

coll. 482

167

1871-1888

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Call. 482 (6)

1871-88

see back of book (1875)

ACADEMY

NAT. SCI.

PHILA.

MS. 228

coll. 482 (6)

Dec. 18, 1871. Dissected a *Phrynosoma*
from California, alcoholic specimen. Had two
invaginations of the small intestine; one was
about $\frac{1}{4}$ of an inch of the latter into itself,
the other about an inch and a quarter of the
small into the large intestine.

April 17, 1872. Found beneath a log in
woods of Swanton a single *Phrynosoma*
5 lines long. Smoky color above due to black
reticulation of pigment, which is absent
beneath. Mouth a circular orifice behind the
middle. Prothorax cylindrical. Intestine same
as in other *Phrynosoma*. Eyes 2, only visible
on compressing the animal.

1873.

Left Philad. June 30, 12.40 P.M. arrived in
Chicago July 1st 7.30 + put up at Sherman
House. Left for Omaha July 2d in morning
& arrived there July 3d, 9 A.M. Put up at
Wyoming Hotel. Excessively warm. Left July 4
about noon & arrived at Ft Bridger July
6th. about 10 A.M.

Expenses.

Porterage on baggage - - - - -	1.35
Sleeping Car Phil. to Chicago for two -	10.00
Hotel charges & porterage Chicago - -	8.50
Fare to Omaha self & wife - - - - -	35.30
Pullman Car for do - - - - -	6.00
7 meals at 75cts - - - - -	5.25
Half fare to Ogden & return for two	155.00
Pullman Car for two to Ft Bridger - -	16.00
Hotel charges Omaha - - - - -	7.00
Meals \$8. do \$1. Sundries \$1.50 -	10.50

Fossil fishes & other bones purchased at Green
R. Station - - - - - 3.50

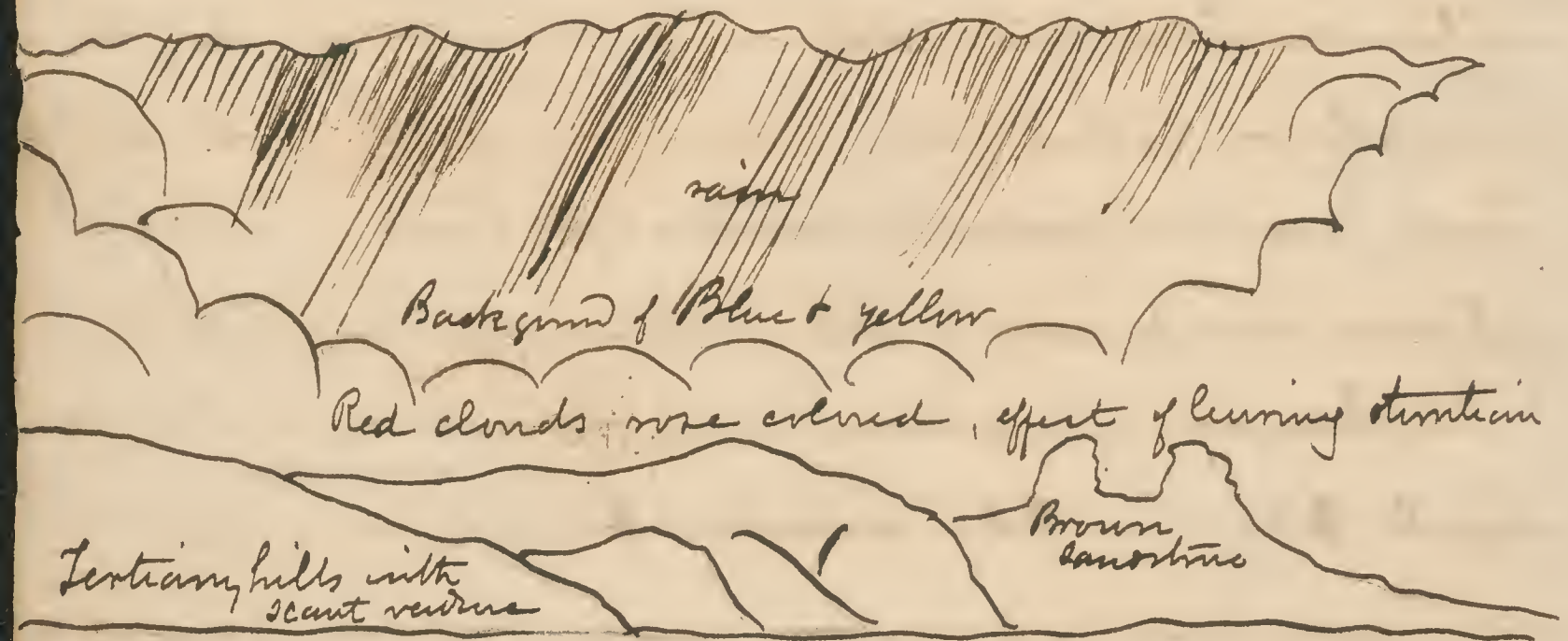
Party. Self & Wife, Dr. J. C. Porter, Joseph
Willert, Dr. H. C. Chapman, & Charles
Dolley of Rochester, N. Y.

Thursday July 10th In company with Wilson & Chapman
went to Green River Station on U. P. R. R. Hotel kept
by S. J. Field. July 11th went with Johnson as guide
to the north hills to examine the tertiary strata
containing fishes. These are in limestones
shales & quite abundant.

Purchased of Field a collection of *Limnithorax*
bones, collected by a Shoshone in the buttes
between Black's & Ham's Forks.

Wind storm & dust in the afternoon.
Grand scenic effect of clouds in west just
after sunset.

Black rain cloud

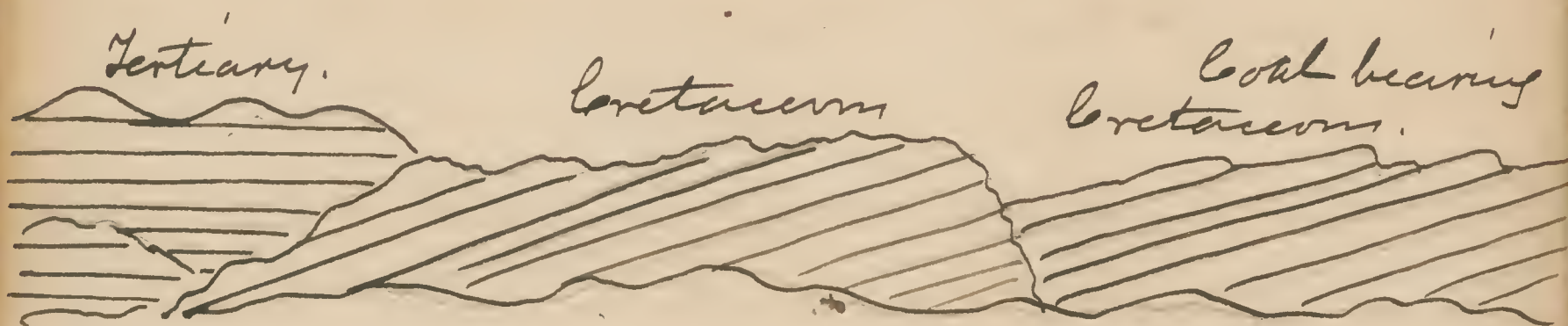


Scenic effect of clouds looking west.

Saturday 12th Wilson & I visited the coal mines
of the Wyoming Coal Co. at Rock Springs about
4 pm. east of Green R. Station.

Fine compact lignite coal in strata
between clay shales above and bluish white
& ochreous sandstone beneath.

The coal belongs to the cretaceous strata, and these dip from the east towards the west beneath the nearly horizontal tertiary strata.



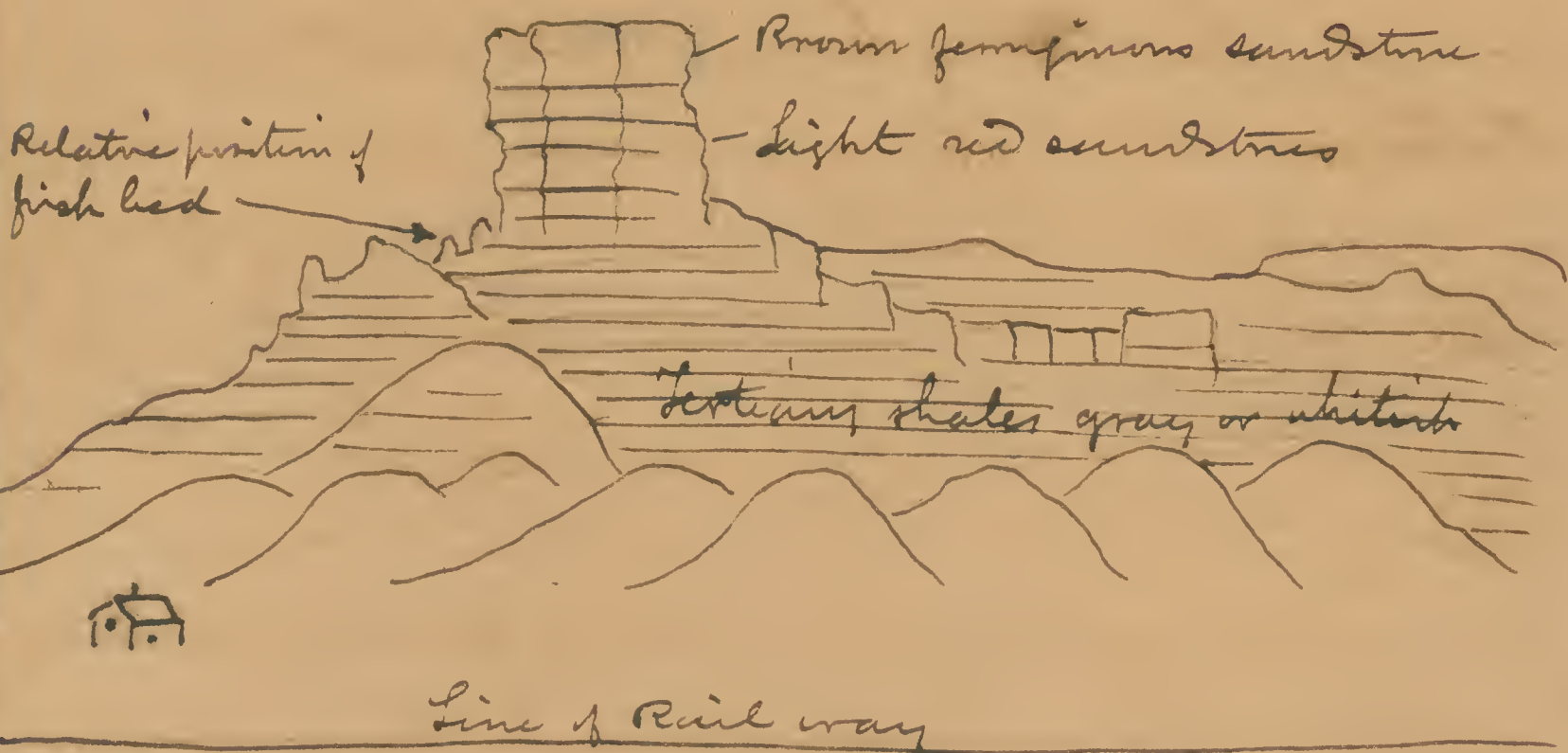
Looking north from Rock Springs Station on Bitter Creek, W.

Opposite Rock Springs Station, a ~~tin~~ shoemaker Charles Hudson, exhibited a small collection consisting mainly of garnets but also containing a few minute diamonds and apparently spinel rubies, which he declared he had found in the range of country extending from Elk Mt to the Uintas.

Fast to Green R. & Return	- - - - -	10.50
To Rock Springs & return	- - - - -	2.50
Hotel charges & sundries	- - - - -	3.50

Fossils purchased for A. N. S. at Green R.	- - -	13.00
Head of Rocky Mt Sheep	- - -	15.00

Returned to Bridgee Saturday evening July 12.



Green R. Station looking north.

Monday July 14th camped at Millersville about 13 m.
 from Ft. Bridges, next day miles further to Edwards
 Spring from Ft Bridges. Spring at foot of Buttes
 & from a small meadow with grasses *Calceolaria*,
Hordeum & *Triticum*

Spring a circular well about 1 foot in diameter
 & upward of 4 feet in depth. Temperature of water 42°
 Wednesday morning temp. of air at sunrise 48°
 Thursday 36° and thin ice in a basin. Visited Wed.
 Buttes about 6 miles distant, but found no fossils
 of importance.

Vicinity of Edwards' spring formerly no doubt a
 favorite camping place of Indians. Evidences

of which in abundance of rude stone implements.
Name given to Spring in honor of Ike Edwards
a landowner living at Milledville.
Afterwards went to Church Buttes, camped there
on Black's Fork on Thursday night. Abundance
of Mosquitoes. Friday reached Buttes but found
no important fossils, & by night returned to
Bridgeport.

Temperature of air at Church Buttes Friday morning 40°
In shade about noon 80°

Temp. of air at Bridgeport in porch of Dr. Carter's home
opposed to reflection of sun 90° about noon,
in my room in about quarter of an hour sunk
to 76° Sat. July 19th. 1873.

July 25th Trip to the Winta Mts. All our party,
Judge Carter & daughter Ada, Gen Flint's daughters,
Ed. Carter & mother, &c. Camped near Judge's
Saw mill. Next day went to Gilbert's Meadow
& there camped. 27th Party of Judge Carter, self & wife
Dr. Parter, Dolly & Ed. Carter, &c. visited a
lake 4 m. distant and also head of Smith's
Fork. 28th returned to Ft. Bridgeport.

