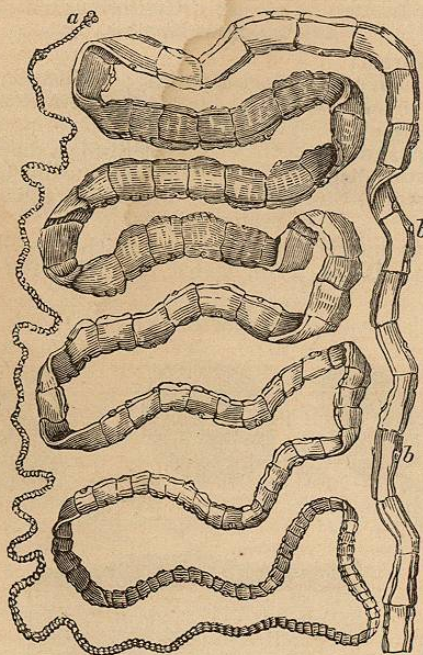


Küchenmeister and Siebold proved by actual experiment that hydatid parasites are young or immature tapeworms. Humbert, of Geneva, in 1854, swallowed fourteen *cysticerci*, and in three months discharged fragments of *tænie*, which had developed within his body. The immature forms are non-sexual; they may remain, as in hydatids, for a long time, within solid organs, without development. They only become mature and sexual, capable of reproduction, in parts of the body having some communication with the external air, as in the alimentary canal or lungs; generally the former. Migration from one part of the body to another occurs with some; e. g., *trichina spiralis*.

*Tænia solium* and *tænia mediocanellata* look a good deal alike; but the former is much the smaller. The immature *cysticercus* of

Fig. 97.



Tænia solium.

the former is  $\frac{3}{16}$ ths of an inch long; that of the latter, of the size of a pea. The *t. solium* has a circle of hooklets around a convexity of the head; the *mediocanellata* is club-headed, with larger sucking disks than the *solium* has. One is designated as "armed" and the other "unarmed" tapeworm. The former is from the *cysti-*

*cercus cellulose* of the hog; the latter from the "*cysticercus bovis*"<sup>1</sup> (Cobbold), and is the most common. The unarmed is the easiest to drive out.

The tapeworm is formed of flat segments, often several hundred in number, connected with the head by a slender neck. Each segment has male and female organs (hermaphrodite); as those at the tail mature, they are cast off. Some patients thus pass six or eight fragments from the bowels in a day. The whole length of the parasite is from ten to thirty feet.

The symptoms caused by tapeworm are not very determinate. They resemble those produced by other worms; namely, uneasy sensations in the abdomen, and general nervous irritation; bad sleep, attacks of faintness, lowness of spirits, indigestion, irregularity of appetite and of the action of the bowels; itching of the nose, and sometimes of the anus. Epilepsy and insanity are said to have been sometimes caused by it. The only proof of tapeworm is the finding of fragments of it in the stools. It is a common impression that it is never destroyed unless the head is discoverable; but this is not exactly true. Conversely, if the head comes away, the parasite to which it belongs is no longer reproduced. More than one of them may, however, be present at once; though this is rare.

The broad tapeworm, *bothriocephalus*, is only known in Central Europe; Russia, Sweden, Norway, Lapland, Finland, Poland, and Switzerland.<sup>2</sup> Its head is elongated, compressed, obtuse; its length from six to twenty or twenty-five feet. It does not give off detached segments. Cobbold says it is indigenous to Ireland; although he has never met with a patient born in that country who has been the subject of it.

**Treatment of Tapeworm.**—Oil of turpentine, in half ounce or ounce doses, will generally purge and bring away the worm. It intoxicates some persons. In Egypt, petroleum is used for the same purpose, in doses of twenty to thirty drops. The ethereal extract (commonly called oil) of male fern, *extractum filicis liquidum*, U. S. Pharm., in the dose of a drachm and a half to two drachms, is esteemed highly by Cobbold and some other practitioners. *Koosso*, the flower of the *Brayera anthelmintica* of Abyssinia, in half ounce doses, mixed with water, given on an empty stomach, is almost certain to destroy or remove the parasite. So is said to be *Kameela*, the *Rottlera tinctoria* of botanists. Pumpkin-seeds, plentifully taken on an empty stomach, are quite effectual; and so is pomegranate-root bark. Dr. J. H. Bill<sup>3</sup> has reported the cure of a case by carbolic acid, given in five grain pills with extract of liquorice. Thirty-five such pills were taken without apparent inconvenience.

