ERGENCY AND HYGIENE NOTES

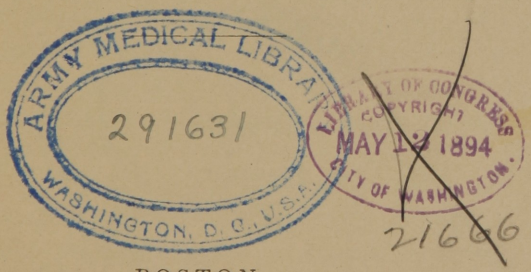
For the Volunteer Militia.

WM. N. DEVINE.

EMERGENCY AND HYGIENE NOTES FOR THE MILITIA.

BY

WILLIAM H. DEVINE, M. D.,
SURGEON NINTH REGIMENT, MASSACHUSETTS VOLUNTEER MILITIA.



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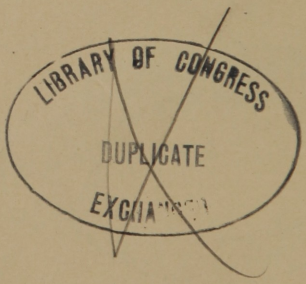

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PREFACE.

THE aim of this little work is to guide the volunteer soldier in matters pertaining to hygiene (especially as regards camp life), and to enable him to render intelligent aid in an emergency. Where so much depends upon the vigor of an organization, the importance of the former cannot be overestimated; and a knowledge of the latter is essential, inasmuch as it prevents unnecessary suffering and even loss of life.

The efficiency of an organization may be materially increased by having every man trained, to a certain extent, in such matters. Much of the illness due to camp life may be avoided by the observance of a few rules of health.

In the late war, more men were incapacitated by illness than wounds. Many cases of illness were due to the disregard of simple hygienic rules.

In all military organizations emergency lectures are delivered; where these are followed by recita-

tions, the efficiency attained by the men can be readily determined. But one cannot absorb all the important points of a lecture; and it occurred to the author that if the gist of such lectures were presented in a convenient form, it might serve as a useful adjunct to them. It is only by frequent reference to such a work as is here offered that a valuable and trustworthy familiarity with the subject can be acquired.

The main points considered are, how to keep the men in good health under such circumstances as they may be placed when on military duty, particularly in camp, and the simple treatment of the common complaints and accidents to which the soldier is liable. Rules and statements have been made brief and explicit, avoiding technical terms.

Although these notes have been written especially for the militia, many of them will be found equally serviceable in civil life.

[NOTE. — This work incorporates the substance of four emergency lectures given in the spring of 1893. Specially prepared for the Ninth Regiment, M. V. M.]

CONTENTS.

EMERGENCY AND HYGIENE NOTES.

CHAPTER I.

HYGIENE.

THE uniform of the militia is regulated by the State, but each soldier should make an effort to obtain well-fitting clothes.

Tight clothing should be avoided, as it interferes with the action of the chest and abdomen. The white helmet now in use is light and comfortable; when wearing the heavy helmet in warm weather, a piece of wet muslin placed inside will materially cool the head. Great care should be taken that shoes fit comfortably. Many men are incapacitated on a long march from tight-fitting shoes, which cause painful abrasions of the skin.

Corns and bunions should receive attention before going on a tour of duty. These are caused by pressure of ill-fitting shoes. If pressure is removed, the corn

generally disappears; if it does not, the simple and popular method of shaving off the outer portion with a sharp knife or razor may be tried, and then applying a ring of felt, wadding or similar material, with hollow part over the corn. Soft corns are small ulcers, usually situated between the toes, sometimes on the under surface. They may be readily cured by inserting pellets of absorbent cotton moistened with borax dissolved in glycerine, and applied so as to protect the raw surface and prevent friction.

A bunion is a hard swelling on the joint of the great toe. The pressure over it should be relieved in the same manner as described in treating of corns, and the surgeon consulted.

For chafing, use zinc ointment or vaseline. Blisters on the feet, after a long march, should be drained by puncturing with a needle, and protected by absorbent cotton.

Each man should carry, at least, two pairs of stockings.

The coat should be large enough to admit of extra underclothing.

It is better to wear several garments than one of aggregate thickness. Two light shirts are better than

one heavy one, for in case of sudden change in weather an extra one may be discarded or put on. The shirt should extend to the middle of the thigh, in order to protect abdominal walls. A smoothly-knitted merino, one-third cotton, will be found comfortable. In cold weather, a piece of flannel to cover the abdomen is advisable.

Cotton drawers for summer, fastened with tape at the ankles, and Canton flannel for cooler weather, are desirable.

Most militiamen are unused to out-door life, and though the weather may be warm, they should have ample bed-clothing.

Lying on the ground when overheated is a cause of diarrhœa.

The disorders of digestion on a tour of duty can, for the most part, be traced to errors in diet. Men should be careful not to eat the many fancy and indigestible dishes placed before them.

The food should be clean, wholesome and as near like that which one finds to agree with him at home.

At camp, the bill of fare can be regulated by the surgeon; but this cannot always be done on field days and other independent tours of duty made by militia organizations.

Only water approved by medical officers should be used. At State camp-grounds, the water now used is obtained from a reliable source and is pure. The water in some of the springs on camp-grounds is unsafe, and should be avoided.

Daily bathing should be encouraged, for it promotes the general health of the soldier in many ways. Personal neatness, when growing into a habit, ensures so many excellencies that it may well be called a social virtue.

Bathing should be taken, if possible, when the sun is shining, and never during the digestion of the principal meal, or late in the evening. The feet should receive daily attention, if it be no more than a vigorous rubbing with a wet cloth, followed by a dry one. After a long march, nothing is more refreshing, especially in summer, than a generous foot-bath in cool or tepid water, followed by an entire change in shoes and stockings.

It is unwise to bathe when copious perspiration has continued for an hour or more, unless the heat of the weather be excessive, or the perspiration has been induced by loading with clothes rather than by exertion. When much perspiration has been produced by muscular exercise, it is unsafe to bathe, because the body is

so fatigued and exhausted that reaction cannot be insured.

Special attention should be paid by bathers to the exclusion of salt water from the mouth and ears. Many cases of inflammation of the ear, followed by severe and lasting trouble, even to deafness, are due to the neglect of this precaution. Incoming waves should never be received in the face or the ears, and water which enters the ears when floating or diving should be wiped out with soft cotton. The best plan is to plug the openings of the ears with cotton, which is to be kept there during the bath.

A man can do better work if he is a total abstainer from alcohol; he is advised, therefore, to abstain from alcohol in every form. The idea that alcohol gives strength is a popular fallacy.

As long as liquor is allowed in militia camps, malt liquors should be encouraged. Many of the men overcome by the heat are found, on investigation, to be those who use stimulants to excess, and obtain insufficient sleep.

In the army and militia, many men are found who have "tobacco heart," caused by the excessive use of tobacco, either smoking or chewing. The heart beats rapidly, the pulse ranging from 100 upward.

CHAPTER II.

ANATOMY.

ANATOMY is the description of the various parts of the animal body. The word anatomy comes from a Greek word, which means, literally, dissecting, or cutting up; and it generally implies the art of dissecting any animal body to discover its structure.

Before going any further into this subject, which I may here remark I do not presume to do in the broad and comprehensive manner of those whose duty it is to teach medical students, I wish you to obtain, first, a thorough and clear idea of the structure of the human skeleton, which is the framework of bone that supports the rest of the body.

Bone is composed of animal and earthy matters. The earthy matter gives the bone its hardness, and the animal its toughness.

In the bones of children, the animal, or gelatinous part, is so much more abundant than the earthy matter, that instead of breaking, they are apt to twist or bend

like a green branch. In adults, and especially the aged, the proportion of earthy matter is, on the contrary, much greater, and the bones consequently more brittle; they are liable to snap like a dry branch.

Bones are enveloped in a tough membrane called the periosteum, through which the blood-vessels (which are found in bones) branch off. These blood-vessels give to the living bone a reddish color.

The skeleton consists of a number of bones (214) joined together to form the framework of the body. It serves to protect the internal organs, and as means of locomotion. The bones comprising the skeleton may be divided into those of the head, trunk, upper and lower extremities.

The head, or cranium, forms a box to protect the brain. It is formed of eight flat bones joined together. The other bones of the head form the face, and give attachment to the muscles.

The trunk is formed by the spinal column, breast-bone, ribs (the last two forming protection for the heart and lungs) and pelvis.

