. The patient should be kept in bed for a few days after the symptoms have subsided. The duration of the disease is very uncertain. The acute symptoms may subside in a few days and the patient may be up and about in a week or ten days, but relapses are common and the acute may pass into the subacute or chronic form.

In *chronic rheumatism* there is stiffness and pain. A cracking or

grating sound is frequently produced when the joints are suddenly moved. In severe cases the joints become enlarged and distorted. The deformity is sometimes very great.

The treatment consists chiefly in local application of liniments, etc., which afford relief because of the rubbing (massage) by which they are applied. Severe pain in the joint may be relieved by cold applications (flannel wrung out of iced water, applied to the joint and covered with oiled silk or oiled muslin). Hot applications to the joints are sometimes of value.

Five to eight grains (0.3 gm. to 0.5 gm.) of iodide of potassium in a teaspoonful of sirup of sarsaparilla and a little water, or in water alone, may be given three times a day after meals.

The general health should be looked after. The skin should be kept in good condition by frequent baths of tepid water. The bowels should be moved at least once a day. Patient should be allowed good food. Fresh air is also important.

In *muscular rheumatism* the muscles most frequently affected are those of the back (lumbago), side of neck (stiff neck or wry neck), and side of chest (pleurodynia). Exposure to cold, sudden cooling of the body—especially after active exercise, and sitting in a draft of air—are the chief causes, or exciting causes.

As a rule there are no symptoms other than the stiffness and pain on motion. The muscles may be slightly swollen, and very sensitive. Sometimes the attacks come on suddenly and apparently without cause, or following a slight twist or strain, as a “kink in the back,” or patient may wake up in the morning with a stiff neck.

*Treatment.*—In acute cases salicylate soda may be given in 5 or 10-grain doses (0.3 gm. to 0.6 gm.) every three hours until four or six doses are taken. Apply hot applications, dry heat, hot-water bag, or a hot poultice locally, or the heat may be applied by a flat-iron, over folds of flannel or a piece of blanket, and the rheumatism “ironed out.” Later apply liniment with friction (massage). Keep the affected muscles at rest. If the muscles of the chest are affected, apply strips of adhesive plaster, the same as for fractured rib. Acute attacks are of short duration, but relapses are not uncommon, and chronic forms are frequently met with. Good food, fresh air, and attention to the general health are especially important in the treatment of chronic muscular rheumatism.

*Gonorrhœal rheumatism* (gonorrhœal inflammation of joints) may occur during an acute attack or gonorrhœa, but it is more frequently associated with chronic gonorrhœa or gleet. One or several joints may be affected. There may or may not be considerable fever. If only one joint is affected it is apt to be the knee or the ankle. In chronic cases the pain is sometimes centered in the heel. The attack may begin in the wrist, elbow, or shoulder. The disease is not always



limited to the joints. Sometimes the inflammation is in the tissues outside the joint proper, in the sheaths of the tendons of muscles, or in the fascia of the soles of the feet. The swelling is frequently quite marked. In chronic cases there may be effusion ("water on the joint"). In very severe cases suppuration occurs (abscess forms). The eye and the heart may also be seriously involved.

*Treatment* is not very satisfactory. Give a teaspoonful of elixir of iron, quinine, and strychnine three times a day before meals, and from 5 to 10 grains (0.3 gm. to 0.6 gm.) iodide of potassium in a little water or in a teaspoonful of sirup sarsaparilla after meals. Keep the joint at rest. Apply a flannel bandage. Change it frequently and wash the joint with hot water and soap. In chronic cases liniments and passive motion should be applied. Tincture of iodine may be painted over the joint.

*Syphilitic rheumatism*, so called, is associated with secondary or tertiary syphilis. The joints, and the shafts of long bones may be affected—thickened and painful. The pain is always worse at night, but this is true to a less degree of pain from any cause.

The *treatment* is by iodide of potassium, beginning with 10 grains (0.66 gm.) of iodide of potassium three times a day after meals and gradually increasing the dose. Ten drops of the tincture of the chloride of iron with a grain (0.1 gm.) of quinine in a wineglassful of water may be given before meals. Good food and attention to the bowels are important.

#### DELIRIUM TREMENS.

Delirium tremens occurs as an incident in the life of persons addicted to the excessive use, or rather to the abuse, of intoxicating liquors.

Loss of appetite, sleeplessness, or a marked mental depression are the chief symptoms of the first stage of the affection which is known among drunkards as "the horrors."

As the disease advances the patient talks incoherently, has a wild expression, his mind wanders from one thing to another, he answers questions in a rambling manner, he fancies he is being pursued by wild animals, or that he sees rats, snakes, and other animals crawling on the walls or around his bed. Or he may imagine himself to be engaged in his regular duties, or as master of the ship, giving directions to the men.

The delirium is always worse at night, but the patient requires careful watching all the time. He may try to jump overboard and commit suicide.

Delirium tremens may be confounded with acute inflammation of the brain, or with acute mania (insanity), or with certain forms of

pneumonia, and any one of these diseases may also be present. Pneumonia is a frequent complication of delirium tremens, and in fatal cases may be the direct cause of death.

In favorable cases the symptoms begin to improve in three or four days from the onset, the patient sleeps and gradually recovers.

*Treatment.*—The patient requires constant attendance. Physical restraints should be avoided if possible. To support the patient and to procure sleep are the great objects of treatment. Careful feeding is very important. Milk or concentrated broths should be given at regular intervals of two hours. A cold bath is of value in some cases, especially if agreeable to the patient. In other cases a warm bath or a hot footbath may have a better effect. The continuation of alcoholic stimulants in small or moderate quantities may be advisable in some cases. A few drops of tincture of capsicum or tincture of ginger may be given in water or in a little whisky and water every two or three hours.

The serious symptoms are largely, if not entirely, due to the sleeplessness, and if several hours of sound sleep can be procured improvement is almost sure to follow. To this end bromide of potassium in 30-grain (2 gm.) doses may be given in water every three hours. morphia or opium are not to be recommended in this disease except under the immediate direction of a physician.

#### SYPHILIS.

Syphilis is a constitutional disease. It is contagious, or communicable, and is usually acquired during sexual contact. It may, however, be contracted in many different ways, direct and indirect. It begins by a primary lesion or sore called a *chancre* at the seat of inoculation (where the virus enters), and is followed by eruptions of the skin of different forms and different degrees of severity and variable duration. Sores also appear at the angle of the mouth, and *mucous patches* develop on the lips, tongue, inner sides of the cheeks, and sore throat is very common.

*Mucous patches* or *syphilitic warts* are also frequently seen about the anus or in any region where the skin is moist. The hair frequently falls out, the eyes are sometimes seriously involved, and sooner or later every organ in the body may become affected. A man suffering from syphilis in active form should not be allowed to go on board a ship, and if the disease breaks out while on the voyage he should be isolated, or at least be compelled to use separate drinking cups, knives, spoons, forks, towels, etc. He should under no circumstances smoke the pipe belonging to another man nor allow another man to smoke his pipe. All his belongings should be kept strictly to himself, for unless the greatest care is taken other men of the crew

will suffer. Chancre of the lip may be acquired by smoking the pipe of a syphilitic.

The primary or initial lesion of syphilis (the hard chancre) usually appears about three weeks after exposure, but may be as early as ten or twelve days or as late as five or six weeks. It begins as a red spot, or papule, which usually breaks and forms a small ulcer with hard edges; sometimes the sore appears as a simple excoriation or superficial ulcer without hard edges. The neighboring lymph glands become, in the course of a week or two, enlarged and hard. They seldom suppurate. About a month or six weeks later the skin eruption and other secondary symptoms begin. The lymph glands above the elbow, along the side and back of neck, and all over the body are usually enlarged. Patient frequently complains of headache and pain in the limbs, always worse at night, and may have slight, occasionally considerable fever.

*Treatment.*—For the primary sore bathe the part with soap and water, and dust calomel or bismuth, or oxide of zinc, or a mixture of these remedies over the sore twice a day; or instead of the powder “black wash” may be applied, or in some cases, if there is much irritation or suppuration, iodoform may have a better effect.

If secondary symptoms, eruptions of skin, etc., appear, give a pill of protiodide (green iodide) of mercury,  $\frac{1}{4}$  grain (0.01 gm.), three times a day. The mouth and teeth should be kept clean by means of a soft toothbrush and castile soap and water, or water to which a small quantity of bicarbonate of soda (baking soda) or tincture of myrrh has been added. If mucous patches appear in the mouth smoking must not be allowed. As soon as the ship arrives in port send or take the man to the Marine-Hospital office and receive the advice of a surgeon as to further treatment.

#### SOFT CHANCRE (CHANCROID).

Soft chancre or chancroid is a virulent ulcer. It usually begins within twenty-four or thirty-six hours after exposure, first as a red spot, but rapidly developing into an ulcer covered with thick yellowish pus. The period of development is about three or four days. Sometimes a week elapses from the time of exposure to the development of the sore, and occasionally a period of incubation is as long as ten days. A sore appearing within a few days, or a week, or even as late as ten days after the exposure is usually regarded as a chancroid. But in practice this is not a safe rule, for the reason that many venereal sores are of a mixed character. A hard or syphilitic chancre contracted two or three weeks ago, makes its appearance to-day. A soft chancre or chancroid contracted two or three days ago, makes its appearance to-day. The inoculations of both poisons



take place at the one and same spot, the result is a mixed chancre; or if two sores appear the origin of one may be syphilitic, the other chancroidal. It is therefore difficult, if not impossible, in many cases to determine the character of the disease from the period of incubation or from the appearance or local characteristics of the chancre. A mixed chancre is a syphilitic chancre (a hard chancre), while its appearance may be precisely like that of the soft chancre or chancroid. The only safe plan is to regard all venereal sores as suspicious. But while this is true, treatment for syphilis should not be commenced before the appearance of secondary symptoms, for unless such symptoms appear it is impossible to determine that syphilis really exists in any case. The *mixed chancre*, as already stated, is essentially a syphilitic chancre, and the beginning of constitutional disease. Its local effects, however, may be precisely the same as those of soft chancre or chancroid. The ulcer (or ulcers—sometimes there are two or more) may remain as small as a pea or grow as large as a quarter, and if it become phagedenic (eating) may spread over a large portion of the surface of the body. It is also proper to state that a *secondary* syphilitic sore may appear under the foreskin, as well as at any other place on the body, and that cancer (epithelioma) of the organ may begin as a small ulcer. The latter, however, is a rare disease as compared with the different varieties of chancre, the vast majority of which are of venereal origin.

The most frequent complication of soft chancre or chancroid is inflammation of the lymph glands of the groin (bubo), known to the sailor as "blue balls." Another troublesome and serious complication is the elongation and contraction of the orifice of the foreskin (phimosis), on the inner surface of which the sores may be located, and the swelling and tension may be so great as to produce gangrene (mortification). If the foreskin is very tight and pulled back and can not be brought forward again the condition is known as paraphimosis, which produces great swelling, the same as if a string were tied around the organ, frequently resulting in severe ulceration and destruction of tissue. This condition may also be the result if the inflammation and swelling are marked and the foreskin is very tight.

*Treatment.*—The best treatment for soft chancres or chancroids is cauterization with nitric acid. The parts should be first thoroughly washed with soap and water, and dried. The nitric acid should then be carefully applied to the sore by means of a thin glass rod, taking care to prevent the acid from running over the surrounding tissues, or if it does run over, then to immediately soak it up by means of a piece of blotting paper. If the sore is first touched with carbolic acid the application of the nitric acid will be less painful,

and the carbolic acid alone is probably, next to nitric acid, the best local remedy.

If a glass rod is not at hand, a wooden toothpick or thin stick may be wrapped with a bit of absorbent cotton and then dipped into the acid and applied to the sore. When the cauterization is complete every part of the sore and a narrow border around it will be white. If one application is not sufficient another should be tried. The sore should then be dried and covered with a small piece of gauze or absorbent cotton, and later a dusting powder of calomel or iodoform or bismuth may be applied. If the sore extend into the opening of the urethra (the meatus) iodoform had better be applied in place of the acid, for if the acid should run into the urethra it might result in great harm.

If phimosis exist the cavity of the foreskin should be syringed out with hot water, and if there are sores under the foreskin which can not be reached by the acid the cavity should be syringed with a solution of one part of carbolic acid to forty parts of water (1 to 40), or with a solution of one part of bichloride of mercury (corrosive sublimate) to three thousand parts of water (1 to 3,000). Soft chancres or chancroids appearing at the anus or rectum should be treated by frequent washings of warm water and the application of iodoform. The strong acids must not be applied to this region.

In all cases, wherever the sore is located, cleanliness must be insisted upon, and, as already stated, in nearly all inflammations of whatsoever character, hot water alone is a valuable remedy; and rest in bed is of equal importance. If a lump (bubo) appear in the groin, rest in bed is of the greatest importance. The diet should be light but nourishing. Tincture of iodine, pure or diluted one-half with alcohol, may be painted over the lump, but it is not of much value. Rest is the important thing. If the bubo go on to suppuration, it should be carefully opened with the point of a knife, and kept open by a strand of aseptic gauze, which must be frequently changed, and enough gauze should be placed on top of the wound to absorb the discharges. The soiled gauze should be burned, and the person handling it must be careful to wash his hands in soap and water and in one of the anti-septic solutions already referred to. The patient's bowels should be moved once a day, and eight drops of the tincture of chloride of iron in water should be given three times a day, and as soon as the vessel arrives in port he should be sent to the Marine-Hospital surgeon.

#### GONORRHEA (CLAP).

Gonorrhœa is a specific inflammation of the urethra due to a micro-organism, called gonococcus. It usually begins during the first week after exposure, sometimes as early as three or four days and occasionally as late as ten days or two weeks. The first symptoms are a

tickling or itching sensation and a slight swelling about the lips of the orifice of the urethra. A purulent creamy colored discharge soon appears, and a burning or stinging pain attends the passage of urine. The inflammation gradually extends to the deeper parts of the urethra, and, unless checked by medication, reaches its height about the end of the second or during the third week. The patient may experience great difficulty in passing water. If the inflammation run very high, abscesses may form in the tissues around the urethra, and swelled testicle and bubo are frequent complications; also painful erections and bending of the organ (chordee). Phimosis, or paraphimosis occurs if the foreskin is tight or becomes involved in the inflammation.

