ACCIDENTS AND POISONS

THEIR

REMEDIES AND ANTIDOTES.

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ACCIDENTS,

AND

HOW TO SAVE LIFE WHEN THEY OCCUR;

WITH A COMPLETE TREATISE ON

POISONS AND THEIR ANTIDOTES,

DESCRIBING THE SYMPTOMS AND TREATMENT IN EACH CASE.

TO WHICH IS ADDED A CHAPTER ON

CALISTHENICS AND THE CARE OF HEALTH.

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INTRODUCTORY REMARKS.

The life of man is beset with perils. Natural and moral laws, the violation of which is attended with swift and certain punishment, limit him on every hand; but in his ignorance and selfishness he is constantly disobeying them; and, even without culpability on his own part, each individual of the human family is so thoroughly dependent upon all the rest, that the carelessness or guilt of others places him in constant danger, and furthermore the action of physical laws, beyond human foresight or control, subject him to possible accident at every moment of his existence.

This book is intended to furnish in a condensed form a knowledge of the physiological effects of accidents, and the proper methods of averting or lessening the peril and pain attendant upon them.

The term "accident" is used here in a broad sense, to cover cases of ordinary emergency, even though they be not usually included by medical authorities under that title: thus, croup, dysentery, etc., while not, strictly speaking, accidents, often arise in the suddenness of their attack to all the gravity of such, and demand prompt attention.

From the very nature of accidents, physicians are not usually upon the spot at the time of their occurrence; nor will such cases usually admit of delay, promptness frequently meaning life, and delay death; so that a familiar knowledge of the methods and simpler remedies of medical science, in many instances contained among the staples of the household, may be the means of saving many precious lives, or of averting great unnecessary suffering.

As inventions multiply, and daily life becomes more complex, accidents increase in number and frequency. On the railway and steamship, with their thousand chances of peril; on the drive or in the street, crowded with busy traffic; in the workshop, factory and mine, with their sharp tools, whirling machinery, and explosive adjuncts; in the household and field, where poisonous substances and vicious animals are not uncommon; in every phase and walk of life, accidents threaten us momentarily, and homely skill and common sense may be at any instant demanded of the unprofessional bystander. In all such exigencies this little book is intended to supply information that a sensible person can put into practice, without previous preparation.

Of course, in any case, a physician should be summoned at once, but pending his arrival, the instructions contained in the following pages should be put immediately into practice, as upon such action may depend the continuance of the noblest of the works of God—a human life. Promptness is everything, for collapse often follows rapidly upon the original injury, and a minute may do or undo the work of death.

"An ounce of prevention" being "worth a pound of cure," it has been thought eminently fitting to add at the end of this volume a brief section on personal hygiene, under the general title of "Calisthenics and the Care of Health." This section comprises a brief resumé of the various matters which must have attention, if health is to be preserved, and added thereto a fully illustrated section on gymnastics, including exercises with Indian Clubs and Dumb Bells, and the Calisthenic motions, properly so called. With these additions, the book will be found available not only toward ameliorating the perils of ill health, but in preventing disease, by assisting the reader to attain the highest degree of manhood, "A sound mind in a sound body."

POISONING.

Poisoning may arise from one of three causes subjective to the individual, viz.: ignorance, mistake and suicidal intention. In any case, the treatment at first must be directed toward getting rid of the poison before it takes effect, and the remedy should be given with all possible speed.

First—Administer a prompt emetic. Some poisons, by their irritating effect on the lining membrane of the stomach, naturally produce vomiting, so that with a little encouragement from an emetic, all material of whatever kind will be ejected.

Other substances do not produce vomiting, and the quickest methods for bringing it about should be employed. These are generally draughts of warm water and salt or mustard, tickling the back part of the throat with a feather, ipecac, etc., and the treatment should be persistently carried on until the stomach has been excited to completely evacuate itself. Other poisons, as opium, may paralyze the stomach and render it unable to evacuate itself; then, the only resource is the stomach-pump. This instrument requires experience to properly adjust it, and, under circumstances conducive to hurry and excitement, in unskilled hands it may work considerable damage. An inexperienced operator would be as likely to introduce it into the windpipe as into the gullet; besides, many poisons, as corrosive sublimate, soften the mucous membrane of the throat, gullet and stomach, and render it liable to be pierced by the descending tube. However, if the pump must be used, employ no force in adjusting it, and keep the tube pressed back against the posterior wall of the gullet, where it should slide down smoothly into its proper place. As a general rule this instru-

ment is not at hand, and the poorest remedy, at once employed, is far better than the best, applied late.

The method of stopping the effects, and curing them, varies in each particular case with the nature of the poison, and must, therefore, be treated of in connection with the particular poison taken.

Arsenic.

This drug is an irritant, and, when introduced into the stomach, produces vomiting, which should be encouraged with ipecac, salt and water, and mustard mixed in water.

Symptoms.—Vomiting and purging, with discharges of bloody matters; difficult breathing; low, small and quick pulse; extremities cold, and thirst intense. If the poison has an opportunity to complete its work, convulsions and death follow.

Treatment.—Large quantities of chalk, or magnesia, mixed with water, sugar and linseed oil, or chalk and sweet oil, should be frequently swallowed, for the purpose of coating the lining membrane of the stomach, and protecting it against the attack of the poison. Meanwhile, as the best known antidote to arsenic is the hydrated sesquioxide of iron, no time should be lost in securing some from the nearest drug store, or making a supply. As it is effective only when fresh, the latter is probably the better course. For this purpose procure several ounces of the *Tersulphate of Iron*, or, if the druggist does not have that, the *Persulphate of Iron* will answer as well. Place it in a glass and pour on it ammonia, soda, or magnesia. The last, being also an antidote, is best for the purpose. Strain the liquid through a handkerchief, or other cloth, and administer a tablespoonful, or more, of the pasty substance which remains on the cloth. This constitutes the Hydrated *Sesquioxide of Iron*, and is a specific antidote.

If but a small quantity of the poison has been taken, or if

action shall have been sufficiently prompt, the violent symptoms will soon subside, when broth and some light diet may be taken. The inflammation in the stomach and bowels should be treated like any other inflammation ; but permanent paralytic results, or chronic inflammation of the stomach and bowels, may follow.

PARIS GREEN.—This salt of arsenic is very largely used as a poison for killing potato bugs and other insects infesting plants, and many accidents have occurred through such use. It is, in its effects, identical with white arsenic, and the treatment is the same.

Test.—A simple test for arsenic is to throw some of the suspected matter on a hot iron, and, if fumes arise with an odor similar to that of garlic, it may be concluded that arsenic is present.

Copper.

Copper is a metallic poison, and sometimes finds its way into the stomach through the improper use of cooking utensils. If poorly tinned, or untinned copper vessels are left with grease or acid standing in them, the very poisonous acetate of copper, known as "verdigris," or another salt, the sulphate of copper, known as "blue vitriol," is formed; and if this vessel be used for cooking, without being thoroughly cleansed, whatever of poisonous matter remains in it, is taken into the stomach with the food.

This is an accident, so avoidable, that it renders one through whose negligence it may occur, very culpable indeed.

Also, quite a common practice prevails of putting copper coin into a jar with vinegar pickles, in order to heighten their color, and not infrequently do persons after eating these pickles complain of indigestion; however, it is not the pickles, but the copper that offends.

Symptoms.—The symptoms of copper poisoning are intense

pains in the stomach, and vomiting, the substance of the discharge from the stomach having a bluish, or greenish color and a coppery taste. If it happen the victim of copper poisoning be constitutionally weak, or the dose large, the case becomes serious.

Treatment.—After satisfactory results have been obtained from the action of an emetic, or the stomach pump has been used, mix the whites of six eggs in a quart of water, and administer a wine-glass full of the mixture every three or four minutes. This mixture exhausted, resort to a cathartic, and the application of cloths steeped in hot water over the stomach to allay the inflammation. The true nature of inflammation is not known, but its presence is indicated by heat, swelling and redness of the affected parts, a copious flow of blood to, and congestion of, contiguous regions; the object of treatment is to relieve congestion.

"Blue Vitriol" (Copper Bisulphide, Sulphate of Copper).—This familiar salt of copper enters into many disinfecting fluids, and poisoning by it sometimes occurs. The symptoms and treatment are the same as for poisoning by the other salts of copper.

Mercury.

The metal, mercury, both in its elementary state of "quicksilver," and in its various chemical combinations, is a very useful remedy for which the medical profession have been unable to find a substitute. Chronic poisoning by the drug, medicinally used, is not unusual, as it is commonly intentional; though, occurring under the eye of the physician, it is not a matter of serious moment, and is controllable by him. Ointments and unguents of mercury, however, in the familiar forms of "blue ointment" and "red ointment" are sometimes employed without prescription, by persons affected with vermin or certain

diseases for which it is known to be a specific, while blue mass and calomel are popular cathartics, and their use sometimes gives rise to symptoms of poisoning. The metal is also used largely in the arts, as in gilding, mirror-making, etc., and as it gives off fumes at ordinary temperatures, and is entirely volatilized by a comparatively low heat, it is readily inhaled by those who manipulate it. From such sources, serious cases of poisoning have occurred.

Symptoms.—The general symptoms of mercurial poisoning are nervous disturbances, as headache, loss of memory, trembling, partial loss of control over the muscles, disorders of sensation, convulsions, and finally insanity. Persons accustomed to handle the metal or its salts in their occupations should be suspicious of symptoms of this class. The more intense effects produced by mercurial fumes are a copious flow of saliva with great soreness of the gums, sometimes followed by loss of the teeth, decay of the bones, and failure of the intellect. Before these extreme points have been reached, however, the symptoms of "mercurialization" become very marked. These are, tenderness of the gums to touch, first detected in closing the teeth smartly, swelling of the glands in the throat and neck and under the jaw, soreness of the muscles (usually known as "stiffness of the joints"), offensiveness of the breath, and a characteristic blue or dark slate-colored line along the margin of the teeth where they meet the gums. These are the symptoms commonly known as *Salivation.*

Treatment.—In cases of chronic mercurialization, stop the supply of the poison. Give nutritious food, regular exercise and five to ten grain doses of potassium iodide three times daily.

Corrosive Sublimate.—This mercurial salt (the bichloride) is an intensely corrosive poison, which produces bloody discharges from the stomach, small, quick pulse, thirst, and difficult

cult breathing. It is used extensively as a vermin and insect poison, and accidents often accompany its use.

Fortunately the antidote is always at hand, being the white of egg. Vomiting should be induced by taking large draughts of sugar and warm water, and by tickling the back part of the throat. Meanwhile, having mixed the whites of a dozen eggs in a quart of water, administer a wine-glass full every two or three minutes.

Red Precipitate.—The Red Oxide of Mercury is used in a mercurial ointment, and also as a poison for vermin and other pests, and may be swallowed inadvertently. The symptoms and treatment are the same as for the foregoing.

Lead.

The human body is susceptible to poisoning from this substance through the lungs, by inhaling fumes from it; through the skin, by absorption; and through the stomach by swallowing. Lead plays an important part in the arts, and as a medicine; it is the basis of all colors in paints, and in certain combinations is an excellent curative agent if applied directly to an inflamed portion of the mucous membrane.

The channels through which lead may find its way into the system are numerous; thus it may be drunk in water coming through lead pipes, or contained in a leaden cistern; it may be eaten in preserved articles, especially fruit put up in soldered cans; it often afflicts painters, being absorbed through the skin; it is sometimes absorbed from the air of newly painted rooms, etc., etc. When lead is taken gradually in this way it accumulates in the system, and finally produces *chronic lead poisoning*, manifested in the terrible forms of "lead colic," and the no less distressing symptoms of "lead palsy," which first shows itself in the muscles of extension, especially in the wrist. It is this peculiarity which results in

what is known as "wrist-drop," in which the hand hangs pendant whenever the arm is extended, palm downward

Treatment.—The indicated treatment is first to cut off the supply of poison,—find out the source, and remove it. Aperient carbonated drinks should then be taken regularly, the bowels kept free and open with mild saline cathartics, and doses of from five to ten grains of potassium iodide dissolved in a tablespoonful of water, administered three times a day, until the symptoms disappear.

Sugar of Lead.—Many lotions, and nearly all "eye-waters," contain large proportions of the acetate of lead, so that acute poisoning by this salt is not uncommon. In cases of this kind, or, in fact of any acute lead poisoning, no time should be lost in getting rid of the poison, and administering the antidotes. The symptoms are acute pains in the stomach and bowels with extreme nausea and vomiting. Upon the introduction of alum or the carbonates of soda and potash in copious draughts of warm water into the stomach, these symptoms will abate; but in case vomiting is not produced by these agents, give a scruple of the sulphate of zinc (or white vitriol), which will form a harmless salt with the lead, and destroy the activity of the poison, which may then be got rid of by emetics and cathartics.

Zinc: Chloride of Zinc—Acetate of Zinc—Sulphate of Zinc.

The soluble zinc salts, when taken in large doses, act as feebly caustic, irritant poisons. This is more particularly true of the chloride, which enters into some popular disinfectants.

The Symptoms of chloride of zinc poisoning are burning and constriction in the throat, burning in the stomach, nausea, strong metallic taste in the mouth, vomiting, marked depres-

sion of the pulse, coldness of the skin, profuse cold perspiration, cramps, and occasionally other nervous symptoms. The mind remains clear.

Treatment.—As in all cases with irritant poisons, promptness is of the utmost importance. The antidotes are soap and water, baking soda in water (one tablespoonful to the pint), lime water, tannin, strong tea, or decoction of tan-bark, followed by mucilaginous drinks, whites of eggs or milk, to soothe the inflamed membranes. Stimulants may be advisable later.

Antimony—Tartar Emetic.

Tartar emetic, a compound salt of antimony and potash, is not so commonly used as at one time, in medicine; but it is still familiar enough in modern practice to make it desirable to know the symptoms of its effects, and the antidote thereto.

Symptoms.—As the drug takes its name from its powerful emetic effects, one of the most prominent symptoms attending its use in large quantities, is, of course, persistent vomiting; purging follows, and, if violent, the discharges finally come to bear a close resemblance to the "rice water" excreta of cholera. The face grows pale, and the entire skin,—after sometimes a temporary rise in temperature,—becomes icy cold; the pulse is feeble and irregular, and there is great nervous and muscular prostration. Severer symptoms, consequent on still larger doses, such as intense pain at the pit of the stomach, a shrunken and anxious look in the features, coldness of the breath, loss of the voice, and cramps, are superadded to the symptoms already defined, making a case which, in the absence of other knowledge, might be readily mistaken for Asiatic cholera.

Treatment.—The stomach will be most likely to empty itself, and after this has been accomplished, emesis should not

be pushed further. Strong tea, decoction of tan-bark, rhatany, rhubarb root, catechu, or, best of all, tannin should be given at once. Warmth to the feet, hands, spine and pit of the stomach, and small doses of diluted brandy, may also be advisable.

Silver: Nitrate of Silver—Lunar Caustic.

In the application of lunar caustic to ulcers in the throat, it rarely happens that a piece is broken off and swallowed. As silver in any quantity is a corrosive poison to the stomach, such an accident, or the swallowing of the silver salts under any circumstances, should be followed by the

Antidote, which is ordinary table salt. Dissolve the salt in warm water, and administer enough to provoke vomiting.

Phosphorus.

Phosphorus is the chief constituent of ordinary "sulphur-match" heads, as well as many vermin-destroyers; and it is from these forms of phosphorus that poisoning is most likely to be met with. Once in a while, individuals bent on self-destruction, ignorant of the horrible effects of phosphorus poisoning, will take rat poison or match-heads, and die a death of lingering agony therefrom.

The Symptoms of poisoning by stick-phosphorus, or match-heads, are slower in developing than when vermin-paste or other fatty mixtures of phosphorus have been chosen. The first effect is uneasiness of the stomach, a burning sensation and nausea, followed by vomiting. In the matter thrown up from the stomach, the odor of phosphorus may be detected, and it is usually luminous in the dark. There is considerable pain and tenderness to the touch about the region of the stomach, which, with the vomiting, generally

continues for several days, when the matter vomited comes to contain particles resembling "coffee-grounds," constituting the so-called "black vomit." There may be constipation, diarrhea or dysentery, and the matter thrown off by the bowels may or may not be phosphorescent in the dark. The eye usually becomes jaundiced as the poisoning progresses. Hemorrhage is common from all the mucous surfaces. Restlessness and afterward stupor are common, and sometimes violent delirium, insensibility in the hands and feet, succeeded by their paralysis, lead up to the final convulsions which frequently close the sad drama. The length of time elapsing between the administration of the poison and the termination of its effects in death, varies from forty-eight hours to three or more weeks,—a couple of weeks being the most ordinary period.

The Treatment of a case of phosphorus poisoning gives very slight promise of success, for the drug is peculiarly fatal in its effects. There is, however, a fair hope of averting its ravages, if the antidotes be given early enough, before the graver symptoms commence to manifest themselves. This is especially true when the poison has been administered in the solid form (stick phosphorus or match-heads). In such case the waxy particles may remain imbedded in the mucous lining of the gullet or stomach, or may lie undissolved for some time in the alimentary canal, the rapidity of solution depending a great deal upon the quantity of oil or fat present. This explains, also, the fact that phosphorus dissolved in oil acts more promptly than the free poison. On the discovery being made that phosphorus has been swallowed, its chemical antidote, sulphate of copper (blue vitriol) should be taken in large quantities, so that it may perform freely its double mission as an antidote and an emetic. After the stomach has been by this means thoroughly emptied, purging should be induced by hydrated magnesia. Subsequently, small doses of the copper

sulphate may be given repeatedly; but, if it can be procured, the *Acid French Oil of Turpentine* is an extremely reliable antidote. The ordinary rectified oil, or spirits of turpentine, is useless, but it is probable that the American *crude* oil should be found effective. Anyway, it is worth trying, and should be given in great quantities, as rapidly as possible, using an emulsion made with gum. All oil and fat must be carefully avoided, as they aid in the absorption of the poison. To counteract depression, opium will be required; and even direct transfusion of blood may be advisable, though, of course, everything except the primary treatment pertains to the physician in charge.

Iodine.

Iodine being one of the most familiar of our medicines, accidents are likely to happen in its use.

Symptoms.—The yellow stain made by the preparations of iodine is well known, and may be recognized about the lips or clothing, when this poison has been swallowed. Internally it causes a sensation of burning in the stomach, and of heat in the throat. Its pungent metallic taste is also characteristic.

Treatment.—Starch is the antidote for iodine, and it may be given in the form of ordinary starch and water, or flour and water, or arrowroot,—whichever may be handiest. Vomiting should then be induced by means of warm water, with the addition of mustard, or the use of the finger or a feather in the throat, if necessary. The iodide of starch is intensely blue, and consequently the matter ejected from the stomach will be of that color. Milk may be given afterward, until the symptoms of inflammation disappear.

Strychnine—Strychnia.

When this poison is introduced into the blood it throws the victim into convulsions by its effects upon the nervous system.

The time elapsing between the swallowing of the poison and the commencement of convulsions depends on the form in which the poison has been taken. If swallowed in solution, it soon begins its deadly work on the spinal cord; when taken with food, a longer time is required for it to act, since the juices of the stomach must free it from its admixture. In a case of poisoning from strychnine, for an emetic to do any good, it must be given instantly, as the subsequent convulsions prevent swallowing.

The Symptoms are marked. The countenance becomes pale, the muscles rigid, the heart's action quick and stiff. During the paroxysms, which last for some time, respiration is suspended, and the muscles are drawn into great knots all over the body.

Treatment.—Remove all tight clothing from around the patient's body, and lay him on his back in a cool, quiet place; fit a paper cone down over his face, and in the top of it place a sponge or handkerchief saturated with chloroform. Having so perfected these arrangements that the air he breathes will be charged with chloroform, persevere in keeping him under its influence until, when the treatment is discontinued, the spasmodic symptoms do not return. It will be several weeks before the patient is able to move about, if the dose has been large, and he will probably be under the necessity of taking some tonic containing phosphates of iron, quinine, and strychnine. N. B.—In the absence of chloroform, use opium, morphine, ether, amyl nitrite, chloral, or any other narcotic, till it can be procured.

Digitalis (Foxglove).

This is a familiar garden flower, the entire plant of which is poisonous. It is used somewhat extensively in medicine, though less than formerly, a tincture from the leaves of plants

of the second year's growth being generally employed. Overdoses are sometimes taken by error, and as digitalis is classed among cumulative poisons (*i. e.*, those in which small doses accumulate in the system, without effect, until the toxic quantity has been reached, and then suddenly exert their full effect), its action and antidotes should be known.

Symptoms.—An excessive dose may be followed immediately by vomiting, pain in the bowels and purging. In this case, the grass-green color of the matter thrown off in either way, is said to be characteristic. But often some time elapses after the poison has been taken before it manifests itself. The most prominent symptom of digitalis poisoning is intense depression of the heart's action, the pulse becoming irregular and almost imperceptible; patients frequently sleep for a time, and waken in delirium or convulsions; the pupils are dilated and the sight becomes confused or is entirely lost. Toward the end, fainting is constant, and death usually results suddenly from stoppage of the heart, induced by slight exertion, such as an effort to sit up in bed. Digitalis is an uncertain, and therefore a dangerous drug.

Treatment.—If vomiting be absent, emetics, as warm mustard water, ipecac, tickling of the throat, etc., and if these fail, the stomach pump should be promptly resorted to. At any cost, get rid of the poison. Tannin, or tea (which contains tannin), paregoric or laudanum, wine, and plenty of strong coffee are recommended. The patient must be kept lying, and under no circumstances be allowed to rise or to sit up in bed.

Belladonna (Deadly Nightshade)—Atropia.

The deadly nightshade is by no means a rare plant in this country, but may be found growing in almost any deserted garden and about fallow land or the woodland borders in

almost any part of the Eastern States, where it has become naturalized from the gardens. It is quite a goodly-sized plant, growing sometimes to the height of two feet and over, and bears a purplish fruit, somewhat resembling a black cherry in appearance. Besides the fact that children sometimes poison themselves through eating this fruit, persons gathering tonic herbs not infrequently include by mistake specimens of this deadly plant, with disastrous consequences. The root and leaves of the plant are used in medicine, as well as the active principle, atropia or atropina.

