

1028/66/T

Enzoza
WS417/66.1



Jan 4th 1871

My dear Sir

I have been engaged for a short time in the study of Entozoa more particularly those infesting fish & find great difficulty in getting the species described. On consulting Prof Dawson as to who would be the most likely person to aid me, he referred me to you. I enclose a list of those I have met with & the errata in which they were found; hoping you will be able either to name them or to refer me to papers in which they have been described.

Bat Encysted Nematode in walls
of the stomach

Cat-Fish . Iccinia . Distome . Encysted
nematodes in liver . Scler of Iccinia
in kidney . Echinorhynchus

Chub Distome . Echinorhynchus

Pike Iccinia . Ascaris

Perch Nematodes (encysted) Echinorhynchus
Scler in liver . Distome

Sal Iccinia . Echinorhynchus Distome

Squid (red) ascaris

Pickrel Iccinia . Bothrioccephalus
echinorhynchus

Menobranchus lateralis Polystome from
mouth & throat

Skunk Iccinia ascaris

Sun-Fish Distome Ascaris Echinorhynchus

Ruffishen . Distome

Bass . Scler in liver

Harb ascaris

Crane Distome . Ascaris

Fowl Iccinia ascaris

Bar-fish Nematodes in peritoneal
cavity

In closing I do not inconvenience
you or trespass too much on your
valuable time Bel me & ore &

W. Osler

CVS417/66.2

Bat. Encysted Nere
also from walls
of stomach

Cat Fish ^{specie} one, *Icaria*
" *Distome*
Eggs Nere in liver
Scales in Kidney
Echinorhynchus

Chub *Distome*
Echinorhynchus

Pike *Icaria*
ascaris

Perch encys Nere in liver
Echinorhynchus
Scales in liver
Distome

EL *Icaria*
Echinorhynchus
Distome

Squid *ascaris*

Pickrel *Icaria*
Bothrocephalus
Echinorhynchus

Menobranchius lateralis
Polydromus (mouth)

S. R. R. Iania
ascaris

Sunfish Distome
ascaris
Echinorhynchus

Ringfisher, Distome

Bars Scelices

HawR Ascaris

Come Distome
ascaris

Fowl Iania
ascaris

Bar Fish, Neomaloda
in pe curf

1028/66/1

CUS 417/66.3



General form

found in

Urine.

Dec. 15. 69.

12. Caecal afflu-
ence in the
trachea through
them.

Mrs L. (cousin of Dr. R. - of Toronto)
residing 7 miles from Toronto brought
the specimen to Dr. R. . Was passed with-
the name after considerable personal
invitation. He was a woman ^{advanced in years} with a large
family, of hardless life & for returning despondent
& had been personally hunted on R. all his
life. No known motive for deception, no
hysteria

1028/66/2

Weston

Jan^y 6: 1870. W547/66.4

A Found in urine
twice nat size.
Dec^r. 15: 1869.

B Found in very rotten maple.
April 7: 1865. In Glycerine
ever since. Twice Nat size.



B



12.

Cecal appendage
mag^d with 1 inch
obj. VA eye piece
with trachea through
them



D

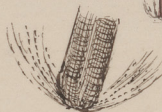


D Foot of the same
with 1 inch obj.
VA eye piece
Seven pairs of feet.

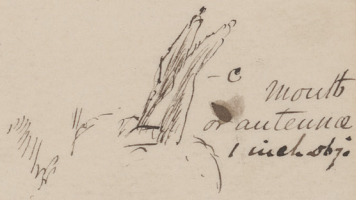
E



E Two projections, like
mouth or antennae.



Tracheal tail
1 inch obj.



Mouth
or antennae
1 inch obj.



Feet & distance apart
1 inch obj. 7 pairs.

CUS417/66.5
dup.

30/4/70

Caught a petite at canal basin

28 *Taenia* numerous small ascus
in stomachs were 5-2 small fish
perch. bars & chub

2/5/70

numerous flukes in the peritoneal
cavity of a chub. attached to the
intestines. see slide no.

7/5/70. From a cut fish caught in the
canal 10 *Taenia*. in the liver there were
numerous encysted nematodes

1028/66/5

7/5/20

dup

From the intestine (Diolema)
Cat-fish 10 Tenia

The Dape worm is about from
 $\frac{1}{4}$ to 1 inch $\frac{1}{2}$ in length
very extensible. dark prominent
can be seen with the naked eye.
four in number, no hootlets

The disks are capable of voluntary
movement one disk moves
in front of the other and taking
each others place

The water vascular system
presents a double set of tubes ~~the~~
on each side which communicate
across the lower segments.

at the head a dense network of
vessels as large as the primary
trunks occupy the front of the
head and spaces between the suckers

Two Distomes were also found
in the intestines

Numerous encysted round worms
in the liver,

a Cysticercus in the Kidney

~~1028/66/6~~

12/5/70

dup

In the duodenum found
several, were about $\frac{1}{2}$ a dozen
ascaris

13/5/70

From four perch. A cysticercus, probably
from the liver. The scolex of the tape worm of the pike
in ~~two~~ of the liver there were encysted
nematodes

In the rectum of three there were
some of the *Myodaclyda*? similar
to those found in the eel

In the intestine there was a curious
worm with a bell shaped uterine
head

Coiled around the base of the ovula
there was a large worm fluke?

