

Locality.	Total number of autopsies.	HYDATIDS PRESENT.	
		Cases.	Percentage.
Rostock.....	1,025	25	2.43
Breslau.....	1,360	20	1.47
Berlin.....	4,470	33	.76
Göttingen.....	639	3	.46
Dresden.....	2,002	7	.34
Vienna.....	1,229	3	.24
Prague.....	1,287	3	.23
Erlangen.....	1,812	2	.11

from which the following data are taken. It is entirely unknown how many patients were infected outside the limits of this continent; certainly some of them acquired the parasite in other countries.

BY SEX.	
Males.....	47
Females.....	28
Unstated.....	25

BY NATIVITY.	
Azorian.....	1
Colored.....	1
English.....	5
Foreigners.....	2
French.....	2
German.....	15
Irish.....	2
Italian.....	5
Japanese.....	1
Mexican.....	1
Mulatto.....	2
Negro.....	2
Pole.....	1
Swede.....	1
Welsh.....	1
White.....	4
Unstated.....	54
Total.....	100

BY STATES.	
Alabama.....	2
California.....	1
Connecticut.....	1
District of Columbia.....	4
Illinois.....	3
Indiana.....	1
Kentucky.....	2
Louisiana.....	1 (or 2?)
Massachusetts.....	5 (or 6?)
Michigan.....	1
Missouri.....	2
New Jersey.....	1
New York.....	33
Ohio.....	7
Pennsylvania.....	10
Tennessee.....	1
Texas.....	1 (+?)
Vermont.....	1
Virginia.....	2
Washington.....	1
Unstated.....	15
Total.....	100

Caution should be exercised in the identification of supposed echinococcus bladders from domestic animals since the hydatid of *Tenia serialis* of the dog, which is abundant in the United States, is large, at times even of very considerable size, and produces numerous secondary bladders both internally and externally, so that the general appearance suggests that of echinococcus. The size and form of the scolices and of the hooks are so very different that even a superficial microscopic examination serves to distinguish the two forms. The hydatid of *Tenia serialis* is common in the rabbit and has also been reported from the horse.

**Pathology.**—The larva gives rise to the hydatid or echinococcus disease, the symptoms of which vary with the seat of the parasite. Cases are on record in which the hydatid has existed for 2, 4, 8, 15, 18, and even 30 years in man. It may be found in any organ, but is most frequently recorded from the liver or lungs. At times its presence is not suspected until revealed by post-mortem examination; and, the danger depends in any case upon the precise location and the size attained by the hydatid. In some situations hydatids exert a fatal pressure upon important vessels or nerves or destroy the tissue of essential organs. They often cause fatal results by bursting into a serous cavity or a blood-vessel, the toxic effect of the fluid having been noted already. Somer gives the following table for 1,806 cases recorded in various countries:

	CLASSIFICATION BY HABITAT.			Total.
	United States.	Canada.	Other countries.	
Liver.....	62	7	942	1,011
Lung.....	7	..	140	147
Passed per rectum.....	2	..	..	2
Spleen.....	3	2	37	42
Brain.....	3	..	..	3
Abdominal wall.....	1	..	..	1
Vomited.....	2	..	..	2

	United States.	Canada.	Other countries.	Total.
Common bile duct.....	2	..	..	2
Bones.....	1	..	..	1
Bladder.....	6	..	..	6
Eye.....	1	..	..	1
Pericardium.....	1	..	..	1
Ovaries.....	1	..	..	1
Uterus.....	3	..	..	3
Trunk and limbs.....	..	..	4	4
Kidneys.....	3	..	123	126
Neck (fascia).....	1	..	..	1
Stomach.....	1	1	..	2
Extensors of thigh.....	1	..	..	1
Pleura.....	1	..	19	20
Circulatory apparatus.....	..	..	53	53
Cranial cavity.....	..	..	91	91
Spinal canal.....	..	..	13	13
Pelvis.....	3	2	70	75
Peritoneum and omentum.....	1	..	61	62
Mesentery and omentum.....	1	..	..	1
Female genital organs and mammary glands.....	..	..	60	60
Male genital organs.....	..	..	9	9
Face, orbit, and mouth.....	..	..	41	41
Neck.....	..	..	18	18
Abdomen.....	2	..	..	2
Omentum.....	1	..	..	1
Brain (ventricles).....	1	..	..	1
Totals.....	113	12	1,681	1,806

**Prevention.**—As "hydatid disease is the most fatal zoonotic parasite disease which affects man, fifty per cent. of the cases dying within five years after infection," too great insistence cannot be laid upon the necessity of guarding against the disease and stamping it out. Measures should be taken to destroy all stray dogs, to prohibit the presence of dogs at abattoirs, to destroy all hydatids found in slaughtered animals, and to discourage all intimate association with dogs. Methods for the treatment of echinococcus diseases in man have been suggested, but surgical interference alone has met with satisfactory results.

**DAVAINEA** R. Blanchard 1891.—Small cestodes with prominent rostellum, sometimes retractile, armed with many small hooks of characteristic form, which may be caducous. Genital pores unilateral, or alternating irregularly. Eggs in capsules. Development unknown.

