

be sacrificed at times to peace of mind. The diet is to be simple and light at first, but as nutritious as possible with returning health: beef-tea palatably made, soups of any kind, milk if it does not increase constipation, scraped raw meat, with a little salt, and gruels, if not distasteful. Plain water, seltzer water, Apollinaris, or any simple carbonated drink, should be proffered at proper intervals, without over-solicitation or any anxiety should everything be refused. With the beginning subsidence of the disease an egg may be dropped into the soup, or sweetbreads, fish, the white meat of fowl may for a few days preface the more solid meats.

Especial attention is to be paid to the bladder. The soft catheter, thoroughly cleansed, warmed above the heat of the body, and greased with pure vaseline, brings this organ, when refractory, under control. Constipation is overcome with calomel, two to ten grains, or castor oil, in preference to an enema, which causes too much disturbance.

The treatment proper is purely symptomatic, and has reference to the two sets of symptoms, general and local. Of these the symptoms produced by the local lesions—pain, opisthotonos, hyperæsthesia—assume prominence in the great majority of cases. For the relief of these symptoms no remedy equals in value opium. Opium is the "sheet-anchor" in the treatment of cerebro-spinal meningitis. It acts solely by its anodyne influence. It protects, by obtunding, the nervous system until the force of the poison is spent. Surprising amounts of the drug may be given in this disease without narcotic effects. Thus Steiner often gave ten grains at a dose in cases of severe convulsions without producing stupor; Chauffard, three to fifteen grains; and Boudin, seven to fifteen grains at first, and later, one to two grains every hour before soporific effects were produced. Stillé was in the habit, he says, of prescribing one grain every hour in very severe, and every two hours in moderately severe cases, without inducing even an approach to narcotism in any case. "Under the influence of the medicine the pain and spasms subsided, the skin grew warmer and the pulse fuller, and the entire condition of the patient more hopeful." When quick effects are to be had, or when the drug is rejected by the stomach, resort will be had, of course, to the hypodermatic use of morphine. Ziemssen gives expression to an experience made by every practitioner with this disease when he says that morphine is, without doubt, "indispensable" in its treatment. But "medicus systematicus periculosissimus vir"; that would be indeed a routine physician who would prescribe opium indiscriminately in every case.

The use of the warm bath in cerebro-spinal meningitis was introduced by Aufrecht, of Magdeburg (1894), with the report of a single case cured by daily warm baths. Voroshilsky, of Odessa (1895), employed the warm baths three times a day in sessions of ten minutes at a temperature of 104° F. with good results in two cases. These observations were confirmed by Borling and Kellmeyer, of St. Petersburg, and Steckel, of Vienna, and more recently by Netter, who reports six cases treated with warm baths repeated every three or four hours, with no mortality. This experience leads Netter to declare that the warm bath is "a specific method of treatment of cerebro-spinal meningitis."

Venesection in this disease belongs to history, or is only at most to be practised in relief of intracranial pressure, as in apoplexy, in the most sthenic cases, and in these cases the same results may often be effected by milder means, as by purgatives, calomel, and jalap. But local blood-letting by cups along the spine, or by leeches behind the ears, may often relieve the headache and unrest. Cold in the form of bags of ice to the head or along the spine is of great value when the period of excitability, hyperæsthesia, and jactitation may have given place to the state of sopor and indifference. Radcliffe claims that "the application of cold to the head and spine either by means of ice or a freezing mixture in Esmarch's (or Chapman's) india-rubber bags, has fur-

nished by far the most satisfactory results of all direct treatment."

Vomiting is best relieved by ice, champagne, effervescent drinks, milk and lime water, bismuth, soda, carboic acid, or creosote. No drug equals in efficacy sips of water excessively hot.

Hiccough is often brought under control by the same means prescribed for vomiting, by the administration of a few drops of the oil of cajeput, or by clysters of sodium bromide. More obstinate cases of either vomiting or singultus call for the subcutaneous use of morphine.

The hypodermatic injection of an aqueous solution of corrosive sublimate along the spinal column has been recommended by Angyan in daily doses of 1. cgm. for adults and .5 cgm. for children, continued until the rigidity disappears. Angyan reports thirty cases treated in this way with twenty-one recoveries.

Kay lauds the virtue of permanganate of potassium in grain-to-the-ounce solution, a tablespoonful every hour, and reports four cases with three recoveries.