If phimosis occur and if the cavity of the foreskin is not thoroughly and frequently washed out, "venereal warts" are apt to form.

True gonorrhœa, if carefully treated, gradually subsides and recovery may take place in from three to four weeks. A urethral discharge that recovers in a few days or a week is probably a *simple urethritis*.

Gonorrhœa is urethritis (inflammation of the urethra), but urethritis is not necessarily gonorrhœa.

*Treatment.*—Rest in bed, light diet, plenty of water to drink, preferably vichy or apollinaris, regularity in eating and sleeping. Keep the bowels open by taking a moderate dose of Epsom or Rochelle salts in the morning. Avoid strong coffee and tea, all stimulants, and greasy articles of food. Keep the body and mind at rest. Bathe frequently in hot water. Be very careful not to convey any of the pus from the urethra to the eyes. (Gonorrhœal inflammation of the eyes is a very serious disease, which not infrequently results in total blindness and loss of the eyes.)

Give 10 grains (0.6 gm.) of citrate of potash in water three times a day, also 10 or 15 drops of oil of sandalwood three times a day. The sandalwood oil may be given in capsules or dropped on a lump of sugar. If much pain in the back or over the region of the kidneys follow the use of the sandalwood, it must be discontinued for a time or the dose lessened. Later in the disease, about the end of the second week, a mixture of balsam copaiba may be given in one or two teaspoonful doses three times a day in place of the sandalwood, or the copaiba may be given in doses of 5 or 7 drops in capsules.

If the chordee is troublesome, apply cloths wrung out of cold water and give a tablet of codeine, one-sixth grain (0.01 gm.), three times a day.

When the acute symptoms of the disease have subsided use an injection of sulphate of zinc, 2 or 3 grains (0.12 gm. to 0.2 gm.) to an ounce (30 c. c.) of water, or 1 grain of argonin (0.06 gm.) to an ounce (30 c. c.) of water, three times a day.



A snug suspensory bandage worn from the beginning may prevent the complication of swelled testicles. If the patient is lying in bed, the dragging of the testicles should be prevented by placing them on a support. The best local remedy for swelled testicles is heat, which may be applied by pieces of cloth or flannel wrung out of hot water or by means of hot flaxseed poultices, frequently renewed. The flaxseed meal should be thoroughly moistened with hot water and placed between two layers of cheesecloth or other thin material. It should then be put around the scrotum and covered with cotton. Oiled silk or oiled muslin should be placed over the cotton to retain the heat.

#### STRICTURE OF THE URETHRA.

True or organic stricture of the urethra is a narrowing of the tube. It is commonly the result of long-continued or neglected gonorrhœa. Stricture of the urethra may be produced by direct injuries, as kicks or falls on the perineum, or by the use of too strong injections, or by the careless passage of instruments.

Occasionally stricture results from simple urethritis, not gonorrhœal, and symptoms not unlike those of stricture are sometimes caused by a stone in the bladder obstructing the passage, and by an enlarged prostate gland.

Gonorrhœal stricture of the urethra is usually of slow development. It may be several months or years after the attack of gonorrhœa before the patient becomes conscious of any change in the size or shape of the stream. First there may be only a twisting or flattening of the stream. In severe cases it gradually becomes smaller and smaller, until it is no larger than a knitting needle and passed with great difficulty, or it comes away drop by drop, and finally results in complete retention. One of the earliest symptoms of stricture is a gleet discharge from the urethra—"gleet means a stricture."

Occasionally retention of urine is the first symptom of the disease.

Sudden retention may be due to spasm of the urethra (spasmodic stricture).

Spasmodic stricture may occur independently of any specific disease of the urethra, but it is more frequently a complication of organic stricture. Exposure to cold and wet (catching cold), or a debauch, are the usual exciting causes.

When retention occurs the bladder gradually becomes distended and a fullness or distinct tumor may be felt in the lower part of the abdomen, which in severe cases may extend as high as the navel. Sometimes there is an involuntary flow, or an overflow of urine from a distended bladder—patient says he can not hold his water, and in such case it may be difficult to convince him that he is suffering from retention, until a catheter is passed and a quantity of urine is withdrawn.

*Treatment.*—A neglected stricture of the urethra is a serious disease, the treatment of which is very difficult in many cases, even in the hands of the most experienced surgeon.

The attention of the ship's captain is rarely called to a case until there is an actual stoppage or retention of urine, and unless this

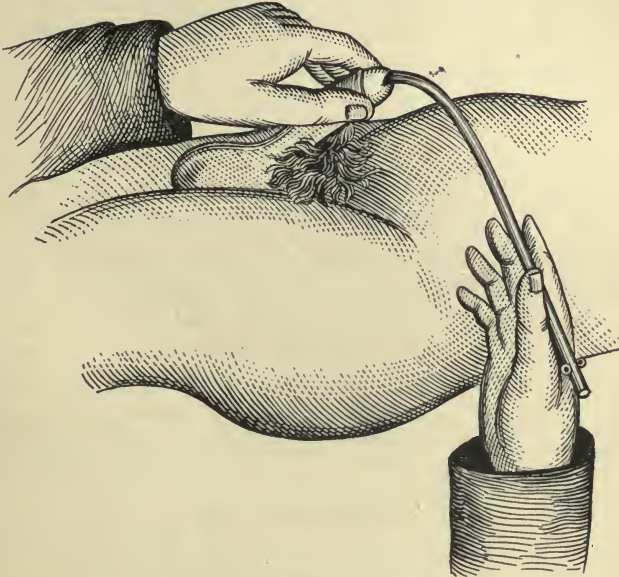


FIG. 1.—How to use catheter.

condition is relieved the consequences are extremely serious and death may be the result.

Place the patient on his back with his knees slightly drawn up, and try to pass a catheter. The instrument should first be thoroughly cleansed by placing it in boiling water. It should then be oiled with

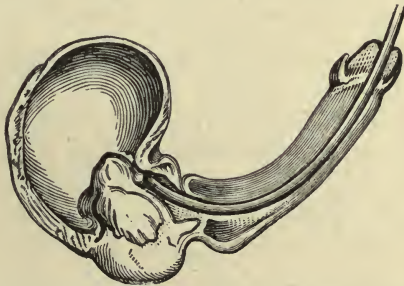


FIG. 2.—Shows the curve of the channel through which the catheter must pass.

olive oil, and carefully passed into the urethra and effort made with the greatest gentleness to pass into the bladder. (Figs. 1 and 2.)

It is a good plan to have several sizes of catheters ready at the same time, and to try the largest one (about a No. 9 English) first; if this

fail, try the smaller ones. If a catheter can not be passed at the first trial, place the patient in a hot bath, give him a Dover's powder, and an hour or two later try the catheter again. If it is not practicable to place the patient in a full bath of hot water, then cover his belly and other parts of his body with flannels wrung out of hot water and change them every fifteen minutes. The object of the hot bath and the Dover's powder is to produce relaxation. Sometimes a patient will pass his water in the bath. If, however, the symptoms are very urgent, if the patient can not pass any water, and after the most careful and gentle manipulation the catheter can not be passed into the bladder, there is but one thing left to be done, and that is to puncture the bladder immediately above the bone (the pubes) at the lower part of the belly. This is done by means of a curved trocar and cannula. A very small incision through the skin (about half an inch long) is first made by a knife, the trocar and cannula are then thrust downward and backward into the bladder. The trocar is then withdrawn and the cannula is secured in place, a soft catheter is passed through it, and in this way the bladder is emptied. The cannula may be kept in place, if necessary, for several days. Before beginning this operation the belly should be carefully washed and scrubbed with soap and water and then with alcohol, the instruments should be boiled, and the operator's hands should be thoroughly cleansed.

If possible to obtain the services of a surgeon in reasonable time, this operation should not be attempted by the captain.

#### ITCH (SCABIES).

This trouble is produced by an insect which burrows into the skin, particularly between the fingers and between the toes, but also at other situations where the skin is most delicate.

Careful examination will show small vesicles on the skin, but most of the eruption is due to the scratching. The itching is always worse at night. The disease is spread by personal contact or by clothing.

*Treatment.*—Sulphur ointment is the remedy. Bathe or scrub the body thoroughly with soap and water, dry the skin, and then apply the ointment. Repeat the process once a day, preferably in the evening, just before turning in, bathing with soap and water each time before applying the ointment.

#### BOILS.

A boil is a circumscribed inflammation of the skin and connective tissue. It is often caused by infection following a slight wound or scratch of the skin, but may occur apparently without any cause. It begins as a small red pimple, and gradually increases in size and forms a dusky red swelling, the size of a silver dollar or less. The central portion of the swelling sloughs, or forms a "core," and as



soon as the core is separated or cast off, the inflammation subsides, the pain lessens, and the ulcer begins to heal.

*Treatment.*—Hot applications—ground flaxseed poultice frequently renewed, until the central portion of the boil is softened, then the separation of the core may be aided by an incision. The incision should be made by a thin blade, thoroughly boiled before it is used. After the core is discharged the ulcer should be dressed with aseptic gauze, held in place by a bandage.

#### PILES.

Piles are varicose dilatations of the veins of the rectum. The symptoms may be slight or severe. Inflamed piles are very painful. There is a constant burning sensation at the anus, which is greatly increased during and immediately after each movement of the bowels. When the veins rupture you have “bleeding piles.” Occasionally the inflammation of a nodule results in an abscess.

*Treatment.*—Piles are frequently due to habitual constipation, and when that condition is improved the piles often disappear, or at least cease to be troublesome. The bowels should be kept in good condition. One easy movement should take place regularly every day. This desirable habit should be brought about by careful attention to diet and by drinking water in the morning before breakfast, rather than by the use of cathartics.

In acute attacks, if the bowels are constipated give a full dose of salts; put the patient on light, soft diet. Apply ice to the anus or inject cold water into the rectum. A hot application or poultice is sometimes very grateful. If the piles protrude, especially if they become strangulated, they should be pushed back with the finger; oil or vaseline may be applied. If the piles are large and persistently painful, see a surgeon and have them removed by operation, which is the only sure cure.

#### INJURIES—HEMORRHAGE (BLEEDING).

In all cases of injury careful examination should be made of the part, after carefully washing the hands.

Hemorrhage is of three kinds—arterial, venous, capillary.

Arterial (bright-red blood from arteries in jets or spurts).

Venous (dark-red or purple blood welling out or flowing from veins in steady stream).

Capillary (blood oozing from the capillaries over the general surface of a wound).

If the bleeding is by jets or spurts, pressure should immediately be made above the wound by the thumb or finger, or better by tying rubber tubing around the limb, or, in the absence of such a tube, a

bandage, handkerchief, suspender, strap, or soft rope may be used to stop or lessen the flow of blood; the blood vessel should then be seized and drawn gently forward with a pair of artery forceps and the ends tied with catgut or silk in a reef knot, when the tubing or strap should be loosened or removed.

If the blood vessel is torn but not completely divided, tie a ligature around the vessel on each side of the wound.

Straps or bandages applied to control or lessen the danger of hemorrhage must always be placed above the wound—that is to say, between the bleeding point and the heart. In wounds of the foot, for example, if the arteries spurt, pressure should be made in the hollow back of the knee. If the blood is flowing slowly or oozing and does not come by jets or spurts, gauze or lint wrung out of hot water should be applied and firmly bandaged over the wound, or hot water may be poured over the wound before applying the gauze or lint. In any case it is well to cleanse the wound with hot water. The oozing may also be stopped by exposing the wound to fresh air and by allowing a stream of cold water to fall upon it, and then applying pressure.

Before beginning the treatment of any wound or any bleeding point, the operator must carefully cleanse his hands and arms, also the wound and surrounding parts, and the instruments and silk ligature should be boiled as will be described under the head of wounds.

In the after treatment of severe bleeding the patient should be kept perfectly quiet in mind and body, his head should be lowered by raising the foot end of his bed or bunk. Give him plenty of fresh air, but keep his body warm and give him hot drinks. After reaction the temperature of the body may rise a degree or two above normal, but if this should continue longer than two or, at most, three days, the dressing should be removed and the wound thoroughly irrigated, first with hot water then with a solution of bichloride of mercury (1 to 5,000), and dressed with aseptic gauze.

#### WOUNDS.

Incised wounds inflicted by sharp cutting instruments may, after the bleeding has been stopped, be drawn together with the fingers or with a needle and thread, a thin layer of absorbent cotton applied over the wound and then saturated with collodion. Strips of adhesive plaster may be used *over* the dressing. The parts should be thoroughly cleansed, first by scrubbing with hot water and soap—the skin to be shaved if hairy—then washed with alcohol, and then again with hot water before the edges are drawn together. The needle and silk thread and all instruments should be boiled before they are used. The operator must roll up his sleeves, scrub his hands and arms with hot water and soap, clean and trim his finger nails, scrub again with

soap and water, then with alcohol, and finally soak his hands in a solution of bichloride of mercury (1 to 1,000) before beginning the operation. The wound, if deep, should not be completely closed, one end should be left open for drainage, unless the patient is under the direct care and treatment of a surgeon.

Contused and lacerated wounds with torn and ragged edges, especially if the surrounding parts are bruised or crushed, should not be drawn tightly together. The bleeding from lacerated wounds at the time of the accident is not so profuse as in incised wounds, but the shock is greater, and very troublesome and serious hemorrhage may come on within a few hours or later. To guard against this the wound should be carefully examined (the operator's hands and all instruments to be first prepared as above described), and if any blood vessels have been torn they should be tied with silk ligatures, though they may not be bleeding at the time. Sweet oil should then be rubbed over the surface and the edges of the wound and adjacent skin, and this in turn scrubbed off with soap and warm water, and then with alcohol, and finally with a solution of bichloride of mercury (1 to 5,000). Thick layers of clean (sterile) gauze dressing should then be applied and held in place by means of a bandage. If the wound is large, the edges of a portion of it may be carefully drawn together. A strand of gauze should then be placed in the bottom of the wound and allowed to project through the opening to the surface, so that it may drain into the layers of gauze placed on top.

When dressings become soaked with the discharges they do more harm than good; they must, therefore, be changed as soon as the soaking is apparent, and the change must be made with all the aseptic precautions exercised in the operation. Clean hands, clean instruments, clean dressings, clean everything, are the watchwords. Water that has been boiled is perfectly safe, and boiling is the best disinfectant for instruments.

