

clothes. Similar curious occurrences have been recorded by other observers.

The symptoms presented by a patient suffering from a lightning-stroke are coldness of the extremities, sighing respiration, absence of radial pulse, and insensibility.

After death the ordinary *rigor mortis* is not witnessed, and the blood is said to be more fluid than in death from other causes.

The treatment consists in friction to the surface, artificial respiration, and the administration of stimulants.

COLIC.—Spasmodic contraction of the muscular walls of the intestines is generally attended with great pain. It is occasioned by cold, or over-indulgence in indigestible food. It is characterized by paroxysms of intense pain over the abdomen; vomiting is sometimes associated with it. The pain is distinguished from that accompanying inflammation by the fact that it is relieved on pressure.

An injection of one or two quarts of very warm water and an opiate will cure it. The following prescription answers in many cases:

R. Bismuthi subnitrat̄is ʒj.
Morphiæ sulphatis gr.ʒ. M.
Ft. pulv. x.

One powder should be given every hour until the patient is relieved. Mustard or hot flax-seed poultices may also be applied over the abdomen. (*See Lead Colic.*)

CHAPTER XX.

T O X I C O L O G Y.

NARCOTIC POISONS.

Opium, Belladonna, Hyoscyamus, Aconite, Tobacco, Stramonium, Chloroform, Hemlock, Lobelia, Woorara, Ether, Alcohol, etc.

OPIMUM is obtained from the unripe capsules of the *Papaver somniferum*, or poppy. The juice of the capsules is the portion used. The plant is cultivated in India, Persia, Europe, and in this country. It has been employed as a medicine from the time of Hippocrates to the present day, and stands unrivalled as a remedy for the alleviation of pain.

In Turkey and China the drug is habitually smoked and chewed. In the western parts of Europe and in this country the habit of smoking and eating opium is not uncommon. It engenders exaltation of ideas, and general buoyancy of spirits. Some of the brightest lights of the literary world have fallen victims to this vile habit of opium-eating. The well-known case of Fitz-Hugh Ludlow is familiar to most American readers, and in England the celebrated Coleridge and De Quincey were victims to the drug.

The quantity of opium necessary to cause death varies with circumstances. Quantities which would destroy life

in ordinary cases are eaten with perfect impunity by persons accustomed to its daily use. Enough has been taken at a dose to destroy a dozen lives. Herdoun mentions the case of a woman with cancer of the uterus who took laudanum by pints. De Quincy was in the habit of taking nine ounces daily. I have known two cases average daily from four to six ounces.

The amount which will destroy life depends also on the age of the person. Infants can bear but a very minute quantity. One drop of laudanum has been known to kill a child. Children are extremely susceptible to its influence. The smallest quantity known to have destroyed the life of an adult is two drachms of laudanum (*Shae*). In the majority of cases larger quantities are required. Opium kills in from four to twelve hours.

Some animals are scarcely affected by the drug. On apes it exerts no perceptible effect. In one instance five hundred grains were given to one of those animals without injury.

Tests.—Perchloride of iron gives a red precipitate with solutions of opium which contain meconic acid. Nitric acid gives a red precipitate with morphia, the principal alkaloid of opium.

The symptoms manifested in persons addicted to opium-eating are readily recognized. The face is sallow, pinched, and parchment-like. The eyes are sunken and glassy. When they are deprived of the drug there is an unsteady, trembling gait, great depression of spirits, and intense mental and physical agony. While under treatment patients endeavor by every conceivable means to obtain a dose, even getting down on their knees, begging piteously for it.

But in such cases it is rarely expedient to satisfy their cravings. "Tapering off," as they call it, will not result in cure. The appetite for the drug remains so long as they are allowed to taste and experience its intoxicating effects. Large doses of bromide of potassium will do much in these cases to diminish the craving.

The effects of poisonous doses of opium appear in from thirty minutes to two hours from its administration. Liquid preparations of opium, and the salts of morphia, act very rapidly. The patient trembles, becomes giddy, drowsy, and unable to resist the tendency to sleep. Gradually the stupor deepens, until there is perfect insensibility. The pupils are contracted, eyes and face congested; the pulse, at first rapid and small, is now slow and feeble. A marked diminution in the number of respiratory movements is discernible. From twenty per minute they run down to twelve, or even eight. The breathing is stertorous. A profuse perspiration breaks out on the surfaces. As coma deepens, and death approaches, the extremities become cold, and the sphincters relaxed. Occasionally the odor of opium may be noticed in the breath, and in such a case the diagnosis is materially assisted.