The spinal column is formed by the union of twenty-four bones, separated by cartilages, and forming a bony canal for the passage of the spinal cord. This

column forms a protection for the spinal cord, affords attachment for the muscles, and supports the head while guarding it from shock. From its mechanism, the spine is capable of considerable motion. The spinal column rests on a wedge-shaped bone called the sacrum, which is formed by the union of five small bones. The sacrum is the broadest part of the vertebral canal. Four small bones unite to form the coccyx, which is a small bone attached by its base to the sacrum, forming the tip, or end, of the vertebral column.

The ribs are curved, flat bones, twelve on each side, and attached behind the spine. The upper seven are called true ribs, and are fastened in front by cartilage to the breast-bone. The five lower ribs are called false ribs, the two lower of which are styled "floating ribs." The eighth, ninth and tenth ribs are connected with each other, and also attached to the cartilage of the seventh rib. The two lower ribs are not connected, and for that reason are called "floating ribs."

The sternum, or breast-bone, is a large, flat bone placed in front of the chest, and held in position by the ribs. It is about eight inches long, two inches wide, and half-an-inch thick.

The thorax, or chest, is formed by the junction of the ribs with the upper part of the spinal column and the breast-bone. The average measurement of its largest part, which is about the middle, is twenty-five inches. The lower part of the chest is closed by a thin partition called the diaphragm.

The two haunch bones, joining the sacrum and coccyx, of which mention has been made in connection with the spinal column, form the pelvis, which receives its name from its fancied resemblance to a basin.

The upper extremities include the scapula or shoulder-blade, the clavicle or collar-bone, the humerus or upper-arm bone, the ulna, radius (bones of the forearm), bones of wrist and hand.

The scapula is a flat bone, somewhat triangular in shape, situated on back part of shoulder, between the second and eighth ribs. On its upper and outer part it presents a shallow depression for articulation with the upper-arm bone. This cavity is so shallow that great motion is given to the shoulder-joint.

The clavicle, or collar-bone, connects the upper extremity with the trunk. Its outer side connects with the scapula, its inner with the sternum.

The humerus, or upper-arm bone, is the largest of the

upper extremity. At the upper end, there is a large, rounded surface called the head; it articulates with the shoulder-blade, forming the shoulder-joint.

The ulna is the longer of the two bones forming the forearm; it articulates above with the humerus, below with the bones of the wrist, and on its outer side with the radius.

The radius, or shorter bone of the forearm, is situated on the outer side, and articulates with the humerus above, the wrist below, and the ulna on its inner side.

The eight small, irregular bones between the forearm and hand form the wrist; there are five bones between the wrist and the fingers; fourteen bones form the fingers. The bones of the wrist are more flexible than those of the ankle.

The lower extremities include the femur or thigh-bone, the tibia and fibula, bones of the leg and the bones of the foot.

The femur, or thigh-bone, is the largest and longest bone of the body; it joins above with the pelvic (haunch) bone, and below with the tibia or shin-bone, and the patella (knee-pan).

The juncture of the femur and pelvic bone forms a socket so deep that the motion is very limited.

Next to the thigh-bone, the shin-bone is the largest of the long bones; it articulates above with the femur, and below with the ankle, or first bone of the foot.

The fibula is a long slender bone situated on the outer side of the leg, and joins the tibia or shin-bone, at both extremities. Below it is joined to the ankle-bone at its outer side.

The patella, or knee-pan, is a little round bone situated in front of the knee.

The bones of the foot are twenty-six in number, seven being in the ankle, five in the foot, and fourteen small ones to form the toes. The bones of the ankle are arranged in such a way that the motion is very limited.

Cartilage, or gristle, is a very firm, tough and elastic substance. The ends of all the movable bones are protected by cushions of cartilage.

A ligament is a cord-like structure which unites two bones.

The muscles constitute the flesh or "lean meat" of the body. They have the power to contract under the influence of the will, and this muscular contraction produces all the motions of the body. There are two kinds of muscles: voluntary, or those which act under

the influence of the will; involuntary, or those which act independent of the will. Examples of the first are the muscles of the trunk and limbs. We can draw up an arm or a foot whenever we wish, because the muscles which control these motions are influenced by the will. The heart is an example of an involuntary muscle, for it beats independent of the will. The walls of the stomach, the intestines, and all the internal organs are examples of involuntary muscles.

Muscles are strengthened by the proper kind and amount of exercise. They are weakened by over-exertion, as well as inaction.

The action of alcohol upon the muscles is to make them soft, pale and flabby.

CHAPTER III.

THE NERVOUS SYSTEM.

THE nervous system is so complex and so difficult to understand, that only slight mention of it will be made.

It may be divided into the cerebro-spinal and sympathetic systems. The cerebro-spinal system includes the brain, spinal cord and the nerves which pass to and from those structures.

The sympathetic system embraces a double chain of nerve-centres lying along either side of the spinal column and extending into the chest and abdomen. From these run delicate nerves to the organs upon which life depends — the heart, lungs, stomach, etc, — to the blood-vessels and to the spinal and cranial nerves over the body.

The brain, "the seat of the mind," is a mass of nervous tissue enclosed in the cranium. It consists of the cerebrum and cerebellum, or large and small brain. The large brain is composed of two soft, egg-shaped

masses, separated by a band of nervous tissue. It lies in the upper part of the brain case and its shape conforms with that cavity. The cerebellum, or little brain, is similar in structure to the cerebrum, and lies below it and above the medulla oblongata, which is the upper and enlarged part of the spinal cord, about one and one-half inches in length.

The spinal cord is that portion of the nervous system lying in the spinal canal. It measures about eighteen inches in length, and about an inch in circumference. It acts as an organ of nervous communication between the brain and external parts. It is also an independent nervous centre.

There are two classes of nerves that extend from the spinal cord to all parts of the body: one called the sensory nerves, or nerves of sensation, and the other called the motor nerves, or nerves of motion. The nerves of sensation convey to the body the power of feeling; the nerves of motion convey the power of motion. Through these nerves (sensory and motor) all the parts and organs have communication with the brain, which is necessary for their life and action. If the sensory nerve is cut off, or if the communication of any part with the brain is interrupted by pressure on

the nerve, or otherwise, the part loses its sensibility and cannot feel. If the motor nerve is cut off or pressed, the part cannot move.

The nervous system may be compared to a telegraph service. The brain is the central office from which all dispatches are sent and received; the various centres, the way-stations; and the nerves, the connecting lines.

CHAPTER IV.

THE CIRCULATION.

THE blood is a nutritious fluid containing the materials necessary for the nourishment of the body.

In the lungs, the blood receives oxygen, which is afterwards given to the tissues; the carbonic-acid gas which is produced in the tissues is collected by the blood and thrown off by the lungs. The organs of circulation are the heart and the blood-vessels (arteries, veins, capillaries).

The heart is a hollow, muscular, pear-shaped organ, which propels the blood. It is situated in the chest, a little to the left, its apex pointing down and to the left. It is divided in the centre by a partition into two cavities, and each cavity is subdivided into two connecting cavities. The upper ones are called auricles and the lower ones, ventricles.

The course of the blood through the heart is as follows: The venous or impure blood, returning from the body, passes into the right auricle; from thence

into right ventricle; it is then driven into the lungs. Here, the blood which is venous, on its return to the right side of the heart, receives its oxygen and gives up its carbonic-acid gas. It has now become arterial or pure blood. Returning from the lungs, it enters the left auricle, then the left ventricle, from whence it passes into the aorta (the main artery) and is distributed throughout the body; it enters the minute vessels called capillaries, and then returns by the veins to the right side of the heart.

The arteries are hollow, branching tubes which convey the blood from the heart. They begin with the aorta or main vessel and spread throughout the body, distributing the blood to the various organs. At each contraction of the heart, the blood is driven through the arteries, causing them to expand. This expansion can be felt in any superficial artery, and is called the pulse. It can be felt most conveniently at the wrist.

While considering this subject, it would be well to notice the principal points where circulation can be controlled by pressure, namely: in the neck, over the carotid; in the arm, over the inner edge of the biceps muscle; in the leg, just below the centre of the groin.

In health, there are about seventy-two pulsations per

minute. (This number varies much with age, sex and individuals.) They increase with excitement or inflammation, weaken with loss of vigor and are modified by nearly every disease. The physician, therefore, finds the pulse a good index of the state of the system and the character of the disorder.

The veins are the tube-like canals which convey the blood to the heart, and differ from the arteries in being thinner and less elastic; if cut, they collapse, while the artery remains open.

A dark blood flows in a steady stream from a vein; from an artery it spurts in bright-red jets. The veins are superficial, while the arteries are in deep, protected places. The great wisdom of nature is displayed by this arrangement, the more important organs being placed where they would be less liable to injury. The minute vessels into which the arteries and veins terminate are called capillaries.

CHAPTER V.

RESPIRATION.