**Prevention of Tapeworm.**—As immature tapeworms find residence in the bodies of animals used for food, and thus get oppor-

<sup>1</sup> Cobbold states that the *hydatid* of the *cysticercus bovis* has never been observed in man. Hydatid or "echinococcus" disease is especially frequent in Iceland; one in fifty of the inhabitants being affected by it.

<sup>2</sup> Frazer (Dublin Quarterly Journal, Nov. 1868) asserts that it has been recognized in some of the Italian cities, and that it probably extends to Northern Africa.

<sup>3</sup> N. Y. Medical Record, Nov. 15, 1878.

tunity to enter the human alimentary canal, the *avoidance of raw or under-cooked meat* is the precept of prophylaxis suggested, and confirmed by experience. This applies not only to the prevention of tapeworm, but also to that of other parasites, especially *trichina*. Tapeworms are derivable from infested beef, even oftener (Cobbold) than from pork. Mutton has been found occasionally to contain cysticeri.

#### TREMATODE WORMS.

These are the *Distomata*, *Bilharzia hæmatobia*, *tetrastoma renale*, and others. They are of a flattened oval shape, soft and smooth. They have a bifurcating alimentary canal, with a mouth, but no anus. Both sexes are upon one individual. They exist in two conditions; mature and encysted, and immature and free. Their methods of reproduction are very curious, but of greater importance in zoological than in pathological science.

*Distoma hepaticum*, found sometimes in the liver and its ducts, measures about an inch in length when mature, and rather less than half an inch in width.

*Distoma ophthalmobium* has been found in the eye of a child having congenital cataract. It is about half a line ( $\frac{1}{2}$  in.) in length.

*Bilharzia hæmatobia* is found in great abundance in Egypt; where it inhabits the *veins* of the *abdominal organs* of the inhabitants, in the proportion of nearly one-third of the population. Hemorrhage from the kidney, and the symptoms of dysentery, may follow from its presence. It is not more than three or four lines ( $\frac{1}{4}$  to  $\frac{1}{2}$  in.) in length. The sexes are on different individuals.

*Tetrastoma renale* is occasionally found in the substance of the kidney. It is nearly half an inch long.

#### NEMATOID, OR ROUND WORMS.

*Ascaris lumbricoides* is the commonest of entozoa. It inhabits mostly the small intestines; but may get into the stomach, and, of course, the large intestines. I have repeatedly known it to be vomited from the stomach. This round worm is from five to fifteen inches in length, light-brown in color, tapering to a point at each end. A considerable number of them may exist together; it is only then that their presence in the bowels is likely to do much harm, unless in very susceptible children. Their escape into the stomach may cause nausea, vomiting, and indigestion, sometimes difficult to account for until the throwing up of the worm explains the cause. I have known this to happen in an adult, in whom the symptoms of gastric irritation continued for two or three weeks. These worms probably enter the body chiefly in drinking-water from shallow wells, muddy streams, etc.

**Treatment: Diagnosis.**—Two things are wanted: to expel the worms present, and to prevent their reaccumulation. As to the evidence of the existence of lumbricoid worms in the bowels, it is always doubtful unless some of them pass out with the evacuations. Signs of gastro-intestinal and nervous irritation attend them, especially in infants and young children. So, grinding the

teeth during sleep, itching of the nose and anus, bad or irregular appetite, and tumidity of the abdomen, are regarded commonly as signs of worms. But other sources of indigestion and disturbance may be thus made known. Convulsions may undoubtedly be caused by worms in children; and so may laryngismus stridulus, and spasmodic croup.