~~1028/66/4~~

1028/66/7

19

CUS417/66.6

The Rectory, Dundas
Mar. 5th. 1870

X

My dear old Willie

You may think perhaps that I forget you, but not so my son. I write under some difficulty now however and can give you but a very brief epistle for I have a very bad cold which unfits me for anything, but I want to set your mind at ease about your Board money. Papa is to be in town on Tuesday next and will make it right then. Nellie would tell you how ill little Isabel has been but she is much better today being inclined to run about a little and play, also beautifully cross. I would like you to let Nellie know this for she will be anxious to hear and I cannot write to her today. Chattie got home yesterday all right staid at Marions for an hour on her way down to the station. Let me know whether you get the shirt from Nellie she said she would give it, if it is forgotten I will get another made for you for I'm sure you must need it.

Excuse this hurried note, Ever your
loving Mother
Ellen Osler

1028/66/8

Mar no - Apr. 21 1870
vacation(?)

CUS47/66.7

MS not done? (Humboldt) box.

44
1870

It does not appear that the medicine school was proving a great success. At least it was not until he migrated to Montreal that he began to take systematic and careful notes of his lectures.

His time was doubtless much spent with Binet who excited from the first an extraordinary fascination for the boy.

He was still making expeditions with Father Johnson and on Jan 1st acquired a large volume blank book in which to enter notes of his collection of

~~Diatoms~~ ~~in water~~ diatoms. "March, 20 '70" Went out to Humber Bay with Rev. W.A.J. and obtained gathering from Grenadier Pond and its outlet. "Mar. 23."

"Mar. 24." Went out again and obtained another gathering from the same place. The Diatoms were all alive and moving freely. Many types of Ucellatoria

were mingled with them and gave the gathering a rather greenish appearance. From the fund on the right hand side of the bridge the following

Diatoms were obtained and there follows a list of twenty five varieties. Some of which are described and pictured. "April 21" Out at Weston. In a

gathering from the G.S. Railway numbers of *Nitzschia amphioxys* and *Mendon cuneolata*??

"Mar. 23" Humber Pond eight varieties. Grenadier Pond nineteen. "April 2" (He is evidently devoting to the microscope) "The endochrome in this (drawing of) specimen) is rolled up into four balls the middle ones the largest. While watching it the two centre ones coalesced and spread themselves throughout the cell pressing the smaller ones against the apices. This was in *Mastigophora* and seen with 1/20" *Mar. affines*

5. put in order of date 1870

(re. *Mendon*)

This description reads much like W.C.'s later description of forms now found in specimens in Montreal, Montreal in Philadelphia and another deposited in Baltimore during the first year. This was about the end of his days with the microscope,

in his note books written

1028/66/9

CUS-47/66.8
James Bowell

Prof. of ¹ in Cambridge
Med. sch. of Upper Can.
12. 257

a church of eng. college
~~Trinity College 1867-1869~~

~~He returned from the war
in the autumn term~~

~~Entered Oct. 1867~~

~~(Probably ex B. bapt. natural theology, etc)~~

~~was he under Bowell's influence here? Bowell was in Trinity Coll. Med. Dept. till~~

~~it broke up & later had some friends in Toronto. Current that he was gone~~

~~turned his young pupil from order to med. yet he himself left med. for the~~

~~church. He left in 1870 for Barbados.~~

of Province reports
this journal

The med. faculty of Trinity Coll. Tor. "has been reconstituted" (Can. Med. Journ. VII 1871 p. 33
November 4th 1871) Faculty includes - J. Bowell, M.D. M.R.C.P. Eng. Pathology &
General & Special, and Medical Jurisprudence.

Much literature would be found about medical education in Ontario - files ^{Canadian} Journals.

~~On July 2 '68 was among his eyes of the Pelagos!~~

Just under Pelagon studies a Prof. Harris (botanist) in autumn of 1868

CVS417/66.9

TRINITY COLLEGE SCHOOL

10-28/66/10

Old Boys' Association Elect Officers at Annual Meeting.

Looking to the jubilee celebration at Trinity College School at Port Hope there has been much activity recently on the part of the Old Boys' Association. The annual meeting of the association was attended by a large and representative number of old boys, which included many of the most prominent professional and business men of Toronto.

Extraordinary interest was taken on account of the large number of old boys of the school who are serving in the Imperial army and the overseas contingents. No less than about one in ten are so serving.

Plans are being laid for a grand gathering of old boys at Port Hope on May 24th to celebrate the fiftieth anniversary of the founding of the school, which has often been referred to as "The Eton of Canada." These plans comprehend the old boys leaving Toronto by special train on the morning of Monday, May 24th, to spend the day at the old school and to renew old associations and friendships and play the time-honored cricket match between the Past and the Present.

The traditions of Trinity College School date back to the days of its origin at Weston in the year 1865, when it was founded by the Rev. W. A. Johnson, father of Dr. Arthur Jukes Johnson, a well known present resident of Toronto, with the Rev. Charles Howard Badgley as head master. From Weston the school was moved to Port Hope in the year 1870 when Mr. Badgley resigned, and was succeeded by the Rev. C. J. S. Bethune, who guided the destinies of the school as head master for upwards of 29 years. The present head master is the Rev. F. G. Orchard, M.A., of Oxford.

At the annual meeting of the Old Boys' Association just held the following officers were elected: Hon. President, Rev. F. G. Orchard, M.A.; President, F. Gordon Osler; Vice-Presidents, D'Arcy Martin, Hamilton, Ont.; Rev. Dr. Rigby, D. W. Saunders, K.C., Toronto; Hon. Secretary-Treasurer, Dr. Newbold C. Jones; Executive Committee—F. C. Allan, A. M. Bethune, Allan Campbell, J. I. Grover, P. E. Henderson, Morgan Jellett, H. J. Lithgow, F. C. Mathers, W. C. McKendrick, L. L. Lindsay, Harold Morris, Norman Robinson.