THE respiratory apparatus begins with the larynx, which communicates with the upper part of the neck. The front of the larynx is commonly called "Adam's apple." Then comes the trachea, or windpipe, which passes down into the chest, and divides into the bronchial tubes; they divide and subdivide like the branches of a tree, and terminate in fine cells, which form the substance of the lungs. The air which enters the lungs becomes rapidly vitiated in the process of respiration, and requires to be promptly expelled and replaced by a fresh supply.

This exchange is caused by expansion and contraction of the chest, which follow each other in regular succession. When we take a fresh breath, the diaphragm (a thin, flat muscle which separates the cavity of the chest from that of the abdomen) is drawn down, enlarging the cavity of the chest; this is called inspiration. After this movement has been accomplished and

the lungs filled with air, the diaphragm and ribs relax and the air is forced out; this is called expiration.

Inspiration and expiration constitute respiration. This alternate expansion and contraction of the lungs takes place about eighteen times a minute in the healthy adult, and is more rapid in a child. The pulse in an adult is about seventy-four, or about four times as frequent as respiration.

CHAPTER VI.

ALIMENTARY CANAL, LIVER, PANCREAS, KIDNEYS, SPLEEN AND SKIN.

THE alimentary canal is a narrow, tortuous tube which commences at the mouth, and is about thirty feet long. It communicates with the stomach by the meat-pipe. The stomach is a pear-shaped sac and is the most dilated part of the canal; its length is from nine to twelve inches, and its capacity about three pints.

The small intestine is from twenty to twenty-five feet long, and is laid in coils in the abdominal cavity.

The large intestine extends from the termination of the small intestine to the end of the bowel; it is about five feet long.

The liver is situated on the right side of the abdominal cavity, just below the diaphragm; it measures from nine to twelve inches from side to side and weighs from one and one-half to four pounds. Its function is to secrete bile.

The pancreas is a glandular body lying behind the stomach and across the spinal column ; we know it as the " sweet-bread." It is from six to eight inches long and weighs from two and a half to four and a half ounces.

The kidneys are two bean-shaped bodies situated in the small of the back, on each side of the spine ; the average length of a kidney is four and a half inches ; width, two inches ; and thickness, one and a quarter inches. The function of the kidneys is to secrete or separate the urine from the blood, the daily secretion averaging about three pints.

The spleen is situated in the left side of the abdominal cavity under the ribs and is four and a half inches long.

The skin is a tough, thin, close-fitting covering for the protection of the tender flesh and internal organs. It guards against changes of temperature, and from external injury. For these purposes it can bear contact with outward substances without injury and endure great variations of heat and cold without suffering. Its perfect elasticity beautifully adapts it to every motion of the body. It oils itself to preserve its smoothness and delicacy, replaces itself as soon as it wears out,

and is at once the perfection of use and beauty. It is more than a mere covering, for it does its part in the work of keeping the body in order. It is the principal seat of the sense of touch, and in it are the sweat and sebaceous glands, hair follicles, nerves and blood-vessels. The sweat glands secrete about thirty-five ounces of water, which contain large quantities of waste material from the tissues.

CHAPTER VII.

DIGESTION.

DIGESTION is the process by which food is modified in various ways, whereby it is fitted for the use of the body, into which it is finally incorporated.

The food, in its course from the mouth (which is the beginning of the alimentary canal) to the end of the bowel, comes in contact with digestive fluids, which act upon it in such a way as to liquefy and dissolve it. These fluids are exuded, or poured forth, from the surface of the alimentary canal, and certain organs, such as the liver, pancreas, etc. The food meets the saliva in the mouth; the gastric juice in the stomach; the intestinal and pancreatic juices and bile, in the small intestines.

As a result of the action of these juices, the food is gradually reduced to liquid form, which renders it fit for absorption by the intestines. The residuum, or portion not absorbed, is excreted.

Excretion: The throwing off of those matters of the

animal body which are useless, namely, urine, perspiration, fæces.

Secretion: A function chiefly executed in glands, by which different liquids are formed, such as bile, saliva, urine, milk, etc.

CHAPTER VIII.

HEMORRHAGE.

A WOUND which includes injury of a blood-vessel, thereby causing a flow of blood, is called hemorrhage. The manner in which the blood issues from the blood-vessel determines the nature of the hemorrhage.

In capillary hemorrhage there is a slight oozing where the minute vessels have been cut; it is not dangerous, and stops in a short time without interference.

Venous hemorrhage is characterized by a steady flow of dark blood.

Arterial hemorrhage is easily recognized, because the blood issues in spurts or jets, and is a bright-red color.

It is very important to control hemorrhage from a large vessel, for although it rarely proves fatal, so much blood may be lost that one may be debilitated for a long time.

Coagulation: A few moments after the blood has been withdrawn from the vessels, it coagulates, or clots.

Upon this coagulation, nature relies for the arrest of hemorrhage from divided or ruptured blood-vessels. Whenever a wound is made, the blood at first flows freely from the external orifice; but a portion of the blood coagulates on the edges of the wound, and after a short time, becomes sufficient to close the opening and prevent further escape of blood.

Simple Methods of Arresting Hemorrhage.

Pressure on the bleeding vessel with the fingers is far preferable to the old-fashioned method of applying hair, spider webs and other filthy things. After arresting the bleeding by pressure with the fingers, make a small pad with a handkerchief or some similar material; place it over bleeding part and bind firmly. When unable to control it by this method, exert pressure on an artery between the heart and the wound; on a vein below the wound.

To control bleeding in head or neck, apply compression to the carotid artery. This is done by standing behind the patient and pressing with the tips of the fingers about the middle of the side of the neck; pressure here is rarely employed, except by the surgeon.

In wounds around the shoulder, compression may

be made over the large artery which runs under the collar-bone, by pushing the thumb firmly down behind the collar-bone, and in this way pressing the artery against the first rib. A convenient method of doing this is to wrap a handkerchief around the end of a short key, hold the key firmly, place its end over the artery and compress it against the first rib.

In hemorrhage of the arm, the artery running along the inner edge of the large muscle of the forearm (the biceps) may be compressed with the tips of the fingers; hold the artery down firmly against the bone.

In hemorrhage of the leg, compress the artery in the centre and just below the groin, with the thumb. In case compression fails, we must have recourse to the tourniquet. This can be readily made with a handkerchief, triangular bandage, roller bandage, suspender, etc., and a small stick, as follows: Tie a handkerchief around the limb at point of injury, improvise a pad and place under knotted ends of the handkerchief and over the point to be compressed; insert a stick or similar object between pad and handkerchief, and twist till sufficient pressure has been exerted to arrest hemorrhage.

What would be the result if the tourniquet was

allowed to remain on a limb too long? It would become blue and cold, and death of the injured member might ensue. Never leave the tourniquet on more than ten or fifteen minutes; gradually loosen, and if hemorrhage has stopped, relieve compression. Allow the tourniquet to remain in position, ready for immediate application in case hemorrhage should start anew.

One is rarely called upon to employ any method, other than simple pressure, to arrest hemorrhage, even in case of rupture of a large vessel.

Let us review, briefly, the treatment of hemorrhage.

Capillary Hemorrhage needs no special treatment other than simple pressure with the fingers. Ordinary hemorrhage may be arrested by pressure with the fingers, pad and bandage, and finally the tourniquet.

The simpler the methods employed to check hemorrhage, before the arrival of the surgeon, the better.

Nosebleed. — Usually this may be checked by simple means. Place the patient in a comfortable position, with head erect; assure him there is no danger; give him cracked ice to suck, and apply the same over the bridge of the nose. Let him snuff cold water, or cold water and vinegar. If these methods fail, await surgical assistance.

Hemorrhage of the Lungs. — It is a fact that this rarely proves fatal, reassuring words doing much to allay the patient. Let the surroundings be cool; place the patient on his side or back; give cooling drinks, cracked ice, and occasionally a teaspoonful of vinegar and water.

Hemorrhage of the Stomach. — Cold drinks, cracked ice, vinegar and water. Not much can be done to control internal hemorrhage; apply treatment for shock, if necessary.

Bleeding after Extracting a Tooth. — Bleeding occurs in all cases to a certain extent after extraction; it is simply an oozing and even if it continues some little time, there is no danger. In cases of so-called "bleeders" (those having a constitutional tendency to bleed), the hemorrhage is obstinate, and the extraction of a tooth is a serious matter, and may be fatal. The cavity should be cleansed of blood-clots, and then packed tightly with lint or absorbent cotton, and over this a plug of cotton or cloth; then exert pressure by closing the jaws on the plug. This will usually check the most severe cases.

CHAPTER IX.

SHOCK, OR COLLAPSE.