**DAVAINEA MADAGASCARIENSIS** R. Blanchard 1891; *Tenia demerariensis* C. W. Daniels 1895.—Length up to 24 cm. with five hundred to six hundred proglottides. Head (Fig. 1233) with retractile rostellum having ninety hooks, 18  $\mu$  in length, which may be wanting. Genital pores unilateral. Ripe proglottides 2 mm. long, 1.4 mm. broad. Eggs in groups surrounded by heavy capsules of parenchyma forming the characteristic egg balls which fill the entire ripe proglottides. Onchospheres 8  $\mu$  in diameter with six delicate nearly straight hooks, surrounded by two transparent membranes of which the outer has two pointed prolongations.

The growth of the cestode is very rapid. At 3 cm. from the head proglottides may be seen in copula. The last hundred segments, which make up more than half of the entire length of the worm, contain only eggs about which the capsules are forming. The characteristic appearance of the ripe proglottis is given in the figure (Fig. 1234). Of the development nothing is known. Blanchard surmises that the larval host is a cosmopolitan insect (e.g., cockroach), which tallies well with known facts regarding the parasite.

Ten cases of the occurrence of this cestode in man are

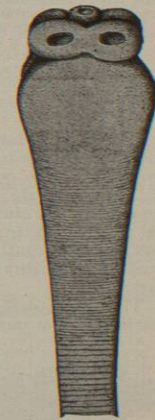


FIG. 1233.—Anterior End of *Davainea madagascariensis*.  $\times 14$ . (After Blanchard.)

on record; they are distributed over the tropics, including both hemispheres. With one exception all individuals affected were infants or children. Although not yet recorded from any other host, it should be noted that the species may be only an adventitious parasite of man.

**HYMENOLEPIS** Weinland 1858; *Diplacanthus* Weinland.—Scolex small, rostellum retractile, armed; suckers unarmed. Genital pores on left margin; three testes in each proglottis. Ripe uterus fills entire proglottis. Eggs spherical or elongated with three widely separated membranes. Larval stage a cercocystis or staphylocystis.

**HYMENOLEPIS NANA** R. Blanchard 1891; *T. aegyptiaca* Bilharz, *Diplacanthus nanus* Weinland.—Length (Fig. 1235) 10 to 15 mm., rarely 20 mm., breadth 0.5 to 0.7 mm.

Spherical scolex (Fig. 1236) 0.25 to 0.3 mm. in diameter with retractile rostellum armed with a single circle of twenty-four to thirty hooks which are only 14 to 18  $\mu$  long. Neck long, proglottides about one hundred and fifty in number, very short, the largest measuring only 0.4 to 0.9 mm. wide by 0.14 to 0.3 mm. long. External egg membrane, measures 30 to 40 rarely 50  $\mu$ , in diameter, the onchosphere membrane 16 to 20  $\mu$ . Adult in the small intestine of man.

The development of this species is still unknown. Grassi regards it as identical with *H. murina* from the rat. According to his investigations this latter form develops directly without any secondary host, so that the chance consumption of ripe proglottides or of onchospheres would ultimately produce the adult tapeworm. Other authors have emphasized a series of differences in detail which militate against the identity of the two forms. In experiments with six persons who had swallowed ripe proglottides of *H. murina*, Grassi obtained specimens of *H. nana* only once, which in a region where the latter is abundant proves nothing. On the other hand the same investigator was unable to infect rats by feeding them ripe proglottides of *H. nana*. The evidently close relationship of the two species is presumption in favor of a similar mode of development.

Discovered in 1851 by Bilharz in Egypt it has been reported occasionally from Russia, Germany, England, France, Argentina, and the United States. In Italy it appears to be comparatively abundant.

The single record of its occurrence in the United States (Spooner, 1873) is somewhat uncertain since the author mentions the possibility that the form described belonged to the following species. *Hymenolepis nana* has been

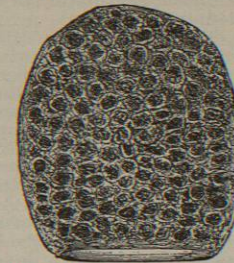


FIG. 1234.—Ripe Proglottis of *Davainea madagascariensis* just Liberated from the Chain.  $\times 10$ . (After Davaine.)

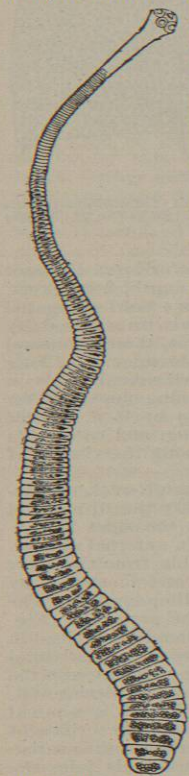


FIG. 1235.—Entire Specimen of *Hymenolepis nana*.  $\times 15$ . (After Leuckart.)

found chiefly in infants, less commonly in children, and only very rarely in adults. It occurs in considerable numbers, two hundred and fifty to one thousand and over, and gives rise to more serious disturbances than are attributable to the large cestodes. In addition to gastric disturbances, secondary reflex nervous symptoms, even epilepsy, have been observed; though of long standing they disappear with the removal of the parasites.

**HYMENOLEPIS DIMINUTA** R. Blanchard 1891; *T. diminuta* Rud., *T. leptocephala* Creplin, *T. flavopunctata* Weinland, *T. carensina* Parona, *T. minima* Grassi.—Length 20 to 60 cm., width 3.5 mm. Head (Fig. 1237) small, claviform, with rudimentary unarmed rostellum. Neck short. Proglottides short and indistinct at first, increasing gradually to a maximum near the posterior end of the chain of 0.66 mm. long by 3.5 mm. wide. External egg membrane, 60 to 86  $\mu$  in length, internal with polar projections; onchospheres, 36 by 28  $\mu$ . Adults in small intestine of various rats and mice, and rarely also of man; larvae (cercocystis) in various insects, chiefly the meal worm (*Asopia farinalis*).