It is useless to encumber space in a work of this kind with more than a mention of other remedies lauded in the treatment of this disease. As to quinine, which was recommended by the committee of the American Medical Association, it is now admitted to be of no avail whatever, except in antipyresis, a call which is seldom made in this disease. But in the exceptional cases, in which high fever does occur, quinine in scruple dose, salicylic acid or antipyrin in double the quantity, are more valuable than the cold bath, because of the commotion created by the bath. Blisters, moxa, ferrum candens, are brutal assaults in the height of the disease, but may be justifiable in the treatment of sequela. The same remarks apply to the use of electricity. Ergot, iodine, physostigma, mercury, the benzoates, the bromides (which may be substituted for opium in a very mild case), other anodynes, belladonna, with a host of other remedies, have been recommended on theoretical grounds, or praised as specifics by practitioners of the "experience" school, who for the most part remain untrained to eliminate "the personal equation," but none of them stands the test of time.

Lumbar puncture has been recommended in treatment, but is not at the present time believed to be curative, although after the withdrawal of a small amount of fluid there is often marked improvement of the symptoms.

The various symptoms presented in the course of the disease are treated precisely as are the same symptoms in any acute infection, after methods mentioned in detail in this work in the history of diseases in which these symptoms assume especial prominence.

James T. Whittaker.
George E. Malsbary.

CERIUM.—A single salt, only, of cerium is official in the United States Pharmacopœia, namely, *cerous oxalate*, entitled *Ceri Oxalas*, Cerium Oxalate: formula, $Ce_2(C_2O_4)_3 \cdot 9H_2O$. This salt is "a white, granular powder, without odor or taste, and permanent in the air. Insoluble in water, alcohol, ether, or in solutions of potassium or sodium hydrate; soluble in diluted sulphuric or hydrochloric acid" (U. S. P.). In effect cerous oxalate most nearly resembles the insoluble bismuth compounds, being, from its insolubility, devoid of active properties, but yet like many other insoluble metallic powders, having a power to allay local nervous irritability. This influence is utilized to combat reflex nausea and vomiting, especially the vomiting of pregnancy, and also to repress irritative dry coughs. In this latter application, when successful, the present drug has the advantage over the ordinary run of cough medicines of not disordering the stomach, but, on the contrary, of tending to quell any irritation of that organ. The oxalate may be given in doses of from .30 to .65 gm. (gr. v. to x.) several times a day, best taken dry upon the tongue. Such doses may be kept up for a number of days in succession with no other effect than causing, at first, a little dryness of the mouth. For cough, the medicine should be persisted in even if, as

may happen, there be no benefit for the first two or three days; and especially should doses be given on the empty stomach early in the morning and late at night.*

Edward Curtis.

CERVICAL FISTULA. See *Teratology*.

CERVICO-BRACHIAL NEURALGIA. See *Neuralgia*.

CERVICO-OCCIPITAL NEURALGIA. See *Neuralgia*.

CESTODA.†—The branch or Phylum Platyhelminthes, commonly known as the Flat Worms, is characterized by a bilaterally symmetrical body somewhat flattened by dorso-ventrally and usually elongate, by the mass of parenchymatous tissue which fills all the spaces of the body, by the absence of any true body cavity, by a protonephridial excretory system, and by the complicated sexual apparatus which with rare exceptions is hermaphroditic, and which produces so called compound eggs. Among the most prominent orders of the branch are the Trematoda or Flukes (*q. v.*) and the Cestoda or Tapeworms to be considered here.

The order Cestoda includes a large number of forms which manifest considerable differences in anatomical detail, but are comparatively uniform in general appearance and structure. The small group of Cestodaria, or Monozoa, which differ from all others in possessing but a single set of reproductive organs, and consequently but a single segment in the body, is included by some investigators in the order under consideration, but by others placed intermediate between the trematodes and the cestodes, forming as it undoubtedly does a group transitional from the one order to the other. The species of Cestodaria are, however, rare and infest the lower animals, so that they will not be discussed here.

In the Cestoda *s. str.* the body is characteristically ribbon-like and divided into "links," segments, or proglottides. In most cases, including all the tapeworms of man, the segmentation is evident externally. At the posterior end of the chain the proglottides are larger and more distinct, and often so loosely attached as to separate from the series under the slightest disturbance. In fact such separation takes place normally as the segments become ripe. Toward the other end of the chain the proglottides grow gradually smaller and less distinct until near the anterior end it is usual to find a short region, the neck, in which no trace of segmentation is visible. The anterior end has the form of a bulbous swelling, known as the head or scolex (Fig. 1203), on which are borne the organs of fixation. The latter are either suckers, hooks, or both, and the suckers may be either elongate grooves or bothridia, cup-shaped hollows or acetabula, or, as in some marine tapeworms, of a folded form which is much more complicated.