THIS is such an important subject to consider in connection with hemorrhage, wounds, burns, etc., that I will briefly explain it. It is a sudden impression of pain or injury on the nervous system which interferes with the action of the heart, and is indicated by the pallid face, glassy eye, fluttering pulse, clammy skin, etc. It may be induced by a slight wound, but generally follows severe injury. The patient may rally in a few minutes, sometimes not for a few hours, or death may ensue without any reaction.

Treatment: Apply hot bottles, or anything that would answer the purpose, to the legs, and sides of the trunk; warm flannels across the abdomen; and wrap him in a blanket or overcoat. Administer a teaspoonful of whiskey in a little water every five or ten minutes, unless there is injury to the head, when alcohol is to be avoided. It is very important to treat shock as quickly as possible, for, in some cases, recovery depends on the adoption of prompt measures.

CHAPTER X.

BURNS, SCALDS, FROST-BITE, POISONED BITES AND POISON IVY.

EXTINGUISH all burning material immediately, by smothering flames with blanket, shawl, mat, or whatever is handy, and apply water till every vestige of fire has disappeared. Cut the clothing off with great care; if any adheres to the flesh, allow it to remain, as the skin may be removed with it.

Linseed oil and lime-water (equal parts), sweet oil, castor oil, vaseline, etc., may be applied. If these cannot be obtained, dust the inflamed surface with flour or starch, and wrap in cotton batting, or any soft, warm material and treat for shock.

In slight burns or scalds, saleratus (the ordinary baking soda) will afford great relief.

Burns from Corrosive Acids and Caustic Alkalies. — The action of corrosive acids and caustic alkalies upon the tissues is similar to that occasioned by the application of intense heat. The corrosive or mineral

acids which most frequently cause burns are the sulphuric, nitric and the muriatic.

In chemical works and in other places where these acids are in common use, burns of the surface are not of infrequent occurrence ; and it is the experience of workmen so injured, that in the immediate treatment of such an injury, the application of water is to be avoided, as it causes when mixed with these acids, a great and sudden elevation of temperature. The proper plan is to instantly apply whiting, or powdered chalk, which causes brisk effervescence, and at once neutralizes the acid, after which the mixture may be washed off with water. The general treatment for burns would be appropriate here.

The caustic alkalies are soda, potassa, ammonia and quicklime; and they cause a burn, if in a state of concentration, such as would be produced by the contact of heat or strong acids. A recent burn of the surface from these agents should be treated by the application of vinegar, or any other mild acid, which neutralizes the alkali. If vinegar be not at hand, any of the oils or fats would be an appropriate application. Failing this, if the caustic be soda, potassa, or ammonia, plenty of water should be used so as to dilute the

caustic, which it does without causing any increase of heat; but in the case of quicklime, vinegar should be relied on, as water, by causing the lime to slake, would act as fuel.

Lightning-Stroke. — One suffering from lightning-stroke should receive the same treatment as for shock. Rest, stimulation, friction of limbs, and the best methods of restoring suspended animation is the entire treatment. A special injury should be treated according to its nature.

Sunburn. — Although these injuries are usually very trivial, so slight generally as to require but a passing notice, yet occasionally persons who have a delicate skin suffer severely from brief exposure, not only to intense but even to ordinary sunshine. This form of pain is characterized by a diffuse redness of the skin, with more or less persistent, smarting pain. The face, neck, forearms and hands are usually involved, though large areas of the body may be affected from bathing or rowing. Treating the affected surfaces with some soothing application, such as vaseline, cosmoline, etc., is usually the only treatment for ordinary sunburn.

Frost-Bite. — The ends of the extremities, the point of the nose and tips of the ears are most liable to be

frozen. Closely-fitting clothes, which impede the circulation, increase the predisposition. Cold wind, and cold accompanied by moisture, induce frost-bite more readily than very great, still, dry cold.

Treatment: Avoid any sudden change to higher temperature, but increase the warmth gradually. Place the patient in a cool room, and apply friction for several hours. If the breathing is weak, induce artificial respiration. Give a little whiskey or brandy (a teaspoonful) in water, every ten or fifteen minutes.

Poisoned Bites. — Fortunately, with us there are few varieties of poisonous serpents, and even they are not frequent. The symptoms of snake-bite are high fever, vomiting, with severe pain, great inflammation, tension and swelling of the skin, great anxiety and depression.

Treatment: The wound must be sucked at once to remove the poison, although this is dangerous if there is an abrasion of the lip. Wash out the wound immediately, and apply bandage above the bite to prevent absorption of the poison into the circulation. The bite of a mad dog may be treated in the same way, and cauterize the wound with a hot iron. Give stimulants in moderate quantities.

Poison Ivy. — The vine commonly known as poison

ivy, when brought in contact with the skin, is capable of exciting an inflammation of its tissues. It is sometimes a vine running over or by the side of stone walls, fences and ledges, or ascending trees to a great height; and sometimes a bush of considerable size and thickness (poison oak.) It is found almost everywhere in the United States.

The poison ivy is often confounded with the harmless woodbine or Virginia creeper, but may be easily distinguished from it by the fact that its leaflets are in clusters of three, while those of the woodbine are in clusters of five.

Treatment: The parts affected should be thoroughly washed, as soon as possible after contact with the poison, in baking-soda (or saleratus) water, or in strong soapsuds. If these cannot be obtained, an abundance of water should be used. Lime-water is also efficacious. The parts should be freely dusted with powdered starch.

CHAPTER XI.

WOUNDS.

A WOUND may be incised, punctured, lacerated, or contused.

An incised wound is clean cut, such as is made by a sharp instrument.

A punctured wound is made by a pointed instrument.

A lacerated wound has irregular edges, and is usually more or less contused. It is made by a dull instrument which tears the tissues.

A contused wound has bruised edges, and is usually lacerated.

A contusion is a bruise without penetration of flesh.

A knife will make an incised wound ; a sabre, an incised and contused wound ; a bayonet, a punctured wound ; a gun shot, a lacerated wound. A "black eye" is a contusion.

Wounds may heal by first intention, that is, the edges unite and heal, leaving a slight scar which can

scarcely be detected. Where the edges cannot be brought into apposition, and even in some cases where they can, but do not unite, we have to depend on healing by granulation, or second intention. The surgeon endeavors to get union by the first method. After carefully cleansing the wound he brings the edges together and holds them in this position by means of sutures. This can generally be accomplished in incised wounds. Lacerated wounds, especially if contused, usually heal by second intention. The surgeon, after thoroughly cleansing the wound, applies iodoform, aristol, or other agents which favor healing. Granulation tissue forms in the space between the edges and gradually fills it.

Since the introduction of the antiseptic method of treating wounds, they heal more rapidly than by the old methods. This method was inaugurated by a distinguished Scotch surgeon named Lister. The theory is, that an open wound does worse than one that is not open, because atmospheric germs enter it and produce fermentation, resulting in irritation and decomposition, which lead to inflammation, blood-poisoning, etc. Certain substances, such as carbolic acid, destroy these germs. On this principle of destroying the germs, Lister prepared his antiseptic system.

To prepare for an operation, the skin around the seat of operation, everything coming in contact with the wound, the hands of the operator and assistants, the instruments, etc., after being carefully cleansed with soap and brush, are disinfected by washing with a strong solution of carbolic acid. During the operation the air in the neighborhood of the wound is filled with a fine spray of carbolic solution from an atomizer. Before dressing the wound it is washed with carbolic solution. The dressings applied to the wound are prepared by soaking in a solution of carbolic acid.

Every time the dressing is changed, the same precautions are used. This method has borne good fruit, and in a modified way is now used by surgeons. In emergency cases it is not possible for a physician to carry out this system in detail, but the foundation on which the antiseptic system rests is cleanliness, and every endeavor should be made in treating a wound to have everything coming in contact with it as clean as possible. The subsequent welfare of a wound often depends on the first dressing. In case of compound fracture, a carelessly applied dressing (soiled) may mean the loss of the patient's limb, or even life.

CHAPTER XII.

SPRAIN, FRACTURE AND DISLOCATION.

SPRAIN is a strain, twist or wrench of the soft parts surrounding a joint. Immediately after injury there is pain, followed by swelling of the parts and partial loss of motion. The joint should be kept quiet, bathing alternately with hot and cold water, or cold water alone if unable to procure hot, then bandage.

FRACTURE is the breaking of a bone, and may be simple, compound or comminuted.

Simple, when the bone is simply broken without there being any external wound.

Compound, when the bone is broken, and there is an external wound communicating with the fracture.

Comminuted, when the bone is splintered or broken in more than one place.

When once a bone is fractured, it is liable to be displaced, not only by the violence of the accident causing the fracture but by involuntary contraction of

the muscles, which causes the ends of the bones to overlap one another, producing a deformity; if the bone is moved, the fractured ends cause a grating sound.