The structure of the species is typical for the group. It has been studied with great care by Zschokke. The arrangement of organs in the sexually mature proglottides is evident from the figure given (Fig. 1238). In the ripe proglottis the egg-filled uterus occupies the entire space within the walls of the segment save for the large flask-shaped cirrus. Sterile proglottides of smaller size and without eggs occur at times in the series.

The larval form, a cercocystis, occurs in many insects, Lepidoptera, Coleoptera, and Orthoptera. Its usual host is the larva and adult of a small moth (*Asopia*). The development to the adult form has been observed in white rats and in man where some fifteen days intervene before the appearance of ripe eggs in the faeces.

This species was first collected from man in Boston in 1842, and described by Weinland in 1858, who regarded it as a new species, *T. flavopunctata*. In 1884 Leidy recorded it from Philadelphia. It has also been observed as a human parasite in Italy and France, and may be met with more widely since its normal host, the rat, is a cosmopolite.

Heretofore it has been found only in infants and children, and the introduction of the larval parasite was probably due to eating fruit or other food in which an infected insect or grub was concealed.

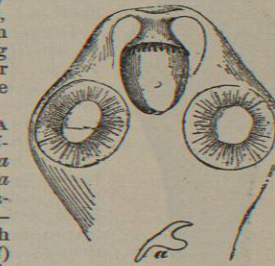


FIG. 1236.—Scolex of *Hymenolepis nana* with Rostellum Retracted.  $\times 80$ . a, Isolated hook.  $\times 480$ . (After Leuckart.)

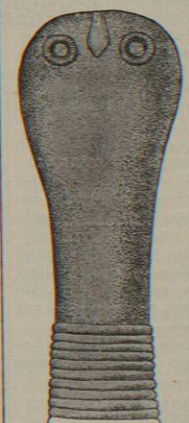


FIG. 1237.—Anterior End of *Hymenolepis diminuta*. Magnified. (After Zschokke.)

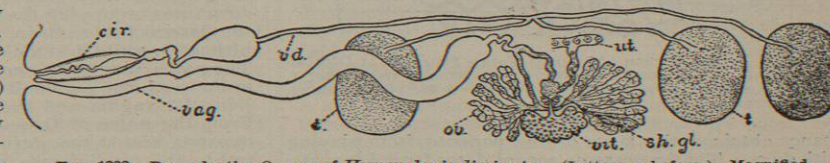


FIG. 1238.—Reproductive Organs of *Hymenolepis diminuta*. (Letters as before.) Magnified. (After Zschokke.)

**DIPYLIDIUM** R. Leuckart 1863.—Rostellum retractile, armed with several annular rows of alternating hooks. Genital pores opposite, organs doubled. Uterus at first a reticulum, which later becomes changed into sacs holding one or more eggs each. Eggs with double shell.

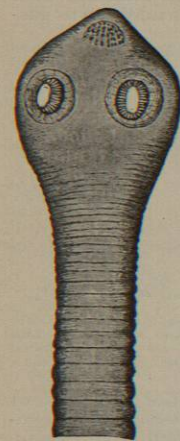


Fig. 1239.—Anterior End of *Dipylidium caninum*. (Original.)

**DIPYLIDIUM CANINUM** Railliet 1893; *T. moniliformis* Pallas, *T. cucumerina* Bloch, *T. elliptica* Batsch.—Length 10 to 40 cm., greatest width 1.5 to 3 mm. Scolex (Fig. 1239) small with retractile claviform rostellum armed with three or four rows of thorn-shaped hooks which decrease in size from 15  $\mu$  in the first row to 6  $\mu$  in the last; suckers elliptical, neck short. First proglottides small, becoming trapezoidal and finally characteristically of melon-seed form. Eggs spherical, 43–50  $\mu$  in diameter; onchosphere, 32 to 36  $\mu$  in diameter. Adult parasitic in the small intestine of the dog, cat, and rarely also man; larva (cryptocystis) in the body cavity of the dog flea and dog louse.

The most striking feature of the structure of this species is the doubling of the reproductive organs, a complete set with genital pores and copulatory organs being present on each side of the proglottis (Fig. 1240). The branches of the uterus, however, become cut off as small capsules containing eight to twelve eggs each; in the ripe proglottis the mass of such capsules fills the entire middle field, and a reddish-brown substance deposited around the eggs imparts a characteristic pink color to these segments. Prismatic and fenestrated specimens have been observed, and also individuals in which four sets of organs lay in a single proglottis.

The onchosphere is transformed in the body cavity of the dog flea, or even of the human flea, into a tailed larva, or cryptocystis. When the dogs, annoyed by the work of the fleas, hunt out and destroy these pests, it is easy to see how they infect themselves.