The stitches may be removed from a wound about the fifth or sixth day, or earlier if they begin to cut or irritate. If the wound is large they need not all be taken out at the same time.

Gunshot wounds are frequently more or less contused and lacerated, and unless one of the main blood vessels is divided, or the lung or other internal organ penetrated, the bleeding is slight. The general treatment for such wounds is about the same as for other lacerated wounds already described, but if the materials for thoroughly cleansing the wound are not readily at hand, and if there is not much bleeding, the wound had better be let alone, simply covering it with antiseptic gauze until the patient can be placed under the care of a surgeon. No effort should be made by the master to find or feel the bullet or other missile by a probe or other instrument, especially if the wound is in the chest or abdomen, as there is more



danger in searching for it than in leaving it where it may be lodged. The wound made by a Mauser bullet not infrequently looks as if made by a large needle—a punctured wound.

Punctured wounds are made by a narrow sharp-pointed instrument, e. g., pin, needle, dagger, or point of a knife or stiletto. They may penetrate to any depth, and if the instruments are clean and no large blood vessels or nerves have been wounded, withdrawal of the instrument may be followed by rapid recovery. But if such wounds are produced by irregularly shaped blunt instruments, or by nails or splinters of wood, and especially if contaminated by any poisonous material, the walls of the wound track are at once dangerously contused, lacerated, and infected, and if large blood vessels, nerves, or other organs have been injured the danger is very great, and the patient should be placed under the care of a surgeon as soon as possible, for unless the master is sufficiently familiar with the nature of such wounds and the anatomy of the part to lay it open to the bottom by additional incisions, he can do little more than apply antiseptic dressings to the surface, and keep the patient quiet.

#### BURNS OR SCALDS.

Burns or scalds are serious, and dangerous to life in proportion to the extent and depth of the injury. A burn covering a large area and producing mere reddening and swelling of the skin is as serious as a burn one-half the size in which the skin is destroyed. The danger is from shock; from fever following reaction; from hemorrhage following sloughing, and from congestion and inflammation of internal organs. Burns of slight extent or moderate degree are not so dangerous, and most of the cases commonly met with will recover. But all cases require careful treatment.

*Treatment.*—For shock give whisky or brandy. In slight or moderate burns or sunburn apply clean cloths wet with warm saturated solution of bicarbonate of soda (baking soda). In severe burns, cut away the clothing, avoid exposure to cold, wash the part with warm saturated solution of bicarbonate of soda, or with solutions of borax or boric acid. The parts burned or the entire body, except the head, may be kept immersed in tepid or warm water for days. Prick the blister with a clean (aseptic) needle, but do not remove the cuticle. Sprinkle with dry bicarbonate of soda or with powdered borax and dress the part with thick layers of clean (aseptic) cotton. (Cotton may be rendered aseptic by heating it in an oven to a point just short of burning.) The dressing should be changed only when absolutely necessary. Keep the patient quiet and his bowels active. Pain or restlessness may be relieved by morphine sulphate,  $\frac{1}{8}$  grain (0.01 gm.), repeated in two hours if necessary. Carron oil (equal parts of linseed oil and lime water) is an old remedy that affords

considerable relief if applied to the surface. Vaseline is also sometimes used. The scars resulting from burns and scalds always contract, and in severe cases terrible deformities are produced. These may be prevented to some extent by active and passive motion and by splints.

EFFECTS OF COLD—FROSTBITE.

Severe cold depresses the action of the heart—suspends the circulation. These effects are first noticed in the ears, nose, fingers, and toes. Numbness and tingling are the first symptoms, then loss of sensation. If not too long exposed, the circulation may be restored by proper treatment. But if the exposure is long continued, or if the cold is very intense, the parts are hopelessly frozen and gangrene will be the result. The parts may look all right for a few days after reaction, and then become discolored, bluish, and finally black. Another effect of extreme cold is an overpowering sense of drowsiness, but to lie down under such circumstances and go to sleep is almost certain death.

*Treatment of frostbites, as recommended by the Surgeon-General.*—1. Do not bring the patient to the fire, nor bathe the parts in warm water.

2. If snow be on the ground, or accessible, take a woollen cloth in the hand, place a handful of snow upon it, and gently rub the frozen part until the natural color is restored. In case snow is not at hand, bathe the part gently with a woollen cloth in the coldest *fresh* water obtainable—ice water if practicable.

3. In case the frostbite is old and the skin has turned black or begun to scale off, do not attempt to restore its vitality by friction, but apply carron oil on a little cotton; after which wrap the part loosely in flannel.

4. In all cases, as soon as the vitality has been restored, apply the carron oil, prepared according to Service formula. As it contains opium, do not administer morphia or other opiate.

5. In the case of a person apparently dead from exposure to cold, friction should be applied to the body and the lower extremities, and artificial respiration practiced as in cases of the apparently drowned. As soon as the circulation appears to be restored, administer spirits and water at intervals of fifteen or twenty minutes until the flesh feels natural. Even if no signs of life appear, friction should be kept up for a long period, as instances are on record of recovery after several hours of suspended animation.

*Carron oil*—(Service formula) :

Olive oil or linseed oil (raw).

Linewater, of each 12 parts.

Tincture of opium, 1 part.

Mix.

## SCALP WOUNDS.

*Treatment.*—Examine the parts carefully; clip and shave the hair from a wide area about the wound; wash with warm water; draw the edges of wound together with the fingers and apply absorbent cotton and collodion. Stitches of silkworm gut, silver wire, or catgut may be used. The stitches must not be drawn tightly, the edges simply brought together. Bleeding is often severe, but usually stops under pressure or after the stitches have been put in and the dressing applied. But if an artery spurts it must first be tied. A few strands of silkworm gut may be put in at the most dependent part of the wound for drainage, but this is not usually necessary. No part of the scalp should be removed, no matter how slender its attachment. If replaced it will probably retain its vitality. Dress the wound with a pad of clean (aseptic) gauze and apply a bandage, not tightly.

The stitches, if of silkworm gut or wire, should be removed the fourth or fifth day. Unconsciousness and bleeding from the ears are grave symptoms, indicating fracture of base of skull or rupture of blood vessels within.

## WOUNDS OF THE FACE.

*Treatment.*—Wounds of the face may be treated in the same manner as wounds of the scalp, using fine silkworm gut or catgut for sutures, but greater care must be exercised in introducing the stitches, and the edges should be brought into accurate apposition. The stitches should be removed on the third day, and narrow strips of adhesive plaster applied over a light dressing placed next the wound, as adhesive plaster should never come in direct contact with the edges of a wound; and if the wound is small, adhesive strips or cotton and collodion may answer the purpose from the beginning, without stitches.

## INJURIES TO THE CHEST.

Contusions of the chest and fracture of the ribs are of frequent occurrence, and it is not always easy to determine in a given case of injury to the chest walls whether fracture actually exists, but if in doubt, give the patient the benefit, and treat the case as one of fracture.

Fracture involving several ribs, or one or more ribs at two points each, is not difficult to make out, for in addition to the sharp pain in breathing, and the bloody expectoration which is present in cases where the lung is wounded, there is considerable deformity.

In single fracture of the ribs there is little or no deformity, but the pain in breathing and coughing is apt to be severe. Pressure on the broken bone is also quite painful, and if a hand is placed over the seat of injury, or a finger on either side of the fracture, and



the patient requested to cough, a grating may be felt, unless the rib is covered with heavy muscle or fat, when, as before stated, it may be difficult if not impossible to say whether or not fracture exists.

*Treatment.*—Strips of adhesive plaster, 3 or 4 inches wide, and long enough to extend from the spine to the middle or a little beyond the middle of the breastbone, should be applied horizontally from the armpits downward over the whole side of the chest. Each piece to be forcibly applied at the end of expiration (when the lungs are empty) and to overlap the preceding piece to one-half its width. Any slight outward deformity at the seat of fracture may be reduced by pressure before the plaster is applied at that point. A broad bandage should then be applied around the chest from below upward.

#### INJURIES TO THE BACK.

Sprains of the spine are of all degrees of severity. In slight sprains the muscles alone are involved, and beyond a temporary stiffness, and pain over a limited area, there may be no trouble.

In severe sprains it is difficult to determine the degree of injury. Marked pain and stiffness are always present, and not infrequently paralysis of the legs, bowels, and bladder. Death may be produced by shock, or occur later from secondary effects of the injury.

*Treatment.*—Rest in bed. Epsom salts to move the bowels; rub the back with soap liniment. Apply a binder or bandage around the body from the hips up over the chest. Give Dover's powder for pain and restlessness, and repeat the same if necessary in two or three hours. See that the bladder does not become distended. If necessary introduce a catheter and draw off the urine.

#### BROKEN BONES (FRACTURES).

There are many varieties of fracture. A fracture is said to be *simple* where there is no open wound directly over the bone injury; *compound* when there is an opening in the skin and soft parts extending down to the broken bone; *comminuted* when the bone is broken in several places; *complicated* when associated with other injuries, as dislocation of the joint or rupture of the main artery of the limb; *impacted* when one fragment is driven into another.

The reliable signs or symptoms of simple fracture are deformity, crepitus (grating) when the ends of the broken bone are rubbed together, unnatural or false point of motion, and, if in the shaft of a long bone, shortening, due to the fact that in most cases the break is obliquely across the bone and the fragments override. But in transverse fracture, where the break is straight across the bone at a right angle with the long axis of the bone, or in a fracture near a joint, there may be no shortening and no deformity. In fractures of cer-

tain bones, as the skull or the spine, or in an impacted fracture, there may be no motion. In fracture of the kneepan or the elbow the fragments are pulled apart by the muscles, so there is lengthening instead of shortening.

Examination should always be made as soon as possible after the accident. Under the most favorable circumstances it is difficult in some cases to determine whether a bone is broken or not, and the difficulty is greatly increased if the examination is delayed until inflammatory swelling has set in. In fractures of the extremities the sound limb should always be placed alongside the injured one for comparison. The shortening in fracture of the thigh may be from 1 to 3 inches, but it must not be forgotten that in some persons there is a natural difference of as much as half an inch in length of the pair of legs; and a limb may be otherwise naturally deformed which should not be mistaken for accidental deformity. In the leg below the knee there are two parallel bones (tibia and fibula). In simple fracture affecting only one of these bones the shortening and deformity and crepitus are less marked; and the same may be said of the forearm, if fracture exists in only one of the bones (radius or ulna). If both bones of the leg (tibia and fibula) or of the arm (radius and ulna) are affected, there may be considerable deformity, and it is a curious fact that fracture of these bones seldom occurs on the same level. The distance between the fractures may be from 1 to 3 inches, usually greater in the leg than in the forearm.

Crepitus (the sound heard, or feeling imparted to the hand when the broken ends of the bone are rubbed together) is a valuable symptom of fracture, but it can not always be detected, and when other marked signs or symptoms are present, need not and should not be looked for. In fractures of the leg below the knee or of the forearm, involving only one of the bones, it is hard to make out because of the difficulty of rubbing the broken ends together, and when much swelling exists the difficulty is increased, or a false crepitus may be produced. In impacted fractures, which occur chiefly in the neck of the thigh bone, no effort should be made to obtain crepitus. The important thing in such cases is not to disturb the impacted fragments, for if pulled apart recovery is rendered more difficult.

#### FRACTURE OF THE LOWER JAW.

Fracture of the lower jaw may be simple, compound, or comminuted. The mucous membrane of the mouth is nearly always lacerated, the bleeding is usually not severe (oozing only), but there may be hemorrhage from an artery (the inferior dental), saliva dribbles from the half-open mouth, the teeth may be out of line, pain is apt to be severe, there may be considerable deformity and a false point of motion.

*Treatment.*—Restore the parts to the natural position and keep them at perfect rest, first washing out the mouth with hot water to cleanse it and check bleeding. If the bleeding is very severe pressure should be made by the thumb or finger for a time on the bleeding point if possible, or on the large artery (carotid) on the side of the neck, which may be easily located by the pulsation. Loose teeth or pieces of bone should not as a rule be removed. Mold them into place, bring the teeth and jaw into natural line, and keep them so by a pasteboard or binder's board splint (figs. 3 and 4), held in place by a four-tailed bandage.



FIG. 3.



FIG. 4.

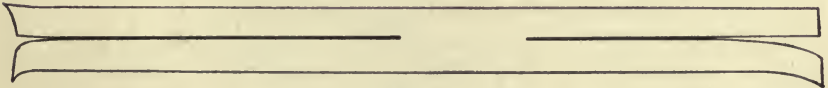


FIG. 5.



FIG. 6.

Fig. 3 shows the pasteboard or leather as cut out; Fig. 4 shows the same molded to fit the chin and jaw; Fig. 5 is a four-tailed bandage, and Fig. 6 shows how they are applied.

Take a piece of pasteboard about 8 or 9 inches long by 4 inches wide and cut it up in the middle from each end to within about an inch or inch and a half from the center, according to the size of the chin. Dip it in hot water and mold it to the chin and jaw. (Fig. 4.)

Remove it carefully, line it with absorbent cotton, reapply it, and retain it in place by the four-tailed bandage. (Fig. 5.) *The four-tailed bandage* may be made in the following manner: Take a bandage or piece of heavy muslin about 3 inches wide and a yard or a yard and a half long. In the middle of this or a little to one side of



the middle cut a slit large enough for the point of the chin; place the narrower portion upward, then tear the bandage down the middle from each end to within 2 inches of the slit, so as to make four ends or tails; then carry the two upper ends backward and tie at the nape of the neck; carry the two lower tails to the top of the head and tie in a knot. (Fig. 6.) The ends of the knots at nape of neck and top of head may then be tied together to hold them in place and prevent slipping. If necessary, a bandage may also be carried around the head and secured with pins. A splint of this kind may also be made of gutta-percha.

If the parts can not be kept in place by the methods described, the teeth may be fastened together with silver wire passed between the teeth on each side of the break and twisting the ends together. Feed the patient on liquid food through a rubber tube introduced behind the last tooth or through any space left by the loss of a tooth, the object being to prevent movement of the jaw. Wash out the mouth frequently with hot water, and, if necessary, change the dressing every two or three days until the end of about the sixth or eighth week, when, if all goes well, union will be complete, and the splint and bandage may be discontinued.

#### FRACTURE OF THE THUMB AND FINGERS.

*Treatment.*—Put the fragments in place by extension and pressure; then cut a piece of pasteboard, leather, cigar box, or thin board long enough to extend from above the wrist joint to a little below the ends of the fingers and a little wider than the hand. Cover the board with lint or any soft cloth, place the palm of the hand flat upon it, and apply a bandage around the whole hand and wrist.