Fracture is generally accompanied by swelling of the surrounding parts, and pain. As movement is likely to increase the displacement, it is of the highest importance to keep the seat of injury at rest. Nature makes little or no effort to replace the broken bone; the surgeon, therefore, extends the limb, by stretching it until the two ends of the bone are in apposition. This is called "setting a fracture." Nature, nevertheless, does something to repair the injury, for she throws out an exudation, or honey-like substance, and this gradually develops into bony matter, constituting what is termed "callus," which, congealing, fixes and eventually assists materially in uniting the broken ends firmly together. The surgeon, following her lead where it is possible, applies a splint externally, in order to ensure for the limb perfect rest in a proper position.

There is no great hurry about setting a fracture, although the popular idea is that it requires immediate attention.

If the surgeon can be procured in a short time, it is better to wait, and simply place the limb in a comfortable position.

If considered advisable to set the fracture without delay, compare the injured limb with the other, and note the deformity. Draw the limb into position, if it can be done without causing much suffering, by grasping the limb firmly with one hand, above the break, and extending the part below the break; when the limb is in position, apply splints. Splints may be improvised from various materials: thin board, barrel-staves, pasteboard, sole-leather, pieces of cigar-box, trunk-trays, umbrellas, canes, muskets, etc., are always available. For padding a splint, use cotton-batting, cloth, hay, straw, leaves, etc.

To prepare an ordinary splint for arm, leg, finger, toe, pad two pieces of board, or material used, making them about as wide and slightly longer than the broken bone, and bandage firmly.

How to Treat Fracture.

Of the Arm (forearm). — Prepare splints, adjust one on each flat surface, and apply bandage.

Of the Leg. — An ordinary pillow makes a model

emergency splint in this case. Place the leg on lengthwise and bandage.

Of the Thigh. — A musket with the butt under the arm, barrel extending along the leg, and bound at the waist, thigh and leg, would make an admirable splint.

Of the Skull. — Do not confound this with drunkenness. Little can be done other than placing the patient in a comfortable position, and await surgical assistance. Give no stimulants.

Of the Collar-Bone. — Adjust pad under the armpit, bring forearm across the chest, and bandage in this position.

Of the Ribs. — Place a binder about one foot wide, and of sufficient length, around the chest, fastening with safety-pins.

Of the Jaw. — After reducing it, or placing it in position, bind with four-tailed bandage. (See "Bandaging.")

Dislocation is the throwing of a bone out of its socket. There is pain and loss of motion.

Treatment: Compare the injured side with the opposite side, and you will notice a change of form; an

injured limb is shorter than a sound one. In many cases a dislocation may be reduced by moderate traction, or pulling into place; but in some your endeavors will be futile, and surgical assistance necessary. If moderate pulling reduces a limb, well and good, but do not be tempted to apply great force.

Dislocation of the Jaw. — This can take place only in the lower jaw, and sometimes happens when one is yawning, laughing, etc. There is great pain, and difficulty in swallowing and speaking; the jaw is advanced, and the mouth wide open.

Treatment: Wrap the thumbs in several layers of cloth; place a thumb along the lower back teeth on each side, and the fingers beneath the chin. Press down and backwards with thumbs, while the fingers lift the chin upwards. Apply chin and head bandage. (See "Bandaging.")

Dislocation of the Shoulder. — This is the most common dislocation.

Treatment: Place the patient on his back; sit beside and facing him; adjust the unbooted foot under the armpit, and while pressing moderately with the heel, draw the arm at right angles to the body, and extend firmly across to the other side. This generally

snaps the head of the bone back into the socket. If this method is unsuccessful, it is better to desist and await the surgeon.

Dislocation of the Hip. — Do not tamper with this; it is better to seek surgical aid.

CHAPTER XIII.

ARTIFICIAL RESPIRATION.

THIS may be necessary in cases where the lungs have been suddenly deprived of air, such as in drowning, strangulation, suffocation by illuminating or sewer gas, or poisoning by chloroform, ether, or opium. A person receiving a terrible shock to the nervous system may have breathing temporarily suspended; shock and hemorrhage from a gun-shot wound might occasion it. In all these cases artificial respiration is of great service.

After the heart has ceased to beat, the method is useless, but often the heart is beating when an inexperienced person cannot detect it. Always give the patient the benefit of the doubt.

To Restore the Apparently Drowned. — This method applies to the other conditions above mentioned. While violently struggling to obtain air, the drowning man gulps a large amount of water into the lungs, thus excluding the air and causing suffocation. Treat the sufferer upon the spot, if the weather be not too unfa-

vorable. Send immediately for blankets, dry clothing and a physician. Roll the patient over on his face, having the head a little lower than the body ; pry the mouth open, and keep it so by inserting the handle of a knife, a piece of wood, or a knotted handkerchief between the teeth; it is important that the tongue should be drawn forward. Then getting astride the patient, press with the palm of the hand on the abdomen, in order to push up the diaphragm. By this means the water will in a short time be partially driven out; then employ "Sylvester's method," namely, place the patient on his back ; keep the mouth open by using the gag ; draw the tongue forward, and hold in position by wrapping a handkerchief around the end, and place in charge of an assistant ; it is very important to keep the tongue forward. If there be no assistant, a large pin may be passed through the tongue about a quarter of an inch from the tip, the ends of the pin, pressing against the lips, will prevent that organ from falling into the mouth ; or a handkerchief may be passed over the tongue and the ends tied around the neck. Cleanse the nostrils, so as to clear the air-passages. Place an overcoat or blanket under the shoulders ; then kneeling behind the patient's head,

grasp the forearms and draw the arms quickly and steadily up and over the head until the hands touch the ground behind his head; retain this position two or three seconds. This motion expands the chest. Now reverse this movement, or bring the arms forward and press them against the sides of the chest. This reverse movement causes the chest to contract. This to-and-fro movement should be repeated fifteen or sixteen times a minute, to simulate natural respiration, and be continued half an hour or even longer; do not cease effort while there is hope. Life has been restored after five hours of suspended animation. When respiration has been established, wrap the patient in dry, warm clothing, rub the limbs under the blankets or even the dry clothes energetically *towards the heart.* Apply bottles of hot water, or heated flannels to the extremities, a mustard plaster to the chest and stomach, and give a little whiskey in hot water, coffee or beef broth.

When one has no assistant, "Marshall Hall's Ready Method" is easier and often effective. Place the body on its side, and roll it alternately on the face, to compress the chest, and on the back to expand the chest and draw air into the lungs. It is not as effective as "Sylvester's Method."

CHAPTER XIV.

UNCONSCIOUSNESS.

It is not to be expected that one can always decide the causes of unconsciousness. Even the experienced physician is often puzzled and sometimes unable to determine its origin. If one can in a measure, learn to distinguish between drunkenness and other conditions which cause unconsciousness, I shall feel that much has been accomplished by this chapter. Many unfortunates, suffering from illness or accident, are unattended for hours and even days, because they are supposed to be intoxicated. Do not fall into the error of deciding that a man is intoxicated simply because the odor of liquor is on his breath; he may have partaken of liquor just before going into the unconscious state; it may have been administered to him by a bystander; or he may have sustained an injury while under the influence of liquor.

Unconsciousness may be due to the following conditions: Injuries to the head, apoplexy, epilepsy, sun-

stroke, suffocation, fainting, loss of blood, blood-poisoning resulting from Bright's disease, or poisoning from opium or alcohol.

Injuries to the Head. — There may be nothing more than concussion or stunning; the pulse is feeble and frequent; vomiting sometimes occurs; the extremities are cold. Unless it is very severe, the patient rallies in a short time.

If the skull is broken, the fracture will not always be revealed by an examination, still a careful one should be made, and if a portion of the skull is depressed or driven in, the case is clear. In simple fracture there may be symptoms only of concussion, and perhaps bleeding from the ears. In depressed fracture, the bone is driven into the brain, and from pressure on its substance causes symptoms resembling those of apoplexy. Even if there is no depression, the blow on the head may cause laceration of blood-vessels within the skull, and cause the same condition.

Apoplexy. — This is caused by pressure, or hemorrhage into the substance of the brain. The pulse is full and slow; the breathing labored; the pupils dilated, insensible to light, and sometimes unequal in size; the mouth is twisted to one side. The patient

is in a deep stupor, and cannot be aroused even by pinching or pricking with pins.

Epilepsy. — If a history of the case can be obtained, it will be found that the patient has had a violent fit, and probably has had previous ones. Foam may be found on the lips, the tongue bitten, and scars remaining from former attacks in which he had bitten himself.