With a single exception all recorded cases of this tapeworm in man are among children who have by some

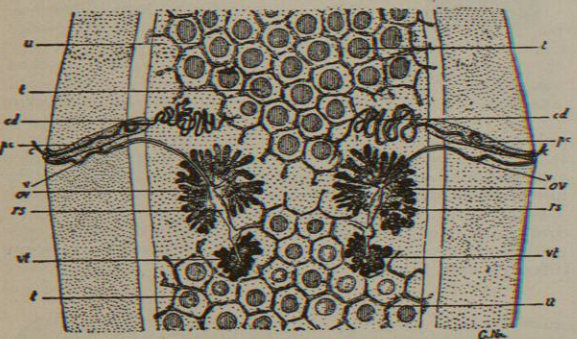


Fig. 1240.—Median Portion of Sexually Mature Proglottis of *Dipylidium caninum*; c, cirrus; ov, ovary; rs, seminal receptacle; t, testis; u, uterus; v, vagina; vt, vitellarium.  $\times 25$ . (From Railliet, after Neumann.)

chance obtained the larva of the parasite from playing with dogs. The first case on record dates from Linnæus, and other cases have been reported from England, Ger-

many, France, Russia, and Scandinavia. Judging from the frequency of the parasite in dogs in this country, similar cases should not be rare here. I have found none definitely recorded.

The order Pseudophyllidea is characterized by the presence on the scolex of two poorly developed sucking grooves which may be in some cases much modified. Of the three sexual pores the uterine orifice lies always on one surface of the proglottis, whereas the two others may be on the same or opposite surface, or on the margin of the proglottis. The sexual organs are generally single, rarely doubled; their development does not transcend the stage of maturity so that no parts degenerate. Eggs usually with cover. Among the twenty-one genera known, only two are of immediate importance here.

**DIBOTHRIOCEPHALUS** Lühe.—Scolex elongated; suckers not powerfully developed; genital organs single; genital pores ventral; uterus in coils in centre of the proglottis producing a characteristic rosette figure (Fig. 1241).

**DIBOTHRIOCEPHALUS LATUS** Lühe 1899; *Tenia lata*

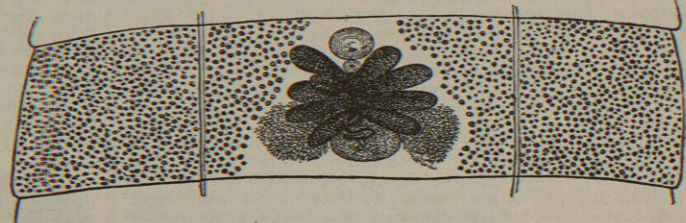


Fig. 1241.—Ventral Aspect of Sexually Mature Proglottis of *Dibothriocephalus latus*, Showing Female Reproductive Organs. (After Leuckart.)

and *T. vulgaris* L. 1748; *Bothriocephalus latus* Bremser 1819; *Dibothrium latus* Dies 1850. Length, 2–9 meters, rarely up to 20 meters, grayish yellow; head elongated oval, 2–3 mm. long, 0.7–1 mm. broad, transversely by two deep lateral grooves. Proglottides, three thousand to four thousand in number, usually broader than long but becoming gradually quadratic. All sexual pores on mid-ventral line, cirrus and vagina opening close together and in front of uterus. Eggs, 68–70  $\mu$  by 45  $\mu$ . Adult parasitic in small intestine of man, dog, and cat; larva (plerocercoid) in the muscles and among the viscera of various fish.

**Structure.**—The longitudinal sucking grooves, characteristic of these forms, occupy in reality the upper and lower face of the head, appearing at the sides in consequence of the torsion of the neck. In external appearance the chain is clearly distinguishable from the other large human tapeworms, *T. saginata* and *T. solium*, by its greater thickness at the middle of the segment. The arrangement of the sexual organs in the proglottis (Fig. 1206) also differs radically from that already described in the genus *Tenia*. The numerous testes occupy a lateral position in the medullary region of the segment, and the vas deferens extends in loops toward the anterior end, terminating in a muscular cirrus pouch with a seminal vesicle. Next the male genital pore lies the orifice of the vagina which passes directly posteriad in the median line, and after forming a receptaculum seminis joins the common yolk duct near the centre of the voluminous shell gland. The vitellaria or yolk glands are racemose structures occupying the cortical layer of the segment in the lateral fields; their numerous ducts converge and ultimately unite into the common yolk duct noted above. The paired ovaries lie one on either side of the shell gland in the posterior region of the proglottis, and the oviduct joins the vagina and the yolk duct in the shell gland. From the union of these ducts originates a canal which expands, and as the uterus, lying in irregular loops ventral to the vas deferens, extends forward to the special uterine orifice, a simple pore in the mid-ventral line a

short distance behind the common opening of the cirrus and vagina. In the last proglottides the uterus is often empty of eggs and the genital glands are atrophied.

**Development.**—Ripe proglottides contain numbers of brownish, elliptical eggs in which may be distinguished the egg cell surrounded by masses of yolk cells. After lying in water several weeks a ciliated onchosphere (Fig. 1209) is hatched out and swims about in the surrounding water. Sometimes this embryo throws off the ciliary covering, but ultimately dies without attaining any further development. How the onchosphere is transformed into a plerocercoid remains still undiscovered. Braun was inclined to believe in the necessity of another intermediate host, and Leuckart and others have endeavored in vain to infect directly with onchospheres the various fish which harbor the larval form. The bladder worm of *Dibothriocephalus latus* was first discovered by Braun in the muscles and viscera of food fish in the Baltic provinces. It is an elongated form known as a plerocercoid (Fig. 1242), and measures 8–30 mm. in length. These larvae were abundant in fresh fish from Dorpat markets, and living specimens were also obtained from smoked, salted, and frozen fish as well as in the roes of the pike, which salted are eaten raw as caviar. Experimentation on dogs, cats, and man established the connection of this larva with the adult *Dibothriocephalus latus*. Other authors, notably Zschokke in Switzerland (Geneva), have discovered the larvae in perch, salmon, trout, grayling, and whitefish, and in some instances have determined experimentally their relation to the species of cestode under consideration, confirming fully the discoveries of Braun. In Scandinavia, Lombardy, Switzerland, and Japan the existence of the plerocercoid in various fishes and the consumption of some part of the latter in a raw condition by the native population explain the method of human infection which has been further determined experimentally in specific cases.