The following singular case of opium-poisoning in conjunction with cholera illustrates the characteristic effects of the drug:

A colored woman was admitted, in the summer of 1866, to the pavilion attached to Bellevue Hospital; she was suffering from a bad attack of Asiatic cholera, and when brought to the ward was fast approaching a state of collapse. Inquiring into her history, she stated that the attack came on four hours previous, and while at the station-house half an hour

before her admission a policeman had given her a table-spoonful of pure laudanum. As there were no symptoms to corroborate her story, I did not credit it and left her. In about three-quarters of an hour the nurse in charge informed me that the patient was insensible, and could not be roused to take her medicine. I went down immediately and found the patient as the nurse had stated, in a comatose condition. The pupils were contracted, respiration down to eight per minute. Pulse slow and small. Injections of brandy and ammonia, and strong coffee, were ordered. The body was properly stripped, and flagellation applied with twisted towels. After two hours of this treatment signs of consciousness appeared. The patient was then lifted from the bed and rapidly marched up and down the ward, supported by her nurses until she was fully restored. Five hours were spent in bringing this woman to a state of consciousness.

The treatment for opium-poisoning, and the opium itself, seemed to exert a curative effect on the cholera, and the patient was discharged three days after her admission, cured.

Treatment.—If the patient is seen soon after the poison has been taken, the stomach should be emptied by a stomach-pump or emetics. Twenty grains of zinc, or ipecac., a tablespoonful of mustard or common salt, will suffice to eject the poison. These medicines should be followed by copious draughts of warm water to keep up the vomiting. As soon as the stomach is emptied, belladonna, the physiological antidote for opium, may be tried. The active principle of belladonna (*atropia*) may be given by hypodermic injections. A solution of one grain to the ounce is made, and fifteen or twenty minims injected, and

repeated, if necessary. Strong coffee is another antidote. In all cases the antidotes should be accompanied by stimulants. Brandy and ammonia may be frequently given by the mouth or rectum. Flagellation of the surface by the hands or towels, and causing the patient to walk about, are important aids to restoration.

The use of the Faradic current will be of service in all cases. The electrodes may be applied over the phrenic nerve and diaphragm, and over the frontal bone.

BELLADONNA.

The leaves and root of *Atropa belladonna*, or deadly nightshade, are largely employed for medicinal purposes. All parts of the plant possess poisonous qualities. The leaves and berries are frequently eaten by children, and with deleterious effects. Thirty-six berries have produced death in a child. An infusion made from two drachms of the leaves has killed an adult. Atropia, the active principle of the plant, given in two-grain doses, has proved fatal.

The first symptoms of poisoning are dryness of the throat, constriction of the fauces, difficult deglutition, indistinct vision (*amblyopia*), or double vision (*diplopia*), headache, staggering, and confusion of ideas, stammering, etc. The pupils are widely dilated, face suffused, lips livid, and pulse rapid and intermittent. Delirium and deep coma soon supervene, followed rapidly by death. In a few cases there are convulsions.

After death putrefaction rapidly ensues. Large purple spots form on the body. There may be signs of inflammation in the stomach and intestines.

Treatment.—An emetic should be administered without delay, and repeated until the stomach is completely emptied. This should be followed by stimulation, friction to the extremities, and warmth. Some recommend opium as an antidote. It has been successful in one or two cases. Runge advocates the use of lime-water in large quantities as a neutralizer of the poison. Bouchard has employed the ioduretted iodide of potassium with benefit. All the strong alteratives are said to possess more or less remedial power; but experiments have not proved their efficacy.

Brandy by enema, and opium by hypodermic injection, in conjunction with large doses of lime-water, constitute the most reliable remedies that have yet been fixed upon. If the coma appear rapidly and without convulsive movements, electricity may be used with benefit, and cold water may be poured on the chest and face.

HEMLOCK.

There are five varieties of hemlock which possess poisonous properties, viz., *Conium maculatum*, *Cicuta virosa*, *Ænanthe crocata*, *Phellandrium aquaticum*, and *Æthusa cynapium*. *Conium maculatum*, or spotted hemlock, is much used for medicinal purposes. It was a preparation of this drug which caused the death of the philosopher Socrates. All parts of the plant are poisonous. To inhale the air in the vicinity of this plant in the hot months of summer is said to be followed by slight narcotism. Its poisonous effects are manifested within half an hour after entering the stomach, and death results in from one to three hours.

The symptoms are dryness of the throat, muscular tremors, dizziness, difficult deglutition, and a feeling of great

prostration and faintness. The limbs are rendered powerless, sometimes being completely paralyzed. The pupils are dilated, the pulse is rapid and small. Deep insensibility rapidly supervenes, and there may be convulsions preceding the fatal termination.