Sunstroke. — Comparatively few cases occur in the militia, and these are generally of a mild type, and due to exhaustion. Loss of sleep, over-indulgence in alcoholic liquors, distention of stomach with liquors and indigestible food predispose to it.

Sunstroke is caused by great heat, either with or without exposure to the sun's rays. Pain in the head, nausea, vomiting, weakness and dizziness often precede an attack, and should serve as a warning. The soldier should consult the medical officer if these symptoms manifest themselves. In slight cases of heat-stroke, the sufferer is prostrated, and loses consciousness for only a few minutes. He is perhaps at dress parade, or after a fatiguing drill, and recovers quickly when brought to his tent. In severe cases, the patient passes quickly into a state of complete insensibility. The pulse and breathing are rapid; the

heat of the body is great, and there may be convulsions.

Suffocation. — One must depend on the history of the case. Was this condition the result of inhaling illuminating gas? sewer gas? fumes of charcoal? smoke? etc.

Bright's Disease. — A person suffering from this disease is liable to blood-poisoning, which causes attacks of unconsciousness. The stupor comes on gradually; it is not deep, and the patient may be aroused by shouting and shaking. This disease is often indicated by dropsical swellings about the eyes and legs.

Fainting is due to a disordered circulation, or loss of a large quantity of blood. The appearance of one in this condition is familiar. The pallid face, faint breathing and feeble pulse are produced by the temporary arresting of the action of the heart, and consequent diminution of the blood-supply to the brain. Ordinarily, consciousness returns in a short time.

Opium (*and Morphine*).—The breathing is slow and labored; not puffing as in apoplexy; pupils contracted, sometimes to the size of a pin-hole. There is no paralysis. By vigorous efforts the patient may be aroused.

Alcoholic Poisoning or Drunkenness. — This condition closely resembles apoplexy and opium poisoning. There is an odor of alcohol on the breath and matter vomited. Insensibility is only partial (distinguishing it from complete insensibility of apoplexy). There is entire helplessness, no one-sided paralysis; dilated pupils; a feeble and frequent pulse.

Treatment of Unconsciousness.

What is to be done? Feel the pulse. Note the breathing. Are the pupils contracted? dilated? unequal? Has he been drinking? Injured? Is he subject to fits? Bystanders are always eager to furnish all the information bearing on the case that they possess.

General Treatment: Give the sufferer plenty of fresh air; loosen his clothing, and place him in a comfortable position. If the head is hot, apply cold wet cloths, or ice wrapped in oiled silk, if this be possible, to the head and back of neck; hot applications (mustard plasters are excellent) to the stomach and legs.

Fracture of the Skull. — Place the patient in a comfortable position; treat for shock and seek surgical assistance.

Apoplexy. — Elevate the head, and treat with cold applications; hot mustard foot-bath.

Epilepsy.— In epilepsy, prevent the patient from injuring himself; especially, put something in his mouth to keep him from biting his tongue. A cork, piece of wood, a pad made of cloth, inserted between his teeth, will answer the purpose. Keep him quiet, and he will ordinarily obtain refreshing sleep.

Sunstroke.— If the head is hot, apply cracked ice, and dash cold water on the head and chest till consciousness is restored. To avoid sunstroke, wear light, porous head-covering; place a wet handkerchief or a cabbage-leaf in the top of the hat; drink freely of water, not ice water, to induce perspiration. In simple heat-exhaustion, the face is not so red and hot, nor the skin so dry and burning as in sunstroke. Keep the patient cool and quiet, and give stimulants gradually.

Suffocation. — One must be guided by a history of the case. Note the surroundings. Was this condition caused by inhaling illuminating gas? fumes of charcoal? sewer gas? smoke? etc. Give plenty of fresh air and resort to artificial respiration if necessary.

Fainting. — Place patient in a horizontal position, with the head lower than the body; loosen any tight

clothing; give plenty of fresh air; dash water in the face; apply smelling-salts to nose.

Opium.— See Poisons.

Alcohol.— In case of profound intoxication, an emetic may be given. A large draught of vinegar has been recommended for sobering an intoxicated person.

CHAPTER XV.

FOREIGN BODIES IN THE AIR-PASSAGE, MEAT-PIPE, EYE AND EAR. — TOOTHACHE.

Foreign Bodies in the Air-Passage.— There are few accidents which excite more anxiety and alarm to the looker-on than the passage of a foreign body into the windpipe.

Most of the victims of such accidents are children, although adults are not exempt from such a contingency. The symptoms of this condition are violent, convulsive coughing, coming on abruptly, followed by difficult breathing and a feeling of suffocation.

Among the substances which are apt to lodge here, the most frequent are coins, buttons, teeth, pins, particles of food, etc. When an accident of this nature occurs, and danger is apprehended, send immediately for a surgeon. Some substances may be expelled by turning the patient's head downward, slapping him on the back, and at the same time induce coughing or sneezing. If it be a large body, the index finger, pushed

deeply into the throat, may hook the offending substance.

In some cases where asphyxia threatens, it may be necessary to have recourse to "Sylvester's Method of Artificial Respiration."

Foreign Bodies in the Meat-Pipe. — Portions of food, such as bones, pieces of meat, coins, artificial teeth, etc., lodge here. There is local pain, especially on attempting to swallow. Vomiting will sometimes displace the foreign body, but in some cases a surgical operation is necessary.

A vigorous blow between the shoulders may dislodge the substance. If something is in the throat, endeavor to grasp it with the thumb and forefinger. If these methods fail, give an emetic of mustard and water. In all cases where the symptoms are not urgent, quiet the patient's apprehensions by assuring him that there is no immediate danger.

It is well to bear in mind, that the symptoms of irritation may exist in the air and meat passages long after the expulsion of the substance which caused it; and often patients will insist that they have not been relieved, even when it is certain that the foreign body has been expelled.

Foreign Bodies in the Eye. — Cinders and other particles driven by the wind, often strike the eye and fasten themselves upon it, causing great suffering. Small portions of seed, stone, powder and other hard substances driven by some mechanical force, may not only be lodged on the eye and under the lids, but imbedded in it. In the latter case it is best not to tamper with the eye, but leave the removal to a surgeon. Foreign bodies are generally found on the eyeball in front, or under the upper lid.

When upon the surface of the eye, their removal is very easy.

A little absorbent cotton, wound around the end of a match or toothpick, will sometimes sweep off a small particle; a handkerchief will answer the same purpose. When on the under surface of the upper lid, it may come off with a gush of tears by pulling the lid out from the cornea; or if this fails, the lid is everted (turned over) and the body brushed off.

To evert the upper lid, seize the lashes near the centre of the lid with the thumb and index finger of the left hand, directing the patient to look downward; then drawing the lid slightly away and down from the eye, press the end of a pencil, match, or even the tip

of the finger, above the centre of the lid and roll the lid over it. The lower lid is easily everted by drawing it down towards the cheek, directing the patient to look up.

Burns of the Eye.— Caustic material or melted metal are the usual causes; namely, fresh mortar, lime, nitric and other acids, ammonia, melted lead or iron. Red pepper, although not destructive, is very irritating.

Treatment: The eye should be washed copiously with water, and the coarser particles removed with a handkerchief; then apply sweet oil, castor oil or vaseline.

Foreign Bodies in the Ear. — Roaches, fleas, flies, bedbugs and various other small insects sometimes get into the ear. A drop or two of sweet oil, castor oil or liquid vaseline poured into the ear will smother an insect and it can then be removed by forceps. The presence of such objects as beads, beans, peas, buttons, etc., in the ear is not serious, unless they swell from moisture, as peas and beans do.

Most of the bad results following the entrance of a foreign body into the ears, is due to the unskilful endeavors to remove it.

A few syringefuls of warm water will usually remove

a foreign body. If harsh methods are employed, causing swelling of the skin of the canal of the ear, or if the foreign body swells and produces much pressure, the patient suffers greatly and only a skilful surgeon should treat the case.

Toothache. — Generally this is a symptom of dental caries (decay), the ulceration having exposed the pulp. It may also be due to other causes. A healthy tooth may be affected with severe pain from a neighboring diseased tooth. Sometimes toothache is due to neuralgia. Where the pulp is exposed, pain may be relieved by oil of cloves, creosote, carbolic acid, chloroform or laudanum on absorbent cotton. Painting the gums with equal parts of tincture of aconite and tincture of iodine may afford relief.

CHAPTER XVI.

POISON EMERGENCIES.

In cases of this nature, the physician is rarely called in time for him to render valuable assistance; and for this reason it is of the utmost importance that one should know how to act intelligently. A few moments' delay may prove fatal; prompt action may prevent the corrosive action of certain agents or the absorption of a powerful dose, thereby saving life. Next to the proper antidote, promptness is the essential feature.