If pasteboard or leather be used, it may first be dipped into hot water and then molded to the shape of the thumb or finger and palm of the hand, then lined or covered with cloth, and bandaged as above, care being taken not to make the bandage too tight.

#### FRACTURE OF THE FOREARM.

The forearm extends from the wrist to the elbow. When both bones are broken there is apt to be marked displacement and crepitus (grating felt by rubbing the broken ends of the bone together). When only one bone is broken the signs and symptoms are not so clear, but by careful examination the nature of the injury may be determined. When fracture of one of the bones (the radius) occurs near the wrist joint (Colles' fracture) there is generally marked deformity resembling a silver fork in shape.

*Treatment.*—Prepare two splints of thin board or heavy binder's board, one for the palmar side of the forearm long enough to extend

from the elbow to the palm of the hand. The other for the back of the forearm may be a little shorter, but should extend from the elbow to below the wrist back of the hand. Both splints must be a little wider than the arm so as to prevent the bones from being drawn together by the bandage. Line the splints with several layers of lint, or with absorbent cotton or soft cloth. If deformity exists, reduce it by extension and counter extension. Pull on the hand while an assistant holds or pulls at the elbow, and gently press the projecting fragment to its normal position. Place the arm between the splints in such a way that when bent at an angle the thumb will point directly upward, and the palm of the hand lie flat against the chest. Apply a roller bandage outside and around the splints from fingers to elbow, being careful not to make it too tight, and hang the forearm in a broad sling.

Another way to hold the splints in place is to apply strips of adhesive plaster around them, one at the upper and the other at the lower end. If swelling occurs, the bandage must be loosened. The splints should be worn six weeks or two months, and passive motion—that is, gently bending and straightening of the fingers with the other hand—must be made every few days to prevent stiffening.

#### FRACTURE OF THE ARM (BETWEEN THE ELBOW AND SHOULDER).

*Treatment.*—Splints of binder's board dipped in water and molded to the part, or any thin board will answer the purpose if properly



FIG. 7.

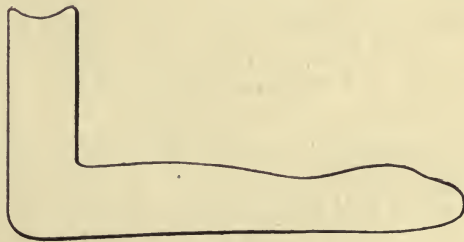


FIG. 8.

lined or padded. Place one splint on the outside of the arm extending from the elbow to the shoulder (fig. 7), an internal angular splint extending from the armpit to the fingers on the inner side (fig. 8), and if need be a narrower splint in front and one behind, and the whole surrounded with a well-fitted bandage. Support the forearm by a sling, but leave the elbow free. (Fig. 9.)

If much swelling occurs, all bandages must be loosened.

The splint should be worn about eight weeks. Under the most

favorable circumstances, after fracture, this bone (the humerus) sometimes fails to unite.

Fractures of the arm (of the humerus) at or near the elbow joint or shoulder joint are frequently very difficult to make out, even by the most skillful surgeon, especially if some time has elapsed since the injury was received; and the treatment of necessity is equally difficult.

If near or at the elbow joint, and if there is much pain, heat, and swelling, as is apt to be the case, cold applications should be applied, and the arm laid upon a pillow until the swelling has gone down. A



FIG. 9.

Fig. 7 is the outside splint to extend from shoulder to elbow; Fig. 8 is the internal angular splint to be placed between the arm and the body; and Fig. 9 shows the two splints applied with a bandage around them and the arm from the fingers to the shoulder, with a sling properly arranged to support the forearm but not to raise the elbow.

rectangular splint of binder's board or leather should then be dipped in hot water and applied to the inner side of the arm and forearm. The splint should be wide enough to extend nearly halfway around the arm. It must be well padded and held in place by a roller bandage, and the forearm supported by a sling.

Fracture of the humerus near the shoulder joint may be treated by means of a shoulder cap of thick pasteboard molded to fit the shoulder and extending nearly to the elbow, or a splint on the outer side of the arm; and a pad of folded lint or of absorbent cotton under the arm (in the armpit). The shoulder cap or splint should be padded



the same as in any other fracture and the whole surrounded by a roller bandage which encircles the chest, binding the arm to the chest. If the deformity is marked, a second and shorter splint may be placed on the inner side of the arm, taking care that the upper end does not press too hard into the armpit. The arm should then be bound to the chest by a board bandage.

After the application of any apparatus for fracture of the arm or forearm, the circulation should be carefully watched by feeling the pulse at the wrist. If it can not be felt, or if the fingers swell, the bandages should be removed and reapplied less tightly.

#### FRACTURE OF THE THIGH.

The thigh bone (femur) extends from the hip to the knee. Fracture of this bone may occur in any portion of the shaft, but the most common seat of fracture is about the middle or the middle third. Fractures high up near the hip joint are frequently very difficult to make out, and the results of treatment in such cases, even under the care of skillful surgeons, are not always satisfactory.

In fracture of the middle or middle third of the bone, the deformity is usually produced by the lower fragment (the broken end of the lower portion of the bone) being drawn up behind and to the inner side of the upper fragment; the weight of the limb then causes rotation and the foot and toes are turned outward.

If the fracture is a little higher up, displacement is shown by the upper fragment, which, by the action of the muscles, is thrown strongly forward and outward. In either case there are complete loss of power, shortening to the extent of 1 to 2 or 3 inches, pain on the slightest movement, *crepitus* (grating) if the broken ends of the bone are rubbed together, and abnormal motion.

In impacted fractures, which are met chiefly at or near the hip joint, the shortening may be, and usually is, less marked. Loss of power is usually complete, but not always. Patients have been known to stand and even walk a few steps. Injuries of this kind require the greatest care; the limbs should be handled very carefully. If on slight traction or manipulation *crepitus* is not felt, no further attempt should be made to obtain this symptom, for in doing so the impacted bones may be pulled apart, which is to be avoided unless especially directed by a skillful surgeon.

*Treatment.*—About all the master of the vessel may reasonably be expected to do in impacted fracture is to apply a broad bandage around the hips and place the patient in a good bed on a firm mattress and make lateral support by means of sand bags, one on the outside long enough to reach from the upper end of the hip bone to the foot, the other along the inner side of the leg from the crotch to

the foot. Fill the bags three-quarters full of dry sand. Keep the leg straight, toes upward.

*Treatment of nonimpacted fracture of the thigh bone at or near the hip joint.*—Apply a broad bandage around the hips and place both legs on the double-inclined plane (fig. 10), or make extension and fix the limb in the straight position by means of a long splint (a splint extending from the armpit to the foot), or by the weight and pulley, or by the long splint and the weight and pulley combined, in the manner now about to be explained in connection with the

*Treatment of fractures of the shaft of the thigh bone.*—In fracture of the shaft of this bone the signs and symptoms, as already

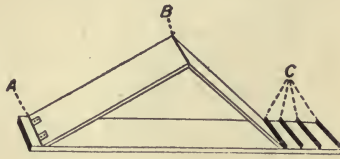


FIG. 10.—Shows a double inclined plane—A and B are hinges, C indicates four cleats.

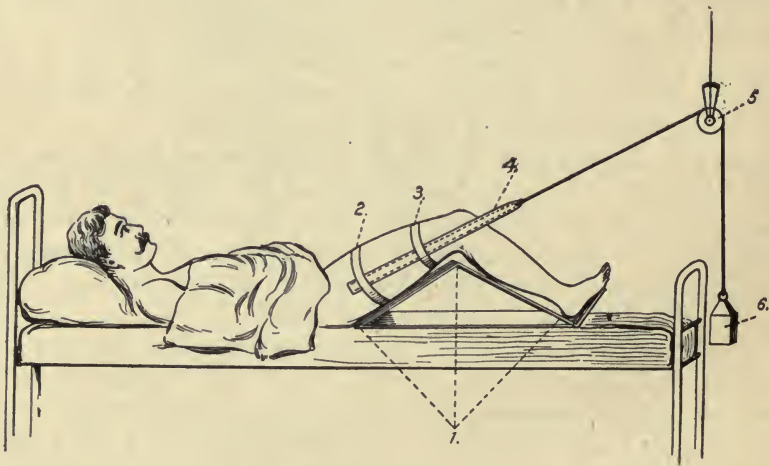


FIG. 11.—Shows the same in use with the weight and pulley—1 is the double inclined plane, 2 and 3 are circular pieces of adhesive plaster to prevent 4, the longitudinal strip on each side of the thigh, from slipping; 5 and 6 are the pulley and weight.

stated, are usually well marked. If the fracture is at the upper end or in the upper third of the bone, especially if the upper fragment is tilted forward, the double-inclined plane (fig. 11) well padded or covered with pillows, with weight and pulley attached by means of adhesive plaster stuck to each side of the thigh as far as the knee, affords the easiest and probably the best means of treatment. But in the majority of cases when the fracture is farther down, about the middle or in the middle third of the bone, the weight and pulley with

the leg and thigh in a straight line (fig. 12), or the weight and pulley and long splint combined (fig. 13), are better adapted if properly applied. Sand bags may also be used in connection with any of the straight splints placed alongside. In all cases the fracture should be

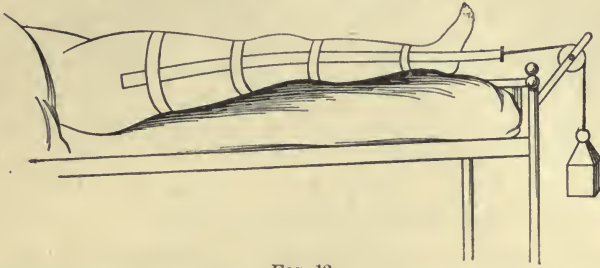


FIG. 12.

Fig. 12 shows the weight and pulley applied with the leg and thigh in the straight position—the adhesive strips being attached to the leg as well as the thigh.

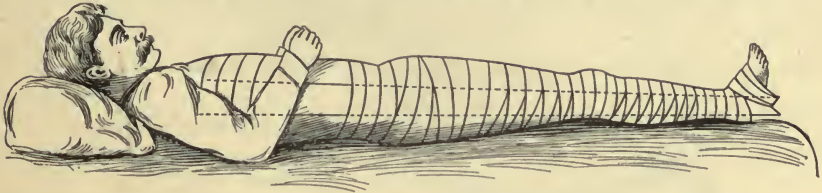


FIG. 13.

Fig. 13 shows the long lateral splint extending from the armpit to a point a little below the foot. It is bandaged to the body and the lower extremity, and may be used with the weight and pulley.

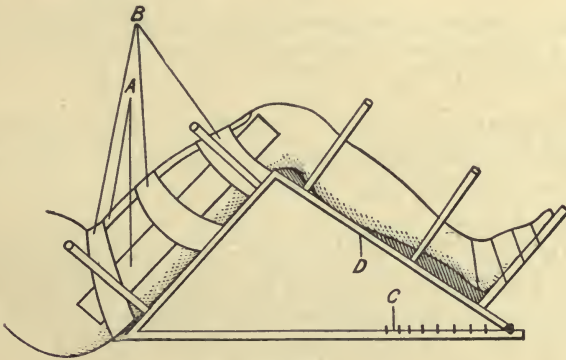


FIG. 14.

Fig. 14 shows a fractured thigh on a double-inclined plane with three short splints applied and held in place by three strips of adhesive plaster. *A* shows two of the three splints—the third one being on the inner side. *B* indicates three strips of adhesive plaster.

reduced by gradually pulling and carefully pressing the broken bones into their natural position. In addition to the splints already mentioned, short splints of narrow strips of thin board or binder's board should be applied directly over the seat of fracture. (Fig. 14.)



If a double-inclined plane (fig. 10) is not at hand, two broad pieces of board may be nailed together at a suitable angle and used instead, always properly padded or covered with pillows.

*The weight and pulley* (figs. 12 and 15).—The weight and pulley are applied as follows: Measure the distance from 1 inch below the crotch to a point 4 inches below the foot. Cut a strip of adhesive plaster exactly twice as long as the distance just measured and 3 inches wide, and stretch it on a table or on the floor, with the sticky side up. Get a block of wood 4 inches long, about 3 inches wide, and about  $\frac{1}{2}$  inch thick, with a hole bored through the center large enough to admit a large cord. Place the block exactly in the center of the long strip of adhesive plaster. Cut another strip of plaster the width of the first and 18 inches long, and place it on the first strip, sticky surfaces together, so as to include the block between the center of each. Thus a stirrup is made and the plaster kept from sticking to the ankle bones, because it would make them

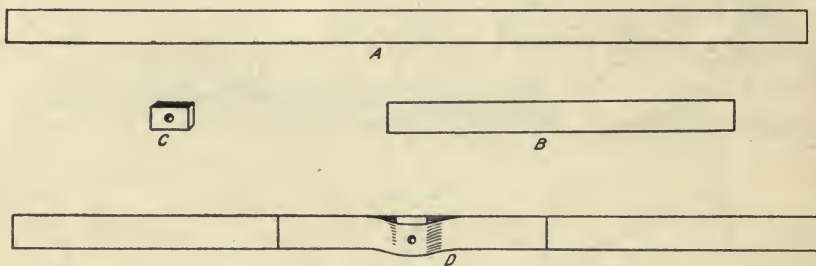


FIG. 15.

A shows the long strip of adhesive plaster; B shows the short strip. C is the block of wood  $4 \times 3 \times \frac{1}{2}$  inches with a hole in the center. D shows the block placed between the two strips of plaster, all ready for application to the leg or thigh.

sore. The long strip of plaster on each side of the stirrup is then applied to the leg and thigh after shaving on each side the surface to which it is to be applied, extending from a point just above the ankle bone to a point about 1 inch below the crotch on the inner side and to the same level on the outer side, being careful to keep the block square when the two ends of the plaster are stuck to the limb. A roller bandage is then applied over the plaster from the ankle up. A strong cord is then passed through the hole in the block and knotted so that it can not slip through, the other end being passed over a pulley attached to the foot of the bed or elsewhere, as may be convenient, on a line with the extended limb, and a weight of from 5 to 30 pounds, as may be necessary or comfortable to the patient, gradually increased, attached. The same kind of apparatus may be used with the double-inclined plane, except that the plaster is applied only to the thigh, the stirrup coming just below the bent knee.

