

84 instances of meningitis supposed not to be the epidemic cerebrospinal form, 12, or 14 per cent., proved to be cerebrospinal meningitis.

#### CONCLUSION.

It will be seen that clinical investigation so far has thrown very little light on the mode of transmission of the disease, nor has any effectual mode of treatment been discovered. It is to the laboratory workers that we must look for assistance, and already new and valuable facts have been discovered regarding the meningococcus, its habitat, mode of transmission, viability, methods of identification, etc.

A very important point that has been brought out is that, in all probability, the disease is much more infectious during the first two weeks of its course. Guided by this, the Department of Health has enforced quarantine for at least the first two weeks, in all cases in which the patients remained at home the medical inspectors keeping the cases under observation, giving all necessary instructions, and ordering disinfection of the rooms and bedding on termination of the case. As a possible result of these precautions the number of deaths reported in the first nineteen weeks of 1906 have been 431 as compared with 1,300 in the same period for 1905.

### SOME PARASITES INFESTING THE HUMAN INTESTINE.

#### DESCRIPTION, DIAGNOSIS AND TREATMENT.

JOHN RITTER, M.D., PH.G.

Clinical Assistant, Department of Chest, Throat and Nose, Rush Medical College.

CHICAGO.

Parasites which inhabit the human alimentary canal are usually described as entozoa or intestinal worms. There are about 20 different known species of the entozoa, all of which infest the alimentary canal of vertebrate animals or man. Entozoa of the order of *Cestoda* are commonly known as tapeworms, and of this particular worm about 10 different varieties have been observed and studied. They inhabit either the intestines of some vertebrate animal or man, but it is the parasite infesting the alimentary canal of man with which the physician is chiefly concerned.

#### DESCRIPTION AND VARIETIES.

Three species of tapeworm are of special interest to the medical practitioner and all are usually found in the upper third of the small intestines.

1. *Tania Solium* (*Pork Tapeworm*).—This is an armed parasite, the head of which is provided with a circle of minute hooklets for the better attachment of the worm to the mucous folds of the intestines. The larval form of this particular parasite is the *Cysticercus cellulosæ*, which, if present in pork, gives the meat a peculiar spotted appearance, known as "measly pork." This tapeworm is the smallest of the three varieties, measuring, when mature, from 5 to 15 feet, and it is said that a single worm is capable of producing from 4 to 5 million of sexually ripe ova. Erroneously the specific name of *solium* (*solus*, *solitare*, *alone*) was given to this parasite, in the belief that it infested the alimentary canal of man only or alone.

2. *Tania Saginata* or *Medio-canellata* (*Beef Tapeworm*).—This is an unarmed parasite, not provided with hooklets. The larval form of this tapeworm is the *Cysticercus bovis* found in beef. This worm is of moderate length, measuring, when matured, from 15 to 25 feet.

3. *Bothriocephalus Latus* (*Fish Tapeworm*).—This

is also an unarmed parasite. It attains great length, from 25 to 30 feet.

The head of the tapeworm, when viewed with the unaided eye, appears about the size of the head of an ordinary pin. On it may be distinctly discerned four minute dark pigmented dots, which, when looked at under an ordinary magnifying glass, are seen to consist of small round discs or suckers. Immediately following the head is the slender, threadlike neck, about one inch in length, from the end of which a distinct segmentation may be observed. New joints are continually produced by budding. On close inspection it will be noticed that all segments or joints assume a distinct shape, that the younger joints are much wider than they are long and very small, but as they grow they gradually widen, and at the same time they grow very much in length, so that by the time the segments reach about the end of the first third of the worm's length the joints are distinctly quadrilateral, from which point they begin to grow in inverse order, the older and more mature segments being very much longer than they are wide and very much larger.

Tapeworms vary much in size. They grow in length from 8 or 10 to 25 or 30 feet. Stories occasionally related of patients passing a single tapeworm measuring from 60 to 80 or more feet should be accepted with a great deal of allowance, as examination of a large number of expelled worms has not verified any such lengths. I have in my possession a specimen of a mass of tapeworm passed by one of my patients which measures about 70 feet, but which, on close inspection, proves to be the remains of five distinct tapeworms, as five distinct heads are seen.