Poisons may be divided into two classes, according to their action on the system, namely, *irritants* and *neurotics*.

Irritant poisons manifest their action chiefly on the stomach and bowels.

Neurotic poisons act directly on one or more parts of the nervous system.

Irritants, when taken in ordinary doses, speedily occasion violent vomiting and purging. The symptoms are accompanied or followed by pain in the throat,

stomach and bowels. The effects of the poisons are apparent chiefly on these organs, which they irritate and influence. Many substances in this class possess corrosive properties, such as strong mineral acids, caustic alkalies, corrosive sublimate and others. These, in the act of swallowing, are accompanied by a burning taste, extending from the mouth down the gullet to the stomach.

Neurotic poisons act upon the nerve-centres and nervous system generally. Either immediately or shortly after the poison is swallowed, the patient has headache, giddiness, numbness, paralysis, stupor, and, in some instances, convulsions. They have not the burning taste of irritants, and rarely give rise to vomiting and purging. If these symptoms occur, they are generally due to the form or quantity in which the substance was taken, and the mechanical effects on the stomach thereby produced, or to the combination with some irritating element, such as alcohol. The pure narcotics do not irritate or influence the stomach and bowels.

The most common agents used in acute poisoning are: carbolic acid, corrosive sublimate, ammonia, tincture of iodine, arsenic (principally in form of Paris

green), opium, alcohol, chloral, strychnia, belladonna and atropia. All these substances, excepting Paris green, are much used in medicine. Paris green is very often used with suicidal intent; the others are generally taken or administered accidentally.

Opium-poisoning is so often mistaken for intoxication and apoplexy that it will be well to remember some of its more important symptoms. The pupils of the eyes are contracted to the size of pin-heads; breathing and pulse are very slow, and the face pale.

In strychnia-poisoning there are convulsions, very much like epilepsy, and the jaws are firmly set, like lock-jaw.

In belladonna-poisoning the pupils are dilated.

It seems to be a wise provision of nature that she has given to many of these dangerous agents their own distinctive odors, thereby aiding us to detect their presence. Under this class may be mentioned laudanum, prussic acid, carbolic acid, phosphorus, alcohol and chloroform.

POISONS AND THEIR ANTIDOTES.

Acids (*Acetic, Citric, Tartaric, Oxalic, Nitric, Sulphuric, Hydrochloric*). — Chalk, magnesia, wall-plaster

(in an emergency), soap-suds. Drink freely of water, except in case of sulphuric acid, on account of the great heat produced by their mixture.

Alkalies (*Potash*, *Soda*, *Lime*, *Ammonia*). — Vinegar and lemon-juice in water; large quantities of olive or any bland oil; copious draughts of milk are good.

Arsenic (*Paris Green*, *Fowler's Solution*, *Rat-Poisons*, *etc.*). — Prompt emetic of mustard and water, or mustard and salt, each a tablespoonful, with water; follow with sweet oil or milk.

Belladonna (*Atropia*, much used in eye-washes). — The immediate evacuation of the stomach by an emetic.

Carbolic Acid. — Flour-water, castor oil, sweet oil, mucilaginous drinks.

Chloroform and Chloral. — Pour cold water on head and face; artificial respiration.

Copper (*Blue Vitriol*, *Verdigris*). — Albumen (whites of eggs), soda, milk.

Corrosive Sublimate (*Bug-Poison*). — Drink freely of milk; whites of eggs; flour-water.

Iodine. — Emetics and soothing drinks, such as starch or flour in water.

Opium (*Morphia*, *Laudanum*, *Paregoric*, *Soothing*

Syrups, etc.).— Emetics, strong coffee. Prevent drowsiness by pinching, dashing cold water in the face, walking about, etc.

Phosphorus (*Matches*). — Magnesia, chalk, flour in water; follow with mucilaginous drinks.

Prussic Acid. — Apply smelling-salts to the nose. Dash cold water in the face. Artificial respiration.

Strychnia (*Nux Vomica*). — Emetic of mustard, or sulphate of zinc aided by large draughts of warm water.

Tartar Emetic. — Drink strong green tea, and in the meantime chew the dry leaves. Copious draughts of warm water.

Try to get a history of the case; if this is not possible, seek for poison in food or medicine taken; notice the odor of any vials at hand; examine vomitus if there is any. In every case, the first thing to be done is to empty the stomach. If considerable time has elapsed since the poison was taken, and there is evidence of absorption, nothing will be gained by emetics.

Vomiting may be caused by tickling the throat with a feather or the forefinger, by administering an emetic, or by using the stomach-tube. The latter can rarely be used to advantage except by the physician.

Emetics.

Ipecac. — As an emetic, it is slow and mild in action. Where speedy action is not required, this agent may be used. On account of its gentle action, it is preferred for the old and feeble, and for very young patients. For adults, the dose varies from ten to twenty grains, repeated at intervals of ten or fifteen minutes till vomiting occurs. Generally, it is given in the form of a powder mixed with an equal quantity of sugar; or it may be given as wine of ipecac, in doses of one-half ounce (tablespoonful). Large draughts of tepid water, taken as soon as nausea begins, hastens the emetic action.

Sulphate of Zinc. — On account of its rapid action, it is best adapted for cases where speedy evacuation of the stomach is required, and for this reason it is usually employed in narcotic poisoning. The adult dose is ten grains, repeated every ten minutes till vomiting ensues. It may be given with an equal part of starch.

Mustard. — When other emetics are not at hand, and this is almost invariably the case, mustard is employed in narcotic poisoning. It should not be used when the poison is of such a nature as to produce inflammation of the stomach. A teaspoonful of mus-

tard may be given in a teacupful of tepid water, and, if necessary, repeated once or twice in ten minutes.

In poisoning with corrosive substances, such as concentrated mineral acids and caustic alkalies, emetics are contraindicated.

Mucilaginous and other soothing drinks play an important part in treatment after poison is evacuated, to soothe the mucous membrane of the stomach and bowels. Those in ordinary use are linseed-tea, starch, bread, honey, figs, olive oil, glycerine, white of egg, gelatine, etc. The chief action is a mechanical one, in forming a smooth, soft coating for an inflamed mucous membrane.

CHAPTER XVII.

BANDAGING.

ROLLER bandages, generally used by surgeons, require considerable practice to apply neatly, and for this reason are not so much used for emergencies as the triangular or handkerchief bandage, which is easier of application. (See page 78.)

The roller bandage is made from cotton, muslin, cheese-cloth, flannel or other suitable material. It should be torn or cut into strips varying from one, two, two-and-one-half, three and four inches or less in width. The wide strip may be used for the chest or abdomen; the two or three inch strips for the arms, legs, neck or head; the narrowest ones for the fingers or toes. A bandage two inches wide and six yards long is a convenient one for ordinary use, as for bandaging an arm or leg; if a narrower one is required, this may be torn down the middle. Avoid bandaging too tightly.

To roll a bandage, fold one end tightly for two or

three inches ; place this on the thigh and roll it up by a sliding motion of the hand ; continue this movement till bandage is rolled. Another method is, after a small cylinder, say half an inch in diameter has been rolled, to grasp lengthwise between the thumb and forefinger of the right hand, and allow the unrolled portion to pass between the thumb and forefinger of the left hand ; the right hand holding the bandage is supinated (turned on its back), drawing the slack bandage on to the roll, the ring and little finger of the left hand serving to steady the bandage underneath ; the right hand is pronated or brought back to position. Thus, by a series of these twisting movements, the bandage is rolled. It is important that the bandage should be tightly rolled.

When the part to be covered is the same, or nearly the same, diameter, a few turns of the bandage are made to secure it, and the surface is covered by bringing each turn higher than the preceding one, and covering about one third of it.

When the part is conical, for instance the leg, a few turns are made above the ankle, then two or three turns around the ankle and foot ; continue these turns as previously described till the swell of the calf

is reached. Here it is necessary to commence reverses. A reverse is made by stopping the bandage as it runs obliquely across the limb, holding it there with the thumb of the left hand, then folding it upon itself in a half-turn so as to change its course and bring it down on the opposite side of the limb, where it is changed to the other hand and snugly drawn. These reverses are made till the entire surface is covered, each turn overlapping about one-third of the one below.

To Bandage an Arm. — After making a few turns around the wrist, the bandage is brought across the back of the hand to the roots of the fingers, and the hand covered by a few turns or reverses to the base of the thumb. Make a few figures-of-eight around wrist and hand, and ascend arm by a series of reverses. When the elbow is reached, cover by a few figures-of-eight, and ascend to shoulder by reverses.