When there is good reason to believe that they exist in the bowels, anthelmintics may be given, with purgatives, in safe doses, watching their effects. Besides the *vermicides* mentioned in connection with tapeworm, many other drugs have more or less such effect; as santonin (most certain of all), calomel, pink-root (*spigelia*), bark of pomegranate root, azedarach, chenopodium, cowhage (*mucuna*), powder of tin, etc. [F. 206, 207, 208.]

*Infusion of senna and spigelia*, half an ounce of each to a pint; for an adult, a wineglassful every morning before breakfast; this is very popular in this country. Instead, may be given *fluid extract of spigelia and senna*, a teaspoonful or two for a dose. As above said, santonin is the most effectual of the vermicides or vermifuges. It requires care in its use, however; producing serious vomiting, prostration, and nervous symptoms in overdose. A child should not take more than half a grain of santonin once or twice daily; an adult, from three to six grains.

*Trichocephalus dispar*.—This worm inhabits the large intestine. It has a length of an inch and a half to two inches. The head is attenuated or hair-like; whence its name. The sexes are on different individuals. The trichocephalus is much less common than the lumbricoid worm.

*Oxyuris vermicularis* (*Ascaris vermicularis*)—*White seat-worm*. Of this the male is about a line ( $\frac{1}{2}$  inch) and a half long; the female, five or six lines. It is found in the rectum,<sup>1</sup> generally of children; sometimes in considerable numbers. They cause a great deal of itching; occasionally, other nervous irritation. Females may have them find their way into the vagina; more rarely, they get into the urethra.

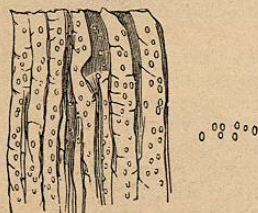
For the **treatment** of seat-worms, I know of nothing equal to *suppositories of santonin*; made with cacao butter, three grains of the drug in each; one to be introduced into the rectum every night [F. 209]. Other common remedies are, injections of lime-water, infusion of aloes, mercurial ointment, etc.

*Trichina spiralis*.—Since 1822, when Tiedeman discovered it (Hilton, 1832), and especially since it was described by Paget and Owen in 1835, the dissecting-room has furnished observers with specimens of this parasite, long supposed to be harmless. Zenker, of Dresden, first showed that, although a few *trichinae* may be innocent, they sometimes abound to such an extent as to cause serious disease, and even to destroy life. Such an affection is called trichinous disease, *trichiniasis* or *trichinosis*. It has occurred particularly often in Germany, where it has been recognized since 1860. In 1863, in a Prussian town, of 103 persons in good health who dined together on a festive occasion, nearly all became ill from eating sausage made of the meat of an ill-conditioned pig;

<sup>1</sup> Cobbold says, more often the *cæcum*.

and quite a number died. Another outbreak, at Hedersleben, in 1865, caused 40 deaths in 300 cases. The first cases in America

Fig. 98.



Trichina in muscle, natural size.

were reported by Dr. Schnetter, of New York.<sup>1</sup> At Marion, Iowa, in 1866, nine cases occurred in one family, under the care of Dr. J. H. Wilson; five died. In the same county, eating raw ham containing trichinae (as proved afterwards by examination) caused the disease in six children at one time; reported by Dr. Ristine. An examination of pork in Chicago by a committee of the Academy of Sciences of that city proved the existence of trichinae in 1 in 50 of the hogs inspected; some of their muscles containing from 10,000 to 18,000

in a cubic inch. Such animals are not themselves nearly always out of health. Cattle, also, are, to a less degree, subject to the same parasite. The meat of those so infested should, of course, not be used for food. In some German cities the butchers have microscopic examination made of the flesh of their animals. To the naked eye, the muscles of a trichinous animal present whitish dots, which a lens will show to be the capsules or cysts of immature trichinae. Those not encysted are invisible without a microscope. The capsule is hard and transparent; the worm is coiled spirally within it. Under the tongue is the preferred place to search for the trichinae in the living animal; a delicate *harpoon* being used.