1028/66/11

CUS417/66.10

Look up the Port Hope Jubilee Nw.

and see just when the school
moved in 1870 & make note
of any shows in some of W.A.'s
letters to W.P.

MMAH

CU 5417/66.11

J.W.

J.P.S.

Principal Dawson, was Pres. of the Mad West Socy earlier (and then some)

Some address in Byell & Judge. L. died July 22nd, 1874

~~1028/66/12~~

1028/66/13

CUS4.7/66.12

PETER BENT BRIGHAM HOSPITAL
BOSTON, MASSACHUSETTS

Ans. paper on Diatomacea 1870

Received by the Recording Secretary

at the Oct. 31st 1870 meeting

~~If W.O. had been copied by some one a
 little more accurate in science - still
 Agassiz takes in on gills & pedicels
 in fact they were here better than in
 science. As it was Powell fluctuating
 with. Chances & science is so many others
 would say at the time it was probably
 Powell had turned the scale & had
 B. been a more fixed point than
 would have affected himself personally.~~

1022/66/14

28

CUS 417/66.13
Dec. 1870 (?)

My dear Willie

It was all a delusion when I thought to write you a long letter by Janette she will tell you how little time I had on hand for anything but every-day necessities and today I am almost as hard pressed for time as then but as the Irishman said "I have all there is of it" Church decorations have kept me the last two afternoons and evenings and I am off to the work again as soon as dinner is over. We shall miss many faces at the Christmas dinner table this year but for our poor Nellie's sake it is better that we should not all assemble, the Fris from Staplehurst are going to Toronto to spend their Xmas at Avenue St. and the great preparations are all with Jennie this year. Edmund and Belle I fancy will have to eat their morsel alone. Nellie will not be with us she will try to forget it is Xmas day and being Sunday it will not be so different. Mr. Williamson is again laid up with rheumatic fever but they hope it will not prove so lasting an attack as he had before, as soon as he is well enough and Jessie Hoskin a little stronger they mean to go to Toronto for a few weeks and then Nellie will come to us the Baby is very delicate my impression is that it will get water-on-the-brain, its head was much swollen the other night, and it does not sleep as it ought, it will be a great grief to them to lose it and is a great source of anxiety to Nellie. She is much better and more cheerful than could have been expected. I am so glad that you like Montreal. M. and J. being there must make it much more pleasant than it would have been otherwise. Did you hear that Dr. Bovell was going to take orders in the West Indies?

Mr. Geddes (the Revd.) told Papa so that he had sent to him for the usual letters etc. I posted a pocket-book to you yesterday as a small gift to my Benjamin but I am not donating gifts on a large scale. Chattie had been laid up with cold ever since she returned but is well enough today to venture over to Carries. You are to get a Banner sent and I dare say that Janette has told you more about the Concert than you will gather from that. Mr. Wright is very poorly, Lucy has just come in to dinner and I must close this with much love to dear boy from his ever affectionate Mother

Ellen Osler

Chattie I suppose has told you all the home news if there is any.

~~1028/66/15~~

CUS417/66.14

The Rectory, Dundas, Oct. 6th 1870.

Willie has gone to Montreal, to McGill's College, where the hospital advantages are greater than at Toronto.

I wish to give him every advantage that is in my power though it is very expensive.

Featherstone Osler to his sister Elizabeth in Falmouth.

Wm

1028/66/16

(1870)

It is interesting that he says "a student with Prof. Bovell" rather than a student at the Toronto Medical School, and it is characteristic also that he links Zimmerman's name with his own, for it is evident from *his personal* ~~his~~ notes in his list of entozoa that the discovery was his own.

22/II/70. No IV. While dissecting the arm of a man who died in the Toronto General Hospital I found numerous Trichinae in the Biceps muscle, and further examination showed them to be scattered freely throughout the muscles. From ~~31~~ of the muscles, from the long head of Biceps I obtained 150 cysts, the greater number of them containing healthy-looking Trichinae.

29/III/70. No V. In the subject following the one above, and also brought from the Toronto General Hospital numberless cysts were found in all parts of the body. The parasites in this case are not as old, none of them beginning to undergo degeneration.

An interest in the entozoa had been awakened some time before. Indeed when he was still at Trinity, the earliest specimen which he records being under the date "7/II/68," but it was not until Jan. 1st of 1870 that he began systematically to record the specimens ~~with explanatory notes~~ *and to give explanatory notes.* in a blank book. It was quite consistent with what was still under way in the study of the diatomaciae and fresh-water polyzoas, but it illus-

trates the formative stage of his habit of ~~mind in~~ observing, collecting, recording and tabulating, ^{specimens or cases,} and thus preparing material for future publications.

Many of the specimens are ^{carried} ~~taken~~ or sent to Johnson, whose interest is obviously aroused, though the preparations all appear to ^{have been mounted by} ~~be those~~ from his young friend who is rapidly forging ahead of him.

date fixed

#1314. 8/XII/69. Trichina spiralis (Encysted) From a subject (on the table) at New York; shows the calcareous deposit.

#1315. Entozoa from mucous stomach of a bat. Both given me by W. Osler; put up by him Nov^d 1869.

#1316. Jan/5/70. Tenaea; ova bearing segment taken from a dog. Given me by W. Osler. Balsam.

#1390-1. 22/IV/70. ^[Easter Recn.] Trichina spiralis from man at the Toronto G. H. from Osler. Gly.

#1392. Tenaea elliptica head protruded. from W. Osler. Gly.