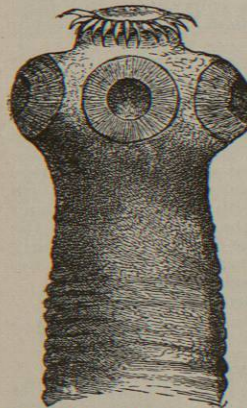


Fig. 1203.—Anterior End of *Taenia solium*, Showing Scolex, Suckers, Rostellum with Hooks, and Neck. $\times 45$.

At the apex of the head is found in the *Tæniadae* a

* Report to New York Therapeutical Society; the Medical Record, June 12th, 1880.

† A general discussion of parasitism and its effects will be found under the heading *Parasites*.

muscular organ, the rostellum which bears the hooks, usually in one or more annular rows. In form and degree of development the rostellum is a very variable organ; at the one extreme in *Taenia saginata* it is reduced to a small muscular sucking apparatus, often spoken of as the apical or fifth sucker of that species, while in other forms it is powerfully developed and capable of extension or retraction into a pocket at the apex of the scolex. It is a valuable feature in the distinction of various species.

In the head one finds the central nervous system in the form of a bilateral ganglionic mass with one or two ring-like commissures from which nerves are given off directly to the suckers and rostellum, and from which the longitudinal nerve trunks pass backward throughout the

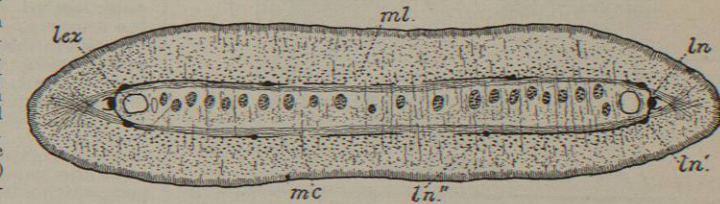


Fig. 1204.—Transverse section of Proglottis of *Taenia solium*, Somewhat Diagrammatic. *ln*, Main lateral nerve; *ln'*, accessory lateral nerve; *ln''*, ventral longitudinal nerve; *lex*, longitudinal excretory canal; *ml*, longitudinal body muscles; *mc*, transverse body muscles. The section is represented as having cut one of the ring commissures throughout nearly its entire extent. (Original.)

length of the chain. Three of these trunks, the main lateral nerve (Fig. 1204, *ln*) and two minor (*ln'*) are grouped together on each side of the proglottis, while the two dorsal and the two ventral longitudinal nerves (*ln''*) are located nearer the median line. The various longitudinal trunks are connected by commissures which at stated intervals pass around the proglottis; they also give off branches by which the various organs are innervated.

Near the lateral nerve trunks are located the main longitudinal canals (*lex*) of the excretory system which originate in an irregular network in the head and from which are given off numerous branches often in the form of a network of fine vessels in each proglottis. In many forms a prominent transverse canal near the posterior margin of each proglottis joins the longitudinal canals (cf. Fig. 1205, *O*). Terminating the finer canals of this system are found the characteristic flame cells which are peculiar to this type of excretory system.

A cross section of a proglottis (Fig. 1204) shows the various layers of which it is composed. Externally the cuticula, a resistant, elastic membrane, covers the body and is reflected a short distance inward at the various external orifices. The older view, by virtue of which an epithelium is wanting in cestodes and the outer layer represents a basement membrane, has been definitely set aside by the recent investigations of Blochmann; the cuticula is really the product of the subcuticular cells, though they are apparently separated from it by a considerable interval. Immediately beneath it occurs a delicate double layer of dermal muscles, having externally circular, and internally longitudinal fibres, the myoblasts of which lie deeper in the body. Between these fibres the bases of the subcuticular cells extend from the cuticula to the deeper lying bodies of the cells; the remaining space of the body between the various organs is filled with parenchymatous tissue. Within the parenchyma occur usually large numbers of calcareous bodies, highly refractive spherical or oval masses of small size, the function of which is yet uncertain. They are, however, characteristic features of cestode structure.

The cross section is divided by the parenchyma or body musculature into two regions, an external cortical layer and the median area or medullary region. In the latter are found most of the reproductive organs, although in the Bothriocephalidæ the vitellaria lie in the cortical layer. The body muscles are of three sets, longitudinal, transverse, and dorso-ventral or sagittal. The longitudinal