Counter extension may be obtained by raising the foot end of the bed on blocks 4 to 6 inches high. The short splints should be well padded and extend well above and below the fracture, and be held in place by strips of plaster or bandage.

The long splint gives additional support and prevents outward rotation of the leg. It should be well padded, and have a cross-piece at the lower end to keep it in position. Treatment will be required for a period of eight to ten weeks, but the extension may be lessened about the end of the sixth week and passive motion made at the kneejoint.

#### FRACTURE OF THE KNEECAP.

Fracture of the kneecap may be transverse, vertical, or oblique. The bone may be broken into two or more irregularly shaped pieces.

*Symptoms and signs.*—Loss of power, inability to extend the joint or raise the limb from the bed. In the transverse variety the

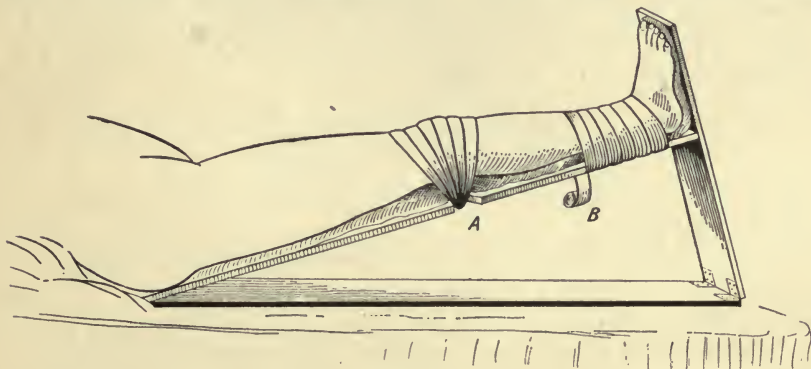


FIG. 16.

Fig. 16 shows a splint and bandage applied for fracture of the knee cap. A is a notch in the board to prevent slipping of the bandage. B is the end of a bandage which is to be carried above the knee over the bandage shown at A.

fragments are widely separated. If seen soon after the accident, the line of fracture—the gap between the fragments—may be seen and felt. Swelling rapidly appears and the signs are obscured.

*Treatment.*—Various forms of apparatus are employed, and in hospital practice the injury is frequently treated by surgical operation, with good result. The simplest form of treatment is to place the limb on a long posterior splint (fig. 16) with the foot raised so as to relax the thigh muscles, or if the patient is propped up in bed by pillows or a back rest, the limb may be allowed to lie on a level.

Apply iced water or the ice bag for a few days, until the swelling and heat have subsided; then remove the splint and apply a roller bandage from the foot to upper end of thigh. The turns of the bandage below and above the knee should be made in an oblique

direction, figure-of-eight fashion, so as to press and hold the fragments of bone together; the indications being, as in other fractures, to restore the broken ends of the bone to their natural position and keep them there. A pad of cotton should be placed in the hollow back of the knee and another smaller pad on the front of the thigh above the upper fragment before the bandage is applied. The splint should then be relined with layers of dry cotton or folds of lint and the limb placed upon it as before, secured by another roller bandage. If swelling or numbness of the foot is complained of, the bandage is too tight, *and must be removed*.

If the bandages become loose, as they are apt to do every few days, they should be reapplied.

The long splint should be worn about six weeks or two months, when it may be replaced by a shorter molded splint of leather, felt, or pasteboard to prevent motion at the joint when the patient may be allowed to walk with canes or crutches. The short splint should be worn for at least a month, and then a suitably constructed knee cap should be worn for one year to support the joint. More or less stiffness of the joint is to be expected.

#### FRACTURE OF THE LEG (BETWEEN THE KNEE AND ANKLE).

The leg extends from the knee to the ankle and has two bones, tibia and fibula.

Fracture of the leg may be simple or compound. Both bones may be broken or only one; the line of fracture may be oblique or transverse. When both bones are broken at the middle or lower third the deformity is usually quite marked. The break is apt to be in an oblique direction and at a lower level in the tibia (the shin) than in the fibula. In simple fracture of the upper part of the leg the deformity may be less marked, but if the knee is involved there may be great swelling because of acute and serious inflammation of the joint.

When the shaft of only one bone (the tibia or fibula) is broken there is not much displacement because in such case the sound bone acts as a side splint. Fracture at the lower end of the tibia at the projection on inner side of ankle is sometimes mistaken for sprained ankle, and if the small fragment of bone is not accurately adjusted and kept in proper position the result may be a weak and stiff joint.

The fibula may be fractured at any point, but the important fracture of this bone is known as "Pott's" fracture. (Figs. 17 and 18.) This fracture occurs about 3 inches above the ankle, on outer side of the leg, and is accompanied or complicated by outward dislocation of the foot, and not infrequently by the breaking or tearing off of the tip of the lower end of the tibia.



*Treatment.*—If the line of fracture is oblique, the limb must be handled very carefully so as to prevent injury to the soft parts by the sharp ends of the bone and thus avoid the conversion of a simple fracture into a compound one.

A Pott's fracture should be treated as follows: Take a board splint

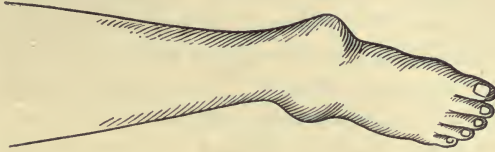


FIG. 17.—Shows the appearance of the right foot after a "Pott's fracture."

long enough to extend from the knee to a few inches beyond the sole of the foot. Pad the splint well, having the lower end of the padding at least 2 inches thick, and do not let it extend quite to the ankle joint below. Apply the splint to the inner side of the leg so that the foot and ankle project below the padding. The foot and leg are



FIG. 18.—Shows on the skeleton the point of fracture in the small bone of the leg and the outward displacement of the bones of the foot.

then bandaged to the splint in such a way as to turn the foot inward and thus correct the outward displacement. (Fig. 19.)

In all ordinary cases of simple fracture of the leg the master of the vessel can probably do no better than to place the leg in a fracture

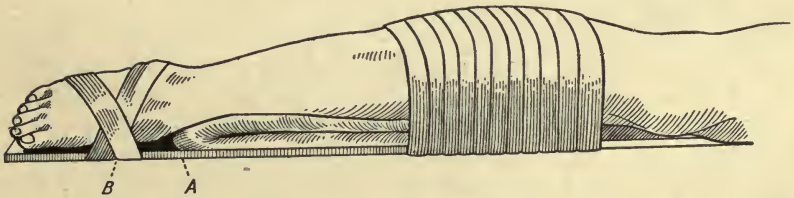


FIG. 19.—Shows the splint applied for a "Pott's fracture." A shows the thick padding (3 inches) ending just above the ankle. The bandage B keeps the foot turned in and prevents the tendency to outward displacement.

box (fig. 20) containing a soft pillow, and if necessary an extra pad of cotton or oakum for the heel. The side pieces of the fracture box are fastened each by two hinges to the backboard so as to be easily opened or closed. A pillow is placed on the backboard and after

the fracture is reduced, by extension and counter extension, the leg is carefully placed upon the pillow and the sides of the box are closed or drawn together closely enough to make easy and equable support to the broken bones. Two or three holes should be bored in the upper edge of the sideboards so that they may be tied together, or strips of bandage may be tied around the box. Two mortise holds should be made in the footboard for the reception of strips of adhesive plaster, so that in addition to the fracture box the weight and pulley may be applied to overcome any shortening or deformity. Another good plan is to line the backboard (the bottom of the box) with a layer of cotton or folds of lint and then fill in and surround the leg with bran.

In the absence of any of the apparatus mentioned, three well-padded splints may be applied—one on each side and one on the back of the leg. But if there is any displacement or overriding the fracture must be reduced and held in proper position while the splints are being applied.



FIG. 20.

Whatever form of appliance is adopted care must be taken that the foot is at a right angle with the leg, the toes pointing directly upward. The inner side of the kneecap, the projection on the inner side of the ankle, and the inner side of the big toe should be on the same line.

In the hospital, or where the patient is under the care of a surgeon, a fixed dressing of plaster of Paris, or silicate of soda, may be used to the greatest advantage after the first week, or, in some cases, from the very beginning of treatment.

#### COMPOUND FRACTURES.

Compound fractures are serious accidents and require prompt attention. The general principles of treatment so far as the bone is concerned (place it in normal position and keep it there) are the same as for simple fracture. But to do this and at the same time give proper attention to the wound in the soft parts (the open wound extending down to the bone) frequently demands the highest surgical skill.

Shock from loss of blood is the immediate danger. Inflammation, erysipelas, blood poisoning, or lockjaw may set in later, and still later the patient may become exhausted from long-continued suppuration.

*Treatment.*—If the wound is very small it should be well cleaned with hot water (water that has been raised to the boiling point and allowed to cool down to about 120°) or by antiseptic solution (sol. bichloride mercury 1 to 5,000), then covered with antiseptic gauze, and the case treated as a simple fracture.

In nearly all cases, however, the safest and best plan is to leave the wound uncovered by splint or bandage, so that light dressings may be easily applied and frequently changed. The wound should be thoroughly cleansed with hot water and antiseptic solution, and, after reducing the fracture, the splints, or extending apparatus, should be so arranged that the wound is freely accessible and easily drained. Strips of antiseptic gauze should be placed in the wound and gently carried down to the bottom by means of a probe, and a larger piece of gauze in loose folds should be laid over the wound.

The gauze dressing should be renewed every day or every second day, or as often as necessary to keep the wound well drained until it heals from the bottom.

In severe cases amputation may be necessary to save life, and in all cases the patient should be placed under the care of a surgeon as soon as possible.

#### DISLOCATIONS.

A bone is dislocated or “out of joint” when it is displaced or forcibly separated from another bone entering into the composition of a joint.

Dislocations may be complete or incomplete. A dislocation is *complete* when the articular surfaces are entirely separated and the ligaments torn, as in dislocation of the hip joint; *incomplete* when the articular surfaces are not entirely displaced. Dislocations may be simple, compound, or complicated.

A dislocation is *simple* when there is no wound of the skin and soft parts—when the articular surfaces are not exposed to the outer air; *compound* when there is an open wound and the outer air is brought into contact with the articular surfaces of the joint; *complicated* when besides the dislocation there is a fracture and serious damage to the soft parts, or to blood vessels or nerves.

Dislocations are said to be most common in adult or middle life, when the bones are strong and the muscles powerful. In the young and old the bones are more apt to break. There are, however, striking exceptions to this rule when applied to the elbow joint and the shoulder joint. The elbow joint in young subjects is frequently dislocated; and dislocation of the shoulder joint in old men is not uncommon.

*Symptoms and signs of dislocations.*—Deformity is always present and may be determined by comparing the injured side with the



sound side. The head or end of the bone is in an abnormal position; the attitude of the limb is changed; the patient can not move the limb; and when the surgeon or the master tries to move the joint he finds it very stiff. There may be shortening or lengthening. For example, in dislocation of the hip the head of the thigh bone may be thrown outward and upward, when there will be shortening of the leg; or it may be forced downward and inward, when the length of the limb will be increased.

*Treatment.*—The indications are to replace the bones in their natural position and to keep the parts at rest until the ligaments and damaged tissues about the joint are healed. A dislocation should be reduced immediately after the accident, whilst the patient is faint and the muscles are in a relaxed condition.

Having thus briefly described a dislocation and the treatment indicated, the question now arises, How shall the treatment be applied, how shall the dislocation be reduced? And when it is taken into consideration that the reduction of dislocations not infrequently taxes the skill of the most experienced surgeon (even with the aid of general anesthetics), it is hardly to be expected that a nonprofessional man will be able to accomplish the desired results in many cases. It must also be borne in mind that there are certain dangers attending efforts at reduction, especially at the larger joints, if improperly or too forcibly applied—such as fracture of bone or rupture of blood vessel.

#### DISLOCATION OF THE FINGERS.

Dislocation of the bones of the fingers may be backward or forward.

*Treatment.*—Extension and counter extension and manipulation. Pull the finger directly in line with the hand, and when fully extended make pressure on the head of the bone. Reduction is usually effected without much difficulty. Place the finger on a well-padded splint for one week, then make passive motion, and, if necessary, the splint may be worn for another week.

#### DISLOCATION OF THE THUMB.

Dislocation of the thumb may be backward or forward.

*Treatment.*—The treatment is not the same as for dislocation of the fingers, and reduction, especially of the backward dislocation, is usually very difficult. Try by pushing the end of the thumb upward and backward until it stands perpendicularly on the bone from which it is dislocated (fig. 21), then make strong pressure against the base of the dislocated bone from behind forward, sliding it on the bone beneath till it gets to the end, then flex or bend the thumb into place. (Fig. 22.)

## DISLOCATION OF THE WRIST.

Dislocation of the wrist joint may be backward or forward. It is a rare injury. Fracture about the wrist is more common, and is sometimes mistaken for dislocation. A stiff joint is apt to be the result.

*Treatment.*—Extension, counter extension, and direct pressure. Grasp the hand of the patient, pull in a straight line, and have an assistant pull on the forearm in the opposite direction, and when the parts are fully extended make direct pressure upon the wrist bones. Apply a bandage, and place the hand and forearm on a well-padded splint for a week; then remove the splint and make passive motion at

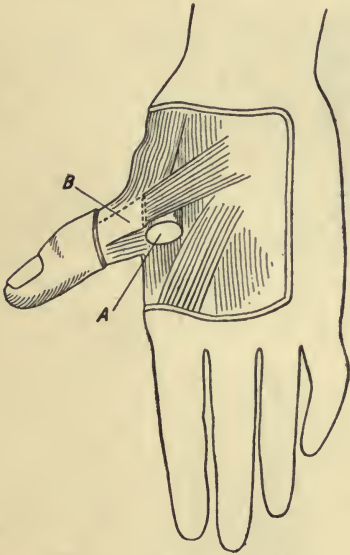


FIG. 21.