#1403. 6/June/70. Echinorkyneus? from the Catfish both male and female. Given me by W. Osler Glycerine (See Cobbold).

It is easy to trace the source of these and other entries in Johnson's note-book. Thus:

[Johnson had troubles with his spelling]
(Johnson had troubles with his spelling)

#1388, 22/IV/70. Parasites on fins, body &c of little fish in my aquarium. They seem to have a chelinous horseshoe shaped piece inside, & are large brown looking things with powers of locomotion & short cilia all round the edges. Gelatinous mass destroyed by drying (Boil)

Whereas in Osler's note-book ^{are} the following, ^{the contents} On the Finns of Chub, ^{the first of}

21/IV/70. ON THE FINNS OF CHUB.

Have some at the end of the Easter recess:

On the finns of chub in the Rev. W. A. Johnson's aquarium were noticed several round white spots. These on examination proved to be some sort of Entozoa. In addition to these, some yellow spots were seen which seem to be a more advanced condition of the parasite. (see slide * * *)

2/V/70. Numerous Flukes attached to the intestine of a small chub. (see slide no. * * *)

12/V/70. Examined three chub: from the intestine of one two Echinorhynchus were obtained, a male and female.

^{of the} This visit to Johnson must have been during the Easter recess, (verified 11/10)

during which, it appears, he subsequently visits his relatives at their summer home on the Island, and later goes to Dundas, if one may judge from the first two of these ^{following} entries on the Entozoa in Pike.

23/4/70. In a pike 2 ft. 7 in. long caught at the Island, I obtained 68 specimens of Taenia and two or three small Ascaridae.

This tape-worm is about a foot long, and exhibited curious undulatory movements which continued for more than twenty-four hours after removal from the intestines. It is very extensible and may be stretched to almost double its ordinary length. The head is flattened, club-shaped when the worm is dead, but during life is generally extended, giving to it the shape of a flint arrow-head. Five suckorial disks are plainly seen but no hocklets. The segments taper very gradually, being exceedingly small at the neck, larger towards the end of the body, they are about twice as broad as they are long. The water vascular system is most distinctly seen in this worm, consisting of four channels, two on each side. At the head and for a considerable distance down the neck these tubes connect by means of inosculating branches, these about the head form a dense network. (see sketch).

30/4/70. From a pike caught in the canal basin at Dundas I obtained 28 Taenia and numerous small Ascaridae. In the stomach of this fish were 52 smaller ones, principally little bass and perch.

30/6/70. From the intestines of two pike obtained at the Fish-market, Toronto. In one 84 Taenia were found and in the other 53 not counting numerous small undeveloped ones, - looked like freshly eaten scolices. A few Ascaridae were found in the stomach of one.

23/6/70. From intestine of a pike obtained in Fish-market, Toronto. 56 Taenia; most of these were of a large size and longer than the usual ones from this fish.

Despite this new and consuming interest in Entozoa, he is not forgetting the diatomaciae as is apparent from these entries in the special note-book devoted to them:

"March 20, '70. Went out to Humber Bay with Rev. W. A. J. and obtained gathering from Grenadier Pond and its outlet."

"Mar. 23. Humber Pond eight varieties. Grenadier Pond nineteen."

"Mar. 24. Went out again and obtained another gathering from the same place. The Diatoms were all alive and moving freely. Many types of Ocellatoria were mingled with them and gave the gathering a rather greenish appearance. From the pond on the right hand side of the bridge the following Diatoms were obtained" - and there follows a

list of twenty-five varieties, some of which are described and pictured.

"April 2. [He is evidently devoting to the microscope] "The endochrome in this [drawing of specimen] is rolled up into four balls the middle ones the largest. While watching it the two centre ones coalesced and spread themselves throughout the cell pressing the smaller ones against the apices. This was in Nav. affines and seen with 1/20."

"April 21st. Out at Weston, In a gathering from the G. T. Railway numbers of Nitzschia amphioxys and Mendion curellare???"

There can be little doubt but that had William Osler at this time come under the influence of Huxley or Agassiz or possibly of Leidy that he would

have gone on with his biological studies and have abandoned medicine.

Aside from his opportunities in the dissecting room it would appear that the school was not proving a great success, and his lecture notes, with their "James Bovell M.R.C.P." scribblings, would indicate that his mind was not captured by the lecturers. There is possibly one thing that might have deterred him, his ineffectiveness with his pencil, for though many of his drawings are probably accurate enough they are lacking in any artistic quality. Years later ~~in Philadelphia~~, when he finally came in contact with Joseph Leidy at the Biological Club in Philadelphia, it was Leidy's superb drawings that especially provoked his enthusiasm. This was shown as late as 1915 when on adding to his library a copy of Leidy's great quarto on Rhizopods he wrote to Joseph Leidy, Jr., to ask for one of his father's sketches to insert in the volume, where it may be found.

However this may be, he persisted in sketching what he saw under the microscope as best he could, and the notes given above, with their accompanying illustrations, are comparable to those accompanying the notes on the entozoa, and later on those made in Montreal and London when he was poring

over blood specimens, those made in Philadelphia when absorbed in the malarial parasite, and those made during the first year in Baltimore on the amoebae of dysentery which practically ended his days with the microscope. The method of the pursuit in each instance was the same, and though occasionally he ventured to reproduce some of his own sketches in his early papers, the art of illustration was not his long suit.