Symptoms.—One of the most familiar properties of belladonna is its power to dilate the pupil of the eye, which it does through paralysis of the nerves of the iris, and this characteristic may be used in diagnosing a case of poisoning. If a drop of the suspected matter (whether the original substance, matter from the stomach, or the urine of the patient) be placed in the eye of the family pet, either dog or cat, enlargement of the pupil will at once decide the nature of the poison. In the poisoned person, dilatation of the pupil is also a prominent system, the expansion being sometimes so marked as to completely hide the iris. The limbs become heavy, and the entire body is seized with tremors of weakness. Dryness of the mucous membrane in the nose, mouth, throat and larynx, and sometimes a peculiar bluish appearance of the lips are observed. Watery purging is common, and the action of the kidneys is stimulated, while the drug may always be found in the urine. The pulse, at first increased in rate, soon falls below normal. The depth and number of respirations are also increased. In persons of light complexion and delicate skin, a diffused redness of the skin, somewhat resembling the rash of scarletina, frequently follows the administration of even an ordinary full dose of atropia. The chief point to remember, however, is the fact that the urine of a person or animal under

the influence of belladonna will dilate the pupil of another person or animal.

Treatment.—Empty the stomach by means of sulphate of zinc or sulphate of copper, and follow this with a ten-drop dose of the compound solution of iodine in a tablespoonful or more of water. Opiates should then be administered, in conjunction with cold applications to the head, and if failing strength calls for stimulants, brandy or other alcoholic drinks should be used. During the entire course of treatment the body should be kept strictly in a recumbent position, with the head depressed, so that the blood may flow easily toward the brain. Hot coffee may be employed both to antagonize the action of the poison, and for its stimulant virtues.

Stramonium (Jamestown or "Jimson" Weed).

This is a very common and familiar weed, growing rank in every conceivable position, where the accumulation of dirt and rubbish favor it. Its leaves are used in preparing home-made ointments for various purposes, and are also smoked for asthma and kindred spasmodic disorders of the respiratory tract. It has been eaten by mistake for other herbs, and poisoning has followed.

The Symptoms produced by it are identical with those from belladonna, described on page 20, and the treatment is also the same.

Alcohol—Excessive Intoxication.

Suspended animation sometimes results from an excessive use of intoxicating beverages. Wine, beer, brandy, and whisky all contain constituent elements which, taken alone, or in combination with some other substance, pass unaltered into the various tissues of the human body, producing local and

constitutional effects. Alcohol enters the stomach as alcohol, and although it courses through the most delicate organism in the amimal creation,—through the organ of mind and thought,—its chemical nature is unchanged.

Alcohol acts as a stimulant, because these organs are excited by contact with it, and increase their activities in order to rid themselves of it.

Upon the introduction of alcohol into the circulation, the nervous centres seem to be exalted, and since the extra force is not imparted to them by the alcohol, the energy is expended, which should be reserved for the performance of the normal functions of the nervous system. This causes the nerve centres to suffer a depression corresponding to their previous exaltation. On this principle, alcohol in large quantities may so far exhaust the vital forces of the body as to render them unable to sustain life.

Treatment.—In case of a purple, bloated face, the patient should be cupped, and the usual methods for promoting circulation and warmth employed. Keep him in motion. In an extreme case, where respiration has stopped, induce it artificially, and administer copious draughts of hot coffee. Aromatic spirits of ammonia, or even ordinary spirits of ammonia, is also a useful corrective and stimulant in such cases.

Delirium Tremens.

Delirium Tremens is a species of delirium, induced by alcoholism, and is characterized by nervous twitching of the muscles, and a constant motion of the eyes, mouth and head. The hands move in harmony with the agitation of the whole body, the patient is restless, sleepless, and temporarily insane. The stomach is deranged, and the bowels are disturbed. Horrid visions float before the patient's eyes ; he feels himself falling

from a lofty height; anon, he is in the presence of foul, loathsome, crawling things, which haunt and menace him; and again, sometimes he fancies that his character is being ruined by some fiend or scandal-monger.

This condition will naturally wear off in a day or two, and aside from the completely exhausted state in which it leaves the nervous system, no radically ill effects are experienced. But in cases where the attacks have been frequent and violent, sometimes natural sleep flies forever, fever grows intense, and feeble convulsions end in death.

Treatment.—The very first end for attainment is to get the patient to sleep, and thereby re-enforce his strength. If a prolonged debauch has led him to neglect food and nourishment, prepare some light diet, and give it in small quantities, and therewith, if necessary, a *small* quantity of brandy and water, or a little ammonia. Meanwhile, if his bowels be deranged, proceed to regulate them, and sleep may follow. In case these simple remedies fail to induce sleep, the physician will administer the proper opiate.

Opium.

Poisoning from this historic drug is of very common occurrence, from design, because it is known to produce stupor, insensibility, and death; and through mistake, because it is used extensively as a medicine, and is a common article of commerce.

Symptoms.—Soon after swallowing a large dose of opium, the patient feels a stupor gradually taking possession of him, which will not yield to his most determined efforts in combating it; and, unless some counteracting remedy is promptly and successfully given, the symptoms, growing more violent, will terminate in death from asphyxia. Of course, if opium has been resorted to with suicidal intent, so long as conscious-

ness remains, the unfortunate may resist all efforts to save him; in such an emergency, the proper course of action must be determined from the circumstances.

Treatment.—To opium there is no known antidote. The plain, invariable rule is to give a prompt emetic. Ten grains of sulphate of copper, or a scruple of sulphate of zinc, will serve the purpose well; but if these are not readily obtainable, give three tablespoonfuls of mustard, in a quart of water, or use an equal amount of common salt, in place of the mustard. Keep the patient moving about, by every possible means arousing him to exertion; and, all hope of removing the poison being gone, administer a cathartic. In case this effort to evacuate the stomach and bowels proves *eminently* successful (otherwise it would be a fatal mistake), administer some acid drink, as a glass of lemonade, or vinegar and water, followed by a cup of hot, strong coffee, without sugar or cream, every half hour, gradually diminishing the size and frequency of the dose. Finally, after the effects of the drug have been entirely conquered, let the patient sleep.

MORPHINE.—Ovid appropriately named this sleep-producing drug "morphia," after Morpheus, the god of sleep. It constitutes about ten per cent. of all opium, of which it is the active principle. Its extensive use as a sedative, legitimately and with suicidal intent, and its close resemblance to quinine and other harmless drugs, are the explanation of the poisoning so often resulting from morphine.

Symptoms.—Since the nature of this drug is exactly the same as that of opium, their physiological effects on the system are identical, and hence the treatment must be the same.

LAUDANUM.—"Laudanum" varies in composition and strength, from the plain tincture of opium, to the acetate or "black drop." The active principle is the same as that of

opium, from which it is made, and treatment, therefore, identical.

PAREGORIC.—This is the camphorated tincture of opium, and is so weak as to be seldom taken in poisonous doses, except by feeble children. The "soothing syrups" belong to the same class. Treatment as above.

Hydrocyanic Acid—Prussic Acid—Cyanide of Potassium—Cyanide of Silver.

Prussic acid is the deadliest poison with which mortals are likely to come in contact, and the cyanides of silver and potassium, which owe their virulence to the acid in their composition, are not less deadly. With the acid itself, not many people shall ever have to do; but the cyanide of silver is extensively used by photographers, and the cyanide of potassium is sometimes employed, deadly as it is, in the household for removing stains from linen; so that prussic-acid poisoning is not merely a theoretical possibility. The peculiar flavor of cherry-laurel water, oil of bitter almonds, peach-kernels, etc., is due to this same poison, and their use may give rise to serious symptoms,—in fact, the writer, in his childhood, at one time very nearly succumbed to the effects of a number of peach-kernels, which he had eaten.

The Symptoms of poisoning by either the acid or its salts,—the cyanides,—are, in the vast majority of cases, instantaneous collapse and death; so that the only thing left to do is to detect, if possible, the bitter almond odor, and decide the cause of death. The milder forms of the poison produce extreme weakness, sickness at the stomach, and intense nervous depression.

Treatment.—Ammonia, well diluted, followed by oxide of iron, should be given at once, and artificial respiration should be practiced, if necessary. Afterward, some warm stimu-

lant, as brandy and water. Perfect quiet and rest are recommended.

Tobacco.

This familiar "weed" is used as a luxury, in one or another of its forms, by every known nation on the earth, and the effects of acute poisoning by it are a matter of personal experience with nearly every smoker.

The Symptoms are those produced by a powerful motor, depressant and nauseating emetic, comprising a feeling of anxiety, depression and uneasiness, succeeded by horrible nausea, purging, great weakness and trembling, and profuse perspiration. From this point the effects of smoking usually wane and disappear; but, if a fatal dose of the poison has been swallowed, there is burning pain in the stomach, and the symptoms already described grow in intensity. The body is bathed in perspiration, and becomes perceptibly cold; the pupils are contracted, and lose their sensibility to light; trembling increases in power and persistence, and spasms, sometimes succeeded by convulsions, lead up to the final death from collapse.

The Treatment indicated, where a large dose of tobacco has been swallowed, is to empty the stomach by means of sulphate of zinc, or any other emetic which may be convenient, or with the stomach pump. Then give tannin,—either the acid itself, or something which contains it, as strong tea, decoction of hemlock bark, etc.,—followed by iodide of potassium in ten-grain doses, or five-drop doses of the compound solution of iodine well diluted with water. To stimulate the depressed circulation, brandy and ten-drop doses of ammonia are advisable. In desperate cases, subcutaneous injections of strychnia and artificial respiration may save life.

For relieving ordinary tobacco sickness there is nothing superior to fifteen-drop doses of the aromatic spirits of ammonia.

Poke Berries—Poke Root—Phytolacca.

This plant, botanically known as *Phytolacca Bacca*, is a very familiar wayside and woodland plant, the purple berries of which are used by country school children for making "red ink," while the tender stalks, as they come up in the spring, are eaten as "greens." The entire plant, especially when mature, is poisonous, and it is probably because the active principle is removed in boiling, that its effects are not oftener felt. It is a homely, but efficient remedy in cases of inflamed breasts, for which purpose it is used with great success by old women and some country practitioners. The berries are sometimes eaten by children, and overdoses of the root decoction are taken now and then.

The Symptoms of its effects are characteristic; they are great and gradually-increasing, agonizing nausea, followed by long-delayed vomiting. This vomiting, which does not occur for an hour after the dose has been taken, is accompanied by extreme depression. The pulse and breathing are slowed, and convulsions, such as accompany lock-jaw, occur in some cases.

Treatment.—As soon as it is ascertained that poke has been taken, empty the stomach by means of water and mustard, the finger, or other emetic, and endeavor to counteract its depressant effects by liquor, fifteen-drop doses of ether, or, still better, Hoffman's anodyne; give one-grain doses of opium, or half-teaspoonful doses of ordinary laudanum, or half an ounce of paregoric. Strychnia and digitalis may be considered applicable by the physician.

Aconite (Monkshood—Wolfsbane).

This excessively poisonous plant is, on account of its beautiful blue flowers, somewhat of a garden favorite. Its leaves

and roots are used to a certain extent in medicine, and in homœopathic practice its various "potencies" are very popular. Some persons are extremely sensitive to its effects, and as all homœopathic doses are not "infinitessimal," symptoms of poisoning might follow a liberal use of "aconitum," a favorite globule among women and children for cold in the head. In Europe, where it grows wild, it is now and then mistaken for horseradish, and the same accident has happened, but more rarely, in this country. Poisoning by aconite occurs more frequently, however, from the erroneous internal administration of certain liniments, of which this drug forms an important constituent, and which are intended for external use only.

Symptoms.—Aconite is an irritant poison, with an exceedingly acrid and pungent taste. When a fatal dose has been taken, the symptoms usually follow in from five to thirty minutes. They are, in common order of development, a sense of irritation and constriction of the throat, tingling of the mouth, lips and the general surface of the skin, as from the prickling of innumerable chestnut burrs; at the same time, a feeling of intense weakness and weariness is developed, together with dimness of sight, dilatation of the pupils, difficult and very shallow breathing, great heat of skin, profuse perspiration, and slowing of the pulse. Death results from paralysis of the nerve centres.

Treatment.—Administer anything containing tannin, as a solution of tannin itself, a decoction of oak bark, or plenty of strong black tea. Empty the stomach by an emetic of mustard or sulphate of zinc (white vitriol), or with a stomach pump. Follow this with milk and sweet or other oil. As in digitalis poisoning (page 18), the patient must be kept strictly in a recumbent position, and where there is danger of collapse, brandy and water, whisky or gin may be administered by

injection, or by the mouth, together with warm applications to the hands, feet and spine, and over the stomach.

Arnica.

A tincture of arnica flowers is one of the commonest of our household remedies. It goes generally under the name "Arnica," and is used for every manner of surface application. Yet, though enjoying great popularity, it is of doubtful service, and has been known to do considerable damage to the skin and adjacent tissues. Internally it acts locally as an irritant and systemically as an arterial excitant, with opposite effects of depression immediately following.

Symptoms.—Arnica, when first swallowed, leaves in the throat and mouth an acrid burning sensation, with an augmented flow of saliva. In the stomach, it produces burning pain, with nausea and vomiting, accompanied by diarrhœa similar to that of cholera. After a brief period of increase in circulation, respiration and temperature, great depression of the entire system follows. Violent headache, dilated pupils and paralysis of the muscles accompany this stage, which ends in death from collapse.

The Treatment naturally indicated is to produce vomiting at once, by means of sulphate of copper or other emetic, followed by such arterial and nervous stimulants as ammonia, alcoholic liquors, camphor, etc., giving opium to quiet local pain and allay inflammation.

Hemlock—Conium—Conine.

This historic poison, which is said to have caused the death of Socrates and Phocion, comes from a plant indigenous to Europe, which has become naturalized with us. It is known botanically as *Conium Maculatum*, from the spotted appearance of its stalks. Conium is an umbelliferous plant growing luxu-

riantly in waste places, by the road-side, and especially near old settlements. It is herbaceous, rising from three to six feet high, and having a branching hollow stem, smooth and shining, and marked with brownish-purple spots. The lower leaves are tripinnate in form, and over a foot in length, and shining, while the upper leaves are bipinnate and smaller; both are dark green above, and paler underneath. The fruit is roundish ovate, and being quite small, is usually mistaken for a seed. Children sometimes eat it. The plant flowers in July, bearing domes of small white flowers, and at this time the whole plant emits strongly its characteristic mouse-like odor. Long inhalation of this odor has produced symptoms of poisoning. Conia is the alkaloid extracted from the plant, and is used medicinally. It emits the powerful odor of mice which distinguishes the plant. Some animals are poisoned by hemlock, but horses, sheep and goats eat it with impunity.

The Symptoms are similar to those produced by other depressant narcotic poisons. Weakness of the limbs, and a sense of extreme weariness, drooping of the eyelids, double or disturbed vision, drowsiness of the mind, and dizziness next ensue. Utterance is also affected, but the mental faculties are generally unimpaired. If the dose has been fatal, paralysis of the extremities, commencing with the legs, follows; there is a feeling of numbness in the feet, respiration slackens, and death results from asphyxia—convulsions, due to the carbonic acid in the blood, usually terminating the case.

Treatment.—The general outline of treatment should be similar to that recommended for hydrocyanic acid (page 25), both being in the group known as "motor-depressants," or "depresso-motors." Give tannin, strong tea, decoction of tan-bark or something containing tannic acid, aqua ammoniæ, diluted with six times its bulk of water, or if that be not at hand, a few drops of lye in plenty of water. Empty the

stomach by tickling the throat, and follow with strong coffee and exercise, as with opium. Other stimulation, as cold sponging of the chest and small doses of brandy, may be advisable.

Corrosive Acids:—Nitric—Muriatic or Hydrochloric—Sulphuric.

Every now and then one or another of these terribly corrosive acids is swallowed by mistake, and the gravest consequences are sure to follow, unless the action of the chemical be instantly checked. Neither of these acids is, strictly speaking, a poison, but in their concentrated form they corrode, discolor, and destroy the tissues with which they come in contact, and are more fatal than many actual poisons.

Symptoms.—Nitric acid stains the skin and tissues yellow, while sulphuric acid blackens them. The physical symptoms are intense burning agony in the mouth, throat and stomach, with the general distressful effects of other corrosive poisons.

The Treatment must be instantaneous; give, whichever chances to be handiest, chalk and water, lime water, magnesia, soap, soda (washing or baking), diluted lye, or, in the absence of anything else, calcimine knocked from the wall and pounded up in water. These combine, chemically, with the acid and neutralize it. They should be followed by eggs, milk and oil, to protect the tissues. The depressant effects should be counteracted by opium or morphia, injections of beef-tea and brandy, and even injection, directly into the vein, of ammonia, may be necessary to avert collapse.

Carbolic Acid.

This substance, in solution, bears a close resemblance to alcohol, and the uses to which it may be put are so manifold, that it is quite an article of commerce. Carbolic acid, in aqueous

solution, is an effective agent in uniting with animal substances and preserving them from decomposition, and in removing the offensive odor from putrefying material. In weak solution, it is a good liniment for bruises. Since it is put to such general use this acid is liable to be inadvertently swallowed.

Symptoms.—Wherever strong carbolic acid comes in contact with the mucous membrane, it cooks and softens this tissue until it presents a grayish-white appearance. The symptoms are severe pain and burning in the throat and stomach, swelling of the tongue, dizziness, and, finally, convulsions.

Treatment.—Olive and castor oil should be given in large doses with frequent and copious drinks of sweet milk. Sweet oil and castor oil not being at hand, any other bland oil will serve, until the doctor's arrival.

Oxalic Acid.

This chemical, though little used in medicine, is nevertheless familiar to most house-wives under the names of "salt of lemon" and "salt of sorrel," and though accidents with it are uncommon, they do sometimes occur. The best precaution against all manner of poisons, is to taste everything in the form of medicine before swallowing of it. This simple rule, strictly kept, would prevent a great many sad casualties. Oxalic acid may be recognized by the sour taste it possesses in common with other acids, and if a liquid supposed to be alkaline, prove acid, it should be investigated.

The Symptoms in oxalic acid poisoning, as with other corrosive acids, are burning of the throat and stomach, copious and sometimes bloody vomiting, accompanied by extreme general debility, very nearly paralytic in its depressant effects, with a feeble, almost imperceptible, pulse. A large dose will produce death in half an hour.

Treatment.—The chemical antidotes for all acids are the alkalies. Therefore, magnesia, chalk, lime, washing or baking soda, or ammonia diluted with water, should be given every three or four minutes. The magnesia is preferable, as its promptness of action does away with the necessity of an emetic. However, vomiting had better be induced in any case, as it is well to err on the side of safety.

Lye—Caustic Soda—Caustic Potash.

Strong lye is sometimes swallowed by children, and its equivalents, the caustics named, have caused death. Its local action is similar to that of hartshorn, described below, only much more severe and decided, including the entire mouth, throat and stomach in its corrosive action. Bloody vomit and evacuations, cold sweat and hiccup, precede death.

The Treatment is to give vinegar, lemon-juice or oil immediately. The first two convert the caustic into acetate of potash or soda (as the case may be), and the latter produces soap. Follow this with an emetic of mustard water if necessary, and, after the stomach has been emptied, give sweet oil and mucilaginous drinks. Care must be taken afterward to allay inflammation of the injured mucous membrane.

Hartshorn—Ammonia—Aqua Ammoniæ—Spirits of Ammonia.

Taken without dilution, this is a violent caustic poison; acting first, on its way to the stomach, upon the mucous lining of the mouth, tongue and throat, which it inflames and swells excessively. From the stomach it finds its way quickly into the circulation, increasing the heart's action, and raising the whole arterial system to a febrile pitch.

Treatment.—When a dose of ammonia has been swal-

lowed, vinegar should follow it as closely as possible, succeeded by sweet oil, and drinks of flaxseed tea, mucilage, or other familiar demulcents. To allay the arterial excitement, a cold bath may be advisable.

Cantharides—Spanish Fly—Fly-Blister.

The tincture of cantharides, as well as the powdered fly, is sometimes administered on account of its supposed excitant powers, and has occasionally produced unexpected poisoning as a result. It is also a popular agent for "raising a blister."

Symptoms.—The odor of cantharides is sickening, fetid and distinctive, and may be detected on the breath soon after an overdose has been taken, or in the matter thrown up from the stomach. The ingestion of a poisonous dose is soon followed by a sense of constriction in the throat, with difficulty of swallowing, and at the same time there is a profuse discharge of saliva. These symptoms are followed or accompanied by intense pains in the stomach, vomiting of blood, streaked mucus, having the glairy appearance of white of eggs, tenderness over the abdomen, and *tenesmus* followed by the discharge of mucus and bloody stools. There is also pain and tenderness about the small of the back, with swelling and pain of the genito-urinary tract and organs (the characteristic effects looked for in the administration of the drug), with painful and often bloody urination. Generally, there are also trembling and local or general convulsions, stupor, insensibility and final collapse.

Treatment.—As there is no known chemical or physiological antidote, safety consists in getting rid of the poison and alleviating its local effects. Give prompt emetics, as sulphate of zinc, sulphate of copper or mustard water; or else use the stomach pump. At all odds, empty the stomach. Follow this by mucilaginous substances, as flaxseed tea. Milk, sugar

and water, and sweet oil are also recommended, though oil of any kind facilitates the absorption of cantharides, and should only be used in the absence of anything better, or after the stomach has been thoroughly emptied. Opium will be desirable to allay inflammation, and ten to fifteen-drop doses of camphor may relieve strangury, when it occurs.

There is no doubt that Spanish fly possesses the properties popularly ascribed to it, but it is doubtful whether anything short of a poisonous dose will produce these effects. Those who would not hesitate on account of moral scruples to employ it, may be deterred by consideration of the danger incurred.

Mad-Dog Bite (Hydrophobia).