The roots of *Cicuta virosa*, or water-hemlock, are sometimes mistaken for parsnips, and eaten in large quantities. The symptoms of poisoning resemble those of the preceding variety, with the addition of vomiting, and pain in the epigastrium; convulsions are also more frequent.

The leaves and roots of the *Ænanthe crocata* are more deadly than any other species of hemlock. The plant grows at the sides of ditches and other moist places; it resembles celery.

When taken internally, it always produces violent and protracted convulsions, in conjunction with the symptoms previously enumerated (*Taylor*).

Æthusa cynapium, or fool's parsley, does not kill so rapidly as the other varieties. It resembles ordinary parsley, and is sometimes eaten by mistake. The symptoms commence by intense pain in the abdomen, followed by vomiting and purging, and a tendency to coma.

Treatment.—Empty the stomach of its contents, and use diffusible stimulants in large quantities. If there are much pain and vomiting, bromide of potassium, in ten-grain doses, may be given at short intervals.

HYOSCYAMUS.

Hyoscyamus niger, or henbane, is a European plant, cultivated in this country. The leaves and seeds are largely employed in medicine. All parts of the plant are poisonous.

The seeds are more powerful than other parts. Its alkaloid (*hyoscyamia*) is a deadly poison taken in minute quantities. Animals, such as horses, goats, cows, etc., are exempt from its injurious influences, and eat it without receiving harm. Dogs and cats are soon killed by it.

Poisonous doses of the seeds or leaves are followed rapidly by dilatation of the pupils, dimness of vision, muscular twitchings, inability to articulate plainly, and a tendency to sleep. In a later stage there are vomiting and purging, abdominal pain, delirium, convulsive movements of the extremities, small, intermittent pulse, and coma, which is often followed by death.

A *post-mortem* examination shows evidences of inflammatory action in the stomach and intestines, and in a few cases congestion of the brain.

Treatment.—Common charcoal has been strongly recommended as an antidote by Dr. Gar. The substance rapidly absorbs the alkaloid upon which the poisonous properties of the plant depend, and prevents its peculiar action. Solutions of caustic alkalies are said to neutralize the poison. In every case stimulants should be employed, as in the other varieties of poisoning.

ACONITE.

This drug is obtained from the leaves and root of the *Aconitum napellus* (monk's-hood, or wolf'sbane). Preparations of the leaves and root are used in medicine. The root is said to have ten times greater strength than the leaves. The plant has been mistaken for horseradish. In small doses it acts as an arterial sedative, diminishing the heart's action, and lowering the pulse. It differs from all other

narcotic medicines in producing a peculiar numbness and tingling sensation in the mouth and fauces.

Cases of poisoning generally result from careless overdosing with the tincture of the root. Thirty drops of Fleming's tincture have caused death, but there are instances of a drachm or two having been taken by mistake without fatal results. The active principle (*aconitia*) is one of the most active poisons known; one-twelfth of a grain has proved fatal.

Poisonous doses produce immediately the characteristic numbness and tingling of the mouth and fauces. The same feeling is experienced in the extremities. There are sore-throat, pain over the stomach, and vomiting. The pulse is extremely weak and compressible. The pupils are in some cases dilated, at others contracted. As in poisoning by other narcotics, there are dimness of vision, vertigo, great prostration, general loss of sensibility, delirium, and coma. Death is said to take place from syncope, asphyxia, and coma.

Treatment.—Emetics are first employed. Complete evacuation of the stomach is sometimes all that is required. Brandy in tablespoonful doses, given in ice-water every half-hour, is a useful method of stimulation. Preparations of nux-vomica are said to neutralize the action of aconitia. The tincture of nux-vomica has been used with apparent benefit. It may be given in ten-drop doses, every fifteen minutes, until the alarming symptoms have subsided.

TOBACCO.

This plant was first discovered in America by the Spaniards. The English are indebted to Sir Walter Ra-

leigh for furnishing them with the "weed." The leaves are employed medicinally as poultices to painful swellings, and for their emetic properties. Five grains of the powder will produce emesis. In the form of snuff it has been employed by keepers of immoral houses to drug their victims. A teaspoonful of snuff in a glass of ale will give rise to delirium, vomiting and purging, and faintness. The active principle (*nicotia*) is a deadly poison. One drop will kill a rabbit (*Taylor*). It causes death in two or three minutes.

The effects produced in persons of nervous temperament by long-continued use of tobacco are well marked. An examination of the heart shows that it is intermittent in its action, and its pulsations more rapid than normal. The pulse is weak. Shortness of breath and palpitation of the heart are complained of in going up-stairs. Slight excitement induces great tremulousness. There is often impairment of the mental faculties, such as defective memory, etc. The countenance has a sallow aspect. Some impairment of the digestive functions is almost always present.