Once introduced into the human alimentary canal the development of this tapeworm is very rapid, being from 5 to 9 cm. per day in the various cases. Eggs appear in the feces of man in from twenty-four to thirty days after infection.

**Anomalies.**—Slender specimens (var. *tenella*) have been recorded, as also some with exceptionally large proglottides. One specimen of the prismatic variety is on record (cf. *T. saginata*) and fenestration of greater or less extent is not rare. Most frequent, however, is the reduplication of the genital pores and organs which Leuckart says he has never failed to find in some proglottis of each specimen examined. Under a separate name (*Bothriocephalus cristatus*) Davaine described a variety which is distinguished from the common by possessing a projecting longitudinal ridge on each flat surface of the head.

**Geographical Distribution.**—The peculiarities in the distribution of this species are intelligible in the light of its development. It is abundant on the shores of the Baltic, especially the Russian and east Prussian, and around the lakes of French Switzerland, while the territory adjacent to these regions furnishes sporadic cases varying greatly in frequency. Small centres, like Munich (Bavaria), are known to exist, where the origin of the parasite has been attributed to the fish of a certain lake or lake region. In Africa a new centre has been reported recently in the territory around Lake N'gami. In Japan this form is the most abundant of human and canine parasites. Its presence in other regions than those noted has been recorded occasionally, and usually in persons known to have come from the infected regions. Of this type is the record of its presence in Philadelphia made by Leidy. According to Zschokke this species is becoming rarer in Geneva, its frequency having fallen

in thirty years from ten to one per cent., and in Paris where it was abundant in the eighteenth century it is no longer autochthonous.

**Pathology.**—It is sometimes solitary, though several individuals occur together in the majority of cases and nearly one hundred have been recorded from a single host. Evidently its frequency depends upon the habits of the individual in eating raw or poorly cooked fish no less than upon the locality. The effect of the parasite is often unnoticed; in other cases are noted gastric and nervous disturbances, and even pernicious anæmia, which disappear with the removal of the worm. These troubles have been attributed to the production of some toxic substance by the parasite. It should be noted that a self-infection is impossible.

**DIBOTHRIOCEPHALUS CORDATUS** (Leuckart 1862).—Length, 80 to 115 cm. Head (Fig. 1243), 2 mm. in diameter, flattened cordiform, with deep bothridia on ventral and dorsal surfaces. Segmentation begins directly behind the head; the proglottides, which increase rapidly in width, become mature within 3 cm. The largest proglottides measure 7–8 mm. in length by 3–4 mm. in breadth and number about six hundred. Eggs, with cover, measure 75  $\mu$  by 50  $\mu$ . Adult parasitic in seal, walrus, dog, and man in Greenland; larva unknown.

The adult is a common parasite in its native land, but records of its presence outside of Greenland are based on errors. However, sporadic cases may occur in those who have become infected while visiting its native home. The intermediate host is doubtless a fish.

**DIBOTHRIUM MANSONI** Ariola 1900. *Ligula Mansoni* Cobbold; *Bothriocephalus liguloides* Leuckart; *B. Mansoni* R. Bl.—Adult unknown. Larva a plerocercoid; length, 12 to 20 or even to 35 cm.; breadth, 3–6–12 mm.; flattened without proglottides, but marked by irregular folds. Anterior end enlarged, bearing the head which may be drawn in or evaginated, and on which two faint bothridia are visible. Parasitic in connective tissue of man in Japan and China.

Ten cases of the occurrence of this parasite are reported, one from China and the rest from Japan. It was first found by Manson in an autopsy when a dozen specimens were taken from below the peritoneum, and one free in the peritoneal cavity. Ijima and Murata have described in detail seven cases from Japan; in three the parasite was passed with urine or taken from the urethra, in three cases also it was drawn from tumors of the eye, and in one from a cavity in the subcutaneous connective tissue of the thigh.

Doubtless the larva wanders about in the body of its host, in which, as appears from the details of the last case cited, it may remain active as long as nine years. Ultimately it reaches the surface of the body or of an internal organ (bladder) from which it eventually attains the exterior. Of its origin or its further development nothing is known. No trace of reproductive organs could be found in the specimens studied. In its unusual size and in the presence of longitudinal grooves on the ventral surface, this larva resembles the following species of which the adult alone is known.

**DIPLOGONOPORUS GRANDIS** Lühe 1899; *Krabbea grandis* R. Blanchard 1894.—Genital organs doubled in each proglottis; in other respects identical with those of *Dibothriocephalus*. Genital orifices of each set ventral on either side of the median line of the body, but in the median line of either uterine field.