That most horrible and deadly disease, hydrophobia, has been known for ages, and among all races of mankind. It is the effect of a specific poison introduced into the blood from an animal or person afflicted with the disease; usually by the bite of a mad dog. It can not arise spontaneously, and can not be taken from the bite of an animal not mad. In cases where the disease fully develops, it is almost always fatal, so that the only possible home treatment must be preventive. As dogs are common household companions, it is important to know the various sets of symptoms of madness in them. Following is a resumé of the famous instructions issued by the Council of Hygiene of Bordeaux, which are thorough:

"1. A short time after the disease has been contracted, the dog becomes agitated and restless, and turns continually in his kennel. If unchained, he roams about restlessly and aimlessly, seems to be sucking something; then stands motionless as if waiting; he starts, snaps at the air as if catching a fly, and dashes himself, barking and howling, against the wall. The

voice of his master recalls him, and he obeys, but slowly, with hesitation and seeming regret.

"2. He does not try to bite, is gentle, even affectionate, and eats and drinks; but he gnaws his litter, the ends of the curtains, the padding of cushions, bed coverlids, carpets, and anything which happens to be in his reach.

"3. From the movement of his paws along the sides of his open mouth, one might suppose him trying to free his throat of a bone.

"4. His voice is changed so markedly that it is impossible to overlook it.

"5. He becomes surly, and begins to fight with other dogs."

But the symptoms are very varied in different cases, and a change in the habits or manners of a pet dog should always be looked on with suspicion, and the animal should be chained for a time.

The probability of hydrophobia being communicated to persons bitten by a rabid animal, varies with the location of the bite. If it be in a part unprotected by clothing, inoculation is almost certain; in other parts, the chances depend on the thickness of the clothing, which wipes the virus from the teeth. The bite of a mad wolf is deadly, as the animal nearly always clutches at the bare face or throat.

Symptoms.—When the history of a case of madness can be traced, there is, of course, little difficulty in recognizing it; but in the absence of such knowledge it may, in its earlier stages, be confounded with less fatal diseases. However, as it *is* fatal when developed, an error would be of little importance save to the attendants.

All the prominent features of the disease are due to excitement of the nervous centres. The patient is irritable and in nervous terror. The muscles of the throat are contracted by

spasm, and the lower limbs are sometimes paralyzed. The slightest touch or sound, as a draught of air blowing on the face, the crawling over the skin of a fly or other insect, the touch of water, a sudden sound, or the sound of liquids poured from one vessel into another, are usually enough to bring on a frightful paroxysm, during which the patient writhes in agony, struggling for breath. A strangling sensation is very common, and the foam and tough, sticky mucus, which is constantly forming in the throat, causes constant hawking, spitting, and efforts to extract it with the fingers. Hallucinations of sight and hearing are not unusual. The period at which death occurs, after the symptoms appear, varies from one day to eight, but it is most usual on the second or third day, feebler persons yielding earlier, and the stronger ones making a more tenacious fight, death finally occurring from exhaustion.

Treatment.—As before stated, the treatment must be preventive. Heretofore there has been no reliable method even for such treatment, but the apparent success of M. Pasteur's plan of inoculation gives good grounds for the hope that at last the dread enemy may be at least forestalled. It is probable that a hospital for the treatment of hydrophobiac patients on this plan will be established in America at an early date, but pending this, the best course for persons bitten by rabid animals, is to set out at once for Paris, and place themselves under the personal care of that eminent French expert.

There are, however, a few immediate precautions which have been used from time immemorial against the disease, and these should be resorted to in any case. They are :

1. In case of a bite in any part of a limb, put a ligature, compress or tourniquet around the injured member *above the wound, between it and the heart.* The manner of applying such compress is shown on page 55. It may be formed of a strap, string, rope,

handkerchief, or an elastic belt; a suspender will serve the purpose well in an emergency. This is done to prevent the spread of the virus by absorption, through the circulation, and should be promptly resorted to.

2. Cut out the injured part with a sharp knife—not sparingly, but so as to remove every bit of flesh that has come in contact with the teeth.

3. "Cup" the wound. "Cups" are not as common now as formerly, but an excellent substitute can be made from a wide-mouthed bottle or similar vessel. Saturate a small quantity of cotton or paper with alcohol or benzine, set it afire and drop it into the bottle (being careful to cork and remove the vessel containing benzine before applying the match). As soon as the flame begins to die out, invert the bottle quickly over the wound, holding it tightly against the skin, to prevent the admission of air. This will draw blood from the exposed vessels.

4. In the absence of any such means, the wound should be sucked; only in this event there must be no sore or cut about the mouth or lips of the person performing the operation.

5. Cauterize the wound thoroughly with a red-hot poker; or, if lunar caustic be at hand, it may be used instead.

6. Start at once for a hydrophobic hospital.

After the specific symptoms manifest themselves, the best known treatment is to keep the patient under the influence of chloroform until death ensues. One or two cases of cure have been reported, however, from the hypodermic injection of *curara*, which should be tried, as well as morphine, amyl nitrite and the alcoholic tincture of nitro-glycerine,—the first hypodermically, the second by inhalation, and the last through the stomach.

In case of bite, unless the animal be unmistakably mad, by

no means kill it, but keep it confined and watch it for a couple of weeks. If it remain in good health during that period, the bitten person may regard himself as safe.

Snake Bite.

The danger connected with snake bite arises from the introduction of a poison into the system, which is so rapidly and thoroughly distributed throughout the whole body that its ultimate effects can be counteracted only by constitutional treatment. The teeth of venomous snakes are situated in the front part of the upper jaw, and are of a hook-shaped form, and when the snake sinks its fang into flesh, it does so by striking with its body lifted up, or springing from a coiled position. There is a fine groove on the under surface of a serpent's fang, which traverses its whole length, and is connected at its base with a small venom-secreting sac or duct. When the tooth is driven into the flesh, this duct ejects its poisonous fluid down the grooved channel of the fang into the wound, and the venom is instantly caught up by the circulation. The wounded part swells to enormous proportions, and assumes various hues, while the patient passes from nausea and vomiting to delirium and unconsciousness. If death does not ensue from these first effects, it is likely to follow from the intense fever and inflammation which are necessary accompaniments of the gangrenous condition of the inoculated parts.

Treatment in this, as in other cases of poisoning, must be promptly applied. If possible, the wound should be sucked vigorously to withdraw the poison, and circulation in the region shut off with bandages, as shown on page 55. In rare instances this will be a sufficient means of preventing poison from doing its work on the system; but from the circumstances under which an accident of this kind usually occurs, and the consternation caused by a realization of the fact that

human life is endangered, the victim and his friends are slow to act, and the effect of the poison is counteracted, if at all, by a combination of local and constitutional treatments. Acetic acid may coagulate the poison, if quickly introduced into the wound; but it is rarely at hand when the accident occurs. In all instances, large and frequent drinks of brandy or whisky, together with the free application of coal-oil to the wound, will prove an effectual remedy. Bandage the wound with some material, such as flannel, which will absorb and hold oil, and keep it thoroughly soaked with coal-oil; give the patient all the liquor he can drink, and all will have been done for the time being that the practiced physician could do. The popular belief is that if the patient can be intoxicated, his life will be placed out of danger.

Poisoning by Decayed Meat, Etc.

Certain changes, not well understood, occurring in animal substances when they ferment, sometimes render them extremely poisonous. Sausages, meat-pies, cheese and fish have been the source, on different occasions, of serious poisonings.

The Symptoms are nausea and headache; and in fish poisoning, dizziness and nettle-rash are generally present; vomiting usually occurs, followed, in rare cases, by collapse.

The Treatment indicated is obviously to give emetics, as alum or mustard-water, and afterward a dose of Epsom salts, followed by any saline drink, as Vichy water, seltzer, etc.

Poisonous Insects.

Despite the current belief that the bites of certain *arachnidæ*, as the tarantula and other spiders, are venomous, experience proves that they are harmless. But stinging insects always inflict a poisonous wound. The instrument of a stinging insect

consists of two fine, sharp darts, surrounded by a tubular sheath, which are connected at their bases with a special venom sack, and when the sting is inserted into the flesh, these venom glands inject their poison down the grooved darts, and thus inoculate the victim.

Symptoms.—Experiences with bees are so common that the symptoms of their sting need not be described.

Treatment.—In moderate cases, a local irritation, which may be arrested by salt or hartshorn, is all that the wounded one suffers. But if a dizzy faintness be the outcome, opiates and cordials must be given. It may happen that a bee, or wasp, is swallowed in taking a drink of water hurriedly, or in the dark, and from the moment the sting enters the throat, the fauces swell so rapidly that the patient is in immediate danger of suffocation. A gargle of hot water and salt should be used pending the arrival of a physicia

Poison Oak—Poison Ivy—Poison Sumach.

While the common sumach and several of its immediate family are perfectly innocent, there are two that possess quite virulent properties. They are the *Rhus Toxicodendron*, "poison ivy," or "poison oak," and the *Rhus Venenata*, or "swamp sumach." Some persons are extremely susceptible to the peculiar action of these plants, contact, and, in the most sensitive, mere proximity to them producing great irritation, swelling and final vesiculation, the symptoms resembling very strongly in their development those due to erysipelas.

The *Rhus Toxicodendron* occurs in two forms, one climbing by the aid of rootlets over tree trunks, etc., and the other growing erect from the surface. It is to the climbing variety that popular nomenclature has given the title "poison ivy," while the other is known as the "poison oak." The latter

varies in height from a few inches to several feet, and often spreads over large areas.

The *Rhus Toxicodendron* differs from the other sumachs, and from the somewhat similar Virginia creeper, in its having but three leaflets, of broad, oval shape, and bright green color. These leaflets have smooth edges, not serrated like the Virginia creeper.

Rhus Venenata, or "swamp sumach," is much the most virulent species. It resembles the safe species closer than does *Rhus Toxicodendron*, yet is easily distinguishable. It grows, as a rule, only in swampy regions, and its leaf-stalks bear but from three to six pairs of leaflets, while the common species bear from eight to twenty pairs. These, like the poison ivy, are smooth-edged, while the safe species have serrated leaflets. The stem is smooth, and from eight to fifteen feet high. The plant is of graceful form and attractive appearance. Its stem and branches are ashen gray in color, though recent shoots and leaf-stems are of a fine crimson or purple hue. The leaves are light green in color, with purple veins. The flowers are of a greenish white hue. Those of the safe species form thick, pompon-like clusters, while these are much more open, and, in this respect, approach the poison ivy and the Virginia creeper. The fruit is of a greenish white, not red, as in the common sumachs. It may be easily distinguished from the safe species by these characteristics. The small number of leaflets is a safe guide. It is most nearly approached by the dwarf sumach, but this is common on dry ground, and can be easily distinguished by its winged or bordered petiole.

Treatment.—Mr. Charles Morris, of Philadelphia, who has studied the subject closely, uses, as a sovereign remedy, frequent bathing of the affected parts in water as hot as can be borne. If used immediately after exposure, it may prevent the eruption appearing. If later, it allays the itching, and grad-

ually dries up the swellings, though they are very stubborn after they have once appeared. But an application every few hours keeps down the intolerable itching, which is the most annoying feature of sumach poisoning. In addition to this, the ordinary astringent ointments are useful, as is also that sovereign lotion, "lead-water and laudanum." Mr. Morris adds to these a preventive prescription of "wide-open eyes."

It may be said, in addition to the above, the climbing variety of the *Rhus Toxicodendron* affects damp and shady situations, while the ground variety grows freely in dry and partly shaded places, as on the edges of woods, along neglected and weed-grown fences, etc. The latter form is the less virulent.

Suffocation by Gas.

FOUL AIR.—In cellars, wells, and tanks, as well as in mines, there is frequently found a poisonous gas known as carbonic-acid; and when it is desirable to enter such a place, a mere suspicion of foul air should be sufficient to cause an examination to be made.

Remember, that a man can not live in an atmosphere where a candle will not burn; flame is supported by oxygen, and so is human life; therefore, the lowering of an unprotected light is a sufficient test for the presence of foul air. If the flame flickers and goes out, by no means enter the place.

In case a person on entering such a place becomes unconscious, another should be lowered by means of one rope, while he carries the end of another in his hand. This second rope he should fasten around the unconscious person, and both should be hauled out with all possible speed.

The methods of restoration are the same as those used in case of drowning (page 47). Carbonic-acid gas, being heavier than the atmosphere, can be removed from any place where it is pent up, by the use of a pump. If no pump is at hand, quick-

lime, scattered about in large quantities, will accomplish the purpose. Fire is worse than useless, as it only adds to the amount of gas, instead of decreasing it.

Coal and Illuminating Gas.—The fumes from charcoal are sometimes inhaled with suicidal intent; and ordinary coal gas is now and then breathed, unintentionally, either from a leaky stove, or from a gas jet ignorantly or accidentally extinguished. The small quantity of gas which escapes into the room from a common coal stove will be ordinarily carried off without damage, by ventilation; but when from any cause the supply becomes excessive, as happens frequently at night, when the stove is left open and the doors and windows closed, the result is occasionally fatal. Under similar circumstances, it happens once in a while, that uninformed persons blow out the gas on retiring, and become victims of their mistake.

In either case unconsciousness ensues, dependent on two causes,—exclusion of oxygen from the lungs and introduction of excessive quantities of carbon into the blood. Illuminating gas is merely coal gas from which the denser constituents have been removed, but in poisonous qualities they are practically identical, consisting in the case of the former principally of "carbonic oxide" (or carbon monoxide), and in the latter of carbon monoxide in company with carbon dioxide ("carbonic acid"), produced by the partial combustion of the first mentioned gas. Both act mechanically by excluding oxygen from the lungs, and the former at least, physiologically, in its qualities as an actual blood poison. The unoxygenated blood is blackened by their agency and the nerve centres are all paralyzed by their noxious effects. Carbonic acid is the resultant product of burning charcoal, and is the "choke-damp" found in mines and old wells (as mentioned on another page), while it is also the cause of poisoning to persons sleeping near limekilns.

The Symptoms of suffocation by gas, in the absence of direct

evidence in the atmosphere or surroundings, are not readily distinguishable from those produced by suffocation, strangling, or drowning, the physiological causes of death in all of these cases being closely allied. The suffocating person at first makes a struggle for breath, all the muscles of respiration acting vigorously, though it may be in sleep; the skin and other vascular portions of the body become livid, with excess of dark-colored blood; convulsions take place, followed by insensibility and death. Or, especially where carbon monoxide is present, as it usually is under ordinary circumstances of this nature, paralysis of all the nerve centres may occur at an early stage, thus making convulsions impossible. The after-appearance of one dead from this cause is very like that ascribed elsewhere to the drowned and the suffocated, and the surroundings will generally enable one to decide the source of the disaster.

The Treatment of persons asphyxiated with gas is precisely that prescribed for the drowned (see page 47), artificial respiration vigorously and persistently maintained, with the additional precaution of stimulating the cutaneous nerves. Thus, besides the use of mechanical means to induce breathing, the face should be vigorously fanned, and if the body be warm, a douche of cold water applied to the back of the neck and shoulders; if the body be cold, it should be immersed in a hot bath, or at least warm plates should be applied to the spinal column, pit of the stomach, hands and feet; after respiration is completely established, it may be necessary to bleed the patient, in order to relieve the congestion in the brain, but this should be left, of course, to a surgeon. In addition to the above-mentioned remedies, copious draughts of vinegar and water are prescribed by some authorities for cases of coal-gas poisoning, while one-drop doses of the tincture of aconite may be tried on the victims of carbonic acid.

Table of the Principal Poisons and their Antidotes.

For arsenic, "white precipitate," "ratsbane" or Paris green.	Emetics followed by free use of hydrated sesqui-oxide of iron, chalk or magnesia and castor oil.
For lead-poisoning, corrosive sublimate, red precipitate, vermilion, saltpetre, white vitriol, blue vitriol, chloride of zinc.	Emetics followed by copious draughts of sweet milk and white of egg, sweet oil and mucilaginous drinks.
For lye-poisoning, strong ammonia, caustic soda, or caustic potash.	Free doses of vinegar or lemon juice, oil or warm lard with white of egg, followed by mustard or ipecac in warm water.
For nitrate of silver or lunar caustic.	Moderate use of strong solution of common salt, vomiting followed by plenty of sweet milk.
For nux vomica, strychnia, and its salts.	An emetic, followed by tannic acid and chloroform.
For carbolic acid or creosote.	Olive or castor oil freely administered.
For oxalic acid, sulphuric, nitric or muriatic acid.	Soda, chalk, lime, calcimine, ammonia or other alkali, followed by oil and emulsions.
For opium, laudanum, morphia, aconite, belladonna, digitalis, stramonium, etc.	Emetics, cold applications to shock the nervous system, strong coffee. With opium and opiates, keep patient constantly moving; with the rest, maintain recumbent position, head low, to induce flow of blood to the brain.
For sugar of lead poisoning.	Alum and carbonates of soda or potash in plenty of water, followed by sulphate of zinc, to induce vomiting.
For tartar emetic (antimony).	Strong tea, or tannin in water; warmth to hands, feet, spine and pit of stomach, followed by small doses of diluted brandy.
For phosphorus, vermin paste, match heads, etc.	Blue vitriol in large quantities to empty stomach, hydrated magnesia to purge, and French oil of turpentine, or, experimentally, the American *crude* oil.
For iodine.	Starch, followed by an emetic.
For alcohol.	Cupping, exercise, hot coffee, and aromatic spirits of ammonia.
For prussic acid, oil of bitter almonds, cherry laurel, cyanides, etc.	Ammonia (diluted), followed by oxide of iron; artificial respiration, if necessary, and stimulants.

CASUALTIES.

Drowning.

In drowning, hanging and suffocation, unattended with poisoning by noxious fumes, the direct cause of death is the same,—exclusion of air from the lungs, and consequent asphyxia. By the contraction of the intercostal muscles and the inwardly arched diaphragm, the space in the chest is enlarged; and, according to a natural law, the air rushes in from without, filling the innumerable air-cells in the sponge-like structure of the lungs. As explained in the chapter on Suffocation by Gas, the air in the lungs comes into intimate contact with the blood which is distributed through the pulmonary capillaries surrounding the air-cells, and the result of this contact is a chemical change in the constitution of both blood and air. The venous blood in the lungs is purified by the absorption of oxygen from the air, and re-enters the heart to be sent out again, loaded with nourishment for the wasted tissues of the body. In absorbing oxygen, the blood also gives off carbon, which is expelled from the lungs in the breath of expiration by the natural elasticity of the chest walls, which comes into play as soon as the relaxation of the intercostals and diaphragm permit it to act. This entire round of movement, comprising inspiration and expiration, with its accompanying physiological phenomena, is called *respiration*. The oxygenation of the blood being the first essential of life in man and the higher animals, it is evident that the stoppage of respiration must be followed by disastrous results. Still, the mere ceasing of respiration does not place the subject beyond hope, provided the respiratory centres can be induced

to resume their suspended duty; and it is to this end that all efforts at resuscitation of the drowned should be directed.

A drowning person at first sinks to the depth of a few feet in the water, and then rises to the surface, making a violent effort to clear the throat. This effort, combined with cries for help and frantic struggles to keep afloat, soon exhausts the muscles and fills the lungs with water. The body sinks a second time, and again rises to the surface, the struggles continuing, though less violently. Upon the third appearance, the quantity of water in the stomach and lungs is sufficient to increase the specific gravity of the body, so that it sinks to remain beneath the water several days. During this time, the decomposition of animal tissue gives rise to the formation of gases in the body, which render it lighter than a corresponding bulk of water, and it then rises and floats upon the surface.

The body of a supposed drowned person, recovered shortly after the accident, presents characteristic appearances. It is livid in spots, cold, the tongue is swollen in the mouth, bluish foam issues from mouth and nostrils, the finger nails are torn at the extremities, with sand and mud embedded beneath them, and the half-opened upper lids of the eyes are livid in hue. On dissection, all the internal organs of one dead from drowning are found to be badly congested, with the lungs and stomach full of water. Drowning may be complicated with fracture, produced by collision with some hard substance as the body descends into the water, and sometimes there are contusions and dislocations. However, when a body is found in the water, it must be determined from its appearance whether or not death has been due to drowning; and if the torn fingers are clinched on sand and weeds, if the skin is rough, if the body is striped with livid patches, and is not yet green from putrefaction, prudence would dictate that work be immediately commenced.

Treatment.—Hastily making a roll from clothing, blankets or anything which may be to hand,—a log will do in want of

Fig. 1.

something softer,—place the body over it, face downward, and press upon the back to expel the water from the lungs and stomach. The position is shown in Fig. 1.

Fig. 2.

The object of this manipulation having been accomplished, remove all clothing from the upper half of the trunk, turn

the body on its back, place the roll beneath the shoulders so as to elevate the chest about four or six inches, and, taking a position at the victim's head, grasp the arms firmly, just above the elbows, flex the arms and press with the elbows against the chest, somewhat forward, so that, while the arm presses against the side, the elbow may be pressing against the front of the chest, as shown in Fig. 2.

After about two seconds,—counting deliberately "*one—two,*" —unflexing the elbows, draw the arms slowly but forcibly to full length over the head, and hold them in this position

Fig. 3.

while counting, as before, "*one—two.*" This movement will be understood from Fig. 3.

Bring the arms back to the side, flex the elbows again, and press against the belly and chest, as in the first movement (Fig. 2).

The first of these movements compresses the wall of the chest, while the second, by stretching the muscles attached to the arms and ribs, lifts the latter and so expands the chest, thus imitating natural respiration. This manipulation should be persevered in at the rate of about fifteen times per minute,

until a spontaneous effort at breathing is induced, or until all hope of resuscitation is lost.

The method above described may be varied occasionally by another, illustrated in Fig. 4, which has proven efficient in many cases.

In this method the body is laid face upward, with the roll under the back. The hands are raised above the head, and tied loosely together with a handkerchief, or something that will

FIG. 4.

not abrade the skin. The operator then takes his position over the body, looking towards the head, and placing his hands against the chest, at about the position of the lower end of the "breast-bone," leans forward and applies a heavy pressure thereon, by throwing a portion of the weight of his body upon his hands. From this position he raises himself gradually to the upright position (as shown by the unshaded portion of the illustration), and allows the chest to expand again by its own elasticity. A pressure of thirty pounds may be safely used

in this way. Still another method is recommended by some authorities, as follows:

Place the body on its breast, supported firmly by any article at hand, then turning it on its side and a little more than half-way over, suddenly throw it back to its original position, face downward. This movement imitates breathing, and should be performed perseveringly, efficiently, and cautiously once every four or five seconds, occasionally varying the side. By either of these methods, the operator may be gratified with favorable results in a few moments, but it may take an hour.