The trichina is a minute bisexual worm, reproducing in the intestinal canal of animals or men; the offspring then finding their way out through the walls of the intestines to become finally encysted in the muscles. The disease produced by them has two distinct stages: 1, that of the presence of the worms in the alimentary canal, and their multiplication there; 2, that of their migration to and location in the muscles. Of the first period, *malaise*, vomiting, and diarrhoea are the leading symptoms. Of the second, fever, resembling typhoid, severe pains, with stiffness in the muscles, and prostration. As the muscles of the larynx are often attacked, hoarseness is a common symptom. The complication of pneumonia is not infrequent. The first stage above-mentioned lasts about a week or less; the second may terminate fatally within six days, but usually has a duration of from two to four or five weeks. A man died, however, in the Middlesex Hospital from phthisis in 1874, in whose muscles millions of trichinae were present, believed by the physicians in attendance (perhaps upon doubtful evidence) to have been perpetuated in his system for several years.<sup>2</sup>

We are not informed of much success with the treatment of trichiniasis. Traube,<sup>3</sup> of Berlin, is reported to obtain recoveries in hospital, under friction of the limbs with bay salt. Others give

<sup>1</sup> Clymer, in Phil. ed. Aitken's Practice of Medicine, vol. i. p. 868.  
<sup>2</sup> Lancet, Jan. 17, 1874.      <sup>3</sup> Lancet, July 8, 1871.

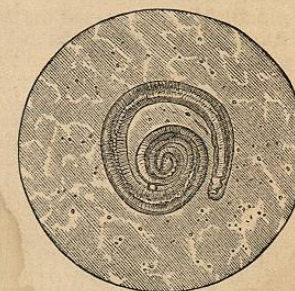
carbolic acid internally. Prevention is always possible. Besides proper inspection of animals, every piece of meat which may be suspected must be *well cooked*. Reliance cannot be had upon salting and smoking; at least unless they be very thoroughly done.

Fig. 99.



Trichina encysted in pork.

Fig. 100.



Trichina, magnified 150 diameters.

*Sclerostoma duodenale* is common in Egypt and in parts of Europe. It exists in the small intestines, and causes a chlorosis-like anaemia. The worm is from a third to a half an inch long. Its *vermicide* is said to be turpentine.

*Strongylus gigas* (*Eustrongylus gigas*) inhabits the kidney. It is rare in man.

*Filaria medinensis* (*Dracunculus*), or Guinea-worm, lives in the subcutaneous tissue. It is common in the tropical regions of the old world. The female worm it is, that enters the skin of a human being, and develops, with its contained young, in a whip-cord-like shape, to a length varying from six inches to four, five, or six feet, and a width of about one-twelfth of an inch. A dozen or more of the worms may exist upon the same person. The lower limbs are especially invaded by them; but they can migrate almost all over the body. They evidently get into the legs and feet of those who bathe in shallow streams or ponds, or walk barefooted in damp or muddy places. An incubation of a year or more is required for the development of the worm to a perceptible size.

A characteristic vesicle appears, generally upon the lower part of the leg, when the worm matures. This bursts, emitting the young filariae; a good deal of itching and irritation ensues, and sometimes ulceration. The natives often rid themselves of the worm by letting a stream of water run or pour for a time upon the leg. When it creeps partly out, they draw upon it until it is dislodged. Dr. Horton<sup>1</sup> asserts, on the basis of experience in West

<sup>1</sup> Brit. and Foreign Medico-Chirurg. Review, Jan. 1869, p. 160.  
 41

Africa, that *tincture of assafoetida* (thirty drops three times a day) will act as a poison to this parasite.

**Filaria sanguinis hominis**, discovered in 1872 by Dr. T. R. Lewis of the British Army Medical Service, is a minute nematoid worm, whose presence, even to the number of hundreds or thousands, in an individual body, does not appear to produce serious injury to health. *Chylous urine* is the most marked symptomatic result. This worm has an average width of  $\frac{1}{35000}$  of an inch; length,  $\frac{1}{75}$  inch. Dr. Lewis estimated that in one of his patients in Calcutta there must have been 140,000 of these worms.