**DIPLOGONOPORUS GRANDIS** Lühe 1899; *Krabbea grandis* R. Blanchard.—Length, 10 meters or more; maximum breadth at anterior end 1.5 mm., in broadest region 25 mm. Proglottides very short, near posterior end only 0.45 mm. in length by 14 to 16 mm. in breadth. Scolex unknown. Genital organs double; two lateral rows of sexual openings on the ventral sur-



Fig. 1242.—Plerocercoids of *Dibothriocephalus latus* from Pike. A, Natural size; B, C, with scolex protruded and retracted.  $\times 2$ . (After Leuckart.)



Fig. 1243.—Anterior End of *Dibothriocephalus cordatus* in Lateral and Surface Views.  $\times 5$ . (After Leuckart.)

face, located in longitudinal grooves with genital sinus in front and orifice of uterus behind it. Eggs brown, thick shelled, 63  $\mu$  by 48 to 50  $\mu$  in diameter. Found in

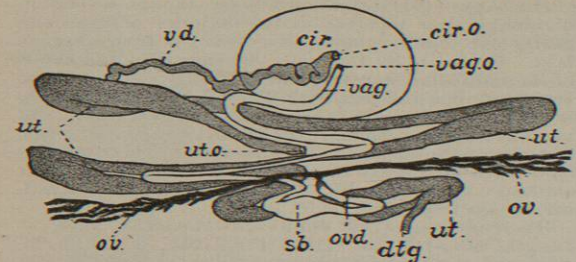


FIG. 1244.—Sinistral Set of Reproductive Organs from Sexually Mature Proglottis of *Diplogonoporus grandis*.  $\times 140$ . (After Ijima and Kurimoto.)

man in Japan; larva unknown. The first account of this remarkable species was given by Ijima and Kurimoto. It is unique not only in the extreme size manifested, but also in the double genital apparatus which occurs in some species from seals, but save for this species is unknown among human parasites of this group. The sexual organs (Fig. 1244) are characteristically bothriocephaline, but they are found in double sets right and left in each segment, and the orifices open at the bottom of two longitudinal grooves which are characteristic features in the appearance of the worm (Fig. 1245).

The authors report that the patient had suffered for five years from dizziness and colic which had finally become so severe as to call for his admission to the hospital at Nagasaki. Here the parasite was removed and even on the following day all the trouble of long standing had entirely disappeared. In view of our rapidly growing intercourse with the East this should be looked for among the unwelcome additions which are sure to be made to our helminthological fauna.

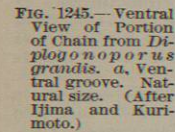


FIG. 1245.—Ventral View of Portion of Chain from *Diplogonoporus grandis*. a, Ventral groove. Natural size. (After Ijima and Kurimoto.)

Quite recently Kurimoto has given an account of a second case (also from Japan) in which two specimens of the same parasite were passed. Unfortunately, both scolices were wanting here also. In other particulars the agreement with the original specimen of this species was complete. Anomalies such as fenestration, intercalated proglottides, and those of asymmetrical form were frequent.

**BIBLIOGRAPHY.**  
Blanchard, R.: Histoire zoologique et médicale des téniaïdes du genre *Hymenolepis* Weimland. Bibliothèque générale de Médecine, Paris, 1891.  
Braun, M.: Cestodes. Bronn's Klassen und Ordnungen des Tierreichs, Bd. iv., Abt. 1., 1894-1900. Die thierischen Parasiten des Menschen. Würzburg, 1895.  
Goldschmidt, R.: Zur Entwicklungsgeschichte der Echinococcus-Köpfechen. Zool. Jahrb., Abt. Anat., Bd. xiii., pp. 467-494, pl. xxxiii., 1900.  
Guyer, M. F.: On the Structure of *Taenia confusa* Ward. Zool. Jahrb., Abth. Syst., Bd. xi., pp. 469-492, pl. xxviii.  
Huber, J. C.: Bibliographie d. klinischen Helminthologie. Hefte 3, 4. München, 1892.  
Ijima, I.: The Source of *Bothriocephalus latus* in Japan. Jour. Coll. Sci. Jap., vol. ii., pp. 49-56, 1888.  
Ijima, I. and Kurimoto, T.: On a New Human Tapeworm (*Bothriocephalus* sp.). Jour. Coll. Sci. Jap., vol. vi., p. 371-385, pl. xviii., 1894.  
Ijima, I. and Murata, K.: Some New Cases of the Occurrence of *Bothriocephalus liguloides* Lkt. Jour. Coll. Sci. Jap., vol. ii., pp. 149-152, pl. v., 1888.  
Krabbe, H.: Forekomsten af Bændelorme hos Mennesket i Danmark. Nord. Med. Arkiv., No. 13, 12 pp., 1896.  
Kratter, J. and Böhmig, L.: Ein freier Gehirncysticercus als Ursache plötzlichen Todes. Beitr. pathol. Anat. u. allg. Pathol., Bd. xxi., pp. 25-42, 1 plate, 1897.