In all these extra-curricular pursuits, though his name infrequently appears, Bovell probably figured largely ^{for they were much together. In a letter written years later} and it is apparent that they ~~kept on office together~~ ^{was located} on Spadina Avenue near Queen Street. Tradition ^{to the Jefferson Medical students, whom he had helped to address in London, he spoke of this period as follows:} ~~has it that this venture was entered upon at Osler's suggestion with the~~ ^{It apparently "the" refers to this talk, they kept it secret and he shared it together.}

object of starting a consulting practice for Bovell and of ^{obliging him: thereby to} ~~making him~~ collect his fees. The partnership is said to have continued for about a year and apparently the business methods ^{of these others} of the senior ^{partner in the end} prevailed ~~in the~~

~~and~~ ^{How Prof} W. R. B. Nevitt who entered Trinity as one of Osler's contemporaries, writes that "he brought there no marked reputation except that he was a good fellow and held the distance record for throwing a cricket-ball."

He says further:

Look up
Macallum
letter of Sept 27, 1920

"Bovell's office was on Spadina Avenue. One afternoon I had some engagement with W.O. and called for him at the office. The room was a large bare room with a few chairs and a small deal table - like a kitchen table. Osler opened the drawer of the table - Dr. B. had gone out - and said 'Look here! This drawer has been filled to overflowing with bills two or three times this afternoon and now look.' One solitary bill lay in the drawer. As the patients paid their fees Osler placed them in the drawer. A needy patient came along and Dr. B. reversed the process and handed money out so that the sick man might get his medicine and the food and other things he required."

There are many like stories of Bovell, many of them probably more or less true and many of them have Osler as an appendage. The older man was adored by ^{all} the students though it could never be foretold whether his lecture was going to be medical or theological, or indeed whether he would remember to come at all, and on a few occasions both at Trinity and the Medical School Osler gave his lecture for him. Just before Osler's entry to the school the row of houses on John Street and St. George's Square where Bovell had lived, were burned down and he had built the house called "The Hermitage" on Dennison Square; and it was here that he and W.O. kept all their rabbits.

9
The two together were concerned with a famous murder trial of the day
for medico-legal jurisprudence was one of Barilli's many interests around
possibly by his earlier relation to the arrest of Bourgeois Hare. With the aid
of the microscope they found before the court that certain blood stains on a
discarded coat were human blood and on this evidence the criminal was hanged.

mice, rats and other animals, including, alas!, to the scandal of the com-
munity, an occasional neighbour's cat which had ventured afield.

It was during the spring of 1870 too, despite all of these accumulat-
ing interests, that he begins visiting the veterinary hospital, possibly
drawn there in the first place through interest in comparative parasitology
and in the expectation of adding to his growing collection of entozoa - an
expectation fully realized. Quite consistent with this were his subse-
quent associations with the veterinarians at McGill. But with all this
he found time to complete his paper on the diatomaceae and to forward it
to Principal Dawson of McGill who was at the same time President of the
Natural History Society of Montreal. The paper was not presented before
the Society until the October meeting, but was published in the June
volume ^{of} ~~and~~ the Transactions.

His evident powers of observation and ability in the presentation of
a subject show forth in this his first appearance in print. He begins:

"Among the many beautiful objects which the microscope has re-
vealed to us, none, perhaps, are such general favourites (especially
with the younger microscopists) as the Diatomaceae. Their almost uni-

~~1028/66/17~~

CVS417/66.16

From "1870" folder
of "Cushing material"
no. 8303 (2nd drawer).

Transcript made for
custody of
"NOTE-BOOK", no. 7666 (c)

p. 200.

ENTOZOA in DOG.

Cf. letter to John Jodel
July 3 1907 about
all pi Parasitology

slut - bitch
W.O. 7

I.

19/12/69.

From a young slut; three or four *Taeniae elliptica*, two *Bothriocephalus cordatus* (slide) and a number of *Ascaridae*. This animal had been about a butcher's shop.

II.

22/1/70.

From a slut, six months old, also got from a butcher's shop. 39 *Taeniae elliptica*, 25 *Ascaris*. In this dog there was but one species of *Taenia*. The *Taeniae* are collected towards the ileum, while the *Ascaridae* are usually in the duodenum and beginning of jejunum. Of the 39 *Taeniae* I obtained 18 with heads, the others came away without, breaking off close to the head. Besides the *Strobilae*, there were numberless mature free *Proglottides*. The eggs contained in these exhibited distinctly the six-hooked embryos-proscolices. Slides nos. , of head; nos. , of ova.

III.

7/2/70.

From a terrier slut about a year old, four *Ascaridae*. No *Taeniae* at all.

IV.

4/3/70.

From a dog about a year old which had on a former occasion (1/3/70) been fed with flesh from Case IV, p. 212, 4 *Ascaris*, and five *Taeniae elliptica*, all with heads, were obtained. No *Trichinae* were found either in the intestines or in the muscles, but on examining the kidneys, six or seven small white spots were seen about o that size (see slide); in each of these a small Nematode worm was observed not coiled up, and looking exceedingly like a *Trichina spiralis*.

V.

14/4/70.

From a pup about four months old, which had previously been fed with *Trichina*, 3 *Ascaris* were obtained.

14/2/76. Examined a fine St. Bernard's dog. No entozoa.

W.O.'s Note book, 1870.

p. 205.

ENTOZOA in BAT.

15/11/69.

Obtained a curious encysted Nematode from the walls of the stomach of the New-York bat.

There were no other Entozoa, either free in stomach and intestines or encysted in the muscles. There were eight altogether, slides no. , see drawing.

p. 207.

ENTOZOA in CAT-FISH.

12/5/69.

Procured two small Taeniae from intestine, length about half an inch; head devoid of hooklets.

7/5/70.