#### EPIZOA.

Parasitic animals living upon the *surface* of the body are (besides the *sarcoptes*) chiefly **lice**, **fleas**, and **ticks**. The former are the **head louse** (*pediculus capitis*), **body louse** (*p. corporis*), and **crab louse** (*p. pubis*). These are true insects, without wings. The *pre-ventive* of them is cleanliness, with avoidance of contact with unclean persons. Their *destruction* must be accomplished either by assiduous search and slaughter, or by parasiticide lotions, ointments, or powders; as corrosive sublimate, cinnabar, pyrethrum, cocculus indicus, sulphur, carbolic acid, staphisagria, sabadilla, alcohol, essential oils [F. 210, 211, 212].

Two or three grains of corrosive sublimate dissolved in an ounce of water, with a drachm or so of alcohol, will be as effectual as any of these. Powder or ointment of cocculus indicus is a good deal employed. The *flea-powder* of the East (quite useful in stupefying fleas in a bed, if sprinkled before lying down) is probably *pyrethrum*.

**Ticks** belong with the *arachnida* of naturalists. People living in the country often have them to enter the skin from other animals or from plants; *e. g.*, the harvest-tick (*leptus autumnalis*). The irritation is moderate and local only.

**Fleas** in most parts of the world produce only annoying *bites*, larger and somewhat more inflamed than mosquito-bites. In Brazil and other parts of South America the chigoe or jigger (*pulex penetrans*) makes a more permanent lodgment, and causes a very considerable irritation.

#### POISONS.

A few *memoranda* upon the more common poisons may be convenient here. Toxic agents are: 1. Irritant; 2. Narcotic; 3. Unclassified.

**Irritant or Corrosive Poisons.**—1. **Acids**; *e. g.*, *sulphuric*, *nitric*, *chlorohydric*, *oxalic*. For all but the last any alkaline substance (carbonate of sodium, potassium, magnesium, or calcium, or magnesia or lime alone), dissolved in or mixed with water, will be suitable as an antidote. *Oxalic acid* should have lime-water freely used as its antidote. 2. **Alkalies**; *e. g.*, caustic potassa, soda, strong solution of ammonia; earths, baryta, lime. For these vinegar or lemon-juice will act antidotally, making neutral salts. Olive or castor oil will *saponify* the alkaline material, and thus render it innocent. 3. **Corrosive Sublimate.**—For this, whites of eggs, or wheat flour mixed with water, will be the best. 4. **Arsenic.**—Hydrated

peroxide of iron has the reputation of being an almost certain antidote for the common arsenical compound, arsenious acid or white oxide of arsenic. It may be made fresh by adding *aqua ammoniac* to *liquor ferri persulphatis*, or *aqua ammoniac* to tincture of the chloride of iron. It is well for every physician to have a pint of each of the two first-named articles always within reach. The precipitated hydrate should be given promptly and freely. Some toxicologists regard *magnesia* as an almost equally reliable antidote for arsenic. 5. **Sulphate of Copper; Salts of Tin.**—Whites of eggs, milk, or flour mixed with water may be given freely. 6. **Tartar Emetic.**—Infusion of galls or oak-bark, or tannic acid in solution, may be administered copiously. Afterwards opiates, as paregoric, will help to compose the stomach and bowels. 7. **Acetate of Lead.**—Sulphate of magnesium is antidotal for this; making the insoluble and inert sulphate of lead. 8. **Sulphate of Iron** (green vitriol); **Sulphate of Zinc** (white vitriol).—Carbonate of sodium is recommended for these; copiously diluted. Flaxseed tea is a good diluent for any corrosive poison. 9. **Nitrate of Silver.**—Common salt is its antidote; making chloride of silver, inert. Drinking milk freely will also aid in protecting the stomach. 10. **Phosphorus.**—A mustard emetic may be the first thing. In *any* poisoning, not accompanied by vomiting as an effect, this will be proper. Magnesia and mucilaginous infusions may then be given, quickly and largely.<sup>1</sup> 11. **Iodine.**—Starch neutralizes iodine; but it will not neutralize iodide of potassium, for which no strictly chemical antidote is known. 12. **Creasote.**—Whites of eggs, or milk, or flour and water, will combine with it. But while waiting for these, free draughts of water should be given. For *carbolic acid*, which is the creasote of coal-oil, Messrs. Calvert state that olive or castor oil is the best antidote. Glycerin and raw eggs will also help to dilute or neutralize it. *Saccharate of lime* is said by Dr. T. Haseman to be an antidote for carbolic acid.