If a patient infested with a tapeworm, in whose case a positive diagnosis has been made, seeks medical advice in order to rid him of his undesirable guest, it becomes the imperative duty of the physician to administer at once such known remedies as will expel the parasite, head and body, so as to avoid more serious consequences which may follow delay. A fit of vomiting in a patient so infested may force one or more of the mature segments up into the stomach and the contents of which, by digesting such segments (should they contain ripe or mature ova), may set the ova free, and by burrowing into and through the various coats of the stomach or some other portion of the alimentary tract they may enter the circulation and be deposited in the liver, the brain or the muscular structure of the body in the larval form (*Cysticercus*), causing most serious disturbances and in extreme cases may be even fatal to life.

#### SYMPTOMS AND DIAGNOSIS.

The so-called subjective symptoms of the presence of the *Cestoda* infesting the alimentary canal are so variable and so unreliable that too much dependence must not be placed on such signs. However, there are certain distinct symptoms which, if present, may lead the physician to suspect the existence of intestinal worms. Subjective symptoms are usually divided into two classes, gastrointestinal and reflex.

Under the head of gastrointestinal may be chiefly mentioned colicky pains in the stomach and bowels, paroxysmal, at times more or less distress following the ingestion of food or of certain articles of food, a distended or a bloated condition of the abdomen, at other times a ravenous, inordinate or occasionally a perverted appetite, which is again followed by a great dislike for food. Constipation may alternate with diarrhea, more or less nausea or vomiting.

The reflex symptoms are usually manifested by nasal or rectal irritation, by cardiac palpitation, tinnitus aurium, dizzy or fainting spells, depression of spirits, lassitude, salivation, pains in the limbs, and various other nervous phenomena, hypochondria, convulsions, hysteria, in women often menstrual disturbances are attributable to the presence of tapeworms, and not infrequently mania.

Both gastrointestinal and reflex symptoms are only presumptive evidence of the presence of entozoa. A positive diagnosis can be made only when pieces or segments are voided or passed with the stools or pass involuntarily from the anus of the host while either walking or while at work; in fact, usually the very first intimation that the patient has of the presence of a tapeworm is when he seeks medical advice and gives a history somewhat like this: That while out walking he suddenly felt something pass out of the anus and slip down his leg and which, on examination, proves to be a single joint or segment of a parasite. This, then, is the only positive diagnostic sign.

#### TREATMENT.

From the earliest history of medicine to the present time various remedies and drugs have been offered and recommended for the removal of entozoa. Some are still in use; many more are obsolete. Some possess distinct anthelmintic properties and only a few are truly teniafuges. Some are used chiefly by the laity; others are prescribed by physicians only. From time to time various mixtures and decoctions have been recommended and extolled as specifics which, on careful trial, have been found utterly unreliable and worthless as teniafuges or tapeworm expellers.

A formula which a few years ago was much vaunted as a teniacide, in some quarters heralded as a specific, was a mixture of castor oil, croton oil, chloroform and fluid extract of ergot, which, with mucilage of acacia, was made into an emulsion, and a carminative was added to make the dose more palatable. This heroic dose was given in the early morning on an empty stomach, and, although its ingestion was followed by the removal of large quantities of segments and sections of tenia, it had no effect in completely expelling tapeworms.

A good remedy, although now somewhat obsolete, but occasionally used by old European practitioners, one which has decided tenifuge properties, is the black oxid of copper, given in  $\frac{1}{2}$  to 1 grain doses. It is especially recommended in the removal of tapeworm from children, to whom it is given in powders mixed with sugar and flavored with either oil of lemon or peppermint to suit the taste. A powder is taken every morning and evening for 8 or 10 days.

Another remedy used chiefly by the laity, and one which possesses some anthelmintic properties, is coral root (*Polypodium vulgare*). A pint decoction, prepared by taking about 2 oz. of the powdered or bruised coral root, using sufficient hot water to make one pint, is given in divided doses, half an hour apart, on an empty stomach, early in the morning, following a fast the previous day.

In some quarters crude petroleum is still in use as a somewhat efficient tapeworm remedy. It may be made into an emulsion and flavored with oil of peppermint, cinnamon or wintergreen and sweetened in order to make it palatable. The following is a desirable formula:

|                               |         |     |    |
|-------------------------------|---------|-----|----|
| R. Olei terrestris crudi..... | 3iv     | 16  | 25 |
| Olei menthæ piperitæ.....     | gtt. iv |     |    |
| Pulveris acaciæ.....          |         |     |    |
| Sacchari albi, āā.....        | 3iv     | 16  |    |
| Aquæ q. s. ad.....            | 3iv     | 120 |    |