From a cat-fish caught in the canal 10 Taeniae were obtained. This Cestode is from $\frac{1}{4}$ to $\frac{1}{2}$ an inch in length and very extensible. Suctorial disks prominent, can be seen with the naked eye, they are four in number; no hooklets were seen. The water vascular system is beautifully seen in this species. At the head it may be seen terminating in a plexus (whose branches are as large as the primary trunks) situated between the disks.

Two Distomes were also found in the intestine; encysted Nematodes in the liver. A Cysticercus in the kidney.

29/5/70.

From the intestines of Cat-fish speared at the Island. 3 Taeniae, very small, and 4 Echinorhynchidae (see slide) accessory claspers of the male - well seen in this species.

p. 209.

ENTOZOA in PIG.

5/6/69.

Obtained from Dr. Maddock of Hamilton a small portion of the heart of a measley pig; contained about a dozen of Cysticercus Allulosa. See slides No.

*G. Johnson as sent to me
no VI 69 No 1245-*

ENTOZOA in MAN.

p. 211.

7/2/68.

I.

Trichina spiralis.

Obtained a piece of muscle from a man who died of the disease in Illinois State, very numerous, not encysted. Two families living on different flats of the same house bought a barrel of pork between them. One flat cooked the pork and escaped the disease, the other ate theirs raw and nine were sickened; of these nine, four died

27/2/69.

II.

The family of a Mr. Getz in Hamilton consisting of himself, wife and daughter, partook of an uncooked ham. All three were laid up with the disease. Miss Getz died first, in her the parasites were numerous and unencysted. Mrs. Getz died some two weeks after her daughter; in her they were just beginning to be encysted. The husband was attacked but not so severely and escaped, most probably from being drunk for some days at the commencement of the attack. See slides Nos.

20/12/69.

III.

Obtained a piece of muscle from a woman in New York. In her the disease was not suspected during life, the students on dissecting the body found (as in the original discovery of the parasite) great difficulty in cleaning the muscles, and on examination they were found to be packed with Trichinae, all encysted. See slides Nos.

22/2/70.

IV.

While dissecting the arm of a man, who had died at the Toronto General Hospital, I found numerous Trichinae in the Biceps muscle, and further examination showed them to be scattered pretty freely throughout the muscles. From ~~30~~ of the muscle, from the beginning of the long head of Biceps I obtained 150 cysts, the greater number of them containing healthy-looking Trichinae.

29/3/70.

V.

In the subject following the one above, and also brought from the Toronto General Hospital, numberless cysts were found in all parts of the body. The parasites in this case are not as old,

1870 (continued)

none of them beginning to undergo degeneration.

ENTOZOA in MAN.

p. 214.

15/3/68.

Taenia solium.

Ten feet passed by a bank-clerk, a patient of Dr. Russell's.
See slides Nos.

23/2/71.

Taenia mediocanellata. Obtained three specimens of this cestode from a man (Earle) who died of heart disease in Montreal Gen. Hospital. He stated during life that he had been suffering from Tape worm for 14 years, got it at Malta while station there with his regiment. He stated that he had been under treatment for it innumerable times and had passed many yards of the worm. While in Hospital during the end of last year and the beginning of this, he was treated with the male shield fern, which brought away several long portions. On opening the small intestines the worms were found extending from the lower part of the duodenum through the jejunum and seeming completely to fill the intestine in the empty condition. The heads were all within $1\frac{1}{2}$ inch of each other and deeply imbedded in the mucous membrane, between the valvulae conniventes. The bodies were convoluted and twisted, extending down the intestine for about $3\frac{1}{2}$ feet, and lower down in the bowel several detached portions were found, consisting of from six to eighteen proglottides. The worms still retained some little vitality, but the movements were very feeble. While in the intestine, the water-vascular system in one of them was beautifully seen, extending up each side of the worm. The length was of each respectively 76.50 and 65 inches, and the number of segments amounted in each to between 275 & 350, falling at least 100 short in the longest one of the fully mature sexual segments. This however is not to be wondered at as it is not more than six weeks ago since he passed several yards. The chief differences between this form and *T. solium* appear to be as follows. The head is larger, abruptly terminated, and lacks the rostellum and consequently the hooklets. It is surrounded by a dark zone of calcareous corpuscles which form a striking contrast to the white segments of the neck. The segments are broader, thicker and not as long. The generative orifice is a little below the centre, and the lateral branches of the uterus appear more numerous and closely packed together. There appears also to be a difference in the shape of the ova in the two species, that in *Taenia solium* being round, while in *T. marginata* they are rather oval and somewhat larger.

p. 223

ENTOZOA in PERCH.

23/4/70. In the liver of a perch taken from the stomach of a pike (see p. 219) were numerous encysted Nematodes (see slide no.).

13/5/70. From four Perch caught in the canal I obtained the following:-

A Cysticercus from the liver, the head of which bears a remarkable resemblance to the head of the Taenia of the pike and most probably is its scolex. Encysted Nematodes from the liver.

Four species of Echinorhynchus from the rectum.

In the intestine there was a curious entozoön with a bell-shaped retractile head furnished with small finger like processes (see sketch and slide).

Coiled around the base of the aorta was a large distoma. The upper thrid is outlined in this sketch.

W.O.'s note book, 1870.

p. 227.

ENTOZOA in EEL.

9/5/70. One solitary tape-worm in the duodenum about four inches long. No generative organs seen, no ova, water-vascular system distinct, no head discovered.