**Narcotic Poisons.—Opium.** When this or any other such poison has been taken, if the patient can swallow, an emetic should be given; ten grains of sulphate of copper, twenty grains of sulphate of zinc, half a teaspoonful of powder of ipecacuanha, or a tablespoonful of mustard, either dissolved or mixed in a large draught of warm water. Vomiting must be insured by repeated doses. If swallowing be impossible, the *stomach-pump* must be used; introducing the flexible tube through the pharynx into the stomach, and washing it out by gently injecting, and then withdrawing, half a pint of water at a time by a syringe.

If any antidote for opium or its alkaloids has given reason for confidence, it is belladonna. Facts fully warrant its administration. Twenty minims of tincture of belladonna may, in opiate narcotism, be given every hour; perhaps oftener. Dr. J. Johnson, of Shanghai, after a very large experience with opium poisoning in China, advises hypodermically injecting half a grain of atropia; to be repeated in two hours if it has failed to produce dilatation of

<sup>1</sup> Letheby, Audant, and Personne are reported to have shown that *oil of turpentine* is an antidote for phosphorus.

the pupils and tranquil breathing.<sup>1</sup> Strong coffee is an older remedy, upon a similar indication. To counteract the comatose tendency, also, cold water may be dashed or poured at intervals over the head and face; strong sinapisms may be applied to the back, epigastrium, and limbs; or the patient, if able, may be made to walk about; or flagellation with the hand or wet towel may be used for the same end.

In the extremest cases *faradization* may be used; the interrupted electrical current being applied to the spine and chest. *Galvano-puncture* is justifiable if other means fail; the fine needle being made to penetrate so as to reach the diaphragm, for the immediate stimulation of its muscular power. The needle for such a purpose should be of soft-tempered steel, platinized; fine and sound, well polished, three or four inches long, with a lance-shaped point. *Artificial respiration* is resorted to in some cases. (See *Asphyxia*.) Dr. Farnsworth, of Iowa, has used successfully the hypodermic injection of diluted *aqua ammoniac*.

**Belladonna** or *atropia* may be antagonized by opium, upon the same kind of evidence as that just alluded to. The antidotal action is not chemical, but physiological. Dr. H. C. Wood, Jr., however, asserts that there is much less satisfactory evidence of the curative influence of opium in poisoning from belladonna, than there is of the converse antagonism. He doubts the value of the former, while admitting the latter. **Stramonium** (Jamestown weed) must also stand in a similar relation to opium; and so may **hyoscyamus**, in a less positive degree. **Hydrate of chloral** may act poisonously in doses of over 50 grains. No certain antidote is yet known for it. An emetic or stomach-pump should be used, and strong coffee or tea may then be given, freely, till the respiration becomes normal.

**Unclassified Poisons.—Prussic Acid.** For this no certain antidote exists; and the arrest of life is so sudden as scarcely to allow its use, if we had one. T. and T. C. Smith, English chemists, assert that they have proved the following recipe to be antidotal for it:—

“Take of liquor of perchloride of iron 57 minims; protosulphate of iron in crystals, pure, 25 grains; as much water as will make a solution of a proto-sesquisalt of iron, measuring about half an ounce. Dissolve, on the other hand, 77 grains of crystallized carbonate of soda in about half an ounce of water. These quantities destroy the poisonous action of between 100 and 200 drops of prussic acid, officinal strength, by giving first the one liquid, and then the other. For *cyanide of potassium* the antidote is the same, except that the solution of proto-sesquisalt of iron is to be used without the soda solution; the hydrocyanic acid having been already combined with an alkaline substance. The use of the soda would, however, not be injurious. The quantities given, as above, would decompose 35 grains of cyanide of potassium.”

*Cold affusion, chlorine water and ammonia*, are the older measures advised for prussic acid poisoning.