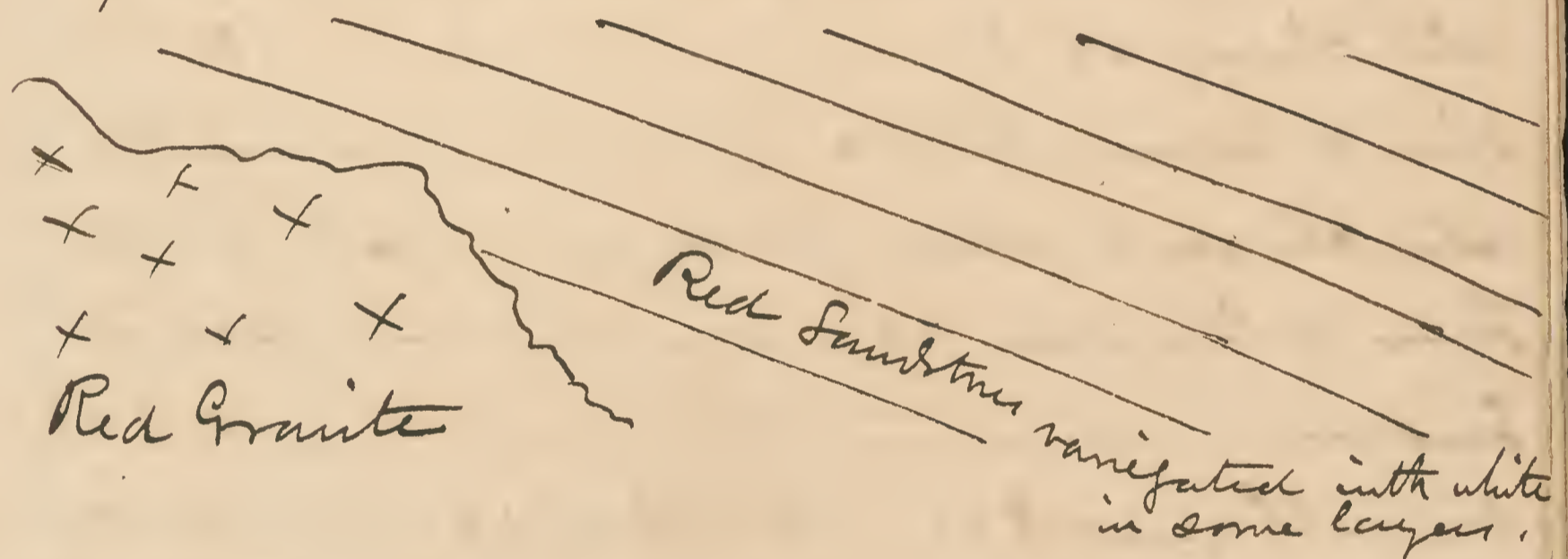
Wed. July 30th Dr. Carter & I, with driver & Tom, & two wagons left Ft. for exploration of Buttes on Henry's Fork about 40 m. distant. 1st camp at Herdhouse on Fork 27 m. from Bridge & a mile or two below second crossing of Fork. 31st examined the Buttes in vicinity for fossils. Found abundant in vicinity. Aug. 1 Proceeded 15 m further down Henry's Fork which was forded 13 times before reaching destination near John Baker's Ranch. Aug. 2 On horse back went to high buttes about 4 or 5 m. distant to seek fossils. Dr. Carter here found teeth of *Uintatherium*, and remains of a carnivore. Aug. 3^d return camped at 2^d crossing of Henry's Fork. Aug 4th evening arrived again at Ft. B.

Meadows of Henry's Fork profusion of *Elymus condensatus*, *Lolium caninum*, in some places *Beckmannia cruceiformis*. Philip Mass, a Mexican landowner has the most beautiful ranch & meadows on Henry's Fork.

Old hat cattle enjoying & thriving on *Juncus horticola* & a species of *Equisetum*.

Made an examination of Buttes near Carter Station Friday Aug. 8th. Same day left for Cheyenne & Denver. Monday Aug 11th visited Colorado Springs about 76 m. below Denver in company with Dr. Porter, wife & Miss Smith. Fine view of Pike's Peak & other Mts. Aug. 12th Drive to Glen Eyrie, Garden of Eads, Manitou Springs, Wte Pass, & Colorado City.

Fine display of the Red & White sandstones resting on the Red Granite at entrance of Wte Pass, as thus:



Same day Aug 12th return to Denver & put up at American House.

Aug. 13th leave Denver for home via Cheyenne U. P. R. R. to Omaha, Burlington & Quincy to Chicago, thence by St Wayne to Pittsburgh & P. R. R. Arrive home Sunday Aug. 17th.

Expenses.

Expedition to Edwards Spring & Church

Ponies - - - - -	\$21.40
Paid Driver - - - - -	5.00
Freight on Box to Ft Bridger from home	4.50
do do	6.25

Pullman car to Cheyenne - (2) - - - -	\$ 6.00
Fare to Denver - half charge (2) - - -	10.00
Hotel charges at Minger Home - (2)	14.00
Fare to Colorado Springs of Mrs. L. & return	13.00
Hotel charges at do (2) - - - - -	10.00
Drive to Garden of Eves &c. - - - - -	2.50
Hotel charges on return to Denver - (2)	6.00
Fare to Cheyenne (2) - - - - -	20.00
Sundries - - - - -	3.00
Dinner Cheyenne \$2. Breakfast \$2. - -	4.00
Pullman car to Omaha (2) - - - - -	8.00
Fare to Chicago each \$17.15 - - - - -	34.30
Pullman to do. (2) - - - - -	6.00
Meals, &c 3.00 Car at Omaha \$1. - - -	4.00
Omibus Chicago \$1. Meals \$2 - - - - -	3.00
Pullman car to Philada. - - - - -	10.00
Meals \$5. Postage baggage \$1.50 - - -	6.50

1873

Aug. 23. Mr J. P. Clark, of Firm of Jewelers 1124 Chestnut St exhibited to me a magnificent specimen of a South African diamond, an octahedral crystal, of 80 carats, of a pale straw color, and with only 2 slight visible flaws. The octahedron perfect, with the borders beveled in a rounded manner.

Ordered through S. S. White, Manuf. Dentist -
Chestnut & 12th, Nov. 8th, 1873.

On account of the University as follows.

1. Three human skeletons, adult, male, & with the bones separated and well marked.
2. One female skeleton, separated bones.
3. Four skulls, male, large, well shaped & of good quality.
4. Four skulls, male, the bones separated and well marked.

On account of Swarthmore College.

Azoni's Models.

1. Large Model of the Eye. Complete Eye ball.
2. Large Model of the Ear.

Expenses University 1873-4 \$11,727.67 ---

Assessment summer of 1874 \$538. —

Exchanged with B. Stütz of Bonn, No 25
Wilhelmstrasse, as follows.

Cornudum and Arkansites Dr. for 50 Markes

Received: 3 Paper Cral and 1 Siliceous slate with
Protomya, Rott, near Bonn. 7 fossil plants from the
Molasse of Oeningen and 16 fossils of the lithographic
stone - value 50 Markes. Oct. 1875.

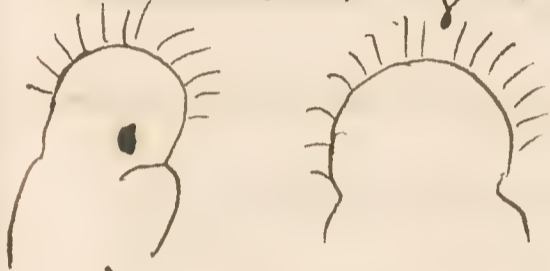
Amphistomum fabaceum Des. Numerous specimens
obtained by Dr. Chapman from large intestine of *Mancatee*
died at Zoological Garden Oct. 1875.

Body shaped like lepsine, demiovoid, convex dorsally,
concave or flat ventrally, and with the ends and
lateral borders incurved, when the animal was detached
from intestine. Acetabulum near the posterior end
ventrally, large, cup-like, adherent to the intestine of
which it included a small rounded papilla like
prominence. Color translucent pinkish, or pale flesh
color, with the acetabulum appearing as a darker
red spot. Intestines on each side appearing as a
yellowish or dirty streaks from food contents. Surface
of body transversely striate and papillate.

Length 3 lines by $1\frac{1}{2}$ or 4 lines by 1 line. Acetabulum $\frac{2}{5}$ line.


The nervous system exhibits a much greater development
 than is supposed to exist by Blanchard
 in *A. conicum*. From the anterior ganglion, as
 many as a dozen strong nervous cords could be
 seen extending longitudinally, in a divergent manner
 toward the back end of the body.

Acanis aquaticus worm from Darby Spring.



21 setigerous segments.

Setae dorsal, in two bunches,

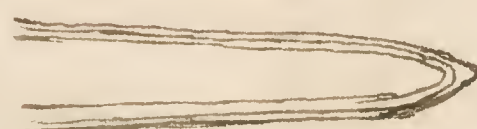
in movement of worm generally directed
 backward, curved, compound thus: 

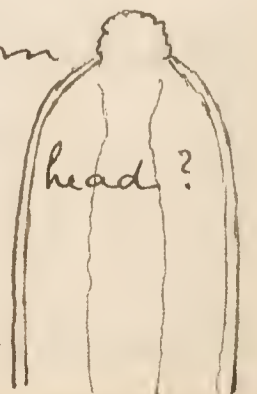
Podal hooks in pairs of fasciculi, ventral,
 bifurcated and truncate at end. Upper lip
 obtuse ciliated with rigid hairs, Tail

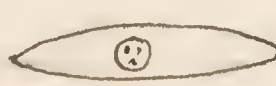

truncate ciliated like upper lip. A
 pair of eyes to head. March 1876

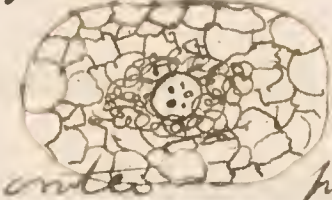
For future observation.

Worm from eye of a woman. Sent to Dr. S. S. Martin
 by R. H. Nassau, Sabine, W. A. June 30, 1876.

Examined Jan. 1877. Worm dark brown, head and
 opaque; cylindrical, tapering towards suppressed tail
 end; thicker obtuse end with a papilliform
 mouth; tail end narrow, conical, obtuse
 with a slight conical thickening at the
 extremity.  Length 16 mm.



April 9, 1877 Enchytraeus obtained day previously
at Robinson's Kuehl. Examination of corpuscles
of body cavity. Generally appeared on edge
at first within body & as they escaped. In this
way they were fusiform  or lenticular
usually 20 to 22 by ~~20~~ 3 1/2 to 4 thick. In broad view
generally oval 20 to 22 and 15 to 17. Largest 25 by
20 + 4 1/2 thick; smallest 14 by 10 + 3 1/2 thick.
Some of them circular & nearly of equal diam-
eter. Appeared uniformly granular. Rapidly
acted on by water became obtuse at poles. some
measuring 30 by 25 and 8 to 9 thick .


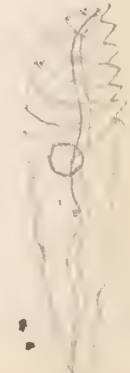
Some granular  matter assumed vesicular
character. The outer portion of larger vesicles
resembling one of appearance of Actin. Eichornii.


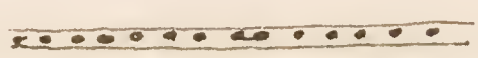
Observed from one of the Enchytraei several
parasitic nematoids resembling Anguillula.

April 12, 1877 Examination of a Lumbricus
from beneath a decaying log in the woods,
contained multitudes of Naisellae, also
a number of Rhabditis terricola, and
liberian an Opalina - see drawings. In
these frequently the nucleus if present
escaped my observation, and a contractile
vesicle was surely present. The nucleus
straight or slightly tortuous, finely granular.

Individuals observed in various stages of transverse division. Anterior extremity of body with a minute mucro.

April 15, 1877 *Leones flauipes*, observed that intestine contained enormous numbers of ciliate infusoria &c. In two saw five different organic forms:

1. Fusiform infusorium with a mantle of long cilia see drawing. Animal colorless, mostly stationary in position, narrowing and widening with shortening of body; head bending to one side when assumed appearance of a peristome reminding one of that of *Stentor*. Motion mainly waving of the long cilia which envelope body in a longitudinal spiral manner projecting far behind. Interior of body finely granular often with no other appearance observed, but often with appearance of a finely granular nucleus, spherical & about 3 dia. Less frequently with one or more additional globules, of which one or two appear to be contractile vesicles.
2. A small elongate ciliate infusorium; revolves rapidly on axis presenting a spiral arrangement of the muscular lines & rows of cilia 
15 long by 2 (No 75.H)
3. A remarkable elongated conical, finely granular infusorium, with spiral arrangement at fore end, often projecting in points as in figure: 

Exhibited rapid movement laterally, flame-like.
Apparently extending whole length a narrow vibrating
band. Animal nearly stationary in position. When
contracted would assume about a spherical
form:  Elongated measured 25 by 10 No 7
4. A rapidly moving one 10 long
5. Astromites threads 

April 17th *Rhynchodemus sylvaticus*. An
individual observed on some *Fegatella*, collected
the previous day from the spring at Lapstone
Quarry. Blackish or brownish black above
with two longitudinal darker lines; beneath
translucent brownish. At rest had the head
doubled back & resting on dorsum as seen
in the third figure.

April 18, 1877 Infusorial parasites of *Yeomes flavipes*.

Trichonympha agilis. Fusiform, head mammilliform, body usually feebly contracted or rather slightly more abruptly expanded at commencement of back two thirds, posteriorly conical sub acute or obtuse according to degree of shortening of body by contraction. Intestine - or entrance of two peritremes: the anterior peritreme oval, finely granular, connected by pedicle to summit of head (mouth?). Posterior peritreme of entrance more coarsely granular, often with solid food particles (fragments of woody filae? &c) Sometimes there are contained in distinct vacuoles. Sometimes one or more large clear spherules, apparently vacuoles or contractile vesicles (never observed contracting &c). A granular nucleus apparently constantly present opposite (within?) anterior division of the entrance. Animal usually nearly or quite stationary in position, occasionally ~~shortly~~ by contraction in length & rather abrupt protrusion propels itself slowly forward, or moves forward by series of slight jerks. Usual movements writhing of body especially the anterior extremity. When the

head is bent to one side and forward or backward it assumes the appearance of a spiral peristome reminding one of that of Stentor. Body clothed with remarkably long cilia. One set the shortest diverge from the head and are incessantly in waving motion. A second set extends from the head falling over the shoulders and body longitudinally, which are frequently partially raised & collapsed like the partial opening & closing of the ribs of an umbrella. An apparent third set the longest extend from the head the entire length of the body and one third the length beyond. These are longitudinally spiral, & form a more or less loose twisted fasciculus projecting posterior to the body, with the ends more or less divergent. These longest cilia are less active than the second set, which also display a constant waving movement given before backward. Body appears to be furnished with longitudinal sarcodermic filaments often partially visible especially at one part of body as uniform parallel lines, but difficult to distinguish separately from the long longitudinal cilia.