Kurimoto, T.: Beschreibung einer zum ersten Male im menschlichen Darm gefundenen Art von *Bothriocephalus*. Zeitsch. f. klin. Med., Bd. xl., pp. 16, 2 plates, 1900.  
Lilje, M.: Zur Anatomie und Systematik der Bothriocephaliden. Verhandl. Deutsch. Zool. Ges., pp. 30-55, 1899.  
Limstow, O. v.: *Taenia africana*. Centralbl. Bakt. u. Parasit., Abt. I., Bd. xxviii., pp. 485-490, 2 figures, 1900.  
Leuckart: Die Parasiten des Menschen, etc., 2 Aufl., Leipzig, 1879-86.  
Neumann, L. G.: A Treatise on Parasites and Parasitic Diseases of the Domesticated Animals. Translation by Fleming, London, 1862.  
Nuttall, G. H. F.: The Poisons Given Off by Parasitic Worms in Man and Animals. Am. Nat., vol. xxxiii., pp. 247-49, 1899.  
Railliet, A.: Traité de zoologie médicale et agricole. 2. Ed. Paris, 1893-95.  
Sommers, H. O.: Further Statistics on Echinococcus Disease in the United States. N. Y. Med. Jour., vol. lxi., pp. 233-235, 1896.  
Stiles, C. W. and Hassall, Albert: The Inspection of Meats for Animal Parasites. U. S. Dept. Agr. Bureau Animal Industry, Bull. 19, 1896.  
Stieda, A.: Durchbohrung des Duodenums und des Pankreas durch eine Tänie. Centralbl. f. Bakt. u. Par., Abt. I., Bd. xxviii., pp. 430-437, 1900.  
Verdun, P. et Iversenc: Note sur un cas de cysticercose du ventricule latéral gauche. Arch. Parasitol., T. I., pp. 330-349, 2 figures, 1898.  
Ward, H. B.: The Parasitic Worms of Man and the Domestic Animals, Report Neb. Bd. Agr., pp. 225-348, 1895. A New Human Tapeworm (*Taenia confusa*). West. Med. Rev., vol. i., pp. 35-36, 1896. Note on *Taenia confusa*. Zool. Anzeiger, Bd. xx., pp. 321-322, 1897.  
Weimland, D. F.: Human Cestoides; An Essay on the Tapeworms of Man. Cambridge, 1858.  
Zschokke, F.: Recherches sur la structure anatomique et histologique des Cestodes. Trav. couronné, Genève, 1888.  
Also numerous shorter papers by the same and other authors.

**CHALYBEATE SPRINGS.** — Meriweather County, Georgia.

**POST-OFFICE.**—Chalybeate Springs. Hotels and cottages.

**ACCESS.**—Take Southeastern Railroad to Bostwick, thence Talbotton Branch Road to Talbotton, thence 20 miles west to Springs.

These springs were discovered by Mr. Rawlings about 1835, and opened by him for the reception of visitors a few years later. The improvements were of a rude character until about 1850, at which time they were considerably enlarged. With the exception of a few years' interval they have been open to the public ever since. Analysis by Prof. W. J. Land:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Silicic acid (soluble).....	2.83
Iron proto-carbonate.....	.62
Iron sesqui-carbonate.....	.17
Lime carbonate.....	.76
Potassium sulphate.....	.33
Sodium sulphate.....	.13
Aluminum sulphate.....	.43
Sodium chloride.....	.03
Total.....	5.30
Carbonic acid gas, 6.55 cubic inches.	

The water is a light chalybeate. There are also traces of hydrogen sulphide, carbonate of magnesia, crenate of iron, and a minute trace of nitric acid, lithium, and organic matter. The proportion of soluble salicylic acid is larger than usual. This compound is not used in medicine, but silica is contained in the human body, and may not be without therapeutical value. It is possible that the trace of sulphureted hydrogen also slightly influences the action of the water. It has been recommended in all cases requiring a chalybeate water. The flow is abundant, being about twenty-five gallons per minute. Near by is a sulphur and magnesia spring, but no analysis has been made of the waters. The improvements are extensive, consisting of two hotels and cottages, sufficient to accommodate five hundred guests. Bathing facilities are ample, both hot and cold water being supplied. The climate of this region is of a salubrious character.

**JAMES K. CROOK.**  
**CHAMÆLIRIUM.** See *Unicorn Root, False*.

**CHAMIQUEL.**—Coalcoman, Michoacan, Mexico. A lukewarm mineral water classified by Dr. Zuniger as a sulphureted calcic water, and containing, according to Forbes, of Coalcoman, carbonic acid, large quantities of lime and magnesia, silica, and traces of copper and iron.

No bathing facilities have been established so far. The bathers are recruited from among those suffering from leprosy and diseases of the skin. *N. J. Ponce de Léon.*

**CHAMOMILE.** — *ANTHEMIS.* *Roman Chamomile.* "The flower-heads of *Anthemis nobilis* L. (fam. *Compositae*), collected from cultivated plants" (U. S. P.). In this definition the Pharmacopœia recognizes the fact that under cultivation the aroma and flavor of the chamomile grow finer and less rank and heavy, notwithstanding that the percentage of volatile oil, and very likely the medicinal strength, are somewhat decreased.

The chamomile plant is a native of Europe and is largely cultivated in temperate regions. It is a low perennial, hairy herb with a branching rhizome, and rather numerous stems, most of which are short and bear leaves only. The flowering stems are long, slender, prostrate, often rooting at the base, but ascending and branched above, and bearing the flowers at the ends of the branches. Flower-heads radiate, about 2 cm. ( $\frac{3}{4}$  in.) across, with, in the "single" (natural) form, a single row of white rays and a yellow disc. Involucre of two or three rows of blunt, appressed, scarious-margined scales. Receptacle chaffy, conical, solid, longer than broad; ray flowers fertile, limb three-toothed; disc flowers perfect, tubular below, bell-shaped above. Achenia obovate, slightly compressed, pappus none. The oil glands are mostly on the corolla tubes, and less abundant on the ray than on the disc flowers.