<sup>1</sup> London Medical Record, April 9, 1873.

*Aconite, digitalis, hemlock, ergot, tobacco, lobelia, veratrum viride, aniline, strychnia, poisonous fungi*, etc., have no known antidotes. **Emetics** should be promptly given when any of them are known to have been taken. Castor oil is also recommended, especially for those least depressing in their action. Aconite, lobelia, and tobacco are the most powerfully sedative. **Animal charcoal** is advised, to absorb and render innocuous organic poisons in the stomach; teaspoonful doses should be given repeatedly. For the spasms caused by *strychnia* or *nux vomica*, inhalation of chloroform is thought to be beneficial. Hydrate of chloral has sometimes succeeded in relieving them. (*Medical News*, March, 1873.) For *tobacco, lobelia, aconite, digitalis*, or *veratrum viride* taken poisonously, brandy or whisky as a stimulant would seem to be indicated.

#### BITES OF SERPENTS.

When a person is bitten by a venomous serpent, or by a rabid dog or other animal, the part should be, if accessible, at once *sucked* strongly with the mouth, to avoid loss of time. Although it has been shown that the venom of serpents is not (as has generally been asserted) innocuous when swallowed, yet, in the absence of excoaration about the mouth, it may be safely withdrawn by suction and at once ejected. Wash the wound then thoroughly with *hot water*. Apply a cupping-glass for some minutes. Cauterize it with red-hot iron or caustic potassa; or carbolic acid, with one-half its bulk of alcohol; or if practicable, *excise* the part bitten. When this cannot be done, a tight ligature may retard absorption. *Aqua ammoniac* has been thought useful also as a local antidote for snake poison, as it is for that of venomous insects; and so has fluid extract of *serpentaria*.<sup>2</sup> The careful experiments of Dr. S. Weir Mitchell throw great doubt over the value of all asserted antidotes for the poison of the rattlesnake. He has shown, however, that a small amount of the venom is often introduced, without fatal effect; the danger depending on its quantity.

Should symptoms of poisoning have already followed the bite of a rattlesnake, experience seems to countenance the antagonistic and supporting use of whisky. Cures are said to have occurred in several instances, when the person bitten drank large amounts of this; intoxication not being produced, on account of the counteracting impression of the poison upon the system. One case of recovery after rattlesnake bite has been reported (*Medical Record*, August 1, 1871) under five twenty-grain doses of chloralhydrate.

Prof. Halford, of Melbourne, Australia, reports the recovery of 17 out of 20 cases of venomous snakebite, after the injection of 30 minims of liquor ammoniac (diluted, 1 part to 3 of water) with a

<sup>1</sup> Bromide of potassium has been used successfully as an antidote to strychnia, by Drs. Gillespie, Baird, and Bates. See *Am. Journal of Med. Sciences*, October, 1870; and *Philada. Med. Times*, June 1, 1871. S. Buckley obtained recovery in one case of strychnia poisoning by the hypodermic injection of atropia. See *Edinburgh Med. Journal*, September, 1873.

<sup>2</sup> Bibron's antidote consists of bromine, ʒjss; iodide of potassium, gr. ij; corrosive sublimate, gr. j; dilute alcohol, fʒxxx. Dose, fʒj, in wine or brandy, p. r. n. *Lime-water* is asserted by Dauverne to give immediate relief to the pain caused by the stings of bees and wasps.

hypodermic syringe, into a superficial vein. Five other Australian physicians confirm his statements; although less success has so far attended the same treatment elsewhere. Dr. Fayerer, with a large experience in India, has found it to fail altogether; possibly because some Indian serpents may be more fatally venomous than those of Australia.<sup>2</sup> Inspector-General C. J. Smith,<sup>3</sup> of Madras, has recorded the cure of a case of cobra poisoning, by the internal use of liquor ammoniæ, in half drachm doses, diluted, taken repeatedly every ten or fifteen minutes. Dr. Fayerer has more confidence in artificial respiration, in bad cases, than in any other remedy; but the cobra bite, especially in vascular parts of the body, is apt to be incurably fatal. So is that of the rattlesnake, about the face or neck; as well as that of the *phoorsa* snake.