Pysonomopha vestens. Body fusiform, clavate
or pyriform, with irregular waving and
partially serrated outline. Delicate,
transparent, granular, with the distinction
of ectosome & endosome much less evident
than in former. As in this also usually
nearly stationary in position, but also
progresses occasionally a short distance with
the narrower part forward. Usual motions
of an active character consist of a rapid
longitudinal waving backward? especially
conspicuous ~~is~~ along the lateral borders,
and reminding one of the flickering
or trembling ascending currents of
flame. Writting movements also incessant,
apparently dependent, or at least
conjointly with ~~long slow undulations~~
the movements of a narrow longitudinal
band extending from one end to the
other of the body. The motion of this band
is in comparatively long angular waves
shorter than in the flame-like motions
of the lateral borders. The motion is
from before backward. Sometimes the
waving band appears to project in a
micronate point, which exhibits a

sudden jerk as ~~the wave~~ of the each successive wave of the hand terminates. Other motions are those of bending the head end and also occasional rotary motion of the body ~~in~~ its long axis. The usual motions give the appearance as if the body incessantly and actively rotated, but I think the appearance is deception or illusory, arising from the wave like movements in spiral lines in the length of the body. Sarcoid lines not distinct everywhere, but partially evident in different portions of body in its movements, & often rendered prominent at one side of head end in minute points, giving the border a serrate or denticulate appearance. From the head end I have apparently detected at times one or two delicate actively vibrating flagella, but of their positive or constant existence I was unable to convince myself. A large oval nucleus, faintly granular, often with a small nucleolus occupies ~~the base of the anterior~~ a position in advance of the middle of the body.

Back of the middle the intestine is usually
more evenly granular and often contains
many particles of solid food, chiefly portions
of woody fibre? No vacuoles or contractile
vesicles observed.

Trichonympha. Second set of cilia about
length of body swell outwardly and close
again. The third set are comparatively
quiet but from time to time diverge at
ends or close together more closely.

The contractile vesicle? back of the
granular nucleus measures from 3 to 4 μ and
exhibits the same apparent pinkish
hue as does in Amurella. Sometimes two
frequently more. Did not see one collapse,
nor enlarge.

April 22 *Physa heterostropha* for
Trematodes. Examined a dozen or more
collected the day before from the Schuykill
near Padmont. None detected.

April 23, 1877 Termites from New Jersey. Examination of a winged specimen taken from a nest in a piece of wood. Mass of infusoria mainly consisting of *Pyrosomympha*, with few *Loichomypha* etc. The former appeared to adhere to intestine by the anterior end, and the ciliary movement gave appearance of turning or rotation from this end outward or toward the other end. So crowded gave appearance of projecting villi with rotary motion. See figure. Generally fusiform or elongated clavate from 25 to 35 by 3 to 5. Uniformly finely granular, without solid food (none of which was in the gut; - the abdomen appears milk white & intestine without any of the brownish pulp so common in the workers) In movement double spiral lines evident. The vibratory band not so distinct as usual & nucleus rarely visible. Most common size about 27 long by 4 broad when evident. Mens. No 7 S.H. Sc. of drawing 2mm for 1 Div micr.

Mouth parts

Lab. parts

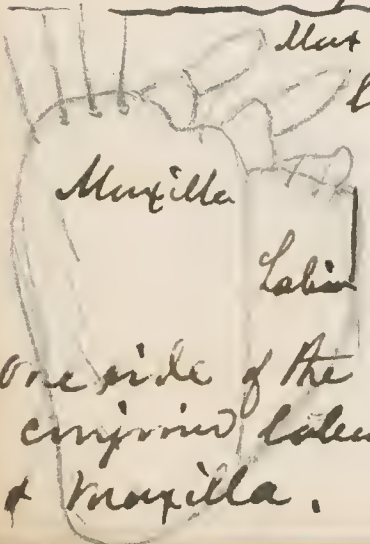
Polydesmus virginensis May 8, 77

Maxilla

Labium

Mouth composed of Labrum; a pair of strong, short robust mandibles with small teeth in two rows; one to upper three to second row; followed by enjained maxillae & labium each with diminutive palps



One side of the enjained labium & Maxilla.



Specimen a female 16 lines long by 4 broad. Color of dorsal scutes shining black merging into a posterior brownish-orange edge but the anterior border of the scutes yellow. Lateral margin orange & beneath the same narrowing into a thin band of same extending to the legs. Under part of body cream colored, with legs beyond the femora yellow. First dorsal scute bordered with yellow in front. Head above brownish black. Antennae brown. Labium white. Mandibles orange.

Earth worms from beneath a stone of Robinson's Mill Examined May 11, 1877. No Eegarium in intestine.

Six milk white masses at fore part of body, rounded or oval from 2 to 3 mm. appeared like mucous glands being composed apparently of white globular bodies. One of these composed of readily detached contained 303 sporocysts or navicella cysts, mostly globular or oval, a few pyriform, a few oval & slightly constricted consisting apparently of united pairs, and one a triplet. Mostly with the navicellae but partially developed, appearing at periphery of cysts as round granular cells about $1\frac{1}{2}$ diam. Most of the cysts enclosed in a thin transparent membrane, but not in a thick striated capsule. A few enclosed in a striated capsular membrane & thick & in such only the navicella appeared mature.

The immature varicella + the mature ones appear to occupy the periphery of the cysts + the central portion by one or more globular masses with consisting of large globules themselves occupied on the periphery with large granules looking also as if they were immature varicella. Measurements of the Varicella cysts generally about 60 with 104. = Thus three 60 diam; two 65; 65 & 60 oval 60 & 70 oval; 80 & 70 ovoid; 90 & 55 torn; 90 & 75  pyriform, 95 & 70 oval, a triplet with each division  55. Another torn 90 & 65.

A second mass, seminal vesicle? with 227 varicella cysts besides 2 groups with 44 immature. Part of the cysts encapsulated with walls 4 thick and with mature varicellae 3 by 1 1/2 with 104.

A third mass of 285 matured + encapsulated varicella cysts and six additional groups of smaller immature ones.

A fourth mass 3 1/2 mm by 2 1/2 + 1 1/2 thick oval with 319 varicella cysts besides 4 groups of small immature ones imbedded in brownish tissue.

A fifth mass 3 mm by 2 broad + 1 thick with 309 varicella cysts and 2 immature groups.

A sixth mass, the smallest with 97 varicella cysts and 3 groups immature ones.

The navicellae of a crushed cyst spread over a surface of about 7 mm square. In each 0.1 of a millimetric square counted 25 navicellae.

$$25 \times 10 = 250 \times 10 = 2500 \times 1540$$

~~1~~ (the number of cysts in the six vesicles)

~~=~~ 3,850,000 navicellae.

The mature navicella cysts encapsulated together in walls having a striated or laminar appearance about .016 m. thick.

The cysts consist of a structureless membrane.

The navicellae appear to form a stratum more or less thick at the periphery, and the central part of the mass appears to be composed of large globules surrounded by wavy granules which apparently are immature navicellae?

Associated with the navicellae were immense quantities of quiescent bacteria generally about $1/125$ mm long + $1/750$ broad 080
Multitude of cupules associated with the Navicellae, usually oval, darkly outlined, or discoid oval with breadth + thickness about one third less than length, usually from 1 to $1\frac{1}{2}$ or 2 long. A few circular discoid from 1 to $1\frac{1}{2}$ diameter 107
Looks like the Calcite Cupules of *Cysticercus*.
Not dissolved by acetic acid!

May 13. 1877 An Anguillula-like nematoid
on the testes of an Earth worm obtained
the day before from beneath a log at
Swerthorne. 14 specimens from 3 to 4 m.
long. Translucent but appearing brownish-
black or black from the interior intestine.
Cylindrical, body distinctly annulate; head
truncate with circular termination; tail
short, conical with a short abrupt termination
but not sharp or mucronate. Oesophagus
cylindo-conical, moderately long; gizzard
barrel shaped; intestine straight black or
dark brown & attached to body walls by
short bands at short distances apart.

Measurements with No 4. Middle of body 0.15 m.m.

thick; oesophagus 0.5 m. long; gizzard 0.125 long 0.075
thick; intestine 0.05 thick; tail 0.175 long from anus.

Mouth a small round aperture and unarm'd.
Color, head end as far as commencement of intestine translucent
& white from the oesophagus & gizzard.

June 2. 1877 Opalina in section of Paludina
incisa from Del. shore at Beverly N. J. From
80 to 125 long 80 to 12 broad in front 8 to 10 behind.
Cylindrical slightly narrower posteriorly, extremities
obtusate, anterior extremity compressed. Vesicles
numerous, usually from 20 to 30 from 1 to

5 in diameter but usually 2 to 3 diam. An axial nucleus extending nearly length of body 2 to 3 wide. A short vibrating membrane at anterior part of body, oblique. Motions wriggling, eel-like, twisting, occasionally slowly rotating on long axis, advancing, receding, doubling on itself. Globular vesicles successively contract to 2 or even 1 & often enlarge to 4 sometimes to 5. Apparently at no time entirely disappear. Terminal one sometimes expanding to 6 or 7. Approaching dissolution animal shortens & widens and the vesicles enlarge & compress one another so as to be transversely elliptical. Sarcodae commences expanding usually in a large bubble at the short vibrating membrane which at times appears to form a narrow elliptical depression. Nucleus pale barely visible at first but becoming more distinct in approaching dissolution of the animal, faintly granular, straight or slightly tortuous, cylindrical, nearly as long as body. Body ciliated everywhere, cilia about 2 to 3 long.

Sunday June 3. In a specimen of *Palaemon* the rectum appeared literally distended or stuffed full of *Opalina*, generally ranging from 80 to 100 in length.

June 4th Observed a number of the Opalina, in which
in course of the excystation the vesicles contracted
so generally & to such an extent that not more than
half a dozen remained of usual size, as many
one half the size & the others reduced to mere
prints or from 1 & less in diameter with No 7.

Observed on same date in Sphagnum from
Albion, a peach blossom colored infusorian
Blepharisma lateritia. Had a chain of
eight nuclei.

June 11th Observed in Anodonta from
the Delaware Elementer Pt. N. J. Conchophthirus
anodontae Stein, in abundance in the mucus
of the palpi & branchiae. Within pericardium also
Aspidozantea conchicola. Imbedded in palpi a
Trematode larva, & imbedded in mantle multitudes
of ova with partially developed embryos apparently of an
ascaride.

June 15. Examined a Heurpulus caliginosus
caught near Easton Sunday previously. In intestine
contained abundance of Gregarinae of which
made a sketch.

Same time in examining an Elater, Elaeus
oculatus, found beneath Elytra on the upper
part of the abdomen 6 Chelifers.

Examined large Lumbricus from the yard. Nothing found in intestine except one nanicella cyst.

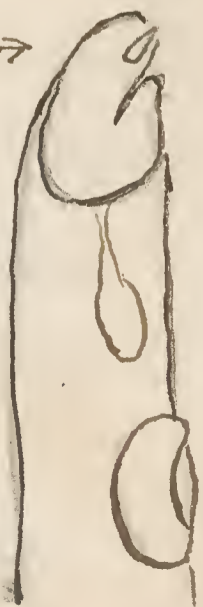
The posterior pair of testes were very large, and contained multitudes of nanicella cysts, not excepted, but thin cysts with nanicellae, also multitudes of a Gregarina, & many embryos apparently towards transformation into nanicella cysts. Many of the Gregarina were covered with numerous cilia.

Fort Bridger, July 27, 1877

Leerearia. From a pool in the meadow in which grew Polygonum &c. Contained Lyncea.

Worm white translucent, body oblong, or beak like, narrow in front; tail cylinder-conical shorter than the body with a broad delicate membranous ala on each side, with the axis filled with vesicles. Pharynx spherical or oval according to degree of contraction and elongation. Mouth circular or triangular or oval; with a conical tooth to the upper lip as it appeared in the side view: —→

Ventral disk circular, smaller than pharynx. A large aperture posteriorly. Internal structure of body appeared vesicular and obstructed view of alimentary or other organs.



The animal kept in cage for some hours finally threw off its tail, and the body assumed a distoma form, compressed oval, widest and rather truncate behind, with a shallow pit at position of former attachment of tail. In moderately contracted state the worm measured 90 by 40 by 8. H.

See next page.

Leech attached to ~~trachea~~ of White Herk caught in Black's Herk. Adhered very tightly and could not be forcibly detached without danger of tearing, but voluntarily separated after having been placed in a portion of the tongue in water after an hour. It adhered by the disk at the broad end. Leech clavate brownish olive with longitudinal blackish stripes due to color of intestine seen through transparent skin. Lateral finely punctate when seen with lens. Apr. 20 m. long, 1 wide in front, 6 behind; anterior disk $2\frac{1}{2}$ m.

The integument of the back exhibits several fine longitudinal blackish lines, independent to color due to intestine shining through.

The *Cantharis* of the preceding account. Under the microscope, power No 7 S.H. the body appeared to be crossed diagonally from each side, probably due to minute joints of the integument. In a certain focus exhibited fine transverse striation apparently due to muscularity. There also appeared to be an oval node, probably a ganglion on each side of the pharynx.

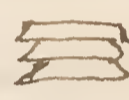

July 31. 1877 *Taraxacum* from the Small intestine of the Sage Fowl at Ft. Bridger. Thousands numerous. To 24 cm long and 5 mm. where widest. Head minute round or oval 18 wide 15 long with a central fovea at the vertex, unarmed, with four circular or slightly oval lathria 9 by 8 or 10 by 8. Neck delicate filiform about 2 m.m. long where undivided usually narrower than the head, then narrowed 10 div. by contraction may become as wide or even slightly wider than the head. Where joints commence about 12 wide. Where the joints are distinct, they are about 3 times as wide as long = $1\frac{1}{2}$ m.m. long $4\frac{1}{2}$ m.m. wide. At middle joints 4 to 5 m.m. long 1 to 2 m.m. long. Posterior joints larger than broad and thick, cylindrical or oval.

Specimen No 1 - 28 c.m. long; about middle the joints 1 m long and 5 m. wide. At the posterior fourth 2 long & 3 wide. Last joints oval, nearly as thick as wide 3 m. long, 2 wide, & $1\frac{1}{2}$ thick.