Additional means may also be used for the preliminary expulsion of water and mucus from the lungs: thus, it is well for an assistant to grasp the tongue, using a handkerchief to hold it, and draw it forward, so as to open a clear passage from the throat, and instead of laying the body over a support, it may be lifted by means of the operator's hands clasped beneath its abdomen, in which position it is given a sharp jerk.

When signs of natural breathing appear, let the rescuer turn his attention to starting the circulation of the blood. Try friction; rub the body and limbs with rough towels or cloth; commence with pressure at the extremities, and traverse the limbs toward the heart, keeping up the pressure; apply hot bricks and warm blankets to the stomach, arm-pits and loins.

When power to swallow has returned, some stimulant may be given in small quantities until the various vital organs begin the performance of their proper functions. Coffee, brandy and wine may be administered with excellent effect.

It should ever be remembered, that the work is a very difficult one, requiring energy and determination; many persons have been revived who stubbornly resisted treatment for two or three hours.

Repose and nutritious food will be necessary for some days

after recovery, as the system suffers a profound shock from asphyxiation.

Suffocation.

Suffocation, in its physiological effects, is the same as drowning. It consists in shutting out free air from the lungs, or stifling them with noxious gases.

Treatment.—In suffocation the same methods for instituting respiration and inducing warmth may be employed as in the case of drowning, accompanied by a periodical sprinkling of the body with cold water and a moderate use of stimulants.

Choking.

The spasmodic effort on the part of the muscles of the throat to throw out a substance which is too large to pass into the œsophagus, or which has entered the windpipe, is known as choking.

If far enough up, the object may be caught between the fingers and withdrawn, but if it has passed beyond reach of the fingers, some instrument, like a piece of whalebone, should be used to push it down into the gullet. A sudden blow on the back, or tickling the back of the throat with a feather, may produce involuntary gasping, and dislodge the intruding substance. In case unconsciousness follow close upon the application of these remedies, some irritating substance should be held to the nostrils, while the methods for artificial respiration are employed.

The windpipe is situated, with reference to the food passages, so that some particle of solid or fluid material may escape from its proper channel into the respiratory tube, exciting a distressful cough, spasmodic contraction of the muscles of the upper part of the windpipe, and impeding respiration. Under such circumstances no direct aid can be given the sufferer, except to

keep him quiet. Voluntary suspension of respiration, or taking a drink of cold water, may allow the muscles to recover from their state of spasm. However, nature herself has provided these irritable muscles for the very purpose of establishing a guard over the air passages, and, through a wise economy the fits of coughing are likely to expel the invading substance; but if these provisions of nature are inefficient, it is generally necessary to give air free access to the lungs by making an opening in the neck with the knife—an operation known as tracheotomy, which only an experienced surgeon can perform.

Wounds.

This general term comprises all injuries to the body, and includes cuts, stabs, breaks, bruises and lacerations. The first and immediate danger which, in most instances, accompanies a wound, is that consequent upon too great a loss of blood, and, naturally, the initial step in treatment should be an effort to check the hemorrhage.

If the blood be of a dark, purplish color, it is from a severed or mangled vein, and, since it flows from the extremities toward the heart through its venous channels, a flow of this kind is obstructed by a pressure on the flesh over the vein, *below* the wound. But if the blood be of a bright red color, it is arterial, and must be quickly stopped. This is done by applying a pressure bandage of some strong material—a handkerchief, for instance—around the limb, *above* the wound. Under the bandage insert a stick, or ruler, and twist it around several times, so that the flesh may be tightly compressed against the arterial tissue, thus closing the channel. This will at least check the flow of blood until skilled aid can be secured to tie the artery.

The surgical instrument known as the *tourniquet*, is merely an improvement on this rough and ready device. To render

it more effective, a pad or roll of hard cloth may be placed directly over the injured artery, so that when the handkerchief is twisted the pressure may be strongest at that point. The manner of application to the arm is shown in Fig. 5.

Fig. 5.

In case a pad is not to be easily had, it is well to tie a hard knot in the handkerchief and adjust it over the vessel, as shown in the case of a wounded *femoral* artery in Fig. 6.

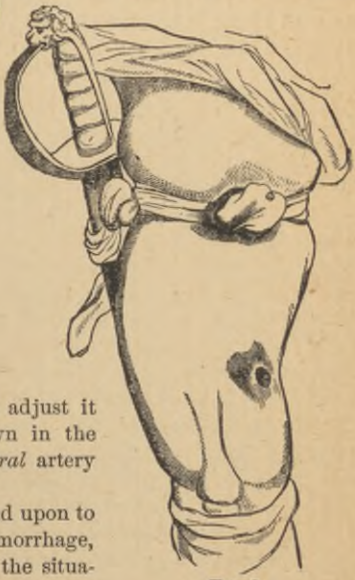

Fig. 6.

As anyone may be called upon to save life by stopping hemorrhage, it will be well to know the situations of some of the arteries most liable to injury, and to remember that pressure at the right place will stop the flow of blood by closing the vessel. For

this purpose the unaided hands may be used in an emergency, and until their strength is exhausted there is nothing better. It should be also remembered that when the blood ceases to flow in *spurts*, the artery is under control.

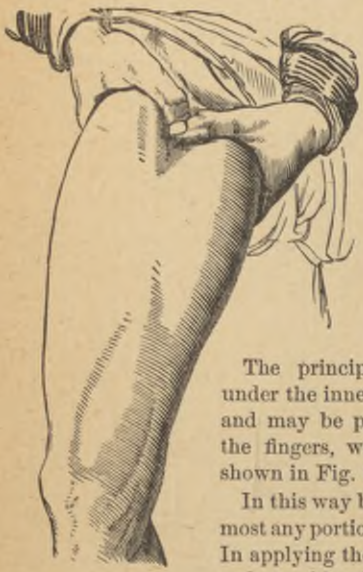

Fig. 7.

The *femoral* artery lies on the inner side of the thigh, and may be reached by the thumbs, as shown in Fig. 7. In wounds to any part of the limb, pressure on this artery will generally control the bleeding to a marked extent. The hands of one person may be thus employed while another is preparing the handkerchief compress.

The principal artery of the arm lies under the inner edge of the *biceps* muscle, and may be pressed against the bone by the fingers, when the arm is grasped as shown in Fig. 8.

In this way bleeding from a wound in almost any portion of the arm may be checked. In applying the handkerchief, the knot or pad should, of course, lie over the point indicated, that is, over the *brachial* artery. This latter vessel, before entering the arm, passes directly over the first rib, and under the *clavicle* or "collar-bone," and in this section of its length is known as the *sub-clavian* artery. In case of an injury to it anywhere above the point indicated in the illustration just referred to, it can be forced down

against the first rib by inserting the thumb or fingers behind the collar-bone, using considerable strength, the head of the patient being inclined toward the injured side, so as to relax the muscles. Meanwhile a bystander may wrap both the ring and wards of a large door-key with cloth, so as to prevent injury to either the skin of the patient or the hand of the attendant, and the key may then take the place of the fingers, as is also shown in Fig. 8.

Fig. 8.

Fig. 9 shows the proper positions for compressing the right and left *facial* arteries, where they pass through their respective notches, over the edge of the lower jaw; the right *temporal*, just in front of the top of the ear, where it

Fig. 9.

may be felt beating, and the right *sub-clavian*, the thumb being used for pressure in the case shown. The *facials* supply the entire face with blood, and obstinate bleeding from the nose or wounds in the face can be controlled by closing them. The *temporals* supply the scalp with blood, and it may be found necessary to compress them in wounds to this portion of the head.

Fig. 10.

The hand is fed by the *ulnar* and *radial* arteries, the beatings of which make in the wrist respectively the deep and superficial pulses. As they join to form an arch in the palm of the hand, both should be constricted in case of injury to the latter. The manner of procedure is shown in Fig. 10.

The many strong tendons, and the closeness of the bones at this point, will prevent the use of any sort of home-made tourniquet.

Cuts.

Cuts are the most common of all the injuries which men sustain, and, consequently, every family should keep on hand a supply of needles, thread and bandages, as well as a small roll of adhesive plaster. In an ordinary wound of this kind a slight pressure over the channel supplying the blood, together with cold water applied to the wound, will stop the bleeding. But if the injury be very severe, it may be necessary to apply a bandage.

Nature will unite divided surfaces, provided the parts are firmly pressed together, and will begin at once to reconstruct mangled flesh. Hence, in a cut, where the edges are smooth, the parts must be pressed together and retained as nearly as possible in their original position, by means of adhesive plaster or stitches, or both.

Stabs.

A wound made by thrusting a dagger or other oblong instrument into the flesh, is best treated, if an artery has not been severed, by applying lint scraped from a linen cloth, which serves as an obstruction, allowing and assisting coagulation. Meanwhile cold water should be applied to the parts adjoining the wound.

Lacerated Flesh.

It frequently happens that parts of flesh are torn away, and a large, gaping wound of quivering flesh is filled with sand, dirt or other foreign substances, according to the nature of the accident; all of which must be removed, and soft cloths, saturated with pure cold water, laid in the gash.

Do not hesitate to use freely a soft sponge and make a vigorous effort to press the parts into their original position, or as nearly so as the nature of the wound will permit, and hold them in place with strips of adhesive plaster. If the adhesive plaster is insufficient, take a few stitches, varying in number with the size of the wound. It may happen that a part of the instrument with which the wound has been made, remains buried deeply in a dangerous locality. Abstain from the excessive use of force in trying to extract it and await the arrival of a surgeon who may withdraw the weapon by such means as his skill and knowledge furnish. Apply bandages rather loosely over the injured parts, and tightly over the sound; this being accomplished, you have done all that anyone could do for the moment.

Wound Becomes Feverish.

Soreness and pain are necessary to the healing of a wound, and should cause no alarm whatever; but, if heat, swelling, and redness indicate that fever has set in, application of cold

water, discontinued when the symptoms cease, should soon reduce the flesh to a healing condition; and if this does not prove effectual on a short trial, give the patient a dose of salts, order low diet, and the desired results will follow.

Beware of stimulants and nostrums; remember that all the remedies known to the practice of medicine are merely aids to nature, the most simple of them being often the most powerful.

Fracture with Flesh Wound.

Fracture, complicated with flesh wounds, such as is caused by a violent blow on the head, or a gash which lays bare a broken bone, constitutes a very aggravated case, and requires scientific skill in its proper treatment. However, the extraneous matter should all be removed by the aid of a soft sponge and tweezers, and the flow of blood checked. And in connection with these measures, employ such remedies to alleviate the sufferer's pain as common sense approves and the circumstances afford.

Gunshot Wound.

An injury of this description may range all the way from a simple flesh wound to the mangling of some vital organ, and be so formidable that scientific skill is required in its successful treatment. However, if there is an alarming flow of blood, it should be checked by applying a strong bandage tightly over the injured point.

Gunshot wounds should be treated from the first with reference to the blood-poisoning and lock-jaw frequently following them.

In the city of Chicago, on the 15th of July, 1885, eight cases of death from lock-jaw, growing out of gunshot wounds received on the Fourth, were reported, and the number of similar cases which did not receive public notice was probably large.

Bleeding at the Nose.

This trouble possesses no alarming features, but is frequently a source of great inconvenience.

Treatment.—Quietude, the recumbent position, application of cold water to the face, neck, and back, or throwing cold water and vinegar into the nostril with a syringe will often succeed.

The temperament of the patient determines the nature of nose-bleeding. It may arise from a plethoric habit of body, being then beneficial; or, it may proceed from a debilitated state of health, when it is manifestly hurtful.

General Rules for Checking a Flow of Blood.

1. If the wound be situated on one of the extremities, wrap a strip of dense, strong fabric around the injured member, and inserting a stick or ruler between the bandage and the flesh, twist it around several times.

2. In a lacerated wound, with small streams of blood issuing from several points, lint, cold water, and ice dipped into the wound, together with slight pressure over the region from which the blood issues, will be sufficient.

3. Should a large vein or an artery be severed in a locality where a pressure bandage can not be applied, find out by experiment at what point a pressure with the finger will cut off the supply of blood, and continue to apply such pressure until skilled hands have tied the severed vessel. For instance, a wound in the temple, which indicates an injury to the temporal artery, should lead the operator to press on each side of it separately, until he has located the artery.

4. Simple, superficial cuts require nothing more than cold water and lint, the patient remaining absolutely quiet.

Dislocation.

The extremities of all bones are covered or cushioned with elastic tissues which prevent violent concussions at the joints when the body or limb makes a change in position. On the ends of both bones meeting at a joint, there are tendons and ligaments which give the limb a certain degree of freedom; but, when it moves beyond the limit imposed by these tissues, it will not return to its proper position. This is known as dislocation.

The most ordinary and simple dislocations are those of the fingers, and may be reduced by an unskilled operator with less

Fig. 11.

pain than would be suffered should the reduction be deferred till the arrival of a surgeon.

Treatment.—Give the patient some stimulant, and immerse the limb in hot water. Seize the extremity of the dislocated member with one hand, placing the other hand above the dislocation, then by a strong, hard jerk, throw the bones into their proper positions.

In more obstinate cases, greater force more gradually applied may be necessary; and for this purpose, nothing is better than the simple device originated by Dr. Levis, of Philadelphia. It consists, as clearly shown in Fig. 12, of a flat piece of wood, about two inches in width, with holes on the edges at

one end, for the passage of tape, and a projection at the other for winding and fastening the free ends of the tape. The manner of application may be readily understood from the engraving.

FIG. 12.

Still another method is that called the "clove-hitch," originated by Sir Astley Cooper. In Fig. 13, the "clove-hitch" is shown as applied in reducing a dislocation of the thumb. When this device is used, a piece of buckskin or wet cloth should be wrapped around the finger to prevent abrasion of

FIG. 13.

the skin by the cord. In connection with the direct force applied by either of these methods, the thumb and fingers of one hand, or those of an assistant, should be employed in pushing the protruding ends of the bones, each in its proper direction, into position. Patience is required in the operator.

Sprains.

A sprain is the result of strain on the tendons and ligaments of a joint, severe enough to injure them but not to displace

the articulation. All sprains are of this nature, except, perhaps, those affecting the back, and all require about the same treatment. Strain in the back is noted as an exception, because this form of sprain is frequently complicated with injury to the spinal nerves or some internal organ.

A fall from a height, a weight thrown heavily on the body, too severe an effort at lifting, or a sudden wrench to the frame, may strain the fibrous structures of the spinal column. Such an injury is accompanied by soreness and weakness in the loins, and blood in the urine, which denotes an injury to the kidneys.

Treatment.—Give a purgative till it acts moderately, and apply fomentations of warm water to the locality of the pain, after so surrounding them with oilcloth as to protect the bed-clothing. In severe cases apply thick cloths saturated with tincture of arnica, or paint the part frequently with iodine. When the patient has recovered sufficiently to be able to sit up in bed, continue to apply tincture of iodine or other stimulating absorbent, and no lasting ill-effects are likely to follow. Sprains in other regions require absolute rest and the application of any liniment at hand.

Railway Accidents.

Aside from the concussion, fractures and dislocations, resulting from an accident to a train, there is a form of injury so frequently attending wrecks, that it is regarded as peculiar to them, and is called the "railway spine."

A combination of circumstances, as the velocity of the moving train, the momentum acquired by the person, and the anxiety naturally felt upon realizing that one has been injured, powerfully shocks the nervous system, and this, in combination with the actual physical shock received, results in the obscure disorder just named.

The visible effects of a concussion of the spine are always obscure, and the severer pains are usually tardy in making their appearance, even though the final outcome may be very serious.

The inflammation which afterward sets up in the spinal chord and surrounding tissues is always disproportionate to the supposed force of the blow, or wrench on the spine, and the disease develops slowly. At the time of the accident the injured man experiences a feeling of general soreness, but no acute pains. The power of motion is not interfered with, and the destined sufferer goes home unaware of the agony that awaits him. Soon he undergoes quite a change, which destroys serenity of mind, produces sleeplessness, and is accompanied by a feeling of stiffness in the loins and back. New complications are daily unfolded; the special senses become impaired, temper is ungovernable, and hope overshadowed. The patient finds his aptitude for business gradually disappearing, and, with mental faculties weakened, he sinks into a miserable immobility. Partial or entire paralysis with defective nutrition render the extremities cold and apparently lifeless. One characteristic of the nervous system is that, once impaired, it never regains its former health and strength. Partial recovery from injury to the spine may be attained, but complete restoration never. All that can be done for such a patient is to compel absolute mental and physical rest, and build up the general health to the utmost possible extent. There is a train of secondary disorders following upon broken-down health, the advance of which may be checked by such remedies as tend to stimulate the vital organs into normal activity; to this end treatment should be directed. On boarding a car it is wise, on the whole, to get as near the centre of the train as convenient, in order to be removed from the vicinity of collisions at either end.

Runaways.

The circumstances attending an accident of this class are so varied that nothing but a few general instructions can be given as pertinent. While you are in the vehicle, sit perfectly still, guard your arms and feet against any entanglements whatever, and keep yourself in readiness for the probable overturn. Jumping about and screaming, besides adding to the horse's terror, render you liable to be caught in some part of the vehicle, and to have a limb torn from the body, or to receive an internal lesion.

There is one important direction to be followed, which presupposes great strength of will and presence of mind: that is, sit with the muscles in an easy and relaxed condition. An infant or intoxicated adult may fall and escape with a bruise, where a sober adult would suffer a fracture or dislocation. The cause for this is found in the condition of the muscles; in the first case, they are relaxed and easy; in the second, contracted, firm, and deprived of that flexibility which is found preëminently in children. Never attempt to jump from a vehicle, unless it is opened behind, and you can slip down and run a short distance, holding on, to break your fall. If you jump when on level road, the violence of your fall will be increased, and your injuries, consequently, more likely to prove fatal. Let prudence, and not unreasoning terror direct your actions.

Burns.

A burn is a condition of the flesh brought about by contact with some heated or burning substance, and is always attended by serious and very frequently fatal results. Heated metals, gas and stones, not in a state of ignition, have the same physiological effects on animal flesh, when brought in close proximity to it, as ignited oil, coal or gas have when in contact with it.

Treatment.—Whenever you discover that a person's clothing is on fire, seize a quilt, mat, rug or anything convenient, and clasp it tightly around the burning garment. To effect this the recumbent position is most favorable, therefore the unfortunate should be thrown upon the floor, where rugs or carpets are usually to be found ready for instant application by rolling them around the sufferer.

This will extinguish the blaze, and limit the severity of the injuries. Having laid the patient down in a comfortable position, skillfully remove the clothing, employing great caution, and using a knife or scissors, if necessary, in order to preclude the possibility of tearing away the flesh with it. Should the two adhere, separate them by saturating the clothing with warm water. The skin serves as a protection to the vital and tender parts beneath, and its removal would be a very serious aggravation.

In any burn, serious or superficial, some coating material should be spread over the injured surface, such as sweet oil or molasses, thickened with flour. Molasses and flour, as a general thing, are easily obtained, and are accessible to all, and when the burn has been denuded of clothing, pour syrup over it, and sprinkle it with flour. Sweet oil poured on a cloth will serve the same purpose. At any rate, those in attendance should employ the means most readily at hand to shut off free air.

Carbonate of soda, sprinkled on the burned parts, and dampened with water, is an excellent curative agent in burns or scalds, and, whereas, an ulcer might reasonably be expected to result, carbonate of soda, applied shortly after the burn, will allay the pain, and prevent a sore.

Intense pain and exhaustion following, the patient should be given some stimulant.

Scald.

Flesh coming in contact with heated oil, water, gas, steam, or other fluids, is reduced to an unhealthy condition known as scald.

The heat of the fluid, the sensibility of the parts, the length of the application, and the extent of surface involved, determine the severity of the injury. In ordinary, mild cases of scalding, the skin is marked by redness and slight swelling, and, if a blister has not been produced, the burning sensation may be relieved by the application of cold water. In an extensive scald the free use of ice and cold water will afford relief. Scald and burn are very different in this respect, since burns require a warm treatment and scalds a cold one. Mix salt or saltpetre with the cold water and, with a view to increasing the cold still more, add an evaporative substance to the solution, applying it freely.

When blisters "raise," cut them open and apply vaseline with floss silk or absorbent cotton around the wound.

Bruise.

Flesh is said to be bruised when the smaller blood vessels are mangled so that the blood escapes from its proper channels into the cellular tissue of the true skin. This condition of the flesh, its appearance and the attendant sensations, are familiar to almost every one. The normal color and condition are gradually restored to the parts through the agency of little vessels known as absorbents.

Treatment enters for the purpose of preventing the effusion of blood into the cellular tissue. To this end cold water application serves admirably, aided by the elevation, if possible, of the injured parts above the level of the body. Of course, if the bruised flesh be situated over a bone, the effusion of

blood is slow; elsewhere it is slow or rapid, as the injury is limited or extensive. When the bruise reaches its maximum density of color, the object of treatment should be to hasten the absorption of the clotted blood, and to reduce the swelling. Tincture of iodine will assist absorption, and puncturing the large dark-brown blisters may permit the blood to escape externally.

Mashed Nails.

In case a finger or toe nail be bruised or mashed, keen pain is occasioned by the collection of blood between the nail and the underlying flesh, producing pressure. The part of the nail involved in the injury dies, and a newly formed nail gradually pushes it off from the finger. In some cases the nail joint may be injured, and give rise to the formation of pus, with considerable inflammation, but the process of building goes on without interruption, and nature soon supplies the finger with a new nail.

Treatment.—If the injured member be plunged into very hot water the nail will become pliable and adapt itself to the new condition of things, thus alleviating agony to some extent. A small hole may be bored in the nail with a pointed instrument, so adroitly as not to cause pain, yet so successfully as to relieve pressure on the sensitive tissues. Free applications of arnica or iodine will have an excellent effect.

Mashed Toe or Finger.