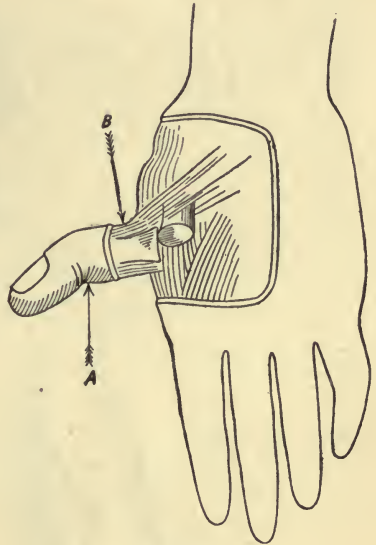


FIG. 22.

Fig. 21 shows a backward dislocation of the right thumb. *A* is the head of the bone in the hand and *B* is the bone in the thumb which has slipped backward and rests on the first bone below or behind its head. Fig. 22 shows how to replace it. The thumb should be brought out perpendicular to the hand (see arrow *A*) and its base pushed forward (see arrow *B*) till it reaches the end of the first bone, then it should be bent into the palm of the hand. Fig. 22 shows the bone in the proper position for bending.

the joint; reapply the splint and remove it after an interval of another week. If there is much pain or swelling after reduction of the dislocation, apply cold water or lead-opium wash.

## DISLOCATION OF THE ELBOW.

Dislocations of the elbow are serious accidents. They present a variety of forms, *backward*, *forward*, *outward*, and *inward*, and these are divided into a number of subvarieties. One or both bones may be

involved, and the dislocation may be associated with fracture. Reduction in some cases is comparatively easy, in others it is very difficult, even in the hands of experienced surgeons.

Without a thorough knowledge of the anatomy of the normal joint it is very difficult to understand the different forms of dislocation, and of necessity equally difficult to apply the proper treatment.

Immediately after the accident and before swelling sets in the injured elbow should be carefully compared with the sound one. When the normal arm is extended (straight) the tip of the elbow and the bony points on either side should be in a transverse line across the joint. If these prominences are found out of line, dislocation or fracture is probably present.

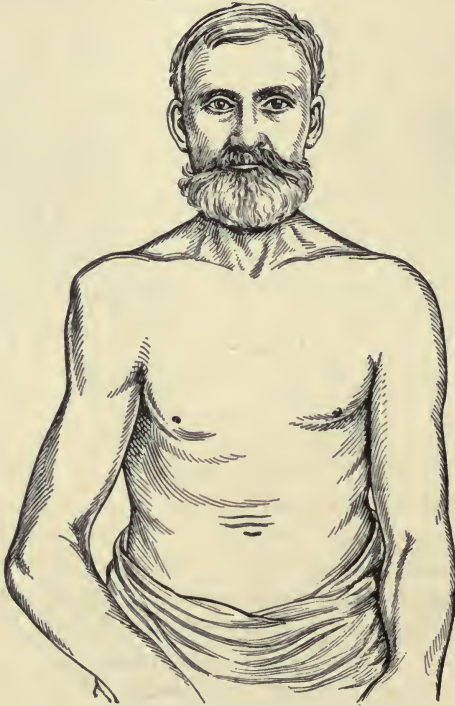


FIG. 23.

Dislocation of the shoulder.

*Treatment.*—Fixation of the arm above the elbow, extension or flexion of the forearm, and direct pressure by means of the thumbs or fingers on the head of the dislocated bone, so as to push it back into the socket. After reduction an angular splint should be applied to inner side of arm (fig. 8), lightly bandaged, and the forearm carried in a sling. Cold water or lead-opium wash may be applied to reduce inflammatory action. Passive motion should be employed at the end of a week.



## DISLOCATION OF THE SHOULDER.

[After Helfrich.]

Dislocation of the shoulder joint is a very common accident. It occurs as frequently as all other dislocations put together. The frequency is explained by the great latitude of motion of the joint, the shallowness of the socket, and the size and rounded shape of the head of the bone, the laxity of the capsular ligament, and the leverage exerted on the joint by the long bone.

There are three chief forms of dislocation of the shoulder, (1) forward and downward below the collar bone, (2) directly downward into the armpit, and (3) backward on the shoulder blade.

The symptoms and signs are *pain*, *swelling*, *rigidity* (stiffness), *loss of power*, *flattening* and *angular appearance* of the shoulder as compared with the other shoulder, abnormal situation of the head of the bones, and *change* in the *axis* of the long bone. (Fig. 23.) In the first variety, the most common of all, the head of the bone may be felt in front of the armpit and below the collar bone, and the elbow points outward and backward. In the second the head of the bone may be felt in the armpit, and the elbow points outward. In the third, the head of the bone may be felt on the back of the shoulder blade, the elbow points forward, and the forearm is thrown across the chest. Another valuable sign is that when the elbow is placed on the chest the patient can not place the hand of the injured side upon the opposite shoulder, or if the hand is placed on the shoulder the elbow can not be brought into contact with the chest.

*Treatment.*—The treatment for the first variety (forward and downward) is as follows: Lay the patient down or let him sit on a chair; bend the forearm on the arm; press the elbow against the side of the chest and hold it there; rotate the arm outward by carrying the forearm outward; pull steadily on the arm and rotate inward by carrying the elbow upward and forward with forearm across the chest. While this is going on have an assistant place his hand in the armpit and press the head of the bone into place.

For the second variety (directly downward into the armpit), place the patient on his back; remove your boot; place your heel in the armpit; grasp the wrist and pull steadily on the arm. If the dislocation is in the right shoulder, seat yourself on the right side of the patient and use your right foot; and if the injury is in the left shoulder, seat yourself on the left side and use your left foot. The same principles may be carried out by seating the patient on a low chair and placing your knee in the armpit.

Another method is to have an assistant stand upon a table and make counter extension with a towel, or a strong piece of soft cloth of any kind, passed under the armpit of the patient, while the oper-

ator pulls the arm downward. The same method may be employed by causing the patient to lie on his back, and an additional advantage may be obtained by placing a rolled bandage or a pad of any kind in the folds of a towel in the armpit.

In dislocation backward on the shoulder blade, pull the arm forward and make direct pressure forward on the head of the bone, or stand behind the patient, draw the elbow backward, and with the thumb press upon the head of the bone and guide it into place.

After reduction, a soft pad should be placed in the armpit, the upper arm bandaged to the body, and the forearm placed in a sling across the chest. Passive motion at the joint should begin at the end of a week and be repeated daily, but the arm should be carried in the sling about three weeks.

#### DISLOCATION OF THE COLLAR BONE.

The collar bone extends from the upper border of the breast bone to the highest point of the shoulder blade. Dislocation may occur at either end. Reduction is comparatively easy, but it is difficult to retain the bone in position.

*Treatment.*—Make extension by drawing back the shoulders, the knee, if necessary, being placed between the shoulder blades; push the end of the bone in place, and try to keep it there by a firm pad, fastened by adhesive plaster and bandage. The best result may be obtained by placing the patient at rest on his back for three weeks.

#### DISLOCATION OF THE TOES.

Dislocations of the toes are very rare accidents. The treatment is the same as for dislocation of the fingers. Dislocation of the big toe may be treated the same as dislocation of the thumb.

#### DISLOCATION OF THE ANKLE.

The foot may be dislocated *forward, backward, outward, inward, or upward*. The dislocation may be complete or incomplete.

The lower ends of the bones of the leg enter into the formation of the ankle joint, the end of the tibia on the inner side and the end of the fibula on the outer side of the joint. Dislocations of the ankle are usually complicated by fracture of the tip of one or both of these bones; when, in addition, the fibula is broken above the ankle, the injury is known as Pott's fracture, already referred to.

*Treatment.*—Extension, counter extension and pressure. Flex the leg on the thigh, and the thigh at right angle to body; pull steadily on the foot, while an assistant makes counter extension at the thigh, and press the bones in place. Apply cold water, or lead-opium wash, and place the foot and leg in a fracture box, or apply

well-padded molded splints. Binder's board dipped in warm water and molded to the part and lined with thick layers of cotton will answer the purpose. If a Pott's fracture use the splint shown in fig. 16. Make passive motion at the joint at the end of two weeks.

#### DISLOCATION OF THE KNEE.

Dislocation of the knee may be complete, incomplete, compound, or complicated. The direction of the dislocation may be forward, backward, outward, or inward. The deformity is quite marked. Reduction is not very difficult, but the injury is a serious one and care must be taken in making reduction not to produce additional damage by too forcible extension. Fortunately the injury is exceedingly rare.

*Treatment.*—Extension, counter extension, and pressure. Have one assistant pull steadily, not too hard, on the leg or ankle, while another assistant fixes or pulls on the thigh and presses the bone into place. After reduction apply cold water, or lead-opium wash, and place the leg in a posterior straight splint, well padded, especially below the hollow of the knee, and make passive motion at the end of two weeks. When the patient begins to walk, a kneecap or flannel bandage should be applied.

#### DISLOCATION OF THE HIP.

Dislocation of the hip joint is a serious injury. It occurs much less frequently than dislocation of the shoulder joint. The socket of the hip joint is very deep, and the ligaments and muscles surrounding the joint are very strong and powerful. Dislocation occurs only when the limb is in a certain position, when its axis is changed from that of the body, and when in consequence of any sudden or great force received on the lower end of the leg or knee the head of the bone is forced through the ligament (the capsule) which surrounds the joints. The head of the bone may then be thrown (1) *backward and upward*, (2) *backward*, (3) *forward and downward*, (4) *forward*. The different directions indicate the different forms of dislocation. The first is the most common.

In the first form examination from below up shows the *big toe turned toward* or resting on the instep of the opposite foot; the knee flexed and resting against thigh at upper margin of opposite kneecap; the thigh rotated inward and drawn toward its fellow; bulging of the hip; and about 2 inches shortening of the entire limb.

In the second form the signs are the same as in the first, but less marked. (Fig. 24.) Fracture of the neck of the thigh bone is sometimes mistaken for this injury. But in fracture there is abnormal motion, and the foot is turned outward.

In the third form (fig. 25) the signs are almost exactly the reverse



of the first form. The foot and knee are turned outward, the hip is flattened, and the entire limb is lengthened.

The signs of the fourth form are nearly the same as those of the third, except that the entire limb is shortened.

*Treatment.*—The treatment is by manipulation, or by extension and counter extension.

For the first and second forms of dislocation, above-described treatment may be applied as follows: Place the patient on his back on a mattress on the floor. Seize the foot or ankle with one hand and place the other hand under the knee. Flex the leg upon the back of the thigh, and the thigh upon the body to about a right angle; then carry the knee inward and rotate it inward on its own axis, then suddenly raise it (lift it toward the ceiling) so that the head of the bone may be thrown over the rim of the socket, and immediately extend



FIG. 24.

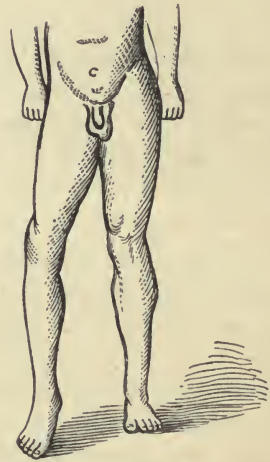


FIG. 25.

Fig. 24 shows a backward dislocation of the hip with the knee and toe turned in and the heel raised and the limb shortened. Fig. 25 shows a forward and downward dislocation of the right hip with the knee and toe turned out and the limb lengthened.

the limb with outward rotation to its normal position so that the head of the bone may return to the socket through the hole in the capsule by which it escaped.

The treatment of the third and fourth forms of injury corresponds to that for the first and second, except that the limb should be carried outward first, then inward, across the median line, and rotated inward on its own axis, and then suddenly lifted and brought down to its normal position by the side of its fellow.

No great force should be used in making these movements. If any considerable resistance is met with in rotating or lifting the bone the movement should be modified in such a way that the head of the bone may follow the path of least resistance.

If extension and counter extension be applied they should follow the line of the axis of the dislocated thigh. It must not be forgotten in the consideration of these methods that the application of too much force or of force improperly applied may produce fracture of the bone.

#### SPRAINS.

A sprain is a stretching or wrenching of a joint. The joints most frequently affected are the ankle, wrist, knee, and shoulder.

The symptoms and signs are pain, swelling, impairment or loss of motion, and discoloration from effusion of blood. When there is much swelling it may be difficult to determine whether sprain or fracture, or both, are present.

*Treatment.*—If seen at once, before there is much swelling, a bandage should be applied from the toes to 2 or 3 inches above the ankle, and the joint should be kept at perfect rest in an elevated position. If much swelling has already taken place apply cold applications continuously for several hours. If the symptoms do not rapidly subside apply hot applications—cloths or towels wrung out of hot water and frequently changed. After the swelling has gone down a bandage properly applied will afford considerable benefit. (Fig. 26.)

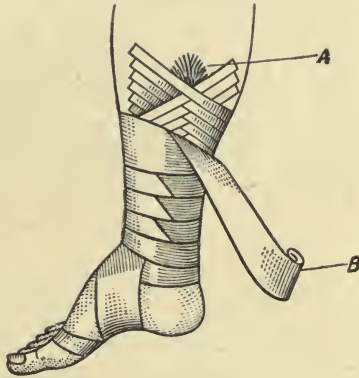


FIG. 26.

Fig. 26 shows the application of adhesive plaster to an ulcer of the leg at *A* and of an ordinary bandage from the foot up the leg, *B*.

The joint must not be kept too long at rest. Passive motion should be performed as soon as the inflammatory symptoms have subsided.

#### NOSEBLEED.

If bleeding of the nose occur in a full-blooded person, especially if such person is subject to dizziness, we should not be in too much of a hurry to stop it. But if the bleeding is the result of injury or if it occur in a person suffering from disease of the heart or lungs or from

the effects of malarial fever, scurvy, or any disease of the general system, effort should be made to stop it.

*Treatment.*—Remove all pressure of clothing from neck and chest. Caution patient not to blow his nose. If too weak to stand, place him on his back with his arms raised and his head on a high pillow. Bathe the nose in cold water, apply cold water to back of neck or an ice bag to the forehead. Pack the nostrils with pellets of absorbent cotton soaked in a solution of alum or gelatin. The bleeding is sometimes brought under control by the application of hot water to the nostrils.