Specimen 2 - 11 c.m. long; posterior joints 4 wide & 1 m. long.

Spec. 3. 17 c.m. long; middle joints 1 m. long 3 m. wide; posterior joints 3 m. long 1 wide, or just reverse.

Head 18 wide, 15 long; neck 100 long, narrowest part 10 wide, where first joints obvious 12 wide with

^{error?}
(~~No 28 H~~) one centimetre back of head 
joints 18 div wide and 5 div. long (~~No 28 H~~). One third length back 90 wide and 35 long  No 75 H.

Last joints ~~30 wide~~. 3 m long 1 to $1\frac{1}{4}$ m wide.

Spec. 4 - 15 c.m. long - posterior joints $1\frac{1}{2}$ m long $4\frac{1}{2}$ wide.

Spec. 5 - 22 c.m. long. posterior joints, seven in the length of a centimetre & 4 m wide.

Spec. 6 - 16 c.m. long; joints at middle 1 m long $2\frac{1}{2}$ wide. Last joints oval 2 long 1 wide 1 thick.

Quercus's apertures marginal, frequently alternating, often several on same margin in succession. Generally more prominent and obvious at the middle than at the posterior joints.
Two drawings.

Ova, pressed from the last segments, oval, compressible, colorless, easily distorted 30 by 20 with No 7. Usually contained three pale granular globules, and a fourth 9 by 8 containing an embryo of 7 furnished with six hooks arranged in three pairs. The hooks about 2 div. long.

Fornica. Red Ant of the Plains observed through western Kansas, in Colorado and on line of Union Pacific R. R. Wyoming. Observation at Bridger.

Fornicaries including the surrounding circular zone from 3 to 18 feet in diameter.


The circular space usually entirely bare of vegetation and skirted by Sage, Grease and ~~grass~~ bushes, occupied centrally by a cone, the surface of which is covered with loose grains of gravel. The entrance of the fornicae usually consists of one or two openings, sometimes 3 or 4, situated on one side near or at the base of the cone, but may be on the side & even approaching within a few inches of the summit. The outer circle is usually even, smooth and composed of fine mud or sand, but sometimes is paved with

coarse stones closely imbedded like mosaic in the mud. This space is usually devoid of all vegetation, but occasionally a few grasses (*Trisetum* & *Sporobolus* noticed) encroach upon it.

The outer surface of the printed conical formicary is covered with gravel or small pebbles. The interior is composed of compacted mud, gravel and often fine roots, apparently mingled with the former to give tenacity, and is traversed with the cylindrical passages about $\frac{3}{4}$ in in diameter.

The working ants are red. Winged ants are usually found among the former in interior of the nest. The workers often observed carrying the bleached or dead leaves of the sage. On one nest two were observed carrying a large species of *Coccus*, described hereafter.

Nest 1. Ft. Bridge near Twin Butte:

 10 ft diameter. Conical hill 3 ft at base 1 foot high. One entrance at base of the hill. Surrounded by Sage, Grease,

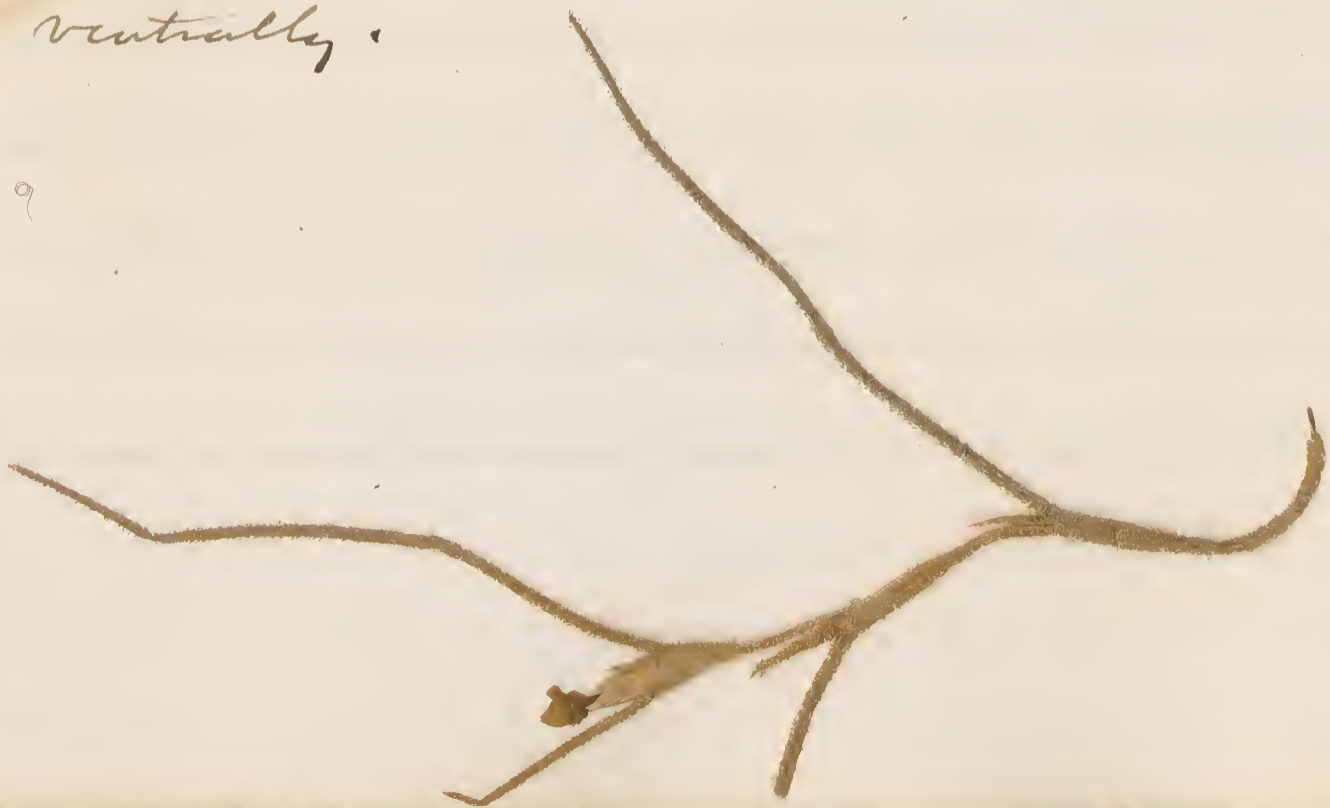
Nest 2. 10 ft. Same same as in former. One entrance at side about 3 inches above base. Outer circle closely paved with stones up to 4 inches

in size closely impacted. These struts were the drift descending from the butte. Cone of the usual materials. Circle entirely bare - & surrounded by Sage & Grease wood.

Net No 3. Oval space 18 by 13 feet - Cone to one side 5 ft at base & 18 in high.

Two entrances on one side about 3 inches below summit. Circle closely surrounded by Sage and Grease 2 ft high.

Locusts. Oval 7 m. long 5 wide, & 2 thick, pale flesh or pinkish hue. Segments of thorax and abdomen distinct, (3 of former 7 of latter) Three pairs of short limbs ending in a single curved black unguit. The anterior pair of limbs twice the size of the others. Antennae furcous, eight jointed. Examined with the lens, the segments of the body exhibited a few minute furcous hairs, especially ventrally.



July. Sat. 14, 1877 Left home, in co. with wife,
 daughter, Dr. Hayden & Col. Stevenson for St.
 Louis when we arrived Sunday night 9 o'clock
 July 15th & put up at Lindell Hotel. Next
 day Mond. July 16, arrival of Prof. Gray & wife,
 Dr. Hooker, Gen. Statchey & wife & Col. Lumbum
 Afternoon visited Shaw's magnificent garden.
 Tuesd. July 17. With Capt. Eads examined the
 St. Louis Bridge. Evening 9.30 left for
 Kansas City & Pueblo. July 19th arrive
 in latter place, leave our party & proceed to
 Denver and put up at American Hotel.
 Sat. July 21. leave Denver for Cheyenne & Ft. Bridge
 when we arrive Sunday July 22.

Expenses:

Pullman Car section to St Louis	---	\$ 12.
Postage on trunks \$1.30 Hayden do .40		1.70
Breakfast Columbus 75. Fare St. Louis Bridge 50		1.25
Omnibus & trunks St. Louis	---	1.25
Hotel expenses St. Louis	---	28.25
Omnibus, trunks, Porters	---	1.75
Breakfast with wife & child	---	2.00
Pullman car paid by Stevenson	---	4.00
do do Kansas City	---	10.00
Supper Mr L. 75 Breakfast for all 1.75	---	2.50
Two lunches .70 Omnibus 1. Baggage 1.	---	2.70

Hotel expenses at Denver - - - - -	13.50
Telegram to Lt B. 1.35 Omnibus to #2 - - -	2.35
1/2 fare to Cheyenne for two - - - - -	10.00
1/2 fare Union Pacific to Carter - - -	35.20
Baggage - - - - -	6.70
Dinner Cheyenne - - - - -	2.50
Pullman to Carter \$7.20 Porter 50 - - -	7.70

Green mineral, from Bear Creek near
 Berge's Ranch Colorado, 25 m. from Denver.
 Marcasite nodules. Vicinity of Canon City, Col.

Purchased of O. S. Westover, Dealer
 in Minerals, P.O. Box 597 Denver Col.
 Another dealer G. L. Taylor do do.

Promised to send a fragment of a Gorgonia
 to Mr. P. F. Mass 19 S. 11th St. St Louis, Mo.

Aug 2, 1877. Trip to the Mineral Springs of
 Pioneer Hollow, in company with Dr. J. V. A
 Carter his brother Dr. Wm. C. and Mr. W.
 Reakint. The springs are situated about
 miles from Ft. Bridges
 About half a dozen springs of different
 qualities. One in upper part of hollow near
 Ranch highly impregnated with
 sulphuretted hydrogen. The most interesting

near together, with alkalis to carbonated
form craters. One of these measured at
the base about 70 feet, was about 4 feet
high with the basin about 15 feet across.
The depth of the circular concave basin
could not be ascertained. Most of these
springs contained an abundant growth
of *Ocellularia* adherent to bottom or
floating in a thick scum on the surface.
The scum on the free surface was dirty
brownish but beneath was dark velvety
green.

Microscopic examination of the scum etc.
Aug. 3. Consisting mainly of a species
of *Ocellularia* (see drawing), with much
fine filaments comparatively few, probably
of another species. With the *Ocellularia*
occurred abundantly chiefly two minute
species of Diatoms as represented in
drawing. Of animals there occurred
abundantly a species of:
Anguillula. Both sexes nearly equally
abundant and about the same size.
Length about 3 millimeters.

Cylindrical, white, head truncate, furnished
with a pair (or four?) cirri, Tail long, slightly

kinked at the end. Oesophagus long cylindrical,
gizzard small and nearly spheroidal, Gen-
ap. near middle. Male with curved spicules.
No tubercles or other appendages observed.

In intestine of both sexes noticed portions
of *Loxiceuria* upon which the worm fed.
No ova noticed in female excreta,
ova. Measurements: as follows.

Female: Width of head at vertex 7, a short
distance posteriorly 10. Length of circhi 2.
Length from head to intestine 100. Length
cylind. oesoph. 90 width at middle 8. Length
of gizzard 9, width 10. Width body at com-
mencement of intestine 14; at middle 14;
at gen. aperture 15; at anus 10. Length
tail from anus 65. Length ovum 20 width 10

Male. Head 7, same posteriorly 10. Circhi 2 long
Length to intestine 100. Length oesophagus 90;
of gizzard 9, width 10. Width body at com. of int.
13; at middle 14; at gen. ap. 11. Length
of tail 40. Spicular penis 20 long. Tail end
of male strongly incurved. Integument even
and with no evident transverse accumulations.

Hydra. Both the brown and green species
observed, not differing from ours. The
brown had some power of elongating arms;
the green one of elongating the body.



Hypotrichum Infusorium, common
at Ft B. in pools. What is it?

Spinatum common. Green
& white Stentor. Procentrum.
Volvox.

Tuesd. Aug. 7th. Expedition into the Uinta Mts.
in co. with Dr. Carter's family & Mr. Reakint.
Camped at 1st mill 25 m. from Ft B.

Aug. 8 Water frozen in the bucket an eighth of an
inch thick. Just after sunrise therm. 40° .

Encamped at 2d mill about 5 m. from former
in a beautiful meadow skirted by pine forest,
with snow peaks to our right.

Aug. 9 Trip to Gilbert's meadow and China Lake
on horse back, in co. with Dr. Carter & bro.
and Mr. Stule, as guide. Distance about
7 miles from Camp.

Aug. 10. Returned to Ft. Bridger.

Camp Aug. 8. Meet with family of Utes on their way
across the Mts. to Uinta reservation. Composed
of father; mother with two small children together
on horse backs; boy with bow & arrows; also
young warrior. Accompanied with horses
packed with baggage. One horse loaded with
great pile of dried Deer meat and bones.
Father had a freshly killed Deer *C. macrotis*
across his saddle. Aug. 9. Therm. in
the morning 50° . A light frost during the
night.

Aug. 9. On way to China Lake passed through
pine forests with a number of fine grassy
parks. Occasionally met with Deer, of
which a fine doe was shot for food.
Fine view of Mt. Gilbert from Gilbert meadow
a beautiful park of several miles in
length & breadth in the bosom of the
pine forests. Good trout fishing in a
stream coursing through Gilbert meadow
& in China Lake. Fire forest
fire in the Mts towards Gilbert Peak.

Trees of the Uintas low down consist
mainly of Aspen Poplars & higher almost
exclusively of One kind of Pine, with a
few Fir of one kind.

The common game bird, excellent when young, on the sage plains up to the timber line of the Sierras is the Sage Cock or Hen Centrocercus urophasianus

This is replaced in the mountains among the bushy places of the parks surrounded by forest, by the Dusky Grouse, Tetrao obscurus. The former in its flesh resembles the Prairie Chicken Cupidonia cupido; the latter our Ruffed Grouse Bonasa umbellus.

China Lake, Sierra Mts., N.Y. feeds one of the tributaries of Smith's Fork. Altitude upwards of 10,000 ft.

The following observed in the lake:

Spongilla.