Bone is ensheathed in an integument known as the *periosteum*, and when it is involved in an injury, the periosteum becomes intensely inflamed. In a short time purulent matter is formed under and around it, which requires immediate attention.

A free incision will afford the pus a ready means of escape,

and the sufferer instant relief. But if it be left unlanced, the surrounding parts will also become purulent. Early application of the bistoury or lancet is, therefore, recommended.

Fish Bone in the Throat.

This is an accident attended by great pain, and some degree of danger. In the action of swallowing, just as the throat closes, if a fish bone chance to be present, it will probably be forced into one of the fleshy walls of the throat, and severe inflammation will ensue.

Treatment.—Press the tongue down with a spoon-handle so as to command a full view of the throat, and with a pair of tweezers remove the offending bone. Should this attempt be ineffectual, the patient may swallow some thick fluid in such large quantities that the bone shall be carried downward. The whites of several eggs, swallowed singly, are almost sure to dislodge and remove the bone; but, if these fail, a surgeon should be sent for at once, as the knife may be the only resource for affording relief.

Wheat-beard in the Throat.

In harvesting their wheat, farmers are compelled to come in contact with the long spears of beard which surround the head of grain. This spear is armed with small projections, which serve like the barb on a fish-hook, to hold it in its place when inserted. The harvester frequently gets one of these fastened in his throat, from drinking water in the fields, or in throwing the grain against his chest in the act of binding the sheaves, and the result is that it becomes embedded in the fleshy parts of the gullet, and swelling follows. The inflammation is sometimes so great that the air-passages are closed, and death results.

Treatment.—Unfortunately, when an accident of this kind occurs, men are farthest removed from the means of relief. However, a paddle may be whittled from wood and with it the tongue may be depressed, and a view obtained of the throat; then the ends of a crooked twig may be beveled off and the stick, being broken in the middle, furnishes a pair of rude forceps, which will serve their purpose well enough; press the tongue down till a fair view is obtained of the throat and use the wooden tweezers to extract the irritating awn or beard of wheat.

Foreign Body in the Eye.

Very few persons are unacquainted with the tormenting pain excited by a hair or other object in contact with the eyeball.

Always bear in mind that the lining membrane of the eyelids and the surface of the eyeballs are very sensitive, and are provided for their protection with secretions which possess a dissolving power sufficient to render an ordinary intruding object harmless. For this reason that vigorous rubbing so often practiced should be refrained from, since by moving the object around, it is made to scratch these tender tissues.

Treatment.—When any foreign body enters the eye, close it instantly, and keep it still until you have an opportunity to ask the assistance of some one; then have the upper lid folded over a pencil and the exposed surfaces closely searched; if the body be invisible, catch the everted lid by the lashes, and drawing it down over the lower lid, suddenly release it, and it will resume its natural position. Unsuccessful in this attempt, you may be pretty well assured that the object has become lodged in the tissues, and will require the assistance of a skilled operator to remove it.

Foreign Body in the Nose.

Accidents of this kind occur through the ignorance of children, greatly to the alarm of mothers.

Treatment.—If the substance is inclined to swell when moistened, any effort to remove it should be hasty. Let the lungs be completely inflated, and, obstructing the outward passage of air through the uninjured nostril, make a violent effort to expel the air through the injured one. A blow on the back, and the introduction of snuff or pepper into the nose, may produce sneezing or hard breathing, which, with the mouth and sound nostril closed, may force the object out. Failure in these efforts should lead to a direct attempt to hook the object out with a crooked hairpin, or an effort to grasp it with the tweezers. Meanwhile have the doctor summoned at once.

Foreign Body in the Ear.

Adults sometimes suffer from insects entering the ear during sleep, while children become victims to their own innocence by poking small foreign bodies into it.

Treatment.—Instead of rashly pushing and poking the object, try some method for producing a pressure behind it. The external opening of the ear terminates on the inside in tender tissues which are injured by rough contact with any hard or pointed instrument; hence, if the offending object be an insect, lay the head down on the uninjured ear, and pour sweet oil into the tube-like opening formed by catching the the edges of the ear, and drawing them up from the head. In a short time, you will be gratified by seeing the insect come floating to the top.

In case the object be a pea, pebble or anything of similar nature, turn the head with the injured ear downward, and,

inserting a syringe, evacuate it forcibly. This will throw the water behind the object, moving it downward and outward.

Fish Hook in the Flesh.

The pain attendant upon an accident of this kind often induces the sufferer to wriggle the hook about until an opening is made in the flesh, large enough to admit of its extraction. The better plan is to push the hook rather in the direction in which it started, until it penetrates the surface of the flesh. An incision with some sharp-pointed instrument may be necessary; force the hook forward until it emerges from the bottom of the incision, then, with clippers or a file break off the flat handle of the hook, and catching the remainder by the point, pull it through the flesh.

Needle, Thorn or Splinter in the Flesh.

The second layer, or true skin, is everywhere provided with a network of nerves, so that no object, however small, can penetrate it without producing considerable pain. Generally, the most prominent feature of such a wound is the discomfort rather than the extent of the injury.

Treatment.—In case a needle become deeply imbedded in the flesh, an incision should be made with the knife, which will expose the offending article to the tweezers or forceps. In certain localities, the flesh can be grasped with the needle, lengthwise between the thumb and forefinger; pressure on the head of the needle will then force it out, point foremost. A thorn, unless broken off in the flesh, can be easily caught and withdrawn. If in such a position that the occasion demands the knife and tweezers, and relief can be afforded in no other way, they should be at once employed, otherwise the flesh adjacent to the thorn will fester.

Splinter in the flesh is of very common occurrence, and affords no cause for alarm, unless so serious that lock-jaw is threatened. Persons engaged in handling undressed wood, building fires, or working around mills, are liable to get splinters imbedded between the finger-nail and the flesh beneath, to which it is attached; and, if allowed to remain, a serious inflammation will take place, ending, probably, in the loss of the injured finger; as the knife will have to be used sooner or later, it is economy to use it in the beginning. Splinters embedded in the flesh elsewhere will have the same general features and treatment as thorns.

Finger Rings Embedded in the Flesh.

A comfortably fitting ring may be retained on a growing finger until the joint becomes too large to admit of removing the ornament, or force may have been required in putting the ring on, and some violent use being made of the hand, a swelling results which shuts off the return of blood from the finger's extremity, and the flesh crowds up around and, sometimes, over the ring. Mortification must inevitably set in, unless the ring be removed. To release the ring from this confinement, wrap the finger with a small, strong twine, commencing at the extremity of the digit, and proceed wrapping it round and round until close to the ring, then, with some flat, blunt instrument, slip the string beneath the ring, commence to unwrap it, and the ring will gradually move to the finger's end. Where the pain is too keen, or the swelling so great as to threaten laceration from the ring's edges, or the wrapping method proves a failure, procure a file or saw, insert something under the ring to prevent wounding the flesh, and proceed to saw or file the band apart.

Cold—Frost Bite—Freezing.

Frost bite is of very common occurrence in our Northern States, and death from exposure to cold is by no means rare. A few general remarks on the subject may prove serviceable:

1. Freezing to death is comparatively painless, and results from lowering of the bodily temperature, producing a congealed state of the blood.

2. When riding or walking through a very cold atmosphere, if a disposition to sleep manifests itself, do not yield; it is death.

3. A covering of snow is better than exposure to the open winds, if you are overcome by the cold.

After an undue exposure to the cold, it is frequently discovered that the nose and ear, a toe or a finger has been "nipped." The physical condition of the injured part is simply this: the blood is frozen in the capillaries, and an application of heat will cause them to expand and burst the flesh adjoining, rendering the part sore and subject to mortification.

Treatment.—Do not expose the frozen part to the heat of a fire-place, or even that of a warm room, but endeavor to start circulation by friction, allowing the temperature to rise very gradually. There is a story frequently related of the Norwegians, that it is their custom, when passing one another, to stoop down, gather a handful of snow, and begin rubbing each other on the nose or face. Experience has taught them the best remedy, and wisdom on our part would lead us to adopt their method. Rub the frosted parts vigorously with snow or very cold water till the proper healthy color returns to them. This may not be a very light task if the case be severe, and the rubbing may require hours of perseverance. Let the subject move about rapidly, or engage in any exer-

cise tending to produce animal heat. When the parts have softened and regained their color, apply lard or sweet oil to the skin; then, after protecting the patient with heavy wraps, and having enveloped the frozen parts in flannel, administer a moderate dose of brandy and direct him to take a rapid walk during an hour or two, and the normal condition will return, leaving no ill effects.

Sunburn.

Soreness of the surface, produced by heat or wind, is called "sunburn." At first the skin smarts and becomes red, but, upon a cessation of the exposure for a time, it assumes its natural condition. However, if the exposure continue, the redness may disappear, and pigment be deposited in the tissues from the blood; the skin is then said to be "tanned;" so that in persons habitually subject to such exposures we find a swarthy skin.

It often happens that boys in bathing, and persons whose skin is tender, are exposed to a degree of heat to which they are unaccustomed, and the red skin frequently becomes puffed up into very painful blisters, while the entire surface that has been exposed is raw and swollen.

Treatment.—Again we go to the kitchen for a remedy. Apply sweet cream to the raw and blistered places; keep the patient quiet, protect the body from contact with rough surfaces, and should the healing skin become hard and dry, anoint it with any bland oil or ointment, and nature will do the rest.

Anyone unused to the open air should, during the first few days of exposure wear some light covering over the surfaces unprotected by the clothing, until the tender integument has had an opportunity to adjust itself to the new order of things.

Sunstroke.

Sunstroke does not necessarily arise from undue exposure to the sun's rays, but may proceed from heat which is either actually too excessive, or which is encountered when the vital forces of the body are near the point of exhaustion.

Symptoms.—The breath becomes heavy and hot, pulse low, head feverish, and total unconsciousness follows. The blood, being collected in the brain and internal organs, leaves the extremities in a chilly state.

Treatment.—If a house be near by, carry the patient to it; if not, select some cool place under a neighboring tree, and stretch the unconscious man out at full length, with the head slightly elevated above the level of the body; apply ice to the head.

City and country people alike should observe certain precautions against attacks of this description, and so avoid the danger. A dry, hard skin will not admit of the proper radiation of heat from the body, and, consequently, the danger of becoming overheated is augmented by such conditions. This state of body, favorable to an attack of prostration from heat, may be produced by loss of sleep, lack of proper nourishment, poor ventilation, uncleanliness of habit, fatigue or intemperance. Plainly, then, where these particulars are properly attended to, the skin will remain moist and pliable, and the liability to sunstroke will be appreciably diminished.

GENERAL DISORDERS.

Falling Fits—Epilepsy.

This is certainly one of the most terrible diseases attendant on humanity. Occurring in infancy, the afflicted one may outgrow the disease, but the probability is that it will become constitutional and incurable. The "fit" consists of convulsions and paroxyms, occurring at uncertain periods, and accompanied by a suspension of sensibility, consciousness and voluntary motion. It may come suddenly, or it may have premonitory symptoms which warn the unfortunate of the approaching paroxysm. When the fit is well under way, the eyeballs protrude, foam issues from the mouth, and the whole countenance becomes livid, swollen and frightfully distorted. At times the convulsions are so violent that only the presence of some one who may interfere prevents the patient from pounding his head or chewing his tongue. Epilepsy may arise from disease of the spinal marrow, from irritation of the stomach and intestines, from excessive loss of blood, or continued overwork, and is invited also by a free indulgence in alcoholic beverages, as well—it is averred—as by the excessive use of calomel.

The Treatment is very simple: Place the patient in the middle of the bed, so that he may not bruise his flesh or fracture his bones, elevate the head slightly above the level of the body, loosen all tight clothing, insert some pliable material, as a piece of cork or rubber, between his jaws, to prevent chewing the tongue, and, after a short period of sleep, consciousness will return.

The most important consideration for the epileptic is his diet, which should be light, plain, simple and nutritious. All his actions should be guided by moderation. Temperance is

demanded in eating and exercise, and especially should such a person avoid crowded, heated rooms, excitement, and any use whatever of intoxicating liquors. He should pay attention to keeping his feet warm and his head cool, and should sleep in a room well ventilated, with head and shoulders slightly elevated. Regulating these particulars may not cure the disease, but will lessen the severity as well as the frequency of its attacks.

Fainting.

Fainting is unconsciousness, produced by feeble and imperfect action of the heart and lungs. It is distinguished from the great variety of other "fits" by low and feeble pulse, slight respiration, and the conspicuous absence of convulsions. It often occasions considerable apprehension among bystanders to see a person faint, but the correct remembrance of these characteristics may obviate this unnecessary fear. The patient suddenly, or, it may be, after some forerunning symptoms, sinks into unconsciousness. In a few minutes, or perhaps an hour, the eyes open languidly, the lips move and the patient speaks in a subdued and languid tone, gradually recovering strength and buoyancy; though recovery is sometimes preceded by violent headache.

Treatment.—The treatment should be directed toward rallying the circulation. This may be effected by placing the patient in a horizontal position, dashing cold water in the face, and applying mustard to the soles of the feet, and camphor to the nostrils. When the subject begins to revive, it may be well to administer a small drink of water and spirits, mixed in equal parts. Persons predisposed to fainting should follow closely the laws of hygiene and general health. If excess in diet, overwhelming emotions, loss of blood, long fasting and fatigue be all avoided, fainting, even though it proceed from some constitutional weakness, will be less frequent.

Hysterics.

Hysteria is an obscure disease, depending mainly upon nervous sympathy, and is by some physicians regarded as purely imaginary. But, however trivial may be its real cause, it is no less an actual disease, demanding treatment. Its occurrence is dependent upon a variety of inherent causes, principally those resulting in a low nervous tone. It is more common in unmarried than in married women, being most frequent in young women under thirty-five years of age; the attacks occurring generally during the duration of feminine "periods." Suppression of these is a common exciting cause, as are also sudden violent emotions of any sort whatever.

Symptoms.—The precursive symptoms are various in different individuals: yawning, dejection, palpitation of the heart, sudden causeless bursts of tears, etc., may be present; but they may be entirely absent. When the paroxysm develops, there is nearly always a sense as of a ball in the throat, accompanied usually by flatulence, and a copious discharge of pale urine. Contortions of the body, alternate fits of laughter, crying and screaming follow, and finally the attack passes off without damage.

The Treatment should be preventive. For one known to be subject to hysterics, nutritious food, plenty of exercise and cheerful surroundings are absolutely necessary, as careful hygiene will almost certainly correct the hysteric tendency. On the occurrence of an attack, place the patient in bed, loosen all the clothing,—especially the corsets,—slap the chest with the end of a towel wet with cold water, and see to it that fresh air is freely admitted to the room. The manner should be firm, but not brutal. Iron, quassia, sea-bathing, and in winter a strip of strengthening plaster along the spine are recommended as excellent in subsequent treatment.

Diphtheria.

This disease, as an epidemic, appears to be gradually developing into more serious and virulent proportions than it formerly attained. It seems to have no relation whatever to the climate or condition of the atmosphere. It appears as frequently in the warm as it does in the cold countries, and is dangerous because the subject is not likely to detect radical symptoms before the malady has obtained a firm hold. The patient becomes feverish and displays a tendency to hoarseness. The glands just beneath the jaw-bone become enlarged, and the neck grows stiff. Such symptoms should arouse suspicion, and incite an investigation. Holding the root of the tongue down with a spoon, carefully examine the throat in search for little white spots in the mucous membrane about the fauces, and, if the spots be present, you may be assured that the disease is under headway and the patient can be saved, if saved at all, only by the most efficient and prompt measures; hence, the family physician should be summoned at once.

Females are more inclined to diphtheria than males, and children are more likely to be afflicted than adults; but, in every case, the weak are more severely attacked than the strong. Diphtheria, in its epidemic form at least, is now classed among the zymotic, or germ, diseases.

Mumps.

This contagious disease, most common among children, begins with soreness, stiffness and swelling in one or both sides of the neck, combined with swelling of the parotid gland. These symptoms increase in severity for four or five days, and sometimes keep up a soreness and difficulty in swallowing for weeks. There are often a dry skin, quick pulse, constipated bowels and scanty, highly-colored urine.

Treatment.—It is very important that the face and neck be kept warm. Avoid catching cold, and regulate the stomach and bowels; because, when aggravated, this disease is communicated to other glands, and assumes there a serious form. Rest and quiet, with a good condition of the general health, will throw off this disease without further inconvenience.

Croup.

In a changeable climate, where the temperature is constantly swinging from one extreme to another, this trouble is one of the most frequent and alarming among children. The principal danger, in cases of this kind, arises from the liability of the mucous lining of the fauces to grow so rapidly as to close the air passages in the throat, and so suffocate the patient.

Symptoms.—The symptoms of croup are a short, dry cough, accompanied by hoarseness, which increases in severity until the breathing becomes very difficult and labored, requiring all the child's strength to sustain respiration. Now, these symptoms may be indications of simple sore throat; but croup is marked by a hoarse, peculiarly rasping cough (the distinctive cough, which has been aptly called the "barking" of croup, from its resemblance to the growling and barking of a dog). It needs to be heard but once to be remembered always.

Treatment.—Summon the family physician, and, pending his arrival, put into practice these directions:

Apply a mustard draught to the feet and throat of the patient until the flesh is fairly reddened, and administer some drink to produce vomiting. To this end, give warm water with salt in solution, or a dose of ipecac, or, better still, alum and water, repeating the dose every three hours, so as to keep the patient on the point of vomiting. Should this fail to afford free breathing, give one teaspoonful of molasses and vinegar every half-hour. This old-fashioned, homely remedy

has been very successfully used in numberless instances. In most cases, however, alum water will be found effective.

Bleeding from the Lungs.

Hemorrhage, or bleeding from the lungs, is a very common occurrence in the middle latitudes of the United States, and may be caused by hereditary predisposition to consumption, long continued abuse of the lungs by breathing noxious airs, or the settling of a cold upon them.

The blood coming from the lungs is of a frothy consistency and scarlet color, and is thrown out by an effort at coughing, rather than by vomiting. When the hemorrhage comes on, the air passages in the throat become clogged up with blood, and the sufferer is threatened with choking; it is, therefore, very desirable to know of some simple remedy which may tide the unfortunate over the first attack.

Treatment.—Mix a drop of paregoric with a teaspoonful of vinegar in a small quantity of cold water, and administer a dose of this size every half-hour, until relief is obtained. The patient should be consulted as to his comfort when propped up in bed, and should not be allowed to exert himself mentally or physically. The chest may be sponged with vinegar and water, and nourishing diet should be given in as large quantities as the sufferer can well digest. Such symptoms, however, should give rise to grave apprehensions, and no time should be lost in placing the subject under the care of an experienced physician.

Hives.

This disorder consists in raised patches or welts, accompanied by redness of the parts, itching and a feeling of depression. They frequently appear in a few moments, and depart as quickly, leaving no traces of their existence. Hives do not

produce fatal results, but the uncomfortable itching and burning which they create makes it desirable to know how one may escape the torment.

Some individuals are free from such afflictions, while others are so unfortunately constituted that any local irritation or slight internal disturbance is sufficient to bring out the hives in great numbers. The internal causes which suffice to produce them are various, and vary in different persons. The commonest fruits, as raspberries and strawberries, which are eaten with great freedom by all classes of people will, in some individuals, bring out hives. Sudden checking of perspiration may produce the same results. This disease, as well as all others which demand our attention on account of their frequency rather than their seriousness, must be treated with reference to the special cause; and persons of ordinary observation can tell, each in his or her individual case, just what the exciting cause may be.

Treatment.—As a general thing, the bowels should be freely evacuated and regulated, and thereafter mild laxatives and stimulants may afford relief, as soon as they have had time to act. Epsom salts and bismuth will serve the purpose well.

The smarting may be so severe that the patient resorts to scratching, which, instead of affording ease, merely increases the irritation. In such case, make an application of vinegar, whisky, bay rum or soda, mixed in equal parts with water, to the smarting surfaces.

A bath in water containing bicarbonate of soda may arrest the irritation, and should be regulated, as regards temperature and strength, to suit the feelings of the patient.

Boils.

Notwithstanding the great advances that have been made in medical science, the cause of these distressingly familiar

eruptions is not certainly known. All the knowledge we have on the subject merely teaches us that an unhealthy state of the blood is likely to produce them, and that the best way to avoid them is to observe carefully the general rules of hygiene. Fortunately, however, though distressful, an eruption of boils is in no way serious, and, were it not for the discomfort and inconvenience attendant upon them, would not be worth notice.

The boil starts in a small pimple, which gradually increases from the proportions of a slight lump in the flesh until it has attained its maximum size. The lump consists of healthy pus, which is thick and viscid, and sometimes deeply imbedded in the flesh, in which case a poultice will serve to soften the lumpy matter, rendering it unhealthy and hastening its discharge.

A thin slice of fat meat put in contact with the boil for about twelve hours will cause a yellow spot to appear on the surface, which may be safely punctured, when pressure on the sides of the boil will expel its contents. Should the boil be situated on the nose, so that fat meat can not be conveniently applied during the day, fasten it on at night with strips of adhesive plaster, and over them place a piece of woolen cloth or oiled silk to protect the bedclothing.

Boils are sometimes erroneously regarded as beneficial; whereas, they are an unhealthy sign and should lead the person afflicted with them to correct his manner of living, and improve the state of his blood. For the latter purpose the compound syrup of sarsaparilla is a time-honored and elegant agent which, if it renders but little real service, is at least harmless and agreeable. The original boil is usually merely the harbinger of an army of invasion, and the malady, unless abated, will run its course. The boil itself may be poulticed with flaxseed, or bread and milk, with laudanum, if painful.

Lancing is recommended, as soon as a "head" appears, though as this merely prevents a couple of days of additional suffering, it is not necessary, should the patient dread the knife. It is asserted that if the initial pimple be lanced exactly through its middle, a boil will not form. The pain of such an operation may be entirely avoided by freezing the spot for a few minutes with ice and salt, so as to render it insensible. Some physicians recommend ten grains of quinine daily for a week, for breaking up a course of boils. It sometimes appears to be effective, but often fails.