M. Ft. emulsio. Sig.: A few teaspoonfuls of this emulsion every morning for eight days.

Oil of turpentine, given either on sugar or in form of an emulsion, has also some advocates, and is an efficient remedy. An emulsion may be prepared as follows:

|  |     |     |    |
|--|-----|-----|----|
| R. Olei terebinthinæ rectificati puri..... | 3ii | 8   | 30 |
| Olei ricini.....                           | 3i  |     |    |
| Pulveris acaciæ.....                       |     |     |    |
| Sacchari albi, āā.....                     | 3i  | 30  |    |
| Aquæ cinnamomi q. s. ad.....               | 3vi | 180 |    |

M. Ft. emulsio. Sig.: Take in the morning, in two doses.

This is taken in the morning in two doses in intervals of one hour.

Another emulsion (*Emulsio pepo*), one which is very efficient and popular with the laity, is prepared from pumpkin seed. This emulsion is best prepared by removing the outer inert shell of the pumpkin seed and pounding, bruising or triturating about two ounces of the inner kernel into a pulpy mass, gradually, in small quantities at each time, adding water until a milky mixture is obtained, then strain through a cloth, press and pour on the mass sufficient water to make a pint. This emulsion is given in two doses early in the morning in intervals of one hour on an empty stomach. The patient is required to fast the previous day in order to "make the worm hungry," as the popular saying is.

These remedies all possess some anthelmintic properties, are all occasionally used and with fairly good success, but can not always be relied on for the complete removal of tapeworms. Remedies of more decided and positive tenifuge properties are the following, and in the order given their value increases as tapeworm expellers.

*Kousso* or *Kosso*.—The powder of the flowers of *Brayera anthelmintica*, a plant indigenous to eastern Abyssinia, is given in doses of 2 to 4 drams either in infusion, decoction or mixed with some black coffee. It is a most effective tapeworm expeller.

*Kamala* (*Powdered*).—The powder of the small glands enveloping the fruit of *Rottlera tinctoria*, a tree indigenous to China, Malabar and Philippine Islands, is given in doses of 1 to 2 drams in milk, coffee or coca. It is one of the most reliable of the teniacides, but has this decided disadvantage, that if given to some patients it induces most severe and violent emesis.

*Pomegranate Bark*.—The bark of the root of *Punica granatum*, a shrub indigenous to the countries bordering on the Mediterranean sea, is next in importance as an entozoa expeller. A decoction prepared from the fresh, dried bark by, taking 2 oz. of the coarsely powdered drug, macerating it in tepid water for about 12 hours, gently boiling, straining and adding sufficient water to make about one pint. This is given in 3 doses in intervals of half an hour in the morning on an empty stomach. A cathartic drug should be administered the evening before.

*Pelletierinæ Tannas* or *Punica Tannas*.—This is a tannate of the mixed alkaloids obtained from pomegranate bark and is of most decided efficiency and reliability as a parasiticide. It may be given in doses of from 2 to 5 or more grains.

*Pelletierinæ Tannas* is now official, being one of the newer remedies added to the Pharmacopeia, 1900.

*Ethereal Extract* or *Oleoresin* of *Male Fern*.—This

is an extract or oil prepared from the rhizome and rootlets of *Nephrodium*, *Polypodium*, *Polystichum*, *Aspidium filix mas*, a plant indigenous to Europe, and is the most efficient of all reputed teniafuges. In the writings of former therapeutists, as well as of those of the present time, oleoresin of male fern has always held the foremost rank as a tapeworm expeller. Its administration either in capsules, mixtures or emulsions is usually followed by very little, if any, depressing effects and it undoubtedly is the most efficient, reliable and trustworthy of the whole list of anthelmintics. It is usually given in doses varying from 10 drops to a dram or more.

All the various tapeworm-expelling remedies enumerated above are administered either singly or in combination in mixtures, capsules, cachets, emulsions or in any form whatsoever. It is usually required that the patient must abstain from taking food or must take food but moderately for at least one day preceding the taking of the teniafuge, or that the evening meal should consist of such articles of food as sour or pickled herring or fish, stale bread and a glass of water, in order to "make the worm hungry," as the saying is.

#### THE RATIONAL METHOD.

I have had a large and extended experience in the treatment of patients suffering from tapeworm, and in not a single instance have I failed to expel the undesirable guest, head and all, if the following instructions were closely observed.