A bright green form encrusting stones and sunken logs, projecting in short finger-like processes. Spicules smooth, 55 to 70 long 3 to 5 thick with N^o 7.

A pale yellowish form beneath stones, apparently S. fragilis. Spicules smooth, 58 by 2 1/2; 62 by 3; 65 by 4; and 70 by 4.

A number of isolated sponge spicules in sediment of the lake were tuberculate and measured 75 by 5.

Hydra. Two kinds observed: A green one, probably *H. viridis*.

A brick red form with bright red head. Preserved some days became pale brownish; probably the *H. carnea*. In the individuals kept the body much elongated as usually observed in the green Hydra.

Aug. 15. Dr. Coates & I went on horseback to 3 mile creek, and "Lumli's Lake" at foot of Bridge Butte about 8 m. from Ft. B.

Notice of two pots of steatite in pos. of Dr. Coates.

No 1. Found in Uinta Mts. miles from Fort B. Resembles in form a Hessian crucible and capacity about a quart. Irregularly trilobed enlarging from bottom upward. Bottom oval $8\frac{1}{2}$ by $5\frac{1}{2}$ c.m. Opening trilaterally ovoid, with larger diameter crossing ~~that~~ that of bottom. Long diameter to outer edge $13\frac{1}{2}$; shut do $11\frac{1}{3}$. On one side just above middle is an oval hole 3.3 long & 1.9 c.m. wide.

The hole appears cut through, has rounded edges & has no appearance of being accidental. Border of mouth uneven and not acute. Thickness of sides about 1.5 c.m. Weight of pot interior excavated to bottom in shape of cone with rounded apex. Depth of largest side 15 c.m. shortest side 14 c.m. Depth internally to centre 16 c.m.

No 2. Looks like the lower half of the former, but more symmetrical and even. Mouth oval 11 c.m. by 8 c.m. Bottom convex & trilobately oval about 6 c.m. by 4.5 c.m. Height 9 c.m. Depth int. 8.3 c.m. Edge of mouth acute. Weight of pot. Found at Ft. Bridger in clearing present site of Dr. Lunter's home.

Both pots composed of dull lead colored steatite or compact talcose rock, resembling that of Sch. R. ab. Manayunk. Both exhibit marks of the tool by which were cut especially the smaller one. The interior vertical narrow grooves, as if made by a narrow gouge pushed down to bottom. No marks of ornament whatever. Larger one clean. Smaller one smoothed on exterior at sides; the smooth. The smaller everywhere externally smoother than the larger one.

Frid. Aug. 17. In co. with Dr. Carter's family & mine
trip to Ogden & Salt-Lake City. Stop at Lawrence
Home.

Sat. Aug. 18. Salt Lake City. Heat & durt. Drought
the last two months, foliage yellow & dry, and
fruit suffering. Lawn shaded mostly with
Locust, (Robinia) cottonwood (Populus) and
Sycamdo. Fruit trees, especially apples &
peaches, cultivated in the gardens. Homes
of adobe, wood, buff bricks, & light red sand-
stone from the Wasatch Mts.

Sund. Aug. 19 Visit Camp Douglas & Dr. Smart
New buildings of red sandstone from the Wasatch
Mts. Fine view from the hospital - the city
& Salt Lake with mts. in front; the Wasatch
Mts behind. These mountains & all others
in vicinity of Salt Lake appear entirely
destitute of trees or even large shrubs. Mts,
have a rugged, steep, sharp aspect, a
few of the hollows on slopes near summits
with patches of snow.

Afternoon attended the Mormon temple at 2
o'clock. Body of church about two thirds filled, but
gallery unoccupied. Fine organ. Lower seat
of altar occupied by six men (apostles?) who broke
bread & prepared water for sacrament, which

is administered every Sunday.

Brizopyrum spicatum a common grass noticed growing in waste places abundantly, and the same is the case in the valley of Ft. Bridger.

Mon. Aug. 20. Returned to Ft. Bridger. Meet with Mr. Henry Hunt on the route, going East, from California & Utah.

Due Dr. Carter:


On account of omnibus fare - - - - - \$2.

Hotel expenses - - - - - 15.

Dinner at Evanston - - - - - 2.50

" Zion's Co-operative Mercantile Institution "


Leech from China Lake. Olive brown, with scattered, irregular black spots dorsally, with a few spots of same kind ventrally. A pair of eye-spots situated transversely on the same segment each side of the mouth. Four black ^{eye-}spots in a transverse curved line to the upper lip. Pharynx long, with three strong longitudinal folds. In elongated condition 3 in. long by 3 lines wide posteriorly and 2 anteriorly. Aetabulum $1\frac{1}{2}$ lines.

The young after escape from a cocoon  examined after several days about $\frac{1}{2}$ in long possessed same number of eyes as in the adult, and in same relative position.

After being in alcohol a specimen measures 6 cm. long by 5 m. broad behind and 3 in front. The gen. aperture 14 m. behind upper lip. Too smooth to allow of count of number of segments anteriorly.

Abronia fragrans. from 6 to 18 inches, spreading ^{in a caudate manner} from a perennial root, prostrate, but ascending. Leaves fleshy, entire, smooth, opposite, unequal, cordate and obtuse, or passing into a cuneate condition at base and ~~a~~ sub-acute at apex. Umbels axillary, long-stalked, involucre 5-leaved ^{scale like,} pinkish. Flowers valvate formed; tube greenish pink, viscid-pubescent; limb white lobes obovate.

Flowers open after sunset and diffuse a strong hyacinth-like odor. Grows abundantly on road side to Coater station about 3 m. from Ft Bridge, on Aragonite hill. Stems green with pink, the terminal ones viscid pubescent & mostly red.

Clepsine. From China Lake, Santa Mts. Length 10 m. breadth 4 m. acetabulum 1 m. Eyes six in three pairs . Translucent, dorsally brown punctate with an interrupted darker marginal line. Median line lighter. On each

of the median line, a narrow longitudinal interrupted black line. Along the latter a half way between it and the margin ~~various~~ scattered clear dots. From transparency some ~~dark~~ colors seen ventrally.

August, 26th, Sunday afternoon. Left Ft Bridges on return for home. Monday 27th reached Cheyenne in afternoon and stopped with Rev. F. M. Tomkins. Cheyenne situated in midst of an arid desert plain, without tree or shrub. (The plains with Sage and Grease-wood begin west of Laramie City.) Left Cheyenne Tuesday 28th, and by way of Omaha, St Louis, Indianapolis, Columbus & Pittsburgh, arrived home Sat. morning Sept. 1st.

Observed along line of Union Pacific R. R. grassy plains with cotton woods along the Platte R. In western part of state the grassy plains utterly destitute of even small shrubs, & no signs of trees. The same condition extending to Cheyenne in Wyoming, and westward to ascent of Rocky Mts to Sherman.

Summit of Rocky Mts in vicinity of
Sherman, before reaching latter &
some distance West, in line of U. P. R.
R. Surface of undulating rounded
hill & valley composed of pulverized
granite. Here & there the granite
rocks crop out in irregular piles,
fractured into blocks which are rounded
from weather, so as to look like
remains of cyclopean walls, or great
piles of bales. Here & there the rocks
with scattered pines.

Further west commence the great
plains with Sage Artemisia
and Grease-wood Sarcobatus
The indentations of the terraces or buttes
with old distorted Cedars.

At a place on the U. P. R. R. before reaching
Sherman at the station called "Granite
Cannon", on the right in ascending one
gets good view of the stratified rocks resting
on the granite, thus:



The Sun-flower, *Helianthus*
one of the most common weeds of the west
in western Missouri, Eastern Kentucky
and in Salt-Lake valley of Utah.

The vegetation of Missouri remarkable for
its rank luxuriance. Forests of large
trees of many kinds. Extensive marshes
corn and Tobacco appear to be the
chief productions in western Missouri.
vast extent of *Asplenium luteum*
absent.

A compact white crystalline marble,
of apparently excellent quality
noticed in front of station at
Laramie City, said to be derived
from the vicinity.

Near Downingtown Station, Chester Co. on
Pa. R. R., noticed from the train an ap-
parent cleft in a limestone quarry
filled with debris!!! To be looked after
for fossil bones.

Good catalogue of flowering plants &c. Beach, Bond & Co
catalogue of seeds &c., Barclay St., N. Y.

Fare from Ogden to Salt Lake City - - - - -	4.00
Return - - - - -	4.00
Hotel expenses Salt Lake City - - - - -	15.00
Omnibus expenses & Meals - - - - -	6.00
Pullman to Cheyenne - - - - -	8.00
Meals, portersage &c - - - - -	6.25
Fare Omaha to St Louis for two - - - - -	32.70
Pulman to do. - - - - -	6.00
Dinner - - - - -	2.00
Pulman to Phila? - - - - -	12.00
Meals, toll St Louis Bridge, porters - - - - -	4.50
Change of Fare for Allie bet. Columbus & Pitts. -	3.25
Trunks, Porter to Philad. - - - - -	1.75.

Dr. to Dr. J. Van A. Carter Sept. 1, 1877

\$117.

order for Dr. Carter Leutmayers Microscope;
 Micrometric measure; Thin glass circles; pair of
 double dividers; Stanhope lens; pocket do.;
 box water colors; case drawing pencils;
 Pritchard!; metre measure.

Conductor bet. Columbus & Pittsburg, took up pass
 bet. Indianapolis & Pittsburg & charged \$3.25 on acct. of
 Allie. Said charged all over 5 yrs. & Pass called only
 for myself & one.

Account of expenses presented to Dr. Hayden

^{III}
 July 1877 Rec^d from Dr. H. V. Hayden:

Check - - - - - 100.

Pulman car fare - - - - - 4.

\$104.

Dr. H. V. Hayden Dr. to Dr. J. S. Leidy on act of
 expenses incurred in exploration in Wyoming
 July & August 1877.

Pulman car fare to St Louis - - - - - 6.

Porterage, meals, toll, &c - - - - - 5.15
 (includes 40cts paid on Hayden's trunk in Phila)

Hotel expenses St Louis - - - - - 28.25

Pulman car to Kansas City - - - - - 2.00

do Pueblo - - - - - 5.00

Meals, porterage &c. - - - - - 4.35

Hotel expenses Denver - - - - - 13.50

omnibus, baggage &c - - - - - 1.50

Telegram - - - - - 1.35

Fare to Cheyenne - - - - - 5.00

Fare Union Pacific R.R. to Bridger - - - - - 17.60

Charge on extra baggage - - - - - 6.70

Pulman car fare to Bridger - - - - - 3.60

Meals & porter - - - - - 3.00

Fare to Salt Lake City & return - - - - - 4.00


Hotel expenses do - - - - - 7.50

Meals & omnibus - - - - - 3.00

Board, working &c 5 weeks Bridger - - -	65.00
Pulman car fare to Cheyenne - - - -	4.00
Meals &c - - - - -	3.50
Fare Omaha to St Louis - - - - -	16.35
Pulman Car fare - - - - -	3.00
Meals, toll, porters - - - - -	3.25
Pulman car fare to Phila - - - - -	6.00
Meals, baggage porters - - - - -	4.00
	<u>\$222.60</u>

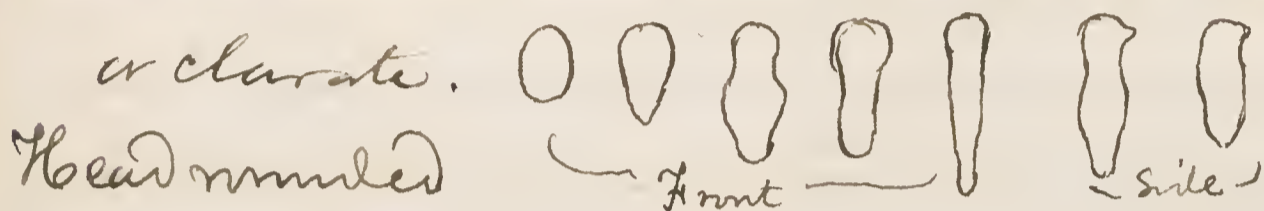
Nov. 21 Rec^d. of Dr. Hayden checks of \$118.60
 which with the \$104 previously received
 balances the above account of \$222.60

Jan. 4, 1878 Sent two receipts to J. M. Pearson, clk. of
 Hayden's Est. Acc^t. :- One of July 9, 1877 for \$100. and the
 other of Nov 20th for \$118.60.

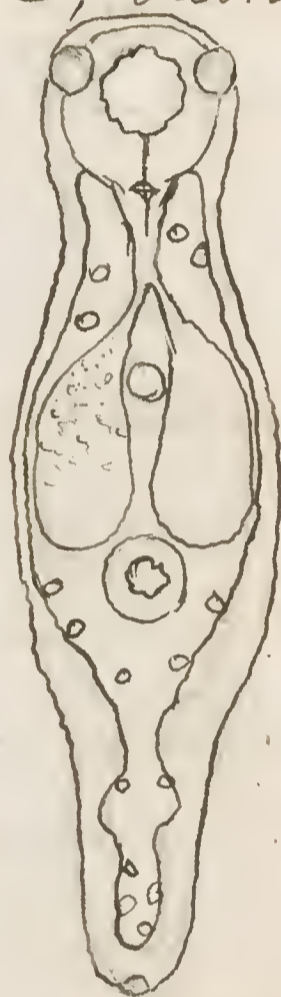
Feb. 23. 1878 Observed in *Stropus pulsatorius* a ciliated
 infusorium  oval or ovoid or reniform
 circular in section, colorless, ciliate everywhere,
 a longer row in an oblique course. Long diameter
 7 to 8 with 107 sm. H. ; short diameter 4 to 5.

Wednesday July 24, 1878 Examination of
Dorax fessor, Say from Cape May, where
 occurred on many parts of beach near low
 tide in innumerable quantities. These
 contained numerous *Distomas* and also
Triclinarias.

Distoma. Immature. Minute oval, obovate,
 or clavate.



with a conspicuous nipple-like
 papilla on each side, which in
 lateral view of animal gave the
 appearance of a beak to the head.
 Tail obtuse, with a minute pore?