CARBUNCLES are little more than *confluent boils*, though the copiousness of their discharges and the intensity of the inflammation induced by them renders them of more serious import. They usually make their appearance at the side or back of the neck, and are more extensive, more ill-conditioned, and larger than simple boils, besides being almost always solitary. The carbuncle comes in the form of a pimple, which soon develops a tumor larger at its base. This tumor finds an outlet for its pus through several openings, discharging finally a membranous "core." When the carbuncle has reached its maximum size it is sometimes as large as an orange, presenting a rough, red, honey-combed appearance.

Old persons are more liable to carbuncle than young people, because an outbreak of this nature indicates general debility.

The Treatment should have in view the strengthening of the system. Stimulants, as wine and ammonia, should be judiciously given with raw eggs, beef tea, cream, mutton chops, etc. The necessary incisions must be made by the surgeon.

Pimples—Flesh Worms—Acne.

Very few persons escape annoyance from simple acne or pimples, at some time during life. The frequency of their

occurrence and their extent varies in different individuals and may proceed from very different causes, and, though the trouble is rarely manifested in so flagrant a form as to require medical assistance, those who are even mildly afflicted would willingly sacrifice much in order to be rid of so disagreeable and noticeable a disease.

A small, red spot appears, singly or in a group with others, becomes yellow, emits a white plug on being squeezed, completes its history, and disappears in a few days.

The white plug is neither a worm itself, nor does it result from the presence of a worm in the flesh,—though one or more microscopic creatures of this sort may be found in it.

One cause of pimples in adults, is the free use of wines, liquors, ale and beer; and, in younger persons, rich diet may produce the same ugly effect. But causes deeper and more difficult of removal may be found in disordered kidneys, liver, or other internal organs; and, when originating in any of these ways, skin eruptions are merely the symptoms of a more serious disorder and will disappear when the inciting disease is cured.

In most cases, acne seems determined to run its course, and the most that can be done is to correct the habits of eating, drinking, bathing and sleeping, and to build up the general health. Mere local applications can do no good, since the pimples proceed from deeper sources.

Felon—Whitlow—Paronychia.

This most painful malady oftener attacks women than men, and is especially common among laundry women. It is rare among persons under about the age of fifteen, and is seldom seen among the wealthier classes. It is possible to bring about a felon by a bruise upon the finger (such as may be made by the head of a pin), but the common cause is maceration in and

changes from hot to cold water—conditions to which wash-women and scrub-women are constantly subject.

The Symptoms are at first, tenderness, a dark red or mottled color, swelling and tension; and finally, extreme throbbing and pulsating pain, which increases greatly in severity when the hand is pendant, so that the blood naturally falls to the extremity. Ordinarily the felon is more painful than dangerous, but when it chances to have its origin near the bone, it may destroy it, and even invade the joints. This is most possible when the tip of the finger is attacked.

Treatment.—All medication, such as poulticing, anointing, and the application of lotions, is but useless waste of time. The surgeon's knife should be used as early as possible, for it will be required sooner or later, and the more promptly it can be applied, the less danger is there from the disease, and the more agony is spared to the unfortunate victim.

Headache.

Headache is an affliction which visits people of all classes and ages. It arises from such a variety of causes, that to lay down a specific treatment is impossible. Each case must be treated with reference to its particular cause.

Pain in the head may be but the symptom of a disease located in some other region of the body, that is to say, it may be purely sympathetic, but in a majority of cases it results from some form of indigestion. If the patient be afflicted with a feeling of general debility and worthlessness, a dose of pills may remove the surplus bile and cause the pain to pass away in its company. Diversion may afford temporary relief to nervous headache, but sleep alone can restore a healthy feeling. When headache is caused by a disordered and flatulent stomach, an emetic, composed of mustard and water, may produce signal beneficent results. In this, as in other affections which

may be due to a variety of causes, each must study his own case, and, having determined the cause, remove it. Should the source be too deeply seated for removal, let the habits be properly regulated, and the attacks may be thereby diminished in frequency and severity.

Heartburn.

In many stomachs, when empty, we find a peculiar fluid poured out in large quantities. It is sometimes acid and sometimes alkaline, and is the product of inflammation in the lining membrane of the stomach. This fluid may be vomited, or may be passed away gradually with the other contents of the stomach.

Treatment.—It is a good thing, when afflicted with heartburn, to discontinue the use of pastry and soup, or the drinking of large quantities of fluid at meal times. The final treatment depends on whether the fluid be acid or alkaline, which can be determined only by experiment. If soda, taken in small quantities after meals, does not relieve the distress, one may rest assured that the fluid is an alkali and requires an acid treatment. Proceed, after eating, to squeeze ten drops of lemon-juice into a small quantity of water, and swallow it. The habits of daily life should be made to conform to the laws of health, or local treatment will prove futile.

Stitch, or Pain in the Side.

This trouble generally results from some derangement of the stomach and digestive organs, or from inflammation of the lining membrane of the chest (the pleura), and since it results from different causes, the treatment must, of course, be varied in accordance. Any form of labor which produces irritation of the pleura (and its soundness can be ascertained by inflating the lungs to their utmost capacity), must be stopped in order

to effect a cure. If, on the other hand, the pain results from indigestion, the stomach and bowels must be regulated. Languor and general debility often accompany the stitch, and demand a treatment which will renovate the whole system.

Neuralgia.

Neuralgia is the name given to a very distressing pain, the source or origin of which is in the immediate vicinity of a nerve and is always referred to the neighboring nerve centre. It is a noticeable fact that severe pain does not accompany the severing of a nerve (not even from cutting the brain matter), but at times a slight pressure in the region of a nerve-trunk may cause unbearable torture.

Neuralgia in the face and head, generally arising from a cold, is the most familiar form of the disease. However, neuralgic pains may also manifest themselves in the limbs, on the body, or in the vicinity of some vital organ — thus, we have neuralgia of the stomach, intestines, and heart.

General neuralgia is an affection of the nerves produced by exhaustion or exposure. If not referable to one of these causes it is periodic, and usually dependent upon some form of malaria.

Treatment.—The cure for all forms of neuralgia is rest and nourishment. The acute symptoms may be allayed by quinine, given, first, in doses of five grains each, every five hours, and afterward gradually decreased in size and frequency. Judicious use of stimulants may have a salutary influence.

If rest be disturbed by the pain, prescribe sedatives, and build up the general health by looking well to diet and exercise.

Special forms of neuralgia, as that of the heart, require the attention of a physician.

Cramp.

Cramp is a spasmodic contraction of the muscles of the body, limbs and stomach, induced by sudden change of location or atmosphere, by taking large quantities of cold material inwardly when the stomach is very warm, or drinking warm liquids when the body is very cold. It occurs most frequently and fatally among swimmers. The muscles in the cramped parts escape the control of the will, and with great attendant agony, are drawn into hard knots.

Treatment.—Wherever friction can be conveniently applied, heat will be generated by it, and the muscle again reduced to a natural condition; but, if the pains proceed from the contraction of some muscle located internally, burnt brandy is an excellent remedy.

A severe attack which will not yield to this simple treatment may be conquered by administering a small dose of laudanum or ether, best given under medical supervision.

Colic.

This trouble may result from a variety of causes, and is marked by a keen pain in the regions of the navel and lower bowel, accompanied by terrible griping, and a contraction of the muscles of the lower abdomen. Cold in the feet or bowels, the eating of large, indigestible vegetables, large draughts of cold beverages on an overheated stomach,—any of these may produce colic and call for mild treatment.

Treatment.—Castor oil, given as soon as the symptoms of colic manifest themselves, has frequently afforded relief. At any rate, the irritating substances must be expelled from the alimentary canal before the pains will subside. All local remedies will be ineffectual, and consequently the purgative should be given in large doses until a copious evacuation is produced.

Diarrhœa.

Diarrhœa is an affection that visits all climates, but is more extensive and severe in warm countries, and in hot seasons. It is very common in all parts of the United States, and arises from a variety of causes. Sudden change of temperature, exhaustion, exposure to extreme heat and malarial influences are all likely to produce diarrhœa in adults. There is one species of diarrhœa induced by inhalation of the effluvia from cesspools, swamps, frog-ponds, or from putrefying animal or vegetable material in any situation. And again, exposure to cold may sometimes drive the blood from the surface of the body to the internal organs, producing congestion in the bowels, with watery passages as a consequence. But the most common form of diarrhœa arises from disordered or inefficient digestion.

Food introduced into the stomach in excessive quantities may produce griping pains in the bowels and frequent stools. Ripe or unripe fruits, large quantities of vegetables and various substances slow of digestion, remaining long undissolved in the intestinal tract, act as mechanical irritants; as soon as they are removed the irritation ceases and the diarrhœa is cured.

The disorder is usually accompanied by pain and a feeling of lassitude pervading the entire body.

Treatment.—Whatever be the cause of the disturbance, the plain, simple rule is to order quiet, freedom from exertion and care against exposure to sudden changes of temperature, or (in warm weather) to the direct rays of the sun. It will be well to give a tablespoonful of "salts," a teaspoonful of castor oil, or a moderate dose of any other mild laxative. Following this by light doses of wine, or by brandy and ginger, with attention to the diet, will effect a cure in simple cases. If it do not yield to such treatment, the source of the disease is probably deep-seated, and demands professional investigation.

Cholera Morbus.

This disease is likely to make its appearance at night during warm weather, and is accompanied by severe cramps in the bowels, vomiting, and purging. As a general thing, all of these symptoms will disappear when the bowels and stomach have been freely emptied, but the physician should be summoned at once.

Treatment.—The cause of the attack is generally known, being in most instances over-indulgence in fruits or untimely eating of vegetables, and the convenient remedies are rhubarb and an emetic; and if these fail to produce the desired results, some stronger purgative should be given until it acts on the bowels. In conjunction with these, warm tea or coffee should be given to induce free perspiration, and then, if the patient crave food, light diet, succeeded by sleep, will bring about a complete recovery.

Worms.

These intruding occupants of the human intestines are of three kinds: Round-worm, thread-worm and tape-worm. They are all supposed to be introduced into the body, in the embryonic state, with our food, and it is also supposed that excessive indulgence in fruit and sweetmeats, or saccharine substances of any kind, procures a favorable condition for their propagation.

Round-Worm.—This species is the most common of the three, especially among children who are allowed to indulge their appetites for sweetmeats to the neglect of salt. The round-worm resembles the common "angle" or earth worm in shape, though it is not quite so pointed as the latter at the extremities, and is of a light, dirty, yellowish color. It infests the cavity of the smaller bowel, just beneath the stomach,

and, consequently, sometimes finds its way through the stomach, and out at the mouth.

Symptoms.—The symptoms are feverishness, uncertain appetite, tickling at the nose, and headache. (The second named symptom induces the typical "picking of the nose.") It is impossible for a parasite to exist in such a delicate organism as the human body without producing irritation of parts which are in sympathy with those disturbed by the worm; consequently, this irritation in the bowels, unless checked, will produce pains in the head, nausea, cough, vertigo, disturbed sleep, and sometimes, in children, spasms.

Treatment should be directed to checking the production of worms and to the expulsion from the bowels of those already in existence, by a combination of local and constitutional remedies. If the blood be normal, and the liver and stomach in a healthy condition, a glassful of water, holding in solution an ounce of table salt, will often suffice, by acting on the bowels, to dislodge the intruders. The most approved treatment, however, is with santonine and spigelia. For a child of seven, the dose is one grain of santonine, followed by a half-teaspoonful of the fluid extract of spigelia (pink-root). These remedies should be taken after a twelve-hours fast, and should be succeeded by a good cathartic, as calomel (three grains), or rhubarb (eight grains), or fluid extract of senna (one-half teaspoonful). The doses here prescribed may be varied to suit the age of the patient.

Thread-Worm.—This annoying little parasite, known also as the "pin-worm" (scientific title, *oxyuris*), is about equal in size to a very small pin. It makes its habitat in the lower portion of the rectum, where it causes great annoyance by the intolerable itching its motions produce.

The Treatment for these pests is simple: Give a dose of castor oil, rhubarb, senna or magnesia; and as soon as possible

after purging is produced, administer an injection of strong salt-water or lime-water, or, far better still, of quassia infusion.

TAPE-WORM.—The *Tænia Solium*, or tape-worm, is a parasite which finds its way into the human intestine from raw meat which has been eaten. The principal source is beef, probably in many cases the "chipped beef" which is usually eaten raw. This fact shows the desirability of cooking all foods, as they may become the vehicle of many forms of infection. The tape-worm is composed of numerous flat, white segments, and has the power of reconstructing all its segments from the head downward. It is, therefore, important, in seeking a cure, to remove the head segment of the worm. This may be recognized by its difference from the remaining segments of the body. It is long, and very narrow, bearing at its end the head, about the size of a pin's head, and can not be mistaken.

Symptoms are not always marked. Some patients have an insatiable appetite, pains, fever, languor and cramps. Others would not be aware of the worm's existence, unless they should accidentally discover some of the segments passing from them.

Treatment, as a rule, should be left to a physician, though two doses of the oil of turpentine, given at an interval of seven days, one ounce to an adult, and half an ounce to a child, is a treatment sometimes employed successfully. The favorite remedy against tænia, however, is pumpkin seed, combined with general treatment. A mild purgative, such as castor oil, is administered, and the subject is then fed on beef tea or mutton broth exclusively, for a couple of days. At the end of this period, an emulsion containing four ounces of the pumpkin seeds is given and followed by an active cathartic, as three compound cathartic pills, or five grains of calomel with ten grains of jalap. This will generally rid the intestines of their unwelcome guest. The oil of male fern, kousso and pomegranate bark are oftentimes substituted with success

for the pumpkin seeds. The result of the treatment, however, depends almost entirely upon the thoroughness of preparation; the nearer a strict fast shall have been observed by the patient, the better are the chances of success.

Piles or Hemorrhoids.

Piles are malformations in the lower part of the rectum, and frequently cause intense pain by their enormous size and great irritability. They constitute growths of the vascular mucous lining of the lower rectum, and may be either venous or arterial in character. If arterial, when nipped by the contraction of those muscles which close the external opening of the rectum, streams of bright arterial blood will issue from the hemorrhoid, and if the hemorrhage be profuse, faintness may result. There are two classes of hemorrhoids, known as internal and external, both arising from the same causes. Too little exercise, congestion of the liver, eating highly seasoned and rich food, and free indulgence in alcoholic drinks—each of these factors is sufficient, if long continued, to induce hemorrhoids.

In a severe case of piles, great pain is experienced on attempting to evacuate the bowels. The round, hard hemorrhoidal lumps descending, obstruct the external opening of the intestine, and violence being likely to follow from the necessary exertion, it may result in fever, loss of blood, and incapacity for work. Piles may sometimes protrude so far that the sufferer will be unable to return them to their original place. From this, inflammation, ending in mortification, may result, producing finally a sloughing away of these abnormal growths. But, in a majority of instances, the piles remain comparatively small and quiet, until some unwise indulgence brings on constipation, when they become irritated and troublesome.

Treatment.—First of all, the attention should be directed

toward building up the general health, and removing those conditions which tend to develop the disease. The afflicted one had better bid farewell to wine and beer, and see to it that the stomach, liver and bowels perform their functions regularly and efficiently. Pastry and highly seasoned dishes had better give place to fruit and vegetables; and, if necessary, some mild aperient may be taken before breakfast. Avoid riding in a jolting vehicle, or on horseback, but spend much time walking in the open air.

The parts should be well bathed every morning with cold water, and thoroughly dried. And whenever a difficult evacuation causes internal piles to protrude, apply to them some bland or slightly astringent ointment, and replace them gently in the rectum. Observance of the following rules may very appreciably diminish the trouble experienced from piles, and, in some instances, effect a cure:

1. Keep the bowels open and regular.
2. Abstain from riding on horseback, or a jolting vehicle.
3. Take plenty of open air exercise, and be temperate in all things.

In cases where the disease is very severe, surgical operations will be necessary in order to obtain relief, though a trial of stramonium ointment may well precede the more heroic measures.

In-Growing Toe Nail.

Owing to the peculiar shape of the toe, and the dense, unyielding texture of its nail, pressure from a shoe often forces the edges of the latter into the flesh, causing great pain and inconvenience.

Treatment.—To correct this malformation, soak the foot in water and soap for a quarter of an hour, until the nail becomes soft and pliable; then, with a sharp knife, carefully pare the cutting edges to the quick, and scrape the nail quite thin on its

upper surface. This will cause it to flatten out in growing, and to assume its proper shape.

Corns.

Corns are the production of poorly fitting shoes. The outer part of the skin being hard and knotty, a pressure upon it irritates the flesh beneath and causes soreness in the surrounding parts.

Treatment.—In the first place, secure a better fitting shoe. If the corn be removed and the offending shoe be retained, there will be merely a repetition of the case. But, having secured a shoe to fit the foot, the corn, when once removed, will not reappear.

Treatment.—To remove a small corn, soak it in warm water, and scrape with a *dull* knife, or, in preference, use a file. In the case of a large, hard corn, cover it with fly-blister at night, fastening the fly-blister to the toe with adhesive plaster, and by morning the corn will be soft and dead, when it may be removed with little pain. Then apply ointment and protect the spot from pressure by means of "corn-plasters."

Warts.

The cause of these rough, protuberant growths on the skin, after ages of familiar experience, remains unknown. They are hypertrophies of the outer and true skins, and, consequently, are filled with blood vessels. They are harmless, though unsightly.

Treatment.—For removing warts various means may be employed: One is the knife; another is acid, to gradually eat it away, and another—one of the most approved methods—is touching the wart once or twice a day with a point of lunar caustic, therewith gradually burning it away. Of the acids, nitric acts the most rapidly, while chromic gives the least pain.

CALISTHENICS AND THE CARE OF HEALTH.

A celebrated authority asserts that half the deaths which occur annually are due to preventable causes, and among such causes he includes violation of sanitary and physiological laws, whether due to ignorance or neglect, and indifference to the precautions necessary for insuring continued health. Accidents are often unpreventable, and, therefore, excusable, but ill-health, due to carelessness or the abuse of physical laws, admits of no defense excepting ignorance. In this chapter it is intended to give briefly some general hygienic directions which will enable one not willfully bent upon self-destruction to preserve the precious boon of health.

Surroundings.

Pure air, pure water, pure food and plenty of light are absolute essentials to health, and of similar importance are cleanliness of person, adequacy of clothing and plenty of exercise. These requirements appear simple enough on first sight, but to the fact that they are not observed, are traceable, as we have before stated, fully half the deaths that occur daily.

Pure Air.

The process of nutrition depends very largely upon the condition and distribution of blood; and the condition of the blood, in turn, depends almost entirely upon the proper performance of their functions by the lungs. In the process of circulation, the blood is forced by contraction of the left ven-

tricle of the heart, through the large arteries and their subdivisions, into every organ and every portion of the body. This arterial blood, when it leaves the heart, is of a bright scarlet color, owing to a high state of oxydation. It contains all the essentials of nutrition for the various tissues, collected beforehand from the digestive system. On its way through the body, it parts with its nutritive elements, and, by oxydation, takes up the waste products of the tissues, including the effete carbon, which, in the chemical process involved, becomes, by union with the oxygen of the blood, carbonic acid, or, more properly speaking, carbon-dioxide. All processes of chemical combination are attended with the production of heat; therefore, in this process, the blood serves two purposes, namely,—the maintenance of animal heat, and the removal of waste products. Having thus performed its dual mission, the blood, now becoming dark in hue, after passing through the capillary system, is collected from every portion of the anatomy by the venous system, and through the large veins returns to the right side of the heart. The contraction of the right ventricle, in its turn, sends this impure blood into the lungs, where it is spread out, as it were, in the thin capillaries surrounding the air-cells, and comes into practically direct contact with the air by which these cells are inflated at every breath. Here a remarkable change occurs: the dark venous blood, when forced into the lungs, is loaded with the deadly poison, carbonic acid, but upon exposure to the air, an exchange takes place, the blood absorbing oxygen and yielding up in return the carbonic acid, which is forced out of the air-cells in the breath. The revitalized red arterial blood now returns to the left side of the heart, to be once more sent forth upon its errand of nutrition and renovation.

It can, then, be easily understood how important it is that the lungs should have plenty of pure air. When it is also

known that carefully conducted experiments have fixed the amount of such air required for each person at 3,000 cubic feet per hour—occupying a space ten feet wide by ten feet high and thirty feet long—the insufficiency of air supply in many buildings and rooms shall have been demonstrated. Many persons, without understanding the cause, feel drowsed or stifled in ordinary churches, theatres, and other public halls, and the more delicate suffer from nausea, headache, and even fainting. When such effects become apparent, it is safe, in nine cases out of ten, to refer them to insufficiency of ventilation. The remedy is pure air.

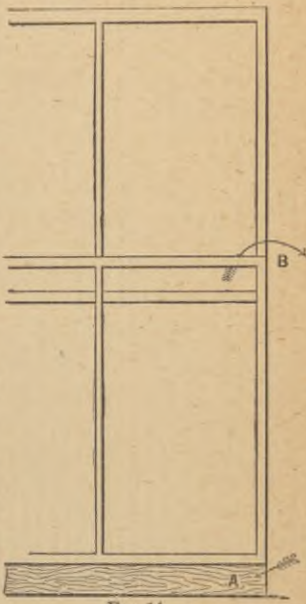

FIG. 14.

Upon the foregoing grounds, we may freely assert that there is nothing which has a greater influence for good or bad upon the health than the air we breathe. Therefore, living and sleeping apartments should be well aired and well ventilated. People generally are too much afraid of catching cold, not knowing that the depressing effects upon the circulation of a vitiated atmosphere are most likely of all causes to predispose them to suffer in this way. But it must not be supposed that cold air is necessarily fresh air; a continuous circulation of warm air through an apartment is infinitely better than cold air, stagnant and unchanged. Every room in a house should be sub-

ject to continuous ventilation, an end which is easily secured in the absence of better methods, by means of a board of a few inches in width, fitted snugly into the sash grooves at the bottom of the window, and beveled along its upper edge so that the sash will fit down tightly against it. The object of this is to keep the lower sash raised, and permit ingress and egress of air between the upper and lower sashes. This arrangement is shown in the accompanying figure, in which A represents the inserted board, while the arrow at B represents the direction of the air current entering between the two sashes.