FIG. 1246.—Chamomile, Wild or Single-Flowered Plant. One-third natural size. (Ballou.)

The plant is a native of Europe, and is largely cultivated in temperate regions. Under cultivation, ligulate flowers largely replace the tubular disc flowers, so that the heads become "double" and large and white, which condition, by careful and rapid drying, should be preserved in the dried heads.

Chamomile contains nearly one per cent. of a blue volatile oil, turning greenish or yellowish with keeping and having a specific gravity of .905 to .915. The important constituents of this oil are *anethol* (C<sub>10</sub>H<sub>16</sub>O) and *cumin aldehyde* (C<sub>8</sub>H<sub>8</sub>, C<sub>2</sub>H<sub>5</sub>, CHO). The composition of the remainder of the oil is very complex. With the oil there are an amaroid, some resin, and a little tannin.

Chamomile is one of the very best of the aromatic bitters, and is strongly carminative and somewhat antispasmodic. The dose is 1 to 4 gm. ( $\frac{3}{4}$  to i.). There is no official preparation. The best form of administration is a tincture, so as to contain all the oil. As a simple stomachic a decoction or infusion is excellent. This should be well diluted, taken slowly before meals, and the dose should be small. The oil is often given as a carminative and antispasmodic, in doses of  $\mathfrak{m}$  i. to v.

**ALLIED PLANTS.**—The genus contains about eighty species, and includes the common mayweed (*Anthemis cotula* Linn.). They are generally less agreeable than chamomile, and although of similar qualities, not in use. *Chrysanthemum parthenium* Pers. (Feverfew) is sometimes used as a substitute or adulterant of this article. It can be told by its flatter and less chaffy receptacles. *Henry H. Rusby.*

**CHAMOMILE, GERMAN.**—*MATRICARIA.* "The flower-heads of *Matricaria Chamomila* L. (fam. *Compositae*)" (U. S. P.). This drug is the product of a daisy-like plant, one to two feet in height, native of Europe and

Western Asia, and introduced, as a roadside weed, into many countries. The reflexed rays are about fifteen in number, nearly half an inch long, white, three-toothed. These rays, together with its elongated, conical, and hollow receptacle, which bears no scales, distinguish it from all drugs or substitutes which might be mistaken for it.

Its active constituents are its anthemic acid, which is very bitter, and less than half of one per cent. of a dark blue volatile oil. There are also a small amount of tannin and some anthemidin.

The drug is very largely used as an ingredient of proprietary "teas" and other herb mixtures, but possesses only ordinary aromatic-bitter properties of the *Compositae*, which see. The ordinary dose is 1 to 4 gm. (gr. xv. to lx.), and it is commonly given in infusion or fluid extract. *Henry H. Rusby.*

**CHANCRE.** See *Syphilis*.

**CHANCROID.**—Chancroid is a local, contagious, venereal disease, appearing as suppurating ulcers about the genitals, and is due to contact with secretions from the same kind of ulcerations. Aside from causing more or less severe inflammatory reaction in the lymph glands in the immediate vicinity of the sores, chancroid is always a local process and never causes constitutional infection.

Until within the last half-century it was generally believed that syphilis and chancroid were due to the same cause, but their individual entity has now so long been established that the old opinions interest us simply as a matter of history. The two diseases very frequently exist in the same individual at the same time, but they are, of course, due to inoculation at the same time and spot with two entirely separate and distinct poisons.

At the outset too much emphasis cannot be placed on the necessity of a careful examination and accurate diagnosis of all venereal sores. Cases of initial syphilis are constantly being diagnosed as chancroids. Many men have married with their doctor's approval (and reassurance that their sore was a soft one and therefore harmless), only to see syphilis appear in themselves and be transmitted to their wives and children.

To the clinical observer the purulent secretion from chancroids is the medium which conveys the contagion, and it has been claimed that the leucocytes alone contain the virus, and that inoculations with a solution from which the pus cells had been removed yielded negative results. We also know that cold has apparently little effect upon the vitality of the organism, while it is readily destroyed by heat, drying, and antiseptics.

**ETIOLOGY.**—Chancroid is undoubtedly due to a specific micro-organism, but what that organism is has not yet been conclusively demonstrated.

At the present time there are only two opinions that are deserving of consideration: first, the claim that the ordinary pyogenic bacteria are capable of producing typical chancroidal ulcers; second, that the bacillus of Ducrey is the pathogenic organism. It has also been claimed that cases of chancroid have arisen *de novo*, there having been no active chancroidal ulcerations present in the party giving the infection.

In asserting that chancroids are of purely pyogenic origin, it has been pointed out that the secretions from chancroids always contain streptococci, staphylococci, and non-pathogenic bacilli, as well as the streptobacillus first described by Ducrey and claimed by him to be the specific organism of chancroid. It is also claimed that chancroid is to mucous membranes what impetigo and pus infection are to the skin, and that the streptobacillus is an accidental accompaniment and not the cause; and, furthermore, that chancroid is usually found in broken-down prostitutes and among the poorer classes in general, a class whose vitality is lowered by lack of proper food, over-indulgence in alcoholics, by filth and unhygienic surroundings; in other words, a class in whom we know that slight abrasions of the skin become easily infected with pus cocci, suppurate freely, and do badly in general.