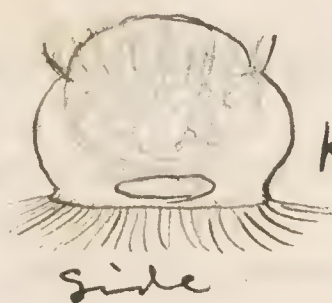
Integument granular. The granules
 minute & arranged in alternating
 transverse series, (seen with $\frac{1}{10}$) Oral acetabulum
 nearly twice the size of the ventral, which
 is median. The former narrowed into a small
 pharynx from which a short narrow
 gullet divides into two large pyriform
 stomachal sacs, which extend as far
 back as the ventral acetabulum. The
 animal apparently with a distinct body
 cavity, the inner surface of which has
 scattered molecules of oil adherent. An

orifice apparently exists midway between the mouth and the ventral acetabulum. Animal changes its form, & extends to nearly double of length from the contracted condition. No appearance of generative apparatus.

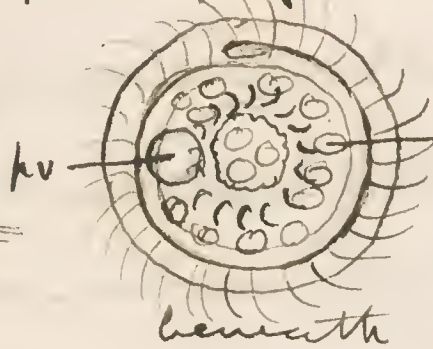
In oval contracted state. 24 mm long .15 wide elongate to .36 and .42 mm by .09 wide. Oval acetabulum .072, ventral do .042 diameter.

Trichodina. Apparently in the buccal cavity.

A peritrichous organism.



side



beneath



beneath

Side view well shaped with a wreath of cilia above and at the margin below. The inner circle below crenate surrounded by a circle of bright teeth; then follows a spiral ciliated line; then the outer boundary. .048 broad .03 to .036 high. A pulsating vesicle .006, & a variable number of smaller globules, perhaps vacuoles. Is it Trichodina pediculus?

July 30. Examination of green film from sand between tides, near light house, at Atlantic city, collected yesterday. Quantity of the sand & green matter scraped up together and put in vial of sea water. This morning had found a film on the surface of the sand. Proved to be a diatome, which I suppose to be an Amphiprova. The Amphiprova in



front view a in side view b straight.

The two extremities on each side strongly carinate. The interior cavity on one side in each half with an oblong oval oil globule. The yellow

green endochrome on the opposite side

and at ends of the oval oil globule. Diatoms

exceedingly active moving to and fro, and turning over from side to side. On the

slide the diatoms readily underwent decem-

piration, when the oval oil globule became

spherical, and several smaller ones from

the endochrome also appeared more distinct. The

endochrome likewise became diffused into indistinct

balls. Length of diatoms with 100 waves

27 to 28. width at extremities 8 to 9 at

middle 6 to 7. thickness 4 by 1 1/2 at ends.

could detect no linear markings!

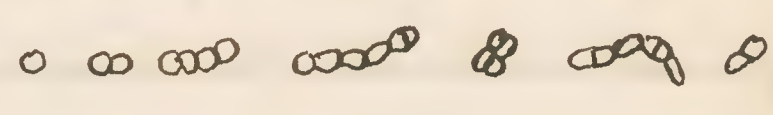
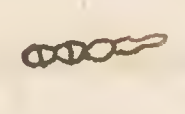
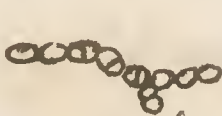
length .081 to .084 mm; breadth at ends .024 to .027

at middle ~~.018~~ .018 to .021. thickness .012; at

end .0045. Probably *Amphiprova alata*.

See Bailey Mic. Obs.
Sm. Fr. II, 1851.
Pl. II. fig. 9.

Both at Cape May & Atlantic City, the sands between tides, especially in the whitish lines of comminuted shells, &c. contain abundance of one Foraminifer, which I take to be *Notionina crassula*.

Sep. 3, 1878 Black mildew of the houses, growing
on the bricks and stone work of granite, in the
large streets near the river front, growing mainly
on places sheltered from the sun. Consists
of minute round cells or chains to 4, 6, or more,
or groups of four or more, the chains more or
less regular or irregular 
 cells nearly uniform globular or oval, or
in the chain with one of the end ones more or less
narrowed and clavate. The cells by transmitted
light appear of a brownish or olive brownish hue.
In mass, or to naked eye the plant appears
of an intense black color. Size of cells 1 to 1 1/2
with 1/5 W. In chains, each cell appears to be about
1 long,  a chain of eleven with an effect of two.
Protococcus lugubris

Little Red Ant. *Monomorium Pharaonis* Linn. or *Myrmica*
moesta. Cosmopolitan. Spread everywhere. Houses, ships, &c.


Sund. Sep. 15 To Atlantic City *Mastra solidissima*
Lunaticia (*Natica*) here, & *Aerivita duplicata* collected.
These latter live the shell of the former.
Monday examined intestinal canal of *Mastra*,
contained in contents, numerous diatoms of different
genera and species. In rectal contents the diatoms
were empty or clean of the endochrome &c. Found in

five empty cases resembling a Diffugia test, of chitinous membrane with sand particles, but probably pertaining to a Lintinus.

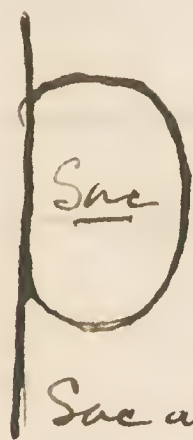
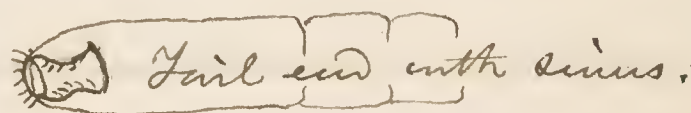
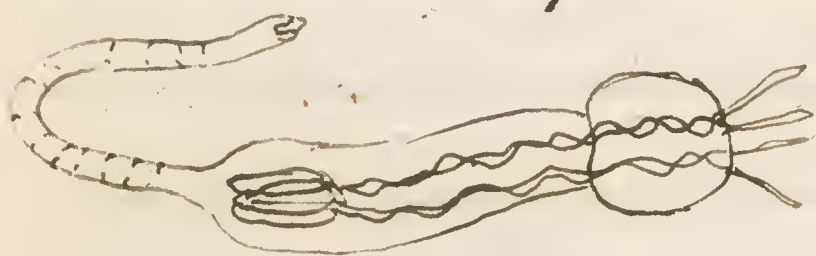
Several years since on beach at upper part of Atlantic City, dug up a number of living Mactra each of which was in possession of a Lintinia.

103 Sand collected on surface between tides below Atlantic City contained 18,720 Nonionina millepora Sand from beach at Newport, rich in Foraminifera generally smaller than those of Atlantic City & Cape May, but of greater number of species & genera, 279,360 individuals to 103 of sand. From Cape May sand 38,400 Nonionina to the ounce, of 480 grains.

Oct. 14. 1878

Tetrachynchus. Contained in a strong compressed oval, pearly, thickwalled sac, attached to outside of intestine of a Penora, Echeris from the Atlantic coast. The sac contained a bottle shaped, translucent, whitish larva or worm thus:  which exhibited feeble extensile & contractile movement at the narrower end, especially in the projection and retraction of a pair of slight papillae. On compressing this about centre, an opaque white worm, coiled up, and enclosed in a delicate cyst, adherent or continuous at one point with the containing bottle shaped larva.

The worm recurved and incised or extended was about 7 lines long and divisible about equally into a broad anterior and a narrow posterior tail-like portion. The head formed of two obcordate lobes inclined from each other. Four long setiform processes, with recurved hooks, partially protruded from the head, and were connected below in the usual manner by intermediate transverse bands, with the oblong elliptical clava at base of body. These clava were about $\frac{1}{3}$ the length of the body. Body about $\frac{3}{5}$ line wide, Tail about half width of body, with disposition to segmentation & with no differentiation of external organs. End of tail with a bell shaped sinus, contractile & expansible & opening externally. End of tail & interior of sinus thickly covered with non-vibrating cils.

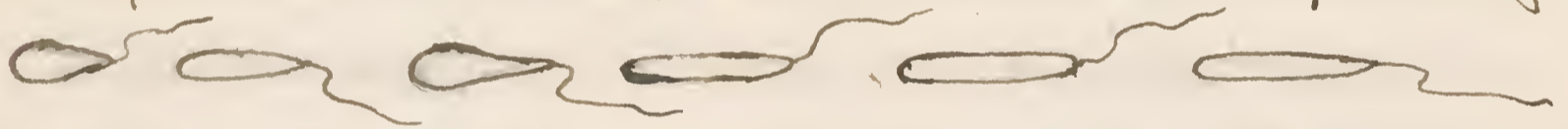


Sac adhering to intestine.



worm
or
larva.
Larva under
compression

Oct. 27, 1878 *Bodo muscarum*. In intestine of
 the Green Fly. Some specimens cylindrical $3 \text{ by } \frac{3}{4}$
 with flagellum about as long. Others oblong ovate,
 pointed in front, blunt behind, $2 \text{ by } 1$, with flagellum 3 long
 Body, appears to vary from ovate, to oblong ovate,
 and cylindrical; blunt & rounded behind, usually
 pointed in front & furnished with a flagellum as
 long or longer than the body. Body from $1\frac{1}{2}$ to 3
 long by $\frac{3}{4}$ to 1 broad. Body apparently capable of
 elongating to the cylindrical narrower form, & contracting
 to the ovate broader form. Movements rapid, retreating,
 and advancing rapidly with narrower end & flagellum
 in advance & often turning round & proceeding in
 the opposite direction; sometimes some slowly backing.



Measurement with No 10 scales.

Sometimes appear spindle shaped, thus:



At times will turn over and over on the short axis.






: As seen under a

higher eye piece (No 4)



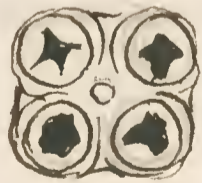
Could distinguish no internal structure and
 whether there was more than one flagellum

Oct. 30, 1878. Affected with *Coryza*. The large drops
 of clear liquid from nose examined. ~~No~~ Bacteria!
 Contained a few scattered colorless, pale, granular
 corpuscles, resembling colorless blood corpuscles
 or mucus corpuscles. Occasionally one showed
 a nucleus. These corpuscles exhibited
 amoeboid movements, which were slow, while the
 corpuscles remained stationary or nearly so
 in position. Occasionally on exhibition minute
 vacuoles with the usual pinkish hue. There
 were in the liquid, still fewer colored blood
 disks (though there was no trace of redness
 in the liquid). The disks were smooth or
 finely tuberculate  ~~***~~  measured 3 dir, No 10 

The colorless corpuscles about $3\frac{1}{2}$ No 10.

 = represent changes of form.

Taenia medicamentata Dr. W. F. Atlee Nov. 26, 1878



Head blackish from black pigment
 points, most obvious in the curved lines
 below the suckers; inside of suckers
 black. Head square with
 rounded corners 1.5 mm wide -
 neck about 5 mm by 1 mm.

Dec. 23, 78. Anomaly of Subclavius muscle. In my subject for the muscles, a white male, aged about 60. The subclavius muscle arose by a narrow tendon from the ant. end of first rib, had no attachment to clavicle, but was inserted into upper edge of scapula for about an inch of breadth tendinously, in front of origin of cruro-humeral and immediately inwardly to the coracoid foramen



Apr. 18, 1879 Polyperus fasciculatus. Found on the limestone cliff on Delaware above Easton. Body = of head, 7 segments with lateral tufts, and a terminal rudimental segment with a pair of dense fasciculi of silvery white hairs, directed backward and close together. The head, and segments dorsally with double transverse rows of clavate compound hairs, the rows diverging forward and backward. A median tuft of similar hairs to the terminal segment usually just at the root of the caudal tufts. All the hairs clavate ~~as shown in fig. 367 A. p. 702~~ except the caudal tufts, which are like those represented in fig. 367 A. p. 702 in Carpenter on the Microscope.

Antennae with 7 joints and ending in a double point.
10 pairs of feet = 1 pair to first segment with lateral tufts;
1 pair to second do; 2 pair to each of the succeeding
4 segments with lateral tufts. The anal segment
without feet. Antennae, head, segments & feet
purplish brown. Hairs white.

1879 Sunday Sep. 28. Cristatella. Fairmount

Park on Belmont Av. at outlet of Pond. In
the greatest profusion lining the rivulet at
sides and bottom and covering stones and sub-
merged grasses etc. for upwards of three yards
in length. Forming close verrucular ridges
interterminating. Groups from circular to
verrucular, from 5 mm in diam. to 4 inches
long by 5 to 10 mm broad. Polyps when fully
extended to 3 mm in length, with stomach of
chocolate brown & greenish exterior. In
younger ones the stomach yellowish or greenish
brown and reticulated. Strobilants light
brown with whitish annules. From 1.125 to 1.2 mm
broad. Rarely to 1.25 mm. Spines to 70 or more.
Example 1.175 broad, annules 0.2 mm Spines 40 and 30 = 70.
" 1.125 " " 0.225 " " 43 and 17 = 60.
" 1.150 " " — " —
" 1.225 " " 0.175 " " 43 and 27 = 70.
Spines 0.25 to 0.375 long.

Large number of the *Cristatella* groups, based
chiefly on a thin skin, probably excrementitious,
of a yellowish hue, homogeneous or indistinctly
granular, with much adherent dirt, and
on it many small diatoms, and numerous
individuals of *Diffugia corona*, with several of
D. spiralis. Among the *Cristatella*, numerous
Vorticellae, *Adorea* white with them. Also
multitudes of *Hydra carnea*.

Several Planariae and Eneae observed. One
Eneca 12 mm long, contained 28 conspicuous eggs in
a double row, as seen by naked eye & transmitted
light.

Hydra carnea, with body elongated to 2 cm,
with arms about half the length.

15 specimens Statoblasts of *Cristatella Idae* as
follows: 7 = 1.2 mm broad; 5 = 1.175 mm; 2 = 1.225 mm
1 = 1.150 mm

No. of Spines 1 = 74, 2 = 67, 2 = 66, 2 = 65, 2 = 64,
2 = 63, 1 = 62, 1 = 58, 1 = 55, 1 = 53.

Smallest no. on one side 12 the other 41. Greatest no
on the less spined side 25, the other 45.