#### ASPHYXIA.

Whether from drowning, breathing coal-gas in an unventilated apartment, or excessive inhalation of chloroform, etc., the treatment for suspended animation must be essentially the same in principle. First loosen everything about the neck. Draw the tongue forward and clear the mouth. Laying the patient upon the back, let both arms be raised (Sylvester) as far as possible above the head, and then brought down again; this should be repeated at least fifteen or twenty times a minute. Pacini's method of drawing the *shoulders* upward, and Bain's of lifting and letting them down, alternately, may be combined with Sylvester's. Blowing into the mouth or nostrils, with or without a trachea-tube or a quill in the nostril, is available sometimes, especially in a child; at the same time, when oxygen gas can be obtained (as, of course, it very rarely can), a jet of it may be used.

Passing a vial of solution of ammonia at intervals under the nostrils will aid to excite the nerve-centres. Rubbing the limbs and trunk, vigorously, and chiefly *towards* the heart, to hurry the venous circulation, is useful. So, also, is the application of mustard, or friction with red pepper and brandy or whisky. Hot bottles may be applied to the feet and legs. Excessive heat will not be expedient before respiration is established; but moderate warmth always promotes vitality. The application of a red-hot iron, momentarily, to the epigastrium or the back of the neck, for intensely stimulant effect, is not unreasonable in idea. Galvanism may be employed in any case of suspended animation. The extraordinary measure has recently been sometimes practised, of forcibly dilating the anus and introducing the hand and forearm into the bowel, as far as the colon. The semi-lunar ganglia, it is believed, may be thus subjected to stimulation by contact.

The Executive Committee of the Life Saving Society of New York, consisting of Prof. Frank Hamilton, Prof. C. F. Chandler,

<sup>1</sup> *Nature*, Sept. 8, 1870. The serpents were the very venomous tiger-snake and brown and black snakes of Australia.

<sup>2</sup> In 1871, Dr. Halford received thanks from the Government of India for the introduction of this treatment; and the republication of his pamphlet, for distribution, was officially ordered. Of 939 cases of snake-bite treated in Bengal by the police, with ammonia, 702 are said to have recovered.

<sup>3</sup> *Brit. Med. Journal*, Feb. 22, 1868.

and others, have issued the following series of rules for the treatment of persons rescued from the water in an insensible condition:—

Rule 1.—To drain off water from chest and stomach: Instantly strip the patient to the waist. Place him face downward, the pit of the stomach being raised above the level of the mouth by a large hard roll of clothing placed beneath it. Throw your weight forcibly two or three times, for a moment or two, upon the patient's back, over a roll of clothing, so as to press all fluids in the stomach out of the mouth.<sup>1</sup>

Rule 2.—To perform artificial breathing: Quickly turn the patient upon his back, the roll of clothing being so placed beneath as to make the breastbone the highest point of the body.

Kneel beside or astride patient's hips. Grasp the front part of the chest on either side of the pit of the stomach, resting your fingers along the spaces between the short ribs. Brace your elbows against your sides, and steadily grasping and pressing forward and upward, throwing your whole weight upon your chest, and gradually increasing the pressure while you can count one, two, three. Then, suddenly, let go with a final push, which springs you back to your first position. Rest erect upon your knees while you can count one, two; then make pressure again as before, repeating the entire motions at first about four or five times a minute, gradually increasing to about ten or twelve times.

Use the same regularity as in blowing bellows, and as is seen in natural breathing, which you are imitating.

If another person be present, let him, with one hand, by means of a dry piece of linen, hold the tip of the tongue out of one corner of the mouth, and, with the other hand, grasp both wrists and pin them to the ground above the patient's head.

*After-treatment.*—After breathing has become natural, dry the patient briskly. Wrap him in blankets only and let him be kept perfectly quiet. Provide free circulation of air. Give brandy and water—a teaspoonful every five minutes the first half hour, and afterwards occasionally as may seem expedient.

(On *Disinfectants*, see the end of the book.)

<sup>1</sup> Of course *violence* must be avoided in such a procedure.