As a rule, I do not ask the unfortunate sufferer either to fast or to subsist on certain articles of diet. Fasting is wholly unnecessary, illogical, and no valid reason can be given therefor, as the worm can be expelled without much difficulty either while the patient fasts or freely partakes of food. On the contrary, the patient should be asked to eat a full dinner in the evening, and he should be fully prepared to eat an equally hearty meal in the morning. Between these two meals the unwelcome visitor takes his departure. Begin the treatment by giving the patient, on retiring, an ordinary cathartic capsule or pill somewhat like the following:

|   |    |
|---|----|
| R. Hydrargyri chloridi mitis.....gr. ii | 13 |
| Extracti colocynthis compositus         |    |
| Extracti cascara sagradæ, āā.....gr. iv | 26 |
| Pulveris jalapæ.....gr. vi              | 39 |

M. Ft. capsulæ No. iii. Sig.: Take all three capsules at bedtime, making one dose.

It is most desirable to procure good evacuation of the bowels before giving the tapeworm remedy, and in order to obtain that the formula above given may be varied to suit each individual case. Should the patient's bowels be unusually obstinate, the cathartic action may be somewhat increased and correspondingly decreased if the bowels are easily evacuated. Early the next morning and after the bowels are well emptied give the following teniafuge:

|  |    |
|--|----|
| R. Resinæ podophyllini.....gr. i       | 06 |
| Oleoresini filicis maris.....3iss      | 6  |
| Extracti fluidi kamalæ.....3iii        | 12 |
| Spiritus chloroformi.....3i            | 4  |
| Mucilago acaciæ.....3i                 | 30 |
| Aquæ menthæ piperitæ q. s. ad.....3iii | 90 |

M. Ft. emulsio. Sig.: Take in three equal doses at intervals of half an hour.

A swallow of coffee or warm milk or a little warm water and whisky may be taken after each dose. A very much more pleasant way for administering the above teniafuge is in the form of a capsule prepared as fol-

lows: Put the 3 drams of fluid extract of kamala into a small evaporating dish and over a water bath evaporate the extract to the consistency of a thick syrup; then add the grain of resin of podophyllin and, lastly, while still slightly warm, add the 1½ drams of oleoresin of male fern; thoroughly incorporate all and fill into empty capsules, making either 9 or 12 capsules, and of this number give either 3 or 4 in intervals of half an hour. The above quantity fills about nine No. 0 capsules of standard size or twelve of No. 1.

From the time that the teniafuge is administered all evacuations of the bowels should be passed into a commode about half filled with tepid water so as to secure the parasite for examination. After careful and repeated washings, by repeatedly pouring water into the commode until it is nearly full, allowing all heavy particles to subside, then decanting the supernatant fluid, the mass of the worm will be found at the bottom, head and all. Examine the mass carefully for the head, which is usually attached to the finest or thread-like section of the worm, generally to a piece from half a foot to one and a half feet in length.

170 Colorado Avenue.

#### PRELIMINARY REPORT OF THE TREATMENT OF IDIOPATHIC EPILEPSY BY APPENDICOSTOMY FOR COLONIC IRRIGATION.\*

ERNEST LAPLACE, M.D.

Professor of Surgery, Medico-Chirurgical College.  
PHILADELPHIA, PA.

Epilepsy is but a symptom revealing some irritation of the general nervous system. It has been aptly divided for purposes of classification into traumatic and idiopathic. In traumatic epilepsy, the cause is evident. Pressure from bone, foreign body, or blood clot is the source which so irritates the brain as to interfere materially with the normal distribution of nerve force through the body.

Certain chemical substances have a distinct affinity for the cortical cells of the brain and cord and, as a result, excite them. Among the alkaloids, strychnin is prominent. Among toxins resulting from infection, the poison of tetanus and hydrophobia afford us similar examples. These toxins generated in the body under the influence of the developing pathogenic organism finally accumulate to such an extent as to produce a violent action on the cerebrospinal system, followed by contractions of the muscular system characteristic of these diseases. Very similar is the reaction of strychnin, which, if given in sufficient doses, will produce analogous muscular contraction.

One of the curious phenomena attending the physiologic action of drugs is the tendency of some, such as digitalis, to accumulate in the body until a certain amount has been taken, and then the physiologic action of the accumulated doses is manifested. This is known as the cumulative action of a drug.

Is it not possible that some such cumulative manifestation of a toxin as a result of the intoxication from improper food or tissue metabolism may be at the bottom of the spasmodic and periodic manifestations known as idiopathic epilepsy?

In early childhood, spasms are known to be due to

\* Read before the Philadelphia, Medical Society, May 23, 1906. Patient was exhibited to the society.