The effects of large quantities of tobacco on the system are well known to smokers and chewers. Early efforts in acquiring the habit are characterized by poisonous symptoms. There are intense nausea and vomiting. The nausea is said to resemble that occurring in sea-sickness. Vertigo, muscular weakness, and intense prostration verging on syncope, are also present. Later the extremities become cold and clammy, and convulsions sometimes precede death.

Treatment.—Hot bottles and blankets should be applied to the body. Brandy by enema is always required if the liquid cannot be retained on the stomach. Sub-nitrate of

bismuth in ten-grain doses, continued with one-fifteenth of a grain of morphia, will do much to allay the distressing nausea.

DIGITALIS

Is a product of the *Digitalis purpurea*, or purple fox-glove. It exerts a powerful sedative effect upon the heart, acts on the kidneys as a diuretic, and on the brain as a narcotic. Some ascribe its influence in diminishing the pulsations of the heart in febrile diseases to a stimulating effect on the heart's fibres, which gives them renewed vigor.

It is dangerous on account of its accumulative effect. It may be administered for several days without apparent action of any kind, when suddenly the patient is prostrated with all the symptoms characterizing poisoning by this drug. The alkaloid *digitalia*, when boiled with sulphuric acid, is changed into glucose, or grape-sugar (*Kinsman*).

The symptoms produced by poisonous doses are loss of strength, feeble and fluttering pulse, faintness, nausea and vomiting, and stupor. The body is bathed in cold perspiration, the pupils are dilated, the breathing is sighing and irregular, and convulsions are sometimes present.

Treatment.—Ammonia, given internally in frequently-repeated doses, is an admirable remedy, when the patient is in a state of syncope. The medicine should also be applied to the nostrils. Brandy internally, and warmth to the surface, are followed by good results.

STRAMONIUM.

The common name of the plant is thorn-apple, or Jamestown weed. It grows all over this country, particularly along the roadsides and in moist grounds. All parts of

the plant are poisonous. The seeds are not unfrequently eaten by children. These seeds are recognized by their dark, almost black color, their flat, roughened surface, and kidney-shape. The drug is much used in asthma and other spasmodic affections. Cigarettes made of the leaves are smoked by asthmatics with great relief. The active principle (*daturia*), given in small doses, proves rapidly fatal.

The symptoms of poisoning are dryness of the throat, thirst, delirium, convulsive movements, swelling of the face, dilatation of the pupil, suffusion of the eyes, small, rapid pulse, hurried breathing, and hot skin. In some cases there are pain over the stomach, and vomiting. Convulsions are nearly always present, and are liable to be mistaken for those arising from uræmia or epilepsy. On examination of the vomited matters, the seeds of stramonium will probably be discovered, which will make the diagnosis clear.

Treatment.—Opium, stimulants, and alkaline medicines are employed in the same manner as after poisoning by belladonna.

LOBELIA INFLATA

Is used in medicines as an emetic and antispasmodic. The common name is Indian tobacco. It is often administered by quacks who style themselves "vegetable doctors," and is sometimes given in dangerous doses. Taylor recites several cases where death resulted from improper quantities administered by those men.

In large doses it induces excessive vomiting and purging, pain in the bowels, contraction of the pupils, delirium, coma, convulsions, and death.

The *post-mortem* appearances consist in congestion of

the membranes of the brain, and evidences of inflammation of the stomach and intestinal canal.

The treatment is confined to stimulants, and counter-irritation over the stomach.

COCULUS INDICUS

Contains a peculiar active principle, called *picrotoxia*, to which its poisonous character is due. The drug is sometimes given to certain kinds of fish in India to render their capture an easy matter. The seeds are small, and about the size of a pin-head. The active principle is said by Glover to produce the same class of convulsive movements witnessed after lesions of the corpora quadrigemina and cerebellum, viz., tonic spasms, and wheeling and backward movements of the body.

The symptoms and treatment are the same as in other varieties.

MUSHROOMS.

This plant is eaten in large quantities in all parts of the civilized world. There are numerous varieties of the plant, some harmless in their nature, and others highly poisonous. Strangely enough, many which are regarded as deleterious in one part of the world are eaten with impunity in others. Mushrooms which are considered dangerous in England and in this country, are used as food in Russia; and some which are eaten in England are thought poisonous at Rome.

The poisonous mushrooms may be recognized, according to Chrystosin and M. Richaud, by their dark color, acid, bitter taste, pungent odor, and by the fact that they generally grow in damp, dark places