Two species of Echinorhynchus both female, length $\frac{3}{4}$ to 1 inch, moved freely, retracting and pushing out the hooked proboscis. Eleven rows of hooklets, recurved like the barb of a harpoon. The two Lemnisci were distinct as also the 3 or 4 muscular retractors of the proboscis. Cysts containing ova occupied the rest of the body. Two or three slight constrictions existed.

12/7/70. From a large silver eel caught at Burlington canal obtained one large Distome from stomach.

W.O.'s note book, 1870.

p. 229.ENTOZOA in SQUIRREL.

12/5/70.

Eight small Ascaridae from the duodenum of the redsquirrel.

p. 230.EXPERIMENTS WITH ENTOZOA.

23/1/70.

I.

Fed two rabbits with mature Proglottides of *Taenia elliptica*, from dog no. 2, six segments to each rabbit. These will in all probability give negative results as the scolices of *Taenia elliptica* are not produced in the rabbits.

THESE FAILED.

23/2/70.

II.

Fed a rabbit with about $\frac{3}{4}$ of Trichinous flesh from man in whom I found them while dissecting.

1/3/70.

III.

Fed a cat and dog with Trichinous flesh. 3/3/70. Repeated the dose to dog.

In these cases the juices of the stomach were in all probability not strong enough to dissolve the cyst and free the parasite.

30/3/70.

IV.

Fed a rabbit and a young pup with muscle from Case V. 31st repeated the dose to pup. 1st again.

14/4/70.

Killed the pup. No traces of Trichinae; the cysts were probably too dense for the juices of the stomach to dissolve.

21/4/70. Killed the rabbit fed with the Trichinous flesh on 30th Mar. Numerous Trichinae in a young immature condition were observed in the muscles. Many of them exhibited sluggish movements. They were more numerous in the abdominal and thigh muscles than in any other.

p. 250.

ENTOZOA in PICKEREL.

3/6/70. From the intestine of a Pickerel in the Fish-market I obtained 8 Taenia. This is a comparatively stout Cestode, length from 10-12 inches breadth of posterior segments about $\frac{1}{4}$ of an inch. Head square, no neck, but a gradual tapering to the head. Disks four, large, no hooklets observed.

23/6/70. From Pickerel (one foot and one half long) in Fish-market Toronto. 18 large Taenia were obtained.

p. 276.

ENTOZOA in DOREY

22/10/70. Examined a dorey in Montreal fish market. One small tape-worm, one Borthriocephalus and about two dozen small Echinorhynchidae were found. The Borthriocephalus occupied the entire cavity of one of the numerous caeca given off at the pylorus. The Taenia was in the duodenum and the Echinorhynchidae move towards the rectum. This fish I find is the Pickerel. see. p. 250.

W.O.'s note bk, 1870.

p. 278.ENTOZOA in BAR -FISH.

1/11/70.

Examined one of the above-named fish, and found in the peritoneal cavity some half dozen Nematode worms. Each worm is about half a line in thickness and from three to four inches in length, dark in colour, annulated towards the anterior extremity, which is blunted and thick. The posterior extremity is pointed and presents the vaginal and rectal orifices. The ovaries extend the whole length of the body.

10/11/70.

Found more of the same kind in the peritoneal cavity packed about the rectum, nothing in the intestines.

ENTOZOA in CAT. ^{to}p. 280.

3/1/71.

Examined intestines of cat, found one *Ascaris mystax*(?) and one *Taenia*.

*Probably *Ascaris* to *Ascaris**

p. 282.

ENTOZOA in LYNX.

5/3/71.

Examined the intestine of an animal obtained by the Nat. History Society of Montreal. In the duodenum were Ascaridae and lower down in the bowel 25 Taeniae. The animal had been dead a long time and the intestines had been thrown out and exposed to the cold for two nights. The greater part of a racoon was found in a semi-digested state in the stomach. The other organs were not examined.

W.O.'s Note book, 1870.p. 284.ENTOZOA in RAT.

8/3/71.

From a rat obtained at Montreal General Hospital I obtained 5 Taeniae. They were situated low down in the intestines, approaching the faeculent matter. This is a small, fine species $2\frac{1}{2}$ to 3 inches in length. Head very small, no hooklets seen. The water vascular system is very distinct.

p. 217.

21/4/70.

Made
ON THE FINNS OF CHUB.

On the finns of chub in the Rev. W. A. Johnson's aquarium were noticed several round white spots. These on examination proved to be some sort of Entozoa. In addition to these, some yellow spots were seen which seem to be a more advanced condition of the parasite. (see slide *** .)

2/5/70. Numerous Flukes attached to the intestine of a small chub. (see slide no. ***)

12/6/70. Examined three chub: from the intestine of one two Echinorhynchus were obtained, a male and female.

p. 219.

ENTOZOA in PIKE.

23/4/70.

Mad

In a pike 2 ft. 7 in. long caught at the Island, I obtained 68 specimens of Taenia and two or three small Ascaridae.

This tape-worm is about a foot long, and exhibited curious undulatory movements which continued for more than twenty-four hours after removal from the intestines. It is very extensible, and may be stretched to almost double its ordinary length. The head is flattened, club-shaped when the worm is dead, but during life is generally extended, giving to it the shape of a flint arrow-head. Five suckorial disks are plainly seen but no hooklets. The segments taper very gradually, being exceedingly small at the neck, larger towards the end of the body, they are about twice as broad as they are long. The Water vascular system is most distinctly seen in this worm, consisting of four channels, two on each side. At the head and for a considerable distance down the neck, these tubes connect by means of inosculating branches, these about the head form a dense net-work. (see sketch).