In very severe cases the posterior as well as the anterior nares should be plugged. In the absence of a surgeon the application of this method may be attended with some difficulties. But if the master of the vessel decides to try it he may proceed as follows: Pass a fine string twine, about 20 inches long, through the eye of a hard rubber catheter, and thus armed pass the catheter along the floor of the nose to the back of the mouth below the soft palate; introduce a forceps into the mouth back to the end of the catheter, seize the twine, and bring it out of the mouth. Then tie a pledget of absorbent cotton or lint to the twine about 12 inches from the end of it; then pull on the catheter and the other end of the twine and draw the pledget into the mouth, guided by the finger, behind the soft palate into the posterior nares. He will then have the posterior nares plugged, and one end of the twine hanging out at the mouth and the other end at the nose.

Secure the ends of the twine by tying them together, and allow the plug to remain about two days.

The pledget of cotton or lint should be about an inch long and half an inch wide.

#### DIRECTIONS FOR RESTORING THE APPARENTLY DROWNED.

As practiced in the United States Life-Saving Service.

*Note.*—These directions differ from those given in the last revision of the Regulations by the addition of means for securing deeper inspiration. The method heretofore published, known as the Howard, or Direct Method, has been productive of excellent results in the practice of the Service, and is retained here. It is, however, here arranged for practice in combination with the Sylvester method, the latter producing deeper inspiration than any other known method, while the former effects the most complete expiration. The combination, therefore, tends to produce the most rapid oxygenation of the blood—the real object to be gained. The combination is prepared primarily for the use of life-saving crews where assistants are at hand. A modification of Rule III, however, is published as a guide



in cases where no assistants are at hand and one person is compelled to act alone. In preparing these directions the able and exhaustive report of Messrs. J. Collins Warren, M. D., and George B. Shattuck, M. D., committee of the Humane Society of Massachusetts, embraced in the annual report of the society for 1895-96, has been availed of, placing the Department under many obligations to these gentlemen for their valuable suggestions.

*Rule I.—Arouse the patient.*—Do not move the patient unless in danger of freezing; instantly expose the face to the air, toward the wind if there be any; wipe dry the mouth and nostrils; rip the clothing so as to expose the chest and waist; give two or three quick, smarting slaps on the chest with the open hand.

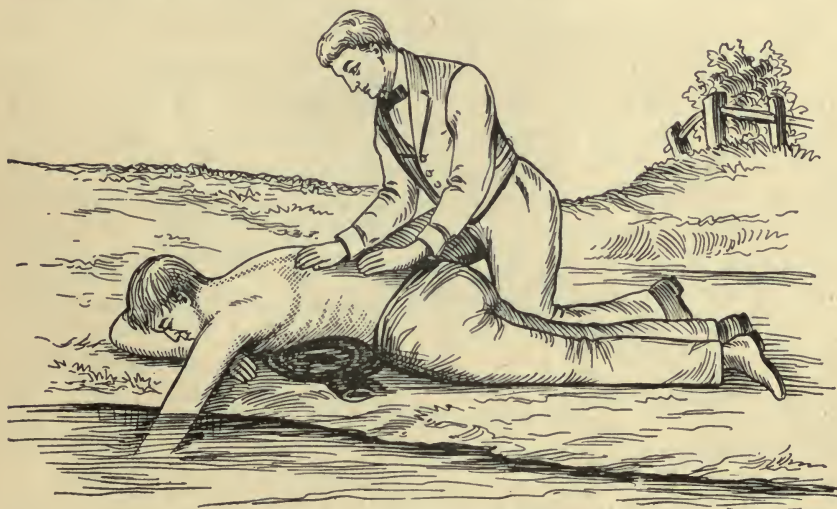


FIG. 27.

If the patient does not revive, proceed immediately as follows:

*Rule II.—To expel water from the stomach and chest* (see fig. 27).—Separate the jaws and keep them apart by placing between the teeth a cork or small bit of wood; turn the patient on his face, a large bundle of tightly rolled clothing being placed beneath the stomach; press heavily on the back over it for half a minute, or as long as fluids flow freely from the mouth.

*Rule III.—To produce breathing* (see figs 28 and 29).—Clear the mouth and throat of mucus by introducing into the throat the corner of a handkerchief wrapped closely around the forefinger; turn the patient on the back, the roll of clothing being so placed as to raise the pit of the stomach above the level of the rest of the body. Let an assistant with a handkerchief or piece of dry cloth draw the tip of the tongue out of one corner of the mouth (which prevents the tongue from falling back and choking the entrance to the windpipe), and

keep it projecting a little beyond the lips. Let another assistant grasp the arms just below the elbows and draw them steadily upward by the sides of the patient's head to the ground, the hands nearly meeting (which enlarges the capacity of the chest and induces inspiration). (Fig. 28.) While this is being done let a third assistant take position astride the patient's hips with his elbows resting upon his own knees, his hands extended ready for action. Next, let the assistant standing at the head turn down the patient's arms to the sides of the body, the assistant holding the tongue changing hands if necessary <sup>a</sup> to let the arms pass. Just before the patient's hands

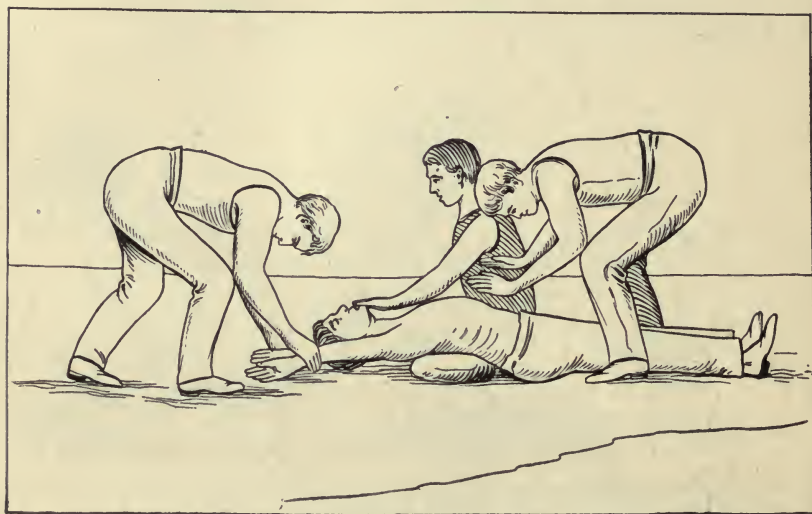


FIG. 28.

reach the ground the man astride the body will grasp the body with his hands, the balls of the thumb resting on either side of the pit of the stomach, the fingers falling into the grooves between the short ribs. Now, using his knees as a pivot, he will at the moment the patient's hands touch the ground throw (not too suddenly) all his weight forward on his hands, and at the same time squeeze the waist between them, as if he wished to force anything in the chest upward out of the mouth; he will deepen the pressure while he slowly counts, one, two, three, four (about five seconds), then suddenly let go with a final push, which will spring him back to his first position.<sup>b</sup> This completes expiration. (Fig. 29.)

At the instant of his letting go, the man at the patient's head will again draw the arms steadily upward to the sides of the patient's head as before (the assistant holding the tongue again changing hands

<sup>a</sup> Changing hands will be found unnecessary after some practice; the tongue, however, must not be released.

<sup>b</sup>A child or very delicate patient must, of course, be more gently handled.

to let the arms pass if necessary), holding them there while he slowly counts one, two, three, four (about five seconds).

Repeat these movements deliberately and perseveringly twelve to fifteen times in every minute—thus imitating the natural motions of breathing.

If natural breathing be not restored after a trial of the bellows movement for the space of about four minutes, then turn the patient a second time on the stomach, as directed in Rule II, rolling the body in the opposite direction from that in which it was first turned, for the purpose of freeing the air passage from any remaining water. Continue the artificial respiration from one to four hours, or until the patient breathes, according to Rule III; and for a while, after the appearance of returning life, carefully aid the first short gasps until

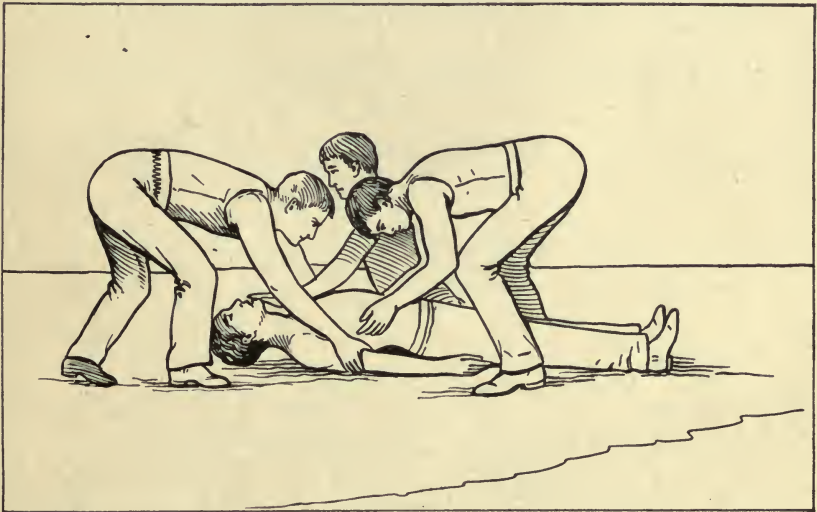


FIG. 29.

deepened into full breaths. Continue the drying and rubbing, which should have been unceasingly practiced from the beginning by assistants, taking care not to interfere with the means employed to produce breathing. Thus the limbs of the patient should be rubbed, always in an upward direction toward the body, with firm-grasping pressure and energy, using the bare hands, dry flannels, or handkerchiefs, and continuing the friction under the blankets or over the dry clothing. The warmth of the body can also be promoted by the application of hot flannels to the stomach and armpits, bottles or bladders of hot water, heated bricks, etc., to the limbs and soles of the feet.

*Rule IV.—After treatment.—Externally:* As soon as breathing is established let the patient be stripped of all wet clothing, wrapped in blankets only, put to bed comfortably warm, but with a free circulation of fresh air, and left to perfect rest. *Internally:* Give



whisky or brandy and hot water in doses of a teaspoonful to a tablespoonful, according to the weight of the patient, or other stimulant at hand, every ten or fifteen minutes for the first hour, and as often thereafter as may seem expedient. *Later manifestations:* After reaction is fully established there is great danger of congestion of the lungs, and if perfect rest is not maintained for at least forty-eight hours, it sometimes occurs that the patient is seized with great difficulty of breathing, and death is liable to follow unless immediate relief is afforded. In such cases apply a large mustard plaster over the breast. If the patient gasps for breath before the mustard takes effect, assist the breathing by carefully repeating the artificial respiration.

#### MODIFICATION OF RULE III.

[To be used after Rules I and II in case no assistance is at hand.]

*To produce respiration.*—If no assistance is at hand and one person must work alone, place the patient on his back with the shoulders

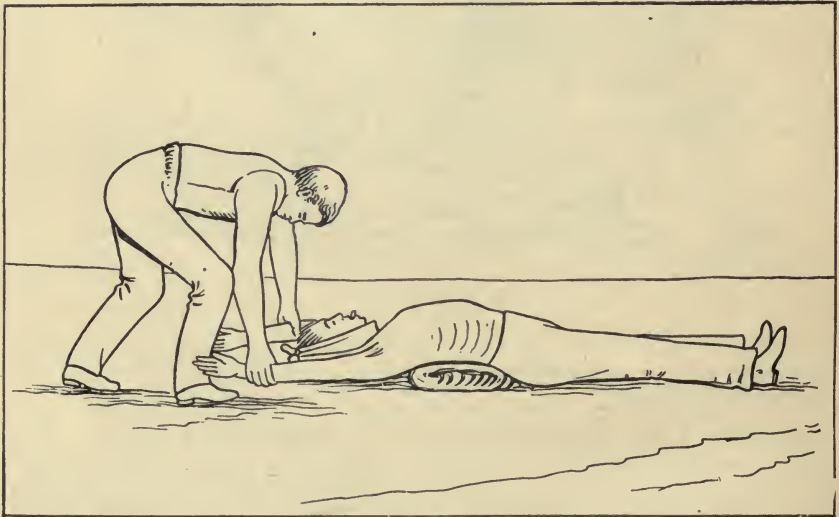


FIG. 30.

slightly raised on a folded article of clothing; draw forward the tongue and keep it projecting just beyond the lips: if the lower jaw be lifted the teeth may be made to hold the tongue in place; it may be necessary to retain the tongue by passing a handkerchief under the chin and tying it over the head.

Grasp the arms just below the elbows and draw them steadily upward by the sides of the patient's head to the ground, the hands nearly meeting. (See fig. 30.)

Next lower the arms to the side and press firmly downward and inward on the sides and front of the chest over the lower ribs, drawing toward the patient's head. (See fig. 31.)

Repeat these movements twelve to fifteen times every minute, etc.

INSTRUCTIONS FOR SAVING DROWNING PERSONS BY SWIMMING TO THEIR RELIEF.

1. When you approach a person drowning in the water, assure him, with a loud and firm voice, that he is safe.

2. Before jumping in to save him, divest yourself as far and as quickly as possible of all clothes; tear them off, if necessary; but if there is not time, loose at all events the foot of your drawers, if they are tied, as, if you do not do so, they fill with water and drag you.

3. On swimming to a person in the sea, if he be struggling do not seize him then, but keep off for a few seconds till he gets quiet, for it

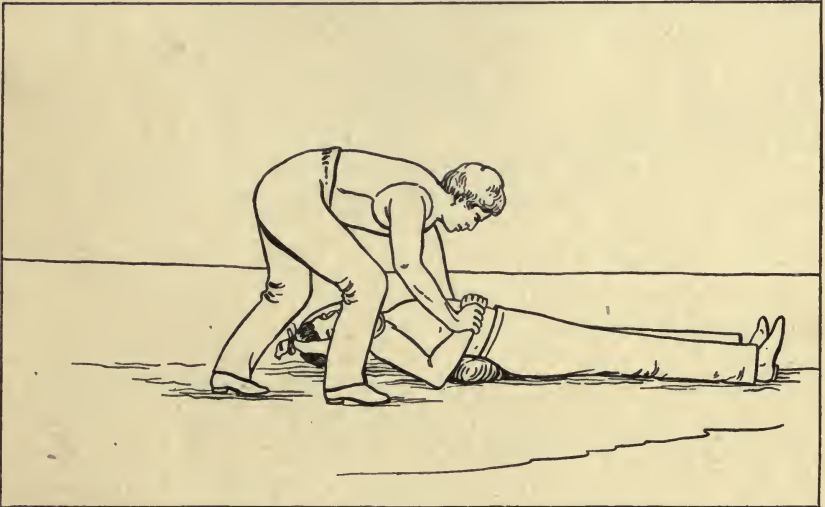


FIG. 31.

is sheer madness to take hold of a man when he is struggling in the water, and if you do you run a great risk.