15 Statoblasts.

Breadth of Statoblast	Breadth of central disk	No of Spines.	Length of Spines.
1.2 mm	$\frac{1 \text{ mm}}{0.8}$	$\frac{47}{20} = 67$	$\frac{10 \text{ to } 12}{8 \text{ to } 10}$ (No 4 Hart.)
1.2	$\frac{0.925}{0.775}$	$\frac{40}{15} = 55$	$\frac{14}{9 \text{ to } 11}$
1.2	$\frac{0.925}{0.8}$	$\frac{46}{17} = 63$	$\frac{14}{8 \text{ to } 12}$
1.2	$\frac{0.925}{0.8}$	$\frac{48}{17} = 65$	$\frac{13}{8-10}$
1.2	$\frac{0.925}{0.725 \text{ by } 0.825}$	$\frac{44}{14} = 58$	$\frac{11-14}{10-13}$
1.2	$\frac{0.925}{0.75}$	$\frac{43}{21} = 64$	$\frac{8 \text{ to } 12}{8 \text{ to } 12}$
1.2	$\frac{0.1}{0.775}$	$\frac{44}{22} = 66$	$\frac{11-14}{10-13}$
1.175	$\frac{0.925}{0.75}$	$\frac{38}{25} = 63$	$\frac{8-12}{7-9}$
1.175	$\frac{0.95}{0.75}$	$\frac{47}{18} = 65$	$\frac{9-12}{10-12}$
1.175	$\frac{0.95}{0.75}$	$\frac{41}{12} = 53$	$\frac{8-14}{8-12}$
1.175	$\frac{0.925}{0.775}$	$\frac{48}{16} = 64$	$\frac{5-14}{8-10}$
1.175	$\frac{0.875}{0.75}$	$\frac{45}{29} = 74$	$\frac{9-14}{8-10}$
1.15	$\frac{0.925}{0.725}$	$\frac{46}{16} = 62$	$\frac{7-14}{7-10}$
1.225	Annulus $\frac{0.1375}{0.2}$	$\frac{41}{26} = 67$	$\frac{0.350 \text{ mm.}}{0.3}$
1.225	Annulus $\frac{0.125}{0.225}$	$\frac{49}{17} = 66$	$\frac{0.375 \text{ mm.}}{0.2 \text{ to } 0.3}$

Oct. 11 *Lophomonas striata* Pritschli. Zitt.

f. vis. Zool. xxx, 1878, 261



Body composed of linear bodies. with a bunch of vibrating cilia at the broader pole. 0.042 long 0.018 lat.

another 0.036 long by 0.021 broad; a third = 0.03 long by 0.018 broad. Cilia about 0.018 long. linear bodies slightly heart-shaped about 0.018 long. Large intestine of *Blattella orientalis*, with *Styctothorus*.

Oxyuris gracilis.

Oxyuris Diesingii. Hammerschmidt: Pis 1838,
354, Taf. 181, fig. 6.

Oxyuris Blattae Orientalis. Hammerschmidt: Naturw.
Abh. v. Haidinger 1847, I, 284, Taf. X, Fig. 6, 7,
13-15. In part.

Anguillula macrura. Dies. Syst. Hel. 1851, II, 134.

Oxyuris Diesingii. Brütchli: Zeits. wis. Zool. 1871,
XXI, 254, Taf. XXI.

Streptostomum gracile. Leidy: Proc. A. N. S. 1850,
100, 285.

Oxyuris appendiculatus.

Oxyuris Blattae Orientalis. Inpt. Hammerschmidt:
Naturw. Abh. Haidinger 1847, I, 284, Taf. X,
Fig. 8-12.

Thelastomum appendiculatum. Leidy, Pr. A. N. S.,
1850, 100, 285.

Oxyuris Blattae Orientalis. Brütchli, Zeits. wis.
Zool. 1871, XXI, 255, Taf. XXI, Fig. 20-23, 28, 29.

Sept. 1882. Observed on a stone from Schuykill R.
below the dam: Many bunches Epistylis plicatilis;
do Coarctarium polypinum. White + green Stentor.
Plumatella. Attached to it Vaginicola crystallina
Tubes 0.1 mm long 0.028 wide. Some tubes with two in-
dividuals. Vaginicola tincta with chestnut-colored
tubes 0.1 mm long; mouth of tube 0.048 wide, just
below 0.04 wide. Also Limnias annulatus - Tubes
0.6 to 0.625 long + 0.05 to 0.0625 wide. Rotary
disks together 0.2 mm broad.

1880

Jan. 17 Rec'd for examination from Dep. of Agriculture
Washington. J. N. Comstock. A Meomys acuminata
from an apple. Measured 10 inches long, the posterior
tip ends with a minute mucro.

April 5. Notes on development of the petro-mastoid. In
a specimen observed the following. 1 a centre of ossifica-
tion at the fore part of the vestibule, its lower part
forming the upper border of the oval window, and with
a process arching over the beginning of the facial canal
from the position of the hiatus to the int. and. meatus. 2
a centre commencing in a knob external and
posterior to the round window, thence winding around
its fore part & between it & the oval window inwardly
along the lower border of the cochlea to its inner side
forming the inner end of the petrosal. 3 Above the
end of the latter appears a minute centre on the
upper part of the cochlea. 4 A minute one also
on the cochlea at the upper border of the int. and.
meatus. No centres observed in the mastoid
portion of the cartilage.

Filaria. Abdomen of Rock-fish, *Poccus lineatus*
3 to 6 in. long, blood red, $\frac{1}{6}$ to $\frac{1}{4}$ line thick, ends
obtusely, mouth prominent. Oesophagus 1 line long,
cylindrical; intestine brown, tapering behind & ending
in a more abrupt translucent portion with
termination not evident. A whitish organ extending
from mouth for about $\frac{3}{4}$ of an inch & ending in a
filamentous process about 2 lines long. Ovaries
visible but their exact relationship not clear.
Phil. March 1862

Numerous small worms, many thousands from the intestine of
Cyclura baculophora Lope from Isle of New Providence.
Body cylindrical-fusiform, tapering most posteriorly; head
trilobate, or tripapillate. Anterior division of intestine of
two nearly equal portions; the first cylindrical, the other
slightly narrower and ending in a bulb; stomach at first
dilated & after a short distance narrowing to one third the
width nearly straight or slightly undulant. Tail
of female long, straight, acutely tapering; in male
curved and ending in a long mucronate point.
Generative aperture of a female a short distance in
advance of the anus. Two curved spicules in male one
double the length and thickness of the other. Tail of
male with two pairs of tubercles about the middle
ventrally and a pair opposite dorsally. Measurements on
6th page next.

1883

March 29. Water with sediment from Lake

Submitted by Mr. Edward Potts, who had preserved it since last autumn.

Reported as containing abundance of a Heliozoan. Examined same date. Contained numerous isolated individuals, active and encysted forms as in figures of March 30.

Observed a dense mass of irregular cylindrical form 0.84 mm long by 0.36 broad, & perhaps containing ^{upwards of} a hundred, ~~some~~ individuals, both active and encysted, mingled with much cloudy yellowish granular matter, perhaps dirt.

Without careful scrutiny the mass might readily be taken as a fragment of decomposing vegetable matter with adherent ooze.

The active heliozoa were exceedingly sluggish & indeed appeared motionless. The mass remained stationary even for 24 hours; but individuals during the time appear to have detached themselves and moved a short distance off, at the periphery. I was at first convinced that the animals were

living and active, not by any clearly perceptible locomotion or change of form, but by closely watching them, and observing contractile vesicles, of which each appeared to possess two, three, or more, which would in the usual way slowly enlarge, contract & disappear. After much time, the central body was also observed to change in shape, especially in the act of feeding, which was done, on minute monads of two kinds. These were caught & swallowed as in Actinophrys.

Description - Spherical or oval, or other forms more or less modified: quadrate rounded, ovoid &c., colorless, granular, with coarse granules & food vacuoles of varied size. Apparently a large central nucleus, but indistinct sometimes pale granular, sometimes of coarse uniform globules as in figure. Usually three contractile vesicles could be detected at different parts of the periphery. A pale striated envelope, apparently of the most delicate, linear spicules, inconspicuously fine; mounting to various depress upon the rays, which are exceedingly delicate, & by night light are distinctly granular.

Central granular body 0.024 to 0.036 mm diam.
An oval one 0.032 by 0.024 an ovoid one 0.036 by 0.032.
Two others measured: ~~smaller~~ one 0.02 diam. length 0.03.
Contractile vesicles 0.004. The former with its envelope
was 0.032 diam.; the latter 0.05. The longest rays
0.05 mm.

Encysted forms spherical, colorless, uniformly finely
granular, with an indistinct nucleus, some-
times apparently two. Defined by a delicate
doubly contoured membrane. With one
envelope of striae, but no granular rays.
Encysted forms usually 0.02 with envelope 0.036
diameters.

Under action of dilute acetic acid, the central
body becomes more defined, & a nucleus with
nucleoli are more distinctly produced. The
granular rays disappear, but the striate
envelope remains unchanged.

In the mass the helizocous appear adherent
like a mass of prickly leaves, but they
were never seen enjoiner by isthmus as in
Ruphidiphrys.

Under acetic acid the envelope appears
to have fine granules mingled with the striae.
The striae or spicules are exceedingly, indeed
immeasurably fine, and apparently resemble simple

sperilla spirales, that is appear straight or feebly bent & pointed or tapering at the ends. //

Wallingford 1884

June 20. Observed a mass of spherical eggs about as dozen, beneath bark of a cutworm log, supposed to be those of *Telimephorus*. Eggs measure about 4 mm diam. Embryos within with a long process ending in a tongue-like contractile pouch.



A similar mass observed under bark of a chestnut log, July 18. at Swantonville.

1885.

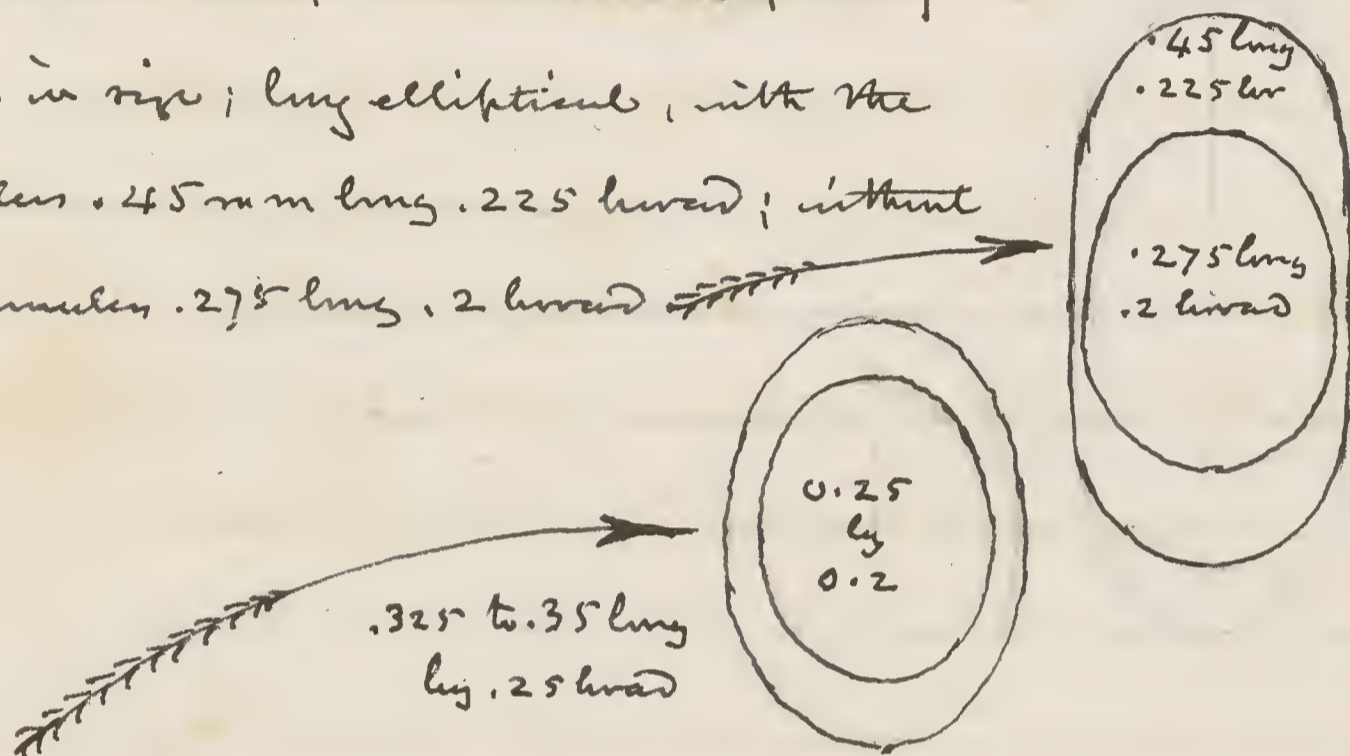
May 23^d with family to go for the summer to Wallingford, with Mr. Bennett & Stansley,

June 8th In company with Dr. Pothorok take a trip to Cambridge Md. on the Chesapeake to examine a tertiary deposit exposed on shore of the bay. Returned following day.

June 20th In company with Jos. Wharton trip to the zinc mines of Friedensville & the steel & zinc works of Bethlehem. Remarkable swarms of the 17 year cicada in the neighborhood & in Bethlehem.

1888,

Dense mats of clay colored *Plumatella*, submitted by Dr. J. Chester Morris, who obtained it from water pipes obstructed by the growth, attached to vegetable matter. Coenocidium translucent yellow, with multitudes of contained statoblasts in rows; the mature ones pretty uniform in size; long elliptical, with the annulus .45 mm long .225 broad; without the annulus .275 long .2 broad



Plumatella densely and thickly covering twigs and stems from fresh water, submitted by Samuel Powell, from near Newport, R. I. about 1860. Coenocidium chocolate color, finely granular. Statoblasts comparatively few, from .225 to .35 mm long by .25 broad with annulus and 0.125 thick, without annulus .25 long 0.2 wide

Plumatella of Dr. Morris above mentioned, from an iron pipe of 6 in. which conveys water from a dam over a water-wheel, & becomes choked with it once or twice every summer. "about a bushel & a half requires to be raked out in order to allow the water to flow freely. Birmingham T., Chester Co., Pa. Letter of Jan. 30, 88.