30/4/70. From a pike caught in the canal basin at Dundas I obtained 28 Taenia and numerous small Ascaridae. In the stomach of this fish were 52 smaller ones, principally little bass and perch.

30/6/70. From the intestines of two pike obtained at the Fish-market, Toronto. In one 84 Taenia were found and in the other 53 not counting numerous small undeveloped ones, - looked like freshly eaten scolices. A few Ascaridae were found in the stomach of one.

23/6/70. From intestine of a pike obtained in Fish-market, Toronto. 56 Taenia; most of these were of a large size and longer than the usual ones from this fish.

p. 254.

ENTOZOA in MENOBRANCHUS lateralis.

2 6/6/70. From a specimen of the above, caught at the Island I obtained numerous Polystomes, some of which were attached to the branchiae others to the upper surface of the mouth. This Nematode presents four disks, two at each extremity. Of these the smaller one situated about the middle of the upper fourth of the body, is the mouth, which leads directly into the intestines. These consist of two simple tubes, which unite about the middle of the lower fourth of the body. The water vascular system is well developed. It appears to commence in a ramification of vessels about the anterior disk, these unite to form two vessels, which run the whole length of the body, join below and open somewhere between the posterior disks. Cilia is to be seen distinctly in the water vascular system, especially at the junction of the tubes below. At the upper third of the body on a level with the generative opening, on each side is seen a curious pulsating organ which is undoubtedly connected with the water vascular system. The pulsations occur about every minute and a half. ~~xxx~~ The external generative orifice is seen a little below the oval disk, this leads into a narrow, slightly curved vagina. The ova occupy the general cavity of the body between the digestive tubes. A bundle of specules (Penis?) are to be seen close to the vulva. Close to the caudal disks two large hooks are placed. These hooks are bifurcate and to one extremity a band of fibres is attached. Besides these numerous small hooklets are to be seen scattered about the posterior disks. The attached extremity of these is trifurcate.

p. 258.ENTOZOA in SKUNK.3
15/6/70.

From a large male skunk, about 30 Taeniae and 14 Ascaridae. Numerous small cysts were observed in the liver and spleen but nothing found in them. The Tape worms are small, from $\frac{1}{2}$ an inch to 2 inches in length, broad in proportion, exhibiting very slight movements. A slight enlargement seems to exist about the neck, which disappears when the worm is much elongated. The segments seem but loosely joined together, breaking very easily. Four larger sucking disks exist at the head, no hooklets seen. The calcareous corpuscles are more numerous in this Cestode than in any I have yet examined. The water-vascular system is not easily seen on account of the dense layer of calc. corpuscles.

The Ascaridae are from $\frac{3}{4}$ of an inch to one inch in length. They move freely. Most of them were in the stomach, not in the intestines.

p. 260.

ENTOZOA in SUN-FISH.

4/7/70.

Examined ten Sun-fish caught in the Canal; in all numerous Distomes were found. This fluke is probably in an immature condition, being encysted and not having its internal organs completely developed. The heart, liver and kidneys presented a swollen appearance from the numbers in them. They seemed only to be attached to the heart, while in the liver and kidneys they occupied the substance of those organs.

Encysted Nematodes were found in one liver and what appeared to me the scolex of one of the Echinorhynchidae, in another.

In the rectum of two, a few Echinorhynchidae were found.

W.O.'s note book, 1870.

ENTOZOA in SUN FISH.

p. 260.

4/7/70.

Examined 10 Sun-fish caught in the canal; in all numerous Distomes were found. This fluke is probably in an immature condition, being encysted and not having its internal organs completely developed. The heart, liver and kidneys presented a swollen appearance from the numbers on them. They seemed only to be attached to the heart; while in the liver and kidneys they occupied the substance of those organs.

Encysted Nematodes were found in one liver and what appeared to me the scolex of one of the Echinorhynchida were found.

Echinorhynchida in another

copy

p. 264.

ENTOZOA in KING-FISHER.

1/7/70.

(a King Fisher)

4 { Examined one of these birds, and much to my surprise found no Entozoa in it.

13/8/70.)

X 5 { Shot a King-fisher. A few small Distomes were found in the liver. The small fish which constitute the food of this bird seem not to share the common fate of fish, inasmuch as few or immature Entozoos are found in them.

W.O.'s note book, 1870.P. 266.ENTOZOA in BLACK SQUIRREL.

1/7/70.

Examined a large male animal. No Entozoa in him.

ENTOZOA IN BASS.p. 268.

7/7/70.

6 [Examined a large black Bass caught in Burlington Bay. A solitary scolex of some tape-worm was found in the peritoneal cavity.

ENTOZOA in HAWK.p. 270.

13/8/70.

8 [Shot a Hawk; a single large Ascaris found in the duodenum.

p. 274.

W.O.'s note book, 1870.

ENTOZOA in FOWL (Gallus).

9/9/70. Examined the intestines of three fowls, one a two-years' old rooster, the others this year's chickens. In the duodenum of the rooster numerous Taenia, from 2-6 inches long, were found; in the younger fowls a few smaller ones of the same kind occurred. The smaller ones were deeply imbedded in the mucous membrane, the larger ones not at all so.

4/1/71. Examined intestines of two fowls. Found in one numerous Taeniae, same kind as above, and one Distome about half an inch long and 2 lines thick, very large posterior sucking disk. The fowl has been frozen so that the worms were dead and had begun to disintegrate. In the other a few small taeniae only were found. The generative organs in this species open by an orifice of considerable size along one margin only of the worm. The opening is more at the junction of the segments than at the centre.

6/11/71. Examined two fowls. One large Ascaris only found. The fowls were grain-fed.