4. Then get close to him and take fast hold of the hair of his head, turn him as quickly as possible onto his back, give him a sudden pull, and this will cause him to float, then throw yourself on your back also and swim for the shore, both hands having hold of his hair, you on your back, and he also on his, and of course his back to your stomach. In this way you will get sooner and safer ashore than by any other means, and you can easily thus swim with two or three persons; the writer has even, as an experiment, done it with four, and gone with them 40 or 50 yards in the sea. One great advantage

of this method is that it enables you to keep your head up and also to hold the person's head up you are trying to save. It is of primary importance that you take fast hold of the hair and throw both the person and yourself on your backs. After many experiments, it is usually found preferable to all other methods. You can in this manner float nearly as long as you please, or until a boat or other help can be obtained.

5. It is believed there is no such thing as a *death grasp*; at least it is very unusual to witness it. As soon as a drowning man begins to get feeble and to lose his recollection, he gradually slackens his hold until he quits it altogether. No apprehension need, therefore, be felt on that head when attempting to rescue a drowning person.

6. After a person has sunk to the bottom, if the water be smooth, the exact position where the body lies may be known by the air bubbles, which will occasionally rise to the surface, allowance being of course made for the motion of the water, if in a tide way or stream, which will have carried the bubbles out of a perpendicular course in rising to the surface. Oftentimes a body may be regained from the bottom, before too late for recovery, by diving for it in the direction indicated by these bubbles.

7. On rescuing a person by diving to the bottom, the hair of the head should be seized by one hand only, and the other used in conjunction with the feet in raising yourself and the drowning person to the surface.

8. If in the sea, it may sometimes be a great error to try to get to land. If there be a strong "outsetting" tide, and you are swimming either by yourself or having hold of a person who can not swim, then get on your back and float till help comes. Many a man exhausts himself by stemming the billows for the shore on a back-going tide, and sinks in the effort, when, if he had floated, a boat or other aid might have been obtained.

9. These instructions apply alike to all circumstances, whether as regards the roughest sea or smooth water.



## APPENDIX.

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### THE UNITED STATES PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

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The United States Marine-Hospital Service was established by an act of Congress approved July 16, 1798. By this act Congress imposed a tax of 20 cents a month on every seaman employed on vessels of the United States engaged in the foreign or coasting trades, and out of the money collected by authority of this act the President of the United States was authorized to furnish temporary relief to sick and disabled seamen. The said act was amended March 2, 1799, extending the operations of the law so as to include the officers and seamen of the Navy; but in the year 1811 separate hospitals were established for the Navy.

Under an act of Congress approved June 29, 1870, the hospital tax was increased from 20 to 40 cents a month, at which rate it was continued until 1884, when, by an act of Congress, the hospital tax was abolished and the tonnage tax was made available for the ordinary expenses of the Service (for the care and treatment of sick and disabled American seamen).

By act of Congress approved July 1, 1902, the name of the Service was changed to that of the Public Health and Marine-Hospital Service of the United States.

The medical corps of the Public Health and Marine-Hospital Service consists of the Surgeon-General, surgeons, passed assistant surgeons, acting assistant surgeons, and sanitary inspectors.

The Surgeon-General is the head of the Service. He is required by law, under the direction of the Secretary of the Treasury, to supervise all matters connected with the Public Health and Marine-Hospital Service, including the National Quarantine Service and the medical work in connection with the Immigration Service.

#### RELIEF STATIONS, BENEFICIARIES, ETC.

[Extracts from the Regulations, Public Health and Marine-Hospital Service, 1903.]

#### RELIEF STATIONS.

PAR. 404. A relief station of the Public Health and Marine-Hospital Service is a port or place where an officer of the Service is on duty to extend relief to seamen or where an officer of the customs service is specifically authorized to extend said relief.

PAR. 405. Relief stations shall be divided into the following classes:

*Class I.*—United States marine hospitals.

*Class II.*—All other stations under command of a commissioned officer.

*Class III.*—All stations under charge of an acting assistant surgeon where there is a contract for the care of sick and disabled seamen.

*Class IV.*—All other relief stations not included in the above classes.

## BENEFICIARIES.

PAR. 411. The persons entitled to the benefits of the Public Health and Marine-Hospital Service are those employed on board in the care, preservation, or navigation of any registered, enrolled, or licensed vessels of the United States, or in the Service on board of those engaged in such care, preservation, or navigation. Officers and crews of the Light-House Establishment, officers and crews of the Revenue-Cutter Service, seamen employed on the vessels of the Mississippi River Commission, seamen employed on the vessels of the Engineer Corps of the Army, and keepers and crews of the United States Life-Saving Service are entitled to the facilities of the hospitals and relief stations under special rules hereinafter prescribed.

PAR. 412. Officers on vessels of the Coast and Geodetic Survey, and seamen thereon, who are not enlisted men from the Navy, are entitled to the benefits of the Service.

PAR. 413. Seamen employed on yachts are entitled to treatment, provided the said yachts are enrolled, licensed, or registered as vessels of the United States.

PAR. 414. Seamen employed on United States army transports or other vessels belonging to the Quartermaster's Department, United States Army, when not enlisted men of the Army, are entitled to the benefits of the Service.

PAR. 415. No person employed in or connected with the navigation, management, or use of canal boats engaged in the coasting trade shall, by reason thereof, be entitled to any benefit or relief from the Service.

PAR. 417. Seamen taken from wrecked vessels of the United States are entitled to the benefits of the Service if sick or disabled, and will be furnished care and treatment without reference to the length of time they have been employed.

PAR. 418. Seamen employed on merchant vessels of the United States returned to the United States from foreign ports by United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the Service without reference to length of service.

PAR. 419. A sick or disabled seaman, in order to obtain the benefits of the Service, must apply in person, or by proxy if too sick or disabled so to do, at the office of the Public Health and Marine-Hospital Service, to an officer of that Service, or to the proper customs officer acting as the agent of the said Service at stations where no medical officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

PAR. 420. Masters' certificates and discharges from United States shipping commissioners, made out and signed in proper form, showing that the applicant for relief has been employed for sixty days of continuous service "in a registered, enrolled, or licensed vessel of the United States," a part of which must have been during the sixty days immediately preceding his application for relief, shall entitle him to treatment. The phrase "sixty days' continuous service" shall not be held to exclude seamen whose papers show brief intermission between short services that aggregate the required sixty days.

PAR. 440. Seamen taken sick or injured while actually employed on a documented vessel shall be entitled to treatment at relief stations without reference to the length of their service.

PAR. 421. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seaman on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

PAR. 422. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certifi-

cate (Form 1915) of the length of time said seaman has been so employed, giving the dates of such employment. This certificate will be filed in the marine-hospital office or office of the customs officer when application is made for relief, whether the relief is furnished or the claim rejected.

PAR. 423. Any master of a vessel or other person who shall furnish a false certificate of service, with intent to procure the admission of a seaman into any marine hospital, shall be immediately reported to the nearest United States attorney for prosecution.

PAR. 424. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation on account of ice or low water, such interval shall not be considered as excluding him from relief unless the sickness or injury for which he applies for relief be the direct result of employment on shore.

#### HOSPITAL RELIEF.

PAR. 480. A sick or disabled seaman entitled to the benefits of the Service shall be admitted to hospital only in cases where the gravity of the disease or injury from which he suffers is such as to require hospital treatment in the opinion of an officer of the Service, or of a reputable physician designated by the Department to act at a place where no officer is stationed.

PAR. 442. Temporary relief only is contemplated, and admission to hospital is not intended to permit an indefinite residence therein for cause other than actual disease or injury.

PAR. 482. Officers shall not be required to attend sick or disabled seamen on board vessels or to visit them in harbor, except at the discretion of the officer to whom the application is made.

#### OUT-PATIENT RELIEF.

PAR. 467. Sick and disabled seamen entitled under these regulations to the benefits of the Service whose diseases or injuries are of such a nature that they can properly be relieved by medicines, dressings, or advice, without admission to hospital, shall be treated as out-patients, and furnished medicines, dressings, surgical appliances, or advice, as the case may require.

PAR. 434. When a seaman who has received continuous treatment at the out-patient office for a period of two months applies for further treatment, he must, to entitle him to treatment, furnish a new certificate of service, showing that he is still following his vocation as seaman, or give satisfactory evidence that such service has been prevented by closure of navigation or by sickness, the latest dates of service, and, in case of lack of recent service, its explanation, to appear in each new relief certificate.

#### THE REVENUE-CUTTER SERVICE.

PAR. 444. The officers and crews of the Revenue-Cutter Service will receive hospital or out-patient treatment, as hereinafter provided, on certificate signed by the commanding officer or executive officer of a revenue cutter without regard to length of service. The certificate shall contain a description of the applicant for relief. Officers on leave or waiting orders may sign their own certificate.

PAR. 449. At ports where there is a marine-hospital station, when an officer or member of a crew of the Revenue-Cutter Service, on account of injury or illness, requires the immediate attention of a physician, and on account of the exigency of the case it is impossible to convey the patient to the marine hospital or office, temporary provision for medical attendance or care may be made by the commanding officer, who will immediately report his action to the proper marine-hospital representative at the port, and the treatment thereafter will



be conducted by the Public Health and Marine-Hospital Service in the manner provided in the annual circular entitled "Contracts for care of seamen, etc.," if in the judgment of the proper officer of the Public Health and Marine-Hospital Service it can be done without detriment to the patient. \* \* \*

PAR. 450. Commissioned medical officers and acting assistant surgeons of the Public Health and Marine-Hospital Service will render professional aid to officers of the Revenue-Cutter Service residing at the port at their residences when said officers of the Revenue-Cutter Service for any reason can not avail themselves of the accommodations offered by the marine hospital and when they are physically unable to present themselves at the marine-hospital office. The medicines or appliances prescribed shall be furnished from the dispensary of the Public Health and Marine-Hospital Service when practicable.

#### THE MISSISSIPPI RIVER COMMISSION.

PAR. 452. Masters, officers, and crews, of vessels in the service of the Mississippi River Commission shall be entitled to the benefits of the Marine-Hospital Service (except at stations of the fourth class) under the same regulations as govern the admission of seamen on documented vessels. \* \* \*

#### THE ENGINEER CORPS, UNITED STATES ARMY.

PAR. 453. Seamen employed on vessels under the charge of the Engineer Corps of the United States Army shall be admitted to the benefits of the Marine-Hospital Service without charge at stations of the first, second, and third class upon the written request of the commanding officers of said vessels.

#### THE LIFE-SAVING SERVICE.

PAR. 454. Keepers and surfmen of the Life-Saving Service will be treated in the marine hospitals, but not at their homes, and will receive out-patient relief only at the dispensaries connected with the Service. Keepers and surfmen will be entitled to the ordinary accommodations of the hospitals, and will comply with all rules and regulations relating to discipline and management.

PAR. 455. An applicant must present a certificate signed by a keeper, district superintendent, or assistant inspector of the Life-Saving Service, in the form prescribed by the Department, testifying to his services as keeper or surfman of a life-saving station, and giving other satisfactory evidence that he is entitled to treatment. When it is impracticable to obtain the certificate, signed as above required, an affidavit of the applicant as to the facts of his employment may be accepted. The applicant must be required to sign his name to the certificate before it is signed by the officer issuing it.

PAR. 456. The certificate must show that the applicant is borne upon the rolls of the Life-Saving Service at the time of making the application. Applicants who have been discharged from the Life-Saving Service, being no longer members thereof, are not entitled to treatment.

PAR. 457. During the period when the life-saving stations are open sick or injured keepers or surfmen will be admitted to hospital or out-patient treatment according to the necessities of the case.

PAR. 458. During the months when the stations are closed sick or injured keepers or surfmen will be admitted as above, unless the sickness or injury is the result of employment not connected with the United States Life-Saving Service. If injured or taken sick during said months as a result of employment not connected with the Life-Saving Service, treatment will not be granted.

PAR. 459. Under the terms of the act of August 4, 1894, a marine hospital will not be considered a home for sick or disabled keepers or surfmen of the Life-

Saving Service. Temporary treatment alone is permitted, and no keeper or surfman will be retained in hospital longer than ninety days unless special authorization is given by the Bureau.

THE LIGHT-HOUSE SERVICE.

PAR. 460. Officers and crews of the several vessels belonging to the Light-House Establishment, including light-ships, may be admitted to the benefits of the Public Health and Marine-Hospital Service upon the application of their respective commanding officers.

UNITED STATES ARMY AND NAVY.

PAR. 461. Officers and enlisted men of the United States Army and Navy may be admitted for care and treatment as patients of the Service only upon the written request of their respective commanding officers. Every such admission shall be immediately reported to the Surgeon-General by the officer in charge of the station, on a daily report (Form 1957) or relief certificate (Form 1916), accompanied by a copy of the request upon which such officer or enlisted man was admitted. They shall be furnished treatment at stations of the first, second, and third class only. The rate of charge to be made for the care and treatment of the said officers and enlisted men will be fixed by the Department at the beginning of each fiscal year.

FOREIGN SEAMEN.

PAR. 462. The accommodations provided for the care and treatment of the patients of the Public Health and Marine-Hospital Service are also available to foreign seamen at relief stations of the first, second, and third class upon the application of the consular officer of the nation under whose flag they are sailing or upon the application of the masters of the vessels upon which said seamen serve, provided satisfactory written security is given for the payment of the expenses of such care and treatment, at rates fixed annually by the Department. \* \* \*





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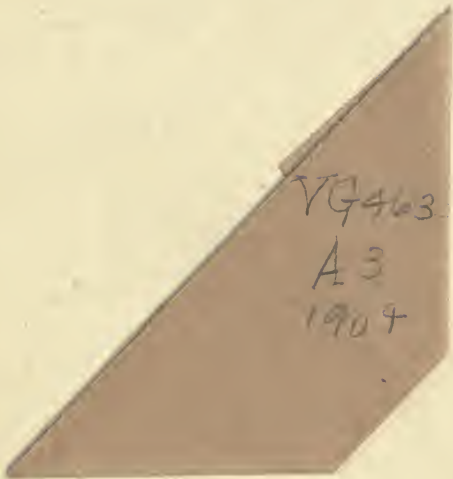












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