Open fire-places are preferable to stoves, and stoves, in turn, to hot-air registers, for heating; but, in case the latter are used (and they are becoming every day more common), care should be taken that the cold air supply be drawn from a pure outside source, and not from a musty, ill-ventilated cellar; and moisture should be provided by keeping the water-well in the furnace always filled, or by means of porous jars of water fastened to the registers. The excessively dry air of modern dwelling houses is a fruitful source of bronchial and throat troubles, for if the superheated air can obtain moisture in no other way, it will rob the moist membranes of the body. Yet no matter how well ventilated a building may be, it is scarcely possible that its atmosphere should equal in purity the open air of heaven; therefore, above all, plenty of outdoor exercise is recommended to every one. We are not all able to control the indoor conditions under which we must pass our daily lives, but there are none so poor and few so busy that a portion of the day can not be passed under the open sky; and one hour in such an atmosphere is worth many dollars in health to any one. A great number of persons, women especially, who need it most, are prone to neglect their opportunities in this direction; and if they answer that weakness or lassitude prevents them, it may be asserted in return that

these very symptoms prove almost certainly that such exercise is greatly needed, if only as a remedial agent.

In conjunction with this active pursuit, as it might be called, of pure air, one must not, of course, neglect the state of the atmosphere which passively surrounds him in his daily life. If there are sources of contamination within doors, they must be removed ; and if nuisances exist without, they must be abated, for it should be remembered always that the germs of disease are falling about us at all times, and when they chance to fall upon "good ground," in a constitution weakened and impoverished by long continued subjection to unwholesome influences, they will strike root and bear a most plentiful harvest. The principal safeguard against disease is the bodily power of resistance, to be maintained only amidst a healthful environment.

Pure Water.

The human body contains about 58½ per cent. of free water in its structure, and a large additional amount of the elements of water in its ultimate composition (nearly 73 per cent. altogether). This plentiful fluid is the great menstruum and solvent of nature, and is absolutely essential to the processes of organic life. It is the liquid constituent of the blood and other fluids of the body, and by holding in suspension or solution the various elements of nutrition, makes possible the assimilation of food by the tissues, while in its capacity as a solvent it also fulfills the duty of carrier in the work of excretion. A healthy average man takes directly into his system during the day, either by drinking or in its natural combination with food, about six pounds of water, which replaces an equal amount excreted from the lungs, skin and other organs, and thus keeps up the natural balance. When the waste is excessive, as in profuse perspiration, the supply must be cor-

respondingly great, and the physical sensation of thirst is a warning that waste is exceeding supply. A man may live for many days without food, but five days is set down by authorities as the limit of possible existence without water.

The universal solvent powers of water naturally suggest the probability of its dissolving and holding impurities, and this danger is, in fact, one of the most important problems with which the modern sanitary engineer has to deal. Indeed, it is impossible, except by distillation, to obtain chemically pure water. But it is not necessary, nor is it desirable, that for ordinary use water should be chemically pure. Certain substances, as air and minute quantities of mineral matters, usually held in solution by drinking water, tend to make it palatable and to give it the peculiar property known as "freshness," in contradistinction to "flatness." Yet, as it takes to itself the harmless elements, so also it appropriates deleterious matters, and contaminated water is one of the most fruitful sources of disease. Frightful epidemics of cholera, typhoid fever and diphtheria have been traced with almost absolute certainty to the infection of the water supplies of the communities in which they have occurred, and through the same medium a single imported case of infectious disease has been disseminated throughout an entire community or district.

Until within very recent years, popular knowledge has been very limited upon this special branch of sanitation, and even to-day phenomenal ignorance is by no means rare. People persist in digging their wells in valleys, and placing their stables and outhouses in the most favorable positions for draining into the former; while for a graveyard, a hillside is sure to be picked out, though the water obtained all along the valley beneath it may be used for drinking and culinary purposes. In fact, one of the largest cities in the United States draws its water supply from a river that flows into its reservoir be-

tween two steep hills, both of which are occupied by immense cemeteries. It is not surprising that the death rate is high in this city. As a rule, water obtained from a well situated near a kitchen, a stable or an outhouse, is not fit for use, and that from the neighborhood of a cemetery is always to be suspected. In arranging a well or spring, care should be taken that the walls are well cemented so as to exclude surface drainage, and they should be protected also by some sort of covering, to keep out animals, insects, and accidental foreign matters. But where the water is suspected, it should be examined for impurities, and if found to be infected, the cause should be looked into and removed, if possible, and if not, then every precaution should be taken to purify the water before using it.

Among the means employed to this end may be mentioned boiling, which destroys many of the lower forms of infusorial life, at present lying under such grave suspicions as the chief source of infectious diseases; sedimentation, that is, allowing the water to stand for a time so that matter held in suspension may settle to the bottom of the containing vessel, and finally, filtration, which, when effectively performed, removes all foreign matters except those that are held in actual solution. Of these means of rectification, boiling, although the most popular, is probably of itself the least useful, as boiled water to be fitted for drinking, should be filtered and aërated; besides, hot water dissolves many impurities which are but little subject to the action of cold water.

Sedimentation is almost absolutely necessary in some cases, where drinking water holds in suspension large quantities of solid matter, vegetable, animal or mineral. Such water should be allowed to stand for a time in a crockery vessel, covered loosely with a cloth, or something which, while excluding dust, will admit air, and after the impurities have had time to settle to the bottom, the clear water should be syphoned or decanted

off into another vessel. Wooden and metallic vessels are not recommended for holding water to be used in cooking or for drinking, as the material of the former absorbs impurities, and is seldom kept clean, while metal is too good a conductor of heat, and therefore likely to keep the contained water disagreeably warm in summer, while there is also a chance of contaminating the contained water with metallic salts, formed by chemical action between the mineral impurities of the water and the metal of the vessel. It is perhaps needless to remark that vessels intended to contain water to be used for drinking or cooking, should be kept scrupulously clean by means of frequent washing with soap and boiling water.

Filtering is probably the most effective ready means we have for ridding water of suspended impurities, and can not be too highly recommended for use in cities and towns drawing their water supplies from surface sources. There is no means of mechanical purification which equals it, and the only step which can be made beyond it is the employment of chemical agents. There are many forms of filters in the market, some good and some worthless; but it may be remarked at once that the best filter will prove worse than useless if it be not subjected to the same scrupulous care that is given to pots, pans and dishes; or, in other words, it must be cleansed thoroughly and often. Among the simplest filtering substances proper to be employed, sponge may be mentioned, which, if of fine grain, makes, when compressed somewhat, a very good rough and ready filter. It has also the advantage of being easily cleansable in hot water. Other substances in common use are gravel, sand and charcoal. The principal end served by the gravel is that it subdivides the water and retains a certain quantity of gelatinous vegetable substances which adhere to its surfaces. An illustration of this action is seen in the slippery stones at the bottom of any brook. It also

assists aëration. The sand used for this purpose is generally clean, white, broken quartz, and its action is similar to that of gravel, as mentioned above. Charcoal, on the other hand, is a more active agent, and will even abstract the floating particles of color from dye waters, letting the liquid pass off clear and colorless. For this purpose animal or bone charcoal alone is available. It should be broken up into fine pieces and packed tightly, and it is safe to say that water which has been first boiled and then passed successively through sponge, gravel, sand and charcoal of this description will be as pure as any art outside of chemistry can make it. Filters on this plan are manufactured for sale, and among the many designs the least elaborate are the best. The most desirable form is a deep earthen-ware or galvanized iron vessel, narrowing towards the bottom, and having successive perforated diaphragms, which can be lifted out at pleasure. The lowest diaphragm rests a few inches above the bottom of the vessel, and over this is packed a layer of animal charcoal about two inches in depth. On this the second diaphragm is placed, and a few inches of clean, fine sand packed down upon it. The third diaphragm comes next, covered with some six inches of gravel. Above this a deep pan is fitted, having in its centre a hole surrounded by a sort of cage into which a sponge is tightly packed. The whole is covered with a loose lid. The water, being poured into the upper pan, passes through the sponge to the gravel, which it percolates. Then, passing the diaphragm, it finds its way through the sand to the next diaphragm, and, finally, after passing through the charcoal and bottom diaphragm, it falls into the space beneath, from which it is drawn, as required, through a small faucet. The especially commendable points in this filter are cheapness, ease of cleaning and readiness of renewal. Other filters are made for attachment directly to the faucet. The head of water is usually so strong as to

force impurities through and render the effects of such devices null. One of the best forms of this style is globular in shape, with screw sockets at top and bottom, for attachment to the hydrant, and having a hole in the side, covered with a screw cap, for filling. Gauze coverings retain the filtering material in the globe. As it comes from the makers, the globe is filled with pulverized white quartz, which, as before shown, is next to useless; but this can be replaced by bone charcoal, or it can be packed with fine sponge, and in this way be made fairly efficient. It is reversible, and admits of having hot water run through it, and this, with the ease of renewing its contents, makes it a convenient filter. Still other forms are made of various materials—including porous stone—which it is unnecessary to enumerate, though the hint is worth dropping that strong, finely-woven "canton-flannel," frequently renewed, serves an excellent purpose as a filter.

Having passed the household water through the three processes of boiling, sedimentation and filtration, all that is possible has been done to free it from foreign matters in suspension. It frequently happens, however, that the impurities are held, not in suspension, but in solution. The medicinal properties of most mineral springs are due to such impurities, and the property of hardness so frequent in well and spring waters is owing principally to the carbonates of lime and magnesia, obtained from the earth. When these constituents are found in excess, they are a positive disadvantage. They can be removed by simply adding small quantities of fresh lime-water, or more easily, by boiling for half an hour, and then decanting. In either case, insoluble carbonates are precipitated, and may be separated by filtering or by decanting, as above explained. Where the impurities are of vegetable origin, tea leaves or some other astringent herb should be boiled with the water, as, by forming insoluble tannates, they greatly increase

the efficiency of the method. Alum is also a familiar efficient coagulant for vegetable impurities.

It is no less important that the water used in cooking should be pure. This is a fact too often overlooked, and many people who are exceedingly particular about their drinking water never give a thought to the quality of that used in the kitchen. It is needless to do more than point out the absurdity of such inconsistency. Water used for the bath also should be pure, as the skin and, more especially, the mucous surfaces absorb certain deleterious matters readily; besides this, hard water curdles soap, rendering it useless.

Finally, it should be remembered that water is not necessarily pure because it is clear; that if it smells bad, tastes bad, or looks bad, it should be suspected and carefully examined; and that among the first objects of suspicion in cases of simultaneous disorder among a number of persons in the same locality, the water supply is to be considered; and, if found impure, it must be corrected or its use abandoned.

Pure Food.

A soldier in the United States army is furnished daily the equivalent of 3.28 ounces of nitrogenous food (meat, etc.) and 30.38 ounces of carbonaceous food (bread, potatoes, etc., calculated as starch), and this is considered a liberal average for a well-fed man the year round. The quantities of food actually consumed by individuals vary with temperament, season, state of health and conditions of daily life.

For the sake of convenience the foods taken by humanity may be divided into the following four classes: Heat-makers, tissue-makers, thought-makers, and frame-makers, of which the first supply the energy consumed in action; the second are metamorphosed by the vital processes into muscle and the other tissues; in the third division may be placed all those

substances which contribute to the formation of brain and nerve substance, the consumption of which takes place in thought, volition and the involuntary nervous functions; to the last belong those mineral substances which contribute to the formation of bone and the other passive elements of the body. To these a fifth division may be added comprising those substances which, while not subject to any change during their passage through the animal system, serve to promote the digestive and secretive actions, and are a necessary constituent of food; among these may be cited, water, salt, etc. This class is sometimes enlarged to include liquors, coffee, tobacco, etc., the substances grouped under it being entitled "Indirect Aliment."

Among the foods we ordinarily consume, these elements are mixed in various proportions, one or another usually predominating, so as admit of division into natural classes, according to their chief constituents.

Among heat-makers (including also the sources of fat, which might be justly termed "reserve heat,") we class all starchy, sugary, and oily or fatty foods, as bread, the vegetables, most fruits, farinaceous preparations, etc. The second class —the tissue-makers—includes the various meats, and albuminous foods, as eggs, cheese, etc.; brain-foods are the aliments containing the phosphates, salt and oil in high percentages, as fish, the entire grain of cereals, eggs, etc. The frame-making elements are constituents of the other classes of food; they are the mineral salts, especially lime, etc. When not contained in the food, they are generally found in the water consumed in a given locality. The last class, the indirect aliments, are used as promoters of digestion, and comprises water, salt, baking-soda, etc., and the various beverages and condiments.

The complex human body—complex alike in its chemical

constituents, its organization and its processes—demands, for its maintenance in working order, food to replace the consumption, which is the constant result of work, active and passive. Every respiration, every heart-throb, every thought, every motion, consumes a certain amount of tissue, which must be replaced by food; and unless the balance be maintained, the body will gradually waste away, and finally vital action will cease in death. But special activity in a particular portion of the mechanism causes special waste in that portion, requiring an extra amount of nutrition to replace it. Thus the manual laborer, exercising his muscular system continuously, will consume a great quantity of muscular tissue, which must be replaced with tissue-making food. The editor, on the other hand, exerting his brain and nervous system at the expense of the other portions of his frame, will require an excessive supply of what we have termed "thought-food." The appetite itself, which is merely the sensible expression of the system that aliment of a special kind is needed, is usually, unless vitiated by cultivation, a tolerably safe guide to the amount and sort of food desirable. Therefore, the workingman would starve on the diet of the editor, and *vice versa*, the editor would probably grow dyspeptic and dull upon the other's generous fare. Moreover, as has been before said, temperament, climate and season have all a great deal to do with the quantity and kind of food required. Thus, a nervous, excitable man will, other things being equal, probably require more food than a phlegmatic individual under similar circumstances. In winter and cold climates, again, more fatty, or heat-making foods are required than in warm weather. This explains the appetite of the Esquimaux for train-oil and whales' blubber.

From the foregoing remarks it will be rightly concluded that food must be varied, both as to kind and quantity necessary

to maintain health under varying conditions. It may be added, also, that a mixed diet is preferable under any circumstances, so that, setting the prejudices of extremists to one side, we may safely say that meat, vegetables, starchy, albuminous and other foods should all have their places in the diet of a properly fed man. It is most important, also, that the diet should be varied from day to day, and from week to week, and nothing so distinguishes a good cook as her ability to vary the bill of fare without making it elaborate, or, what is more common, indigestible. It is needless to say that the simplest food is the most wholesome, that pepper and the various other spices act merely as stimulants and should not be required in a healthy stomach, save to a very limited extent, and that the dainties of the cuisine, as lobster-salad, fried oysters, deviled crabs, apple-dumplings, rich pastry, etc., are to be eaten only on peril. It is the easiest thing in the world to avoid dyspepsia, but it is easy enough for one, so minded, to contract it. There is little excuse for loading the stomach with trash, as the taste for such stuff is deliberately acquired.

Meats should be broiled, roasted, or boiled, the order of preference being the order mentioned—but never fried. It should be remembered, too, that boiling can be done for either of two purposes—to prepare the meat, or to make soup; but never for both. If the meat is intended to be eaten, the water should be brought to the boiling point before putting it in; if soup is to be extracted, the water with the meat in it should be brought gradually to the boiling point. The soup in this case will contain all the nutriment of the meat, which will itself be as valueless as so much chips. Eggs should never be boiled "hard;" a soft-boiled egg is digested in 2¼ hours, while it requires 3½ hours to digest a hard-boiled egg. Meat should never be eaten raw, not because of indigestibility, but because of the dangers of introducing into the system the

embryos of parasites, as trichina, tape-worm, etc.; but it is just as great a mistake to overdo the matter of cooking.

Food that is in any way damaged, tainted or contaminated, should under no circumstances be eaten ; and this injunction applies equally to game, vegetables, and all other kinds of edibles. As a rule, food that is not fit for the nose is doubly unfit for the stomach.

Regularity in time of eating is important, as the system naturally accommodates itself to any habit, and suffers from change. The habit of taking three meals per day is generally considered the best distribution, and for busy people it is preferable that the principal meal should be eaten after the business of the day is over, as more time can then be given to it ; "bolting of food" is the bug-bear of American hygienic writers, and there appears no way to get rid of it, except to remand the heavy meal to the evening, at home.

Coffee, tobacco, tea and articles of this class are not injurious, but rather beneficial to most persons, if taken in moderation. Alcohol, in its various forms, is certainly beneficial when used to a limited extent, but it is capable of such fearful damage, that it is not to be recommended in any shape, except on prescription.

Finally, the rules of diet may be summed up briefly, as follows: clean, fresh, wholesome food ; regularity in eating ; simplicity ; variety ; moderation, and deliberation.

Plenty of Light.

While the entire influence of clear sunlight upon the organic functions does not appear to be thoroughly understood, all hygienic writers agree that it is most important. It is certain that light aids and darkness retards development, a fact which has been proven by direct experiment, as well as by every-day experience. But beyond the direct physical action of light,

the presence of sunlight implies absence of shade and its attendant dampness, mould and corruption; it means free circulation of air, and what is equally important, bright, cheery surroundings. The influence of these latter conditions upon the nervous system, and through that upon all the bodily functions, can not be overestimated. Every room in the house should be open to the direct sunlight, and no false economic ideas, touching the possible fading thereby of carpets or upholstery, should interpose against it. There is an Italian proverb which signifies that the doctor always follows the darkness into a house; and health can not be maintained without the assistance of the "all-creative principle" of light.

Personal Cleanliness.

There is a saying of a celebrated authority, which has become very popular in the profession, to the effect that "Filth is the parent of disease"—a corollary to that other popular saying which places cleanliness next to godliness. But whatever may be the relations existing between piety and purity, it may be stated as an axiom that dirt is procurer to death. War has, in the course of history, slain its thousands, but filth, in the propagation of plagues, epidemics and local scourges, has slain its tens of thousands—yes, its tens of millions.

But, setting to one side the pernicious offices of accumulated filth as a destroyer of public health, and applying the argument to the individual, there is nothing superior to cleanliness for keeping the body sound and the mind pure. Water is cheap and almost universal, and a daily bath, without cost, is within reach of two-thirds of the civilized human race: one could scarcely think of an investment likely to pay a higher rate of interest.

The human skin acts as a sort of balance-wheel upon the

system, and it is only when kept in the highest degree clean, that it can properly fulfill its offices. When the integument becomes thickened from accumulated epidermis, the terminal nerves lose their efficiency and the capillary circulation forgoes a great portion of its functional activity; and when the pores become clogged with dirt, certain effete matters, which it is the natural duty of the skin to eliminate, are retained and forced back into the circulation, with poisonous effects upon the entire system.

The bath serves several purposes: first, in cleansing away effete matter, the epidermic scales, the excretions from the glands, and the adherent dust and grime which settle upon the skin from outside sources. In this capacity it leaves the active surface of the skin open to the air, unclogged and in a condition to exercise to the fullest extent its proper functions. To this end the surfaces most exposed, as the hands, face, neck and ears should be cleansed with lukewarm water, aided by soap, at least twice daily; and the parts most liberally supplied with glands, as the arm pits, groins, etc., should be cleansed every evening, also with the aid of soap. For the rest of the body, excepting the feet, which should be bathed daily, a semi-weekly bath at least should be provided, though daily ablutions are, in every respect commendable. Care should be taken in the selection of soap; fine white castile, and next to that, the transparent soaps are freest from deleterious matter and adulteration. Wash-rags, etc., should be eschewed, and the soap applied directly with the bare hands which adjust themselves better to the folds and crevices of the surface. Fresh water should be used to remove the soap and debris from the skin, and thorough after-rubbing with dry towels is an essential part of the bath.

The second object of bathing is to promote the functions of various elements of the skin, and to secure thereby a general

tonic stimulation of the body through the nervous and circulatory systems. For this purpose the cold bath, ranging from 70° down to 33° Fahrenheit, is employed. The first effect of cold water applied to the skin, is a shock on the cutaneous nerves. The capillaries contract, and the blood is driven from the surface. This is almost immediately followed by a reaction. The temporary "surprise" of the external nerves is interpreted at the vaso-motor centres as a cry for help, and immediately, in response thereto, the pulse is quickened, the arteries are dilated, and the warm blood comes pouring in a stream to the surface. The skin flushes and glows with pleasurable heat, and the beneficial results of the cold bath have been accomplished. If, however, the bath be too long continued, a second depression follows; the skin becomes blue and shrivelled, the teeth chatter, and a feeling of great feebleness succeeds. This may result in dangerous internal congestions, and it may be a long time before the system recovers from the effects of such depression. A bath should never be continued long enough for this state of exhaustion to supervene, but as soon as the glow which follows the first shock is felt subsiding, the bather should leave the water, and rub himself thoroughly dry with rough towels, adapted, of course, to the tenderness of his skin. The cold bath is applied in many ways, the mildest being the sponge bath, and the most violent, the shower or douche baths, and its effects are intensified by following a warm bath with an immersion in cold water. It may be set down as a rule that a warm bath, taken for ablutionary purposes, should always be followed by a cold affusion, so as to avoid the perils of cold from the relaxed state in which the former leaves the skin. No ordinarily healthy person need fear the effects of cold bathing as here recommended, and a daily bath of this sort is earnestly prescribed to all save those in very feeble condition. Probably the most suitable time for

such bath is about three hours after breakfast, but as ladies only could find this a convenient hour, the season next to be preferred is in the evening, just before retiring, though great exhaustion of any kind should always forbid its employment. But whatever hour be selected for the bath, it should never either immediately follow or immediately precede a meal; about three hours after eating is the proper period. The degree of temperature suited to each individual case may be ascertained by experiment, starting with 70°, and running lower day by day. Anything like extreme cold in the bathing water is prohibited to both the very young and the very old, depending somewhat, in the one case, upon the degree of development, and in the other, on the persistence of vigor. William Cullen Bryant is said to have continued his daily cold baths almost to the time of his death.