Measurements of worm from Cyclura. See Ante 7 pages.

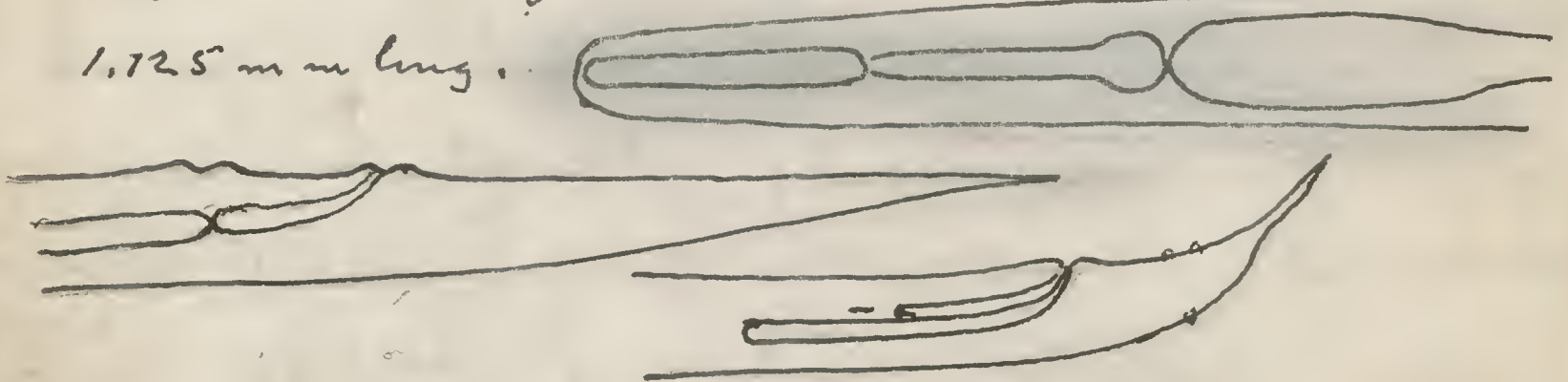
Females 5 mm long .33 mm thick at middle;
male nearly as long but more slender and .2 mm
thick at middle.

Tail of female 1 mm. long from anal aperture; gen-
erative aperture .3 mm in advance of former.

Tail of male .375 mm long of which the musc is .125 mm

Measurements of intestine in female first division .4 mm
long .075 thick second div. .4 mm long with bulb .1 mm;
dilated enormous stomach .475 and after half
a millimeter abruptly narrow to .05 diameter.

Large spiracle of male 2.5 mm long, smaller one
1.125 mm long.



First division of intestine or pharynx apparently lined by
chitinous linear plates. No alae or tubercles to tail of
the female. In a few females 2, 3, or 4 eggs noticed
in the uteri. = Atractis subulata,

Echinorhynchus gigas. Two small individuals from
small intestine of the Herp. 33 mm long, 2.5 thick in
front and 1 mm thick behind, annularly constricted.
Head small and rounded.

Worms in the Terrapin, Feb. 1888. In four
cooked Terrapins in which the intestines were prepared
for examination. In one were several hundred
Echinorhynchus hamulatus, mostly small attached
all along the course of the small intestine. In
a second there were about 50 Echinorhynchus
mostly large up to an inch long or more, lying
among the degenerated epithelium &c. There were
also two Amphistomum grande 13 mm long & 3 mm
in the intestine. In a third there were only half a
dozen small Echinorhynchus; & in the fourth no
worms.

Feb 11 Examined a Terrapin. The small intestine
contained 12 females Echinorhynchus hamulatus
12 to 16 lines long widening behind to 1 + 1.25 mm
thick, head 0.2 mm diam. 1 male 9 lines long
0.625 thick behind. Also contained in lower
part of intestine 70 females 36 males of
Coenobolus microcephalus, light red in
color, filiform, cylindrical, Chitinous capsule of
mouth with 6 longitudinal ridges on each side. Tail of
female straight, curved, subacute ending in
three minute curved tubercles or points close together.
Tail of male incurved, acute, alate, alae ciliate.
Length of females 6 to 8 lines thickness 0.375^{mm} ; males
4 to 5 lines & thickness to 0.2 mm. In the urinary

a single *Polystomum*, about half the size of
P. integerrimum. Body ovate, anteriorly tapering,
posteriorly ending in a nearly circular disk,
with 6 circular bothria. Neither hooks nor
eyespots detected. Bothria with an anterior
structural arrangement resembling the tubes of an
opera glass. Animal pale yellowish, length
3.5 mm, breadth 0.875 mm; disk 1.125 mm;
bothria 0.3 mm. = *Polystomum*

The *Echinorhynchus* were pale to light yellow.
March 8, 1888 Examined three dead *Terrapins*. No 1 small
intestine with about forty *Echinorhynchus hamulatus*, attached,
yellowish, up to 1 in. long. No 2 with about a dozen of
the *Echinorhynchus*, and 8 *Cuculamus microcephalus*.
No 3 Several hundred of the *Cuculamus*, most numerous in
intestine near stomach females up to 15 mm long, brown
or red. All alive and with only five small
Echinorhynchus. Small the specimens were alive &
adherent to the intestine, with *Echinorhynchus* & *Cuculamus*.
In males of *Cuculamus viviparus*, the larger all contained
developed embryos.

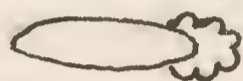
In one of the latter found in the faeces 3 and in the nose
1 *Polystomum*, 3 to 6 mm. long.

Largest - when elongated 6 mm. disk 1.375 broad, width at
middle of body 0.75 bothria 0.5. Central disk 0.2, crown
of hooks 0.12, thirty two hooks - Seen from above appear to
be 0.04 long, at side 0.06 long. Reticles

Body ovate lanceolate, with a terminal disk of variable form provided with six circular lathria. At base of disk three pairs of minute hooks, at end of disk between last pair of lathria 1 pair long hooks and 2 pairs small ones. Near centre of body a disk with a central coronet of 32 hooks.

The three back hooks of disk on each side measured 0.16, 0.08 & 0.028.

Probably, *P. oblongum* found by Prof. R. R. Wright in bladder of Musk Muttel *Stenothemus adonatus*. Proc. Canad. Inst.

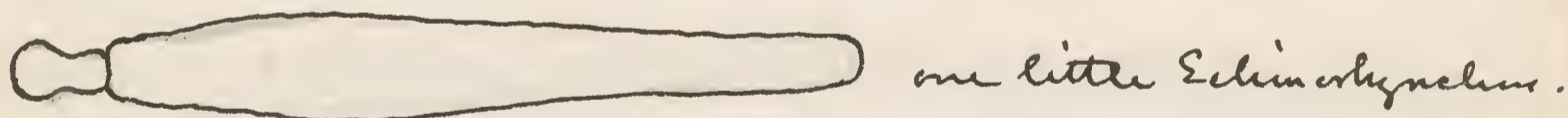


The *Polytomum* from the bladder, with no trace of hooks on the caudal disk. The coronet of hooks near centre of body 0.12 broad consisting of 16 hooks 0.052 long.

Animal under pressure of cover glass showed following:

Length 3.5, breadth of body 1.125 of caudal disk 1.625 of lathria 0.375.

March 10, 1884 Examined a Sizzard Shad *Dorosoma cepedianum*, obtained in market. Intestine contained



one little *Echinorhynchus*.

Body yellowish white, fusiform, rounded blunt behind pedicels middle shaped, widest and rounded at top, two circles of 10 or 12 hooks above the constriction and one circle below it. Length 5 mm. width at middle 0.5, width at fore part 0.18 anterior extremity 0.2. Pedicels 0.18 long fore part 0.16 wide hind part 0.14 wide. A little yellowish mud in sizzard contained sand, vegetal particles, diatoms and a few rhizopods among which saw two *Cyphoderis* and a *Difflugia*.

Distomum variable. From *Tropidonotus sipedon*

3.25 to 4 mm long by 0.875 to 1.25 mm broad. Elliptical obtuse at both ends, minutely ciliated, convex dorsally, flat or slightly concave ventrally; ventral disk nearer the anterior than the posterior extremity, as large or larger than the oral disk; cirrus projecting immediately in advance of the ventral disk; uterus behind, latter with yellow oval eggs 0.225 by 0.125. Vessels on each side black.

Body with some of them having a constriction about the least third; head not obtuse.

In one of 3.5 mm pharynx was 0.6 with mouth 0.2, ventral disk 0.625 with inflex 0.375.

In collection labelled mouth of *Tropidonotus sipedon*. See Proc 1856, 44.

Hedrovius androphora from *Amblystoma mexicanum* from Lake Texcoco, Mexico. Submitted by R. E. Ball, Des Moines Iowa. See Am. Naturalist Aug. 1887. Eleven females attached to portion of stomach + 3 males attached to former.

Trichina spiralis. Feb. 1888 Intestinal *Trichina*

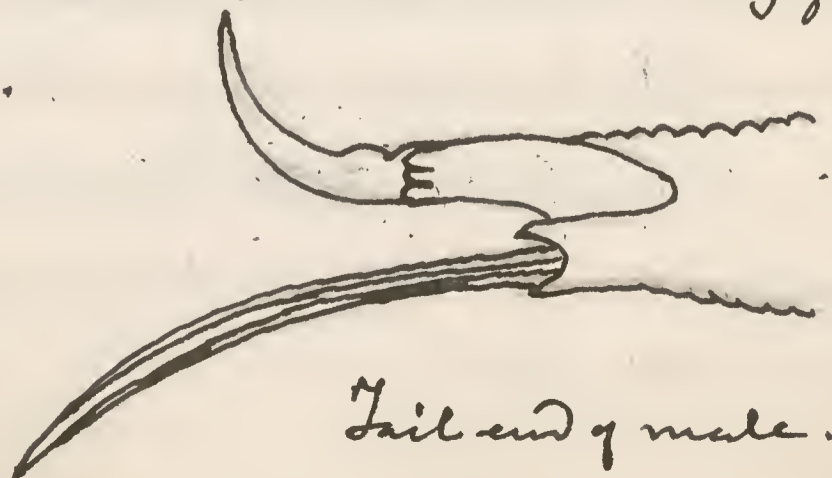
from a child, who died & had eaten insufficiently cooked pork chops. Submitted by Dr. Joseph H. Mills No 102 Cooper St., Camden, N. J. Specimens measured from 1.875 to 2 mm in length by 0.1 thick at head end and 0.25 near posterior end which was rounded obtuse. Animals contained ova & in advance of them developed embryos.

Thelastomum venustum, From Testudo
carolina from Georgia. Specimens preserved in
alcohol. Females of more robust & slender
forms showed following difference in measurements -
Body fusiform; tail long, subulate acute;
integument finely and distinctly annulate.

var. a. robust form 4.75 mm long by 0.3 thick; tail
0.375 long. Thickness at top of head 0.05, spiracle
anus 0.1. Genital aperture 1.5 from tail. Eggs
0.125 by 0.05. Oesophagus cylindrical and gizzard
spherical, together 1.75 long; ventrals 0.025 thick
gizzard 0.1 diameter, anterior dilated portion of
intestine 0.15 widest quickly narrowing.

var. b. slender form 3.75 long 0.225 thick at
middle; tail 0.5 long; head end 0.05 thick, at
anus 0.075 thick. Oesophagus & gizzard 0.75 long,
Genital aperture about middle of body.

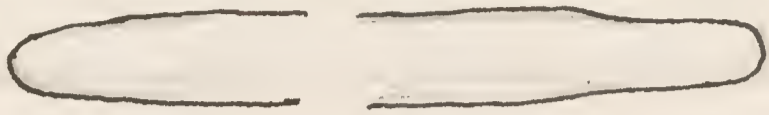
Male 3 mm long 0.25 thick; oesophagus & gizzard
1.375 long. Spicule of penis thick and straight
above & curved & pitted below 0.5 long; end of its
sheath prominent. Tail curved 0.15 long from
surface of spicule.



Tail end of male.

Nemator. Undetermined No 247 of my collection.

From *Ortyx virginianus*, Florida Dr. Warren Nos 50, 52, 65, 75.

from 5 to 8 lines, cylindrical, straight distally, rounded at both extremities,  one extremity slightly and rather abruptly narrowed near the end.

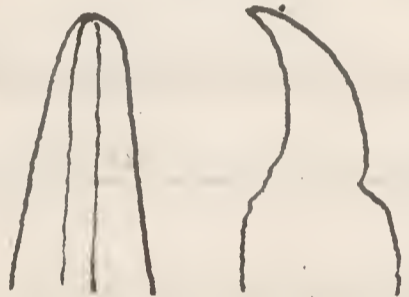
Thickness at middle 0.25 mm.

Oxysona brevicaudatum, Lovén of

Speleotes muleri. Two specimens ♀ about 4 mm long

A. More robust specimen. Fusiform, acute in front

and behind
acute,



Tail short, conical, recurved,
mucronate 0.12 mm from anus.

width of

body opposite commencement of

intestine 0.45; width at middle 0.55. Genital
aperture 1.875 from tail end. Oesophagus with bulb

0.75 long.

B. Less robust specimen. Head conical, rather

abruptly tapering; tail incurved,

conical, acute, mucronate.

Body 0.35 wide at middle. Tail 0.14

long from anus; width at anus 0.16

Cylindrical portion of oesophagus 0.5 long 0.05 wide

bulb 0.1 width commencement intestine 0.25 of

body in same position 0.3; genital orifice 1.625
from end of tail.

March 20. Red Snapper Lutjanus campechanus.

A Siphonostome parasite about the position of the pharynxes white in color, with forked head, milk white throat & half a dozen pouches of which one pair with eggs, also white.

The submucous coat of the stomach filled with encysted oocysts of a cestid, specimens of which measured from 10 mm to 35 mm in length



Head bilobed-shaped milk white, body translucent white flattened cylindrical, tail end a little expanded and obtusely rounded. Pubosities caused to protrude by pressure, narrow thread like 4 mm long by 0.175 wide, extremely expanded quadrilobate with four lobes and four hooked columns partially protruding & deeply extending down the pubosities



width of head at a 2 mm at b 2.25 mm

constriction at c 1 mm width of body nearly uniformly

1.25 mm Length of head 2.5 mm. ~~Pubosities~~ Columns of

hooks 3.25 mm. Pubosities 0.2 mm.

In stomach of Black-bass