To Bandage the Finger.— Secure the end of a bandage (about three-quarters to one inch in width and one yard to one-and-one-quarter yards long) by a few turns around the wrist; bring it obliquely across the back of the hand to the base of the finger to be treated, thence to the tip of the finger, by oblique turns, back to the root of the finger by the same number of turns. Carry

the bandage obliquely across the back of the hand, and terminate by a few turns around the wrist. Either pin the end, or divide into two tails, and tie.

The method for bandaging the toe is essentially the same as for the finger.

Bandage of the Groin.— Use a bandage three inches wide and ten yards long. Make a few circular turns around the abdomen, just above the pelvis, carrying the bandage across the abdomen to the outer side of left thigh (or inner side of right thigh), around the thigh till it crosses the preceding turn, then across the back. Continue this figure-of-eight movement, each turn covering a portion of the preceding turn, till the bandage is exhausted.

Four-tailed Bandage.— A cap may be made from this by taking a piece of cotton or muslin about a yard long and eight or ten inches wide. Split it from each end to within four inches of the centre. Place the centre of the bandage across the top of the head ; bring the posterior tails forward, over the ears and tie under the chin ; the anterior tails backward over the ears and tie at the nape of the neck.

Bandage for Chin and Lower Jaw.— Split both ends of a bandage (thirty inches long and three or four

inches wide) to within one-and-one-half inches of the centre. Place centre on chin, tying the posterior tails on top of the head, and anterior at the back of the neck.

The *Loop Bandage* is convenient for tying on splints. Double the material used as a bandage around the limb, passing one end through the loop, and tie the ends in a bow-knot.

*Triangular Bandage.**

Every portion of the body may be covered with this bandage. Little or no practice is required for its application, and the material for it can be so easily procured that it is preferred in emergencies.

Esmarch's illustrated bandage, which is supplied to every soldier in the German army, shows its application to different parts of the body. A large handkerchief, a square piece of linen, cotton, muslin or cheese-cloth, will answer the purpose.

The most convenient size is forty inches square, although a piece much smaller will do. This may be cut diagonally in two triangles or folded in the same way.

* Bowditch Morton's excellent little work, "First Aid to the Injured," contains an admirable chapter on this subject.

For convenience in describing its uses, the end opposite the centre of the long border is called the point, and the corners the ends.

In describing its application we will suppose wounds of different parts of the body.

To Bandage the Head. — Fold the long border in the form of a narrow hem, say about two inches wide; place the centre on the forehead, the point passing down over the nape of the neck; the two ends are carried backward over the ears, cross at the back of head, and are tied in a knot in front. The point is carried up tightly over the bandage and fastened with a safety-pin.

The bandage folded narrow, about two inches wide, may be tied around the forehead, or under the chin and over top of the head, or around the neck in form of a collar.

To Bandage Shoulder or Upper Arm. — Place centre of bandage on the upper arm, with the point to the side of the neck; carry the two ends around and back again to tie on the outside. Make an arm-sling of a second bandage, bringing the point of the first underneath the sling, and fasten with a safety-pin.

To Bandage the Chest. — Place the middle of the

bandage on the chest, with the point over the shoulder; carry the two ends around the chest, and tie on opposite side; then draw the point over the shoulder and tie or pin to one of the ends.

To Bandage the Hip.— Fold one bandage narrow and tie around the waist; tie another around the upper part of the thigh, point upward; draw the point underneath the first bandage and fasten.

To Bandage the Hand. — Place the palm of the hand on the centre of the bandage, with the fingers towards its point; bring point over the fingers to the wrist. Tie the ends around the wrist and fasten the point. Support the forearm in a sling.

To Bandage the Foot. — Place the foot on the centre of the bandage, with toes toward the point. Bring point up over the toes to front of ankle; the ends are brought around the ankle, crossing on the instep, and are tied on the sole of the foot.

The bandage in the form of a narrow band, may be used in ordinary wounds of arm, leg, etc., where the above are not needed. Make a few turns of the bandage around the limb and tie in bow-knot on the outside. It may also be used in this manner to fasten splints, one being used at upper and another at lower part.

Slings.— To make a small one, fold bandage narrow, carry ends around the neck and tie. To make a broad sling, place the arm in unfolded bandage, with the point extending below the elbow ; carry the ends around the neck and tie. Draw the point around the elbow and fasten in front with safety-pin.

CHAPTER XVIII.

TRANSPORTATION OF THE SICK AND INJURED.*

In most of the States, the National Guard has a well-trained, efficient ambulance corps, whose members are thoroughly instructed in the care and handling of the sick and wounded. This corps, when present, can be relied upon to care for the disabled; but there are many occasions when they may be unable, or only partially able, to perform this duty. On occasions, when a company or squad is on special duty, the ambulance corps may not be present; or in actual warfare they might not be able to care for all those who needed prompt attention. In these emergencies, the knowledge of the militiaman on this subject would be valuable, for it would save much suffering, and sometimes even loss of life.

In civil life, in case of fire, railroad accidents, riots, etc., such knowledge may often be used with much benefit.

* For further information upon this subject one is referred to James E. Pilcher's "First Aid in Illness and Injury."

An ambulance corps receives instruction in the general care of the sick and wounded, in the methods of transportation by regulation apparatus and by extemporized means.

It is not the object of this chapter to teach you all the details of the care of the sick and wounded, but to instruct in the simpler methods of transportation.

I shall treat principally of the emergency methods of carrying the disabled, as it is of equal, if not greater, importance than the manipulation of regulation apparatus.

Hand-litters, or stretchers, are ordinarily used to convey the sick and wounded.

These litters are made of canvas, from six to six-and-one half feet long, and from twenty to twenty-two inches wide. The canvas is attached to side-bars of wood, bamboo or similar material, and are long enough to project at each end, forming handles, between which the bearers may walk. The canvas may be fastened to the side-bars by tacks or nails; or it may be doubled over and sewed so as to form a tube or casing on each side, through which the bars are thrust and removed at pleasure.

The "Halstead" is a good type of litter, and has

stood the test of experience in the United States Army for many years.

Usually, a litter must be improvised from available material. On battle or muster field may be found an abundance. A litter may be formed from an overcoat and two rifles by turning the sleeves of the coat inside out, passing a rifle through each, and buttoning the coat around them, the tails of the coat being fastened with safety-pins.

Substituting blouses for overcoats in the preceding makes an equally serviceable litter.

Blouses or jackets (two or more) may be used in the same manner with poles.

These litters should be carried with buttons down.

Grain-sacks and other bags may be used by thrusting poles through the corners.

Instead of material mentioned, muskets may be connected by belts, straps, knapsacks and similar material.

A very convenient litter may be formed from two rifles with their gun-slings. The slings should be let out nearly full length, care being taken to have them about the same length. The sling of the first rifle is unhooked from ring near the muzzle; that of the second is passed over first, and the unhooked sling of the first

passed over the second and fastened again. The patient sits with his back resting against rear bearer.

To Place Patient on Litter. — Place the litter at the patient's head on a line with his body. Let one bearer pass his arms under patient's legs, the opposite bearer passing his arms under the head and shoulders; if a third person is present, let him care for the injured part. The patient should be gently placed on the litter.

For ordinary purposes a litter may be carried by two persons, but in case of emergency, such as placing in ambulance, ascending stairs, etc., that number is not sufficient. It is best to have at least three persons. When on level ground, the extra man or men may march at the side of the litter and watch the patient, to render any necessary aid.

The litter should be carried by hand, not on shoulders, and with the patient's feet in front, except in going up a hill, stairs, etc.; or if the patient has a fractured leg, and is going down hill, stairs, etc., the position is reversed, to prevent pressure upon the injured part. Do not keep step, as it jolts the patient.

Four-handed Seat. — This is called the ladies' chair, and makes a good seat for one not injured badly enough to be helpless. It is formed by each bearer

grasping his left wrist with his right hand, back uppermost; then each man grasps his companion's right wrist with the left hand.

Three-handed Seat, with Back. — This is formed by one bearer (the right) grasping the left forearm with his right hand, and the left forearm of the other bearer with his left hand; the left bearer grasps with his left hand the right forearm of his companion, and with this right hand his companion's shoulder.

Two-handed Seat, with Back. — The right-hand bearer grasps with his right hand the left wrist of the other bearer, and the right shoulder with his left hand. The left-hand bearer grasps his companion's right wrist with his left hand, and the left shoulder with his right hand.

Bearers at Knees and Shoulders. — The front bearer takes his position between the patient's legs, with back towards patient; grasping him by the thighs, the patient is lifted just above the hips of the bearer; at the same time, the rear bearer, passing his arms under patient's armpits, clasps hands over the latter's chest.

In any of these methods, a third person may render valuable assistance by attending the sick or disabled party, particularly if a limb is injured.