The third use of the bath is as a direct medicinal agent, to which end it should generally be employed only under the advice of a regular (*not* hydropathic) physician. In this class are comprised all the mineral springs and special mechanical forms of bathing devices. To the above rule, however, an exception should be made in favor of sea-bathing, which is both hygienic and medicinal. There are few persons, excepting the most delicate, who do not feel the stimulant and invigorating effects of the combined shock, exercise, pleasurable excitement and tonic virtues of surf-bathing. There is scarcely anything imaginable which is more generally applicable in cases of ordinary ill-health or physical debilitation, and it can not be too generally or too enthusiastically recommended; and even for invalids and the extremely delicate, who are unable to resist the exposure and shock of the open sea, in-door bathing in sea-water, cold, tepid or hot, will frequently prove of incalculable benefit.

The teeth should be cleansed after each meal; the head

should be brushed often to remove dandruff, and in every point it should be remembered that "cleanliness is next to godliness."

Adequacy of Clothing.

There are very few localities on the globe where some form of covering is not necessary to protect the body from heat, cold, or the attacks of insects. In cold climates, and even during the winters of our own temperate zone, clothing, to a certain extent, takes the place of food. This is explained by the fact that a certain proportion of our food is taken merely as fuel, for the purpose of maintaining the bodily temperature, and proper clothing, by preventing the waste of heat from the surface, lessens the amount of fuel required. Thus the poorly clad—other things being equal—require more food than the well clad, and *vice versa;* so that it is economical to dress warmly. But clothing serves a further purpose of preventing the contraction of disease from exposure, and in this respect, should be carefully regulated to the season, and even to the daily variations of temperature. Still, it must be remembered that "adequacy of clothing" does not necessarily mean quantity or weight alone of such covering; it concerns also the substance and texture of the material. In this light, wool and silk are to be preferred for wear next to the skin, as they absorb moisture and are poor conductors of heat. Delicate and feeble persons should wear flannel all the year round, and even the more robust will discover that nothing so thoroughly *excludes* heat as flannel. In those occasional cases of supersensitive skin, where the irritation caused by woolen goods is intolerable, a thin garment of silk, cotton or linen may be worn between the heavier flannel and the skin.

One of the chief recommendations of flannel for clothing is its lightness in proportion to its qualities as a non-conductor of heat; which is, in fact, an important consideration in regard to

the general clothing. Color also has a considerable bearing upon the heating capacity of clothing; black, because of its absorbive powers, being the warmest, and white the coolest color; and between these two are ranged the colors, properly so-called, dark shades being the warmest and light shades coolest, in each case. It is for this reason that white linen and muslin are so grateful to the wearer in the heat of summer. In any case, the clothing should be changed as the season changes, and in winter, an overcoat should always be put on for going out of doors, and it should always be laid aside upon entering the house. Rubber clothing is growing very popular for wear in rainy weather, and if it be worn loose enough and be taken off promptly when the need for it ceases, is probably not harmful; at least, no more so than the alternative of a drenching would be. This leads to the injunction that wet clothes should always be exchanged for dry ones, at the very earliest opportunity. Many diseases might be avoided, many maladies cured, and the general health very considerably improved by a proper attention to the quantity, material and suitability, or—to sum all up in one term—the *adequacy* of clothing.

Sleep.

The poet Young aptly called sleep "tired nature's sweet restorer," and since his day, a better definition has not been found. Sleep is the period of comparative repose, shared by all the vital functions, while the mind and nervous system prepare themselves for renewed activity. That a regularly recurring period of such recuperation is needed by the human race, requires no demonstration, and experience has shown the cycle of twenty-four hours to be the most desirable and effectual, while the existing conditions naturally indicate the night as the proper time for sleep. As to the duration of such rest, the average rule of eight hours is subject

to so many individual exceptions as to be practically valueless. Some persons find themselves satisfied physically with a very small proportion of sleep, while others, again, can maintain health of mind and body only with a liberal allowance of sleep. Among examples of the former class, Bismarck is reputed to find four hours out of the twenty-four amply sufficient to maintain him in his well-known condition of health and vigor. But, for the average individual, less than six hours will scarcely suffice, while more than eight hours will be needed in very few cases. This is a matter to be determined experimentally by each for himself, and once found, the period should be maintained as evenly as practicable. Persistent curtailment of rest must surely tell on the health, and beyond its mere physical effects, the gravest mental disorders are frequently traceable to continued waking. Nature can not be cheated, but whenever she is robbed, calmly helps herself from whatever lies readiest to her hand to make up the deficit. In this connection, a lecture on the evils of balls and other forms of dissipation would be pertinent, but the subject is so familiar that further discussion can serve no good purpose. This much may be said, however, that while the night time is best for sleeping, early rising is desirable for those alone who retire early; what is taken from the beginning must be added to the end of the night.

Another point, which does not usually receive due attention, is the fact that not quantity alone, but quality as well, counts in summing up the value of sleep. Roughly stated, it may be put,—twice as sound, half as long; half as sound, twice as long. So that a deep sleeper might be more refreshed after a short repose, than a light sleeper after a long night's rest. Upon the same principle, that concentrated repose is preferable, naps, "snoozes," dozes, etc., should be eschewed by all excepting the very young, the very old and the very weakly;

six hours of continuous sleep are preferable to eight hours, scattered irregularly through the twenty-four.

As to the means of inducing sleep, it may be said in general terms, that the best "night-cap" is made up of a quiet mind, weary muscles, and a healthy system; but as all these desiderata are not possessed by every one, it may be well to say that attention should be diverted in the evening from the occupation of the day. For the workingman, study may prove the needed relaxation, while for the editor or book-keeper, physical exercise would be indicated.

As stated in an earlier part of this work, pure air is an important accompaniment to health, and it may be added that this applies specially to sleep; for it is in this state that the system most readily receives, and is least able to resist the effects of poison and disease. For this reason the sleeping apartment should be thoroughly ventilated during the entire night, draughts being at the same time guarded against. A window left open in a room communicating with the bed-room is recommended as an excellent plan for securing the wished result. Excepting for very delicate persons, a cold sleeping apartment is not to be feared, if the bed covering be sufficient and of the proper material. In the latter respect, as with clothing, lightness and non-conductiveness are the prime desiderata, and here once more flannel recommends itself. Cotton coverlets are to be eschewed, as they are very heavy in proportion to their capacity for retaining heat. None of the clothing worn during the day-time should be retained during the night; but a loose night-robe should be worn instead. The latter should be wide at the neck, free to open on the bosom, and with wide sleeves, unencumbered with wrist-bands. The garment should have no belt, girdle, or waist-band, but should fall loose and free from the shoulders, the bottom of the skirt reaching some inches beyond the feet. The best

material, here again, is flannel for the winter and muslin or linen for summer wear.

For persons who can not stand the exposure of disrobing in a cold room, it is advisable that they shall undress in an adjoining heated room, and after warming the feet, proceed at once to bed. Still, warmth is not deleterious to the air of a sleeping chamber, if it be not coëxistent, as is so often the case, with ill ventilation. If the atmosphere of a comfortably warmed apartment be kept at the same time pure, there are no grounds for objection to the heat itself.

Coldness of the feet is a fruitful cause of sleeplessness. This disagreeable condition is but a symptom, and can not usually be cured by warm water bottles and the like, but demands heroic measures, which are simple, and nearly always successful. They are merely immersion of the feet at night in cold water, and subsequent friction with flesh-gloves or a rough Turkish towel. The reaction will cause the feet to glow delightfully.

Sleeplessness is sometimes produced, and sometimes again, relieved, by tea, coffee, tobacco, etc. If the use of these be found to induce wakefulness, the quantities should be reduced or their use entirely suspended; and again, strict attention should be paid to the diet in any case, as dyspepsia is more potent than Macbeth to "murder sleep." But all narcotics, anodynes, or drugs of any sort, should be taken only on the prescription of a trustworthy practitioner.

Too much sleep may be indulged in, and be followed by a train of evils, so that the *sleeping habit* should be guarded against as strenuously as insomnia. One can easily accustom himself to over-indulgence in this particular luxury, and is sure to become sluggish, stupid and torpid as a result. In this, as in everything else, moderation is the key to propriety.

"Joy and temperance and repose
Slam the door on the doctor's nose."

PHYSICAL EXERCISE.

Nature is continually endeavoring to exercise economy in her expenditures, and when an organ is not employed in fulfilling the purposes for which it was intended, she curtails to the utmost her supplies of nutriment and heat. Thus it is that the unused brain becomes dull and stupid, and the ligated artery is absorbed ; and thus it is, also, that the unused muscle dwindles from lack of nutrition, loses tone and becomes totally unprepared for any extra demands which may be made upon it. The tissues of the human body are very much in the position described by the scriptural parable, "To him that hath shall be given, and from him that hath not shall be taken away even that he hath."

Ordinary exercise serves a whole chain of purposes, extending throughout the system. The first purpose is mechanical : while the blood is forced through the arterial system by contraction, first of the heart and then of the arteries themselves, the venous circulation, taking place for the most part against gravity, is entirely different in character. The walls of the veins, though elastic to a certain extent, are not muscular, and so the flow of blood through them is passive. They are provided at frequent intervals with valves opening toward the heart, to prevent the return of blood which has passed them. They are generally so situated as to be subject to pressure from the muscles, so that with each contraction of the latter a wave of blood is sent forward on its way to the heart, and when the muscle is in turn relaxed, the valves in the vein prevent the blood from flowing back. Thus, each contraction of

a muscle in any part of the body aids the venous circulation. It is the lack of such assistance which gives rise to the venous congestions, so common in people that stand much without walking, as compositors, who are specially subject to varicose veins. It is a fact generally known that in persons of active habits the circulation is also active and full, and this high tone of circulation, it will be easily understood, increases the nutrition of local tissues, and so raises the tone of the whole system. Again, the circulation being fuller and more rapid, the blood has not, of course, so much chance to become loaded with impurities, and therefore its quality throughout the body is materially improved—a state which aids all the bodily functions, respiration, digestion, assimilation, nervous energy, and reason itself. In fact, there is nothing that comes nearer than exercise to being a real "cure-all."

There are a thousand and one forms of exercise in common use for amusement, and an exercise which includes sociability and enjoyment has a great advantage over those of a grave and solitary nature. Of the former sort are rowing, riding, driving, "wheeling" in its various forms, tennis, and other out-door games. They are all, excepting the roughest and most dangerous, to be heartily recommended, as they combine all the useful elements of fresh air, high spirits and physical effort. Fencing, rowing and tennis are particularly commended to the weak-chested, with the proviso that all in-door exercises must be conducted in well-ventilated rooms. Walking is the most universally practiced of all the exercises, and he who has no other resource should religiously take his daily "constitutional" of from two to six miles. But in whatever form this useful aid to health may be taken, it should form as regularly a part of the day's employment as eating or business.

CALISTHENICS.

This is a term formed from two Greek words—*kalos*, graceful, and *sthenos*, strength—and, as now used, signifies the exercise of the body for the promotion of strength and grace of movement. In this sense it may be made to include all exercises with Indian clubs, dumb-bells, etc. We will so use it, adding these exercises to the simple calisthenic movements without implements.

Indian Clubs.

An infinite number of movements, calling into play nearly all the muscles of the upper half of the body, can be performed with clubs. They should be grasped close to the ball on the end, with the thumb extended along the handle

Fig.1.

Fig.2.

Fig.3.

toward the swell of the club. The proper posture is erect and military, with the head thrown well back, chest well forward. Bring both clubs at once to shoulder arms. Extend both arms horizontally, so that the heavy end of the club falls on a line with the shoulder when the arm is fully extended.

Then swing the clubs upward and backward easily, letting them fall into position back of the arm, with the hands on a level with the ear. Raise the elbow and drop the hand backward over the shoulder. Then swing the clubs forward to the full reach of the arms, and then backward to full extent. Return with them till they are perpendicular over each shoulder, as in first position; then extend them horizontally, as in the first movement, letting them come to rest with the

Fig. 4.

Fig. 5.

arms and clubs horizontal, and extended to their fullest reach. On these simple movements are built up most of the complicated club exercises. The motions may be performed with both clubs at once, one at a time, or one following the other. Figs. 1 to 5 illustrate various simple exercises with one and two clubs. These clubs yield a useful and graceful means of exercise, but they must be *light* or they will injure rather than benefit. Most of the clubs in use are too heavy for the user.

The "Health Pull."

Some years since there was introduced a valuable little apparatus under this title. It consists of a stout elastic tube, provided at each end with removable handles. The exercise consists in stretching the tube by drawing the handles apart, with the arms in every conceivable position. One of the handles may be removed, and then, after attaching the end of the implement to a hook in the wall, it can be used for a direct pull in various positions, or, still better, the apparatus can be used in pairs. The "pulls" in various positions behind the back are extremely useful in expanding the chest.

Dumb-Bells.

One of the most important things to be remembered in all calisthenic exercises is that it is the motion more than the weight of the implement that yields benefit, so that, in the beginning at least, light dumb-bells should be used. Some of the most valuable exercises known to athletes are performed

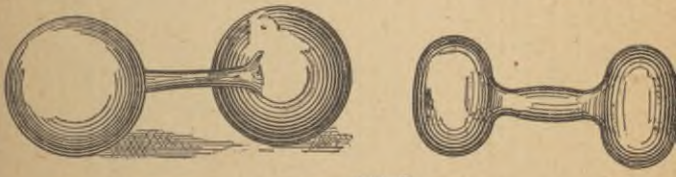

Fig. 6.

empty handed. Fig. 6 illustrates the best forms for the bells. For tender hands, the handles may be made of wood, or, if of iron, should be covered with chamois leather.

In the following directions we indicate some of the more valuable exercises, and show how to make the best use of the muscles in handling the bells.

The rising and swinging of the bells take place from the standing position. Stoop, seize both bells, recover the upright position, and raise them above the head. Repeat this by lowering the bells to the ground, bending the knees, and then rising to the upright position, as shown in Figs. 7 and 8.

Fig. 7.

Fig. 8.

Fig. 9.

Moving the bells in horizontal and slanting planes forms the next exercise. It is better explained in the diagrams, Figs. 9–12, than by any amount of verbal description. These

Fig. 10.

Fig. 11.

Fig. 12.

four positions show how the bells are successfully raised and swung in proper cadence and rotation.

The *circular movements* follow, first with one and then with the

Fig. 13.

Fig. 14.

Fig. 15.

other, and finally with both bells at once. These will be understood from Fig. 13. These movements are succeeded by various *elbow exercises*—the fore-arm thrown out or raised and

Fig. 16.

Fig. 17.

Fig. 18.

brought slowly back, the other arm swerving in like manner, and then both arms together.

The spread arms and the *head swing* are seen in Figs. 14 and 15. Care must be taken in all these move-

Fig. 19.

Fig. 20.

Fig. 21.

ments to prevent the bells clashing or striking against each other. As a rule, the elbows should be close to the sides at the starting of each movement.

The shoulder feats are shown in Figs. 16–19, each position of the body following in succession till we get the arms again extended in spread-eagle fashion, whence the exercises may be repeated.

From the third position of the "shoulder feats," Fig. 18, it is possible to swing the arms and clang the bells behind the back. This is a favorite and useful exercise, and after a little practice one may swing the arms and clap the palms together behind the back without the dumb-bells.

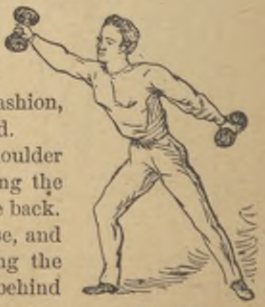

Fig. 22.

The thrusting or striking motions are shown in Figs. 20–22. At starting, keep the elbows close to the sides, bend the right arm and hold the bell to the chest. At the same instant raise the left high above the head. Reverse the arms and repeat the motion, as shown. Repeat the exercise again and again till perfect. Here we have all the movements of the dumb-bell exercise that can be taught on paper. It does not seem, at first sight, that much can be taught, but if the diagrams be examined carefully, and reading combined with practice, absolute knowledge will be acquired.

Simple Calisthenics.

As a preliminary course to regular gymnastics, pupils are generally practiced in the simple movements known as simple calisthenics, or movements without implements. These exercises are equally fitted for both sexes.

Fig. 23.

Fig. 24.

In the first exercise, place the heels together, with the toes turned outward, keeping the body upright and the shoulders well back, the arms stretched out on a level with the shoulders,

Fig. 23. From this position, bring the tips of the fingers quickly in front of the chest, being careful to let the elbows remain on a line with the shoulders, Fig. 24. Then strike quickly and with vigor back to the original position, with the arms fully extended. A good deal of practice in this simple, but at the same time very useful, exercise, will be of value to the pupil before he proceeds any farther.

In exercise 2, close the hands tightly and bring them well up to the chest, with the elbows close

Fig. 25.

Fig. 26.

Fig. 27.

to the body. Then strike forward vigorously, Fig. 25; backward, Fig. 26; upward, Fig. 27; downward, Fig. 28, and sideways, as in Fig. 23, but with this difference, that the hands should be closed. The elbows should be quite close to the body in the forward, upward, and sideways movement; but they must be brought up, well away from the body, previous to the backward and downward movements.

Exercise 3 is simple. The pupil must stand on his toes, with his heels together, and stretch the arms as far above the head as possible, Fig. 27, standing on the toes. While in this posi-

tion, shut and open the hands rapidly, working them as if crushing something.

Exercise 4.—Stretch the arms sideways, and keep them perfectly straight, with the body erect. From this position describe quickly a circle from the shoulders, keeping the palms of the hands facing all the time, as in Fig. 23. The circle should gradually become larger as the pupil gets more familiar with the exercise.

Exercise 5.—Place the hands behind the back with the palms facing each other, and the tips of the fingers touching, with the thumbs pointing outwards and shoulders well back, Fig. 29. In this position walk several times round the room.

Fig. 28.

Fig. 29.

Fig. 30.

Exercise 6.—Stretch the arms forward, with the tips of the fingers touching each other. Strike well back from this position, always keeping the arms on a level with the shoulders.

Exercise 7.—Stretch the arms upward, with the palms of the hands facing each other, and keep the legs perfectly stiff. Then bend forward, and, with the knees still quite firm,

touch the ground with the tips of the fingers, Fig. 30. From this position swing backward to the back bend, Fig. 31. The one difficulty of this exercise is to keep the legs perfectly straight and firm.

Fig.31.

Fig.32.

Exercise 8.—Stretch the arms upward, with the palms of the hands facing each other ; heels together, and toes pointing outward. Bend to the right from the hips from this position, and then to the left, Fig. 32.

Fig.33.

Fig.34.

Exercise 9.—Advance the right leg about eighteen inches and stretch the arms upward. Bend from this position to touch the ground with the tips of the fingers, Fig. 33; then bend backward, Fig. 34. Exactly the same movements should be repeated with the left leg advanced.

Exercise 10.—Place the heels together with the toes outward, and stretch the arms upward with the palms of the hands facing each other. Then hollow the back and bend down from the hips, keeping the head well back and look-

Fig.35.

Fig.36.

Fig.37.

ing up to the ceiling. Throughout the exercise the legs should be kept perfectly straight, Fig. 35.

Exercise 11.—Place the heels together, with the toes outward and the hands on the hips. Then turn the body from the hips, first to the right and then to the left, Fig. 36.

Exercise 12.—Separate the legs sideways and stretch the arms upward with the palms of the hands facing each other. Then bend forward and backward as described in Exercise 7.

Exercise 13.—Place the heels together, with the toes out-

ward ; put the hands on the hips and keep the shoulders well back. Rise from the toes, Fig. 37; then sink down, separating the knees, Fig. 38 ; again raise the body from this position on the toes and return to the first position. Repeat the whole exercise several times quickly.

Exercise 14 is very short, but far from easy. The heels must be placed close together with the toes pointing sideways; the hands on the hips and the shoulders kept well back, Fig. 39. The pupil must then bend his legs as well as he can.

Exercise 15 is also brief, but not very easy of accomplish-

Fig.38.

Fig.39.

Fig.40.

ment. The pupil, with hands on the hips, body upright, toes together and heels pointing sideways, Fig. 40, must straighten his legs as much as he can.

Exercise 16.—Place the right heel to the left toe and bring the feet close together, Fig. 41. Then bend the legs, keeping the body erect and the head back all the time.

Exercise 17.—The pupil stands with his legs quite straight, hands on the hips, heels together and toes pointing outward. He must then bend down forward from the hips and let the head go as far down as possible, Fig. 42. From this position,

keeping the body bent, he must turn to the right side, Fig. 43, then from the right to the back position, Fig. 44, and from the back position to the left. Having gone through this several times, the exercise should be reversed. Thus the pupil

Fig. 41.

Fig. 42.

Fig. 43.

will from the forward bend turn to the left, then back, and from the back to the right. The body should be kept on the move all the time.

Fig. 44.

Fig. 45.

Fig. 46.

Exercise 18.—Body upright and hands on the hips. Raise the right knee as far as possible, Fig. 45, then strike out forward

with vigor, letting the toe point well downward, Fig. 46; then bring the heels together again. This exercise shou'd be gone through quickly, the legs, after a little time, being reversed.

Fig. 47.

Exercise 19.—Raise the left leg from the ground, but only slightly, pointing the toe downward. Then bend down on the right leg without allowing the left to touch the ground, Fig. 47. The pupil must indeed almost sit on his heel. From this position the body must be raised again, heels together. Do this with the right leg stiff. This exercise is by no means easy, and some considerable practice will be needed before it can be perfectly performed.

Exercise 20.—Body erect, shoulders back, hands on hips. The pupil must then *trot* on the spot—that is, raise the knees alternately well up to the chin rapidly, without going either forward or backward.

The exercises described above will not be found to be beyond the capacity of young ladies; but, on the contrary, will be of great value in giving flexibility and strength to the muscles. The beginner, whether male or female, should not attempt the whole twenty exercises. Eight or ten to start with will be quite sufficient. Practice will give increased strength and skill, and in a comparatively short time the pupil will be equal to the whole twenty. Above all things, the novice must beware of overwork. Nothing is so injurious. Practice should not be indulged in either just before or just after a meal; an hour or two before or after is the best time.

Finally, in review of the entire subject, it may be said that with due attention to the hints contained in the second portion of this little book, the chances of needing the aid of the first part will be very much lessened. For, pure air, pure water, pure food, plenty of light, adequate clothing, personal cleanliness and physical exercise are the very best preventives in the world against the assaults of "plague, pestilence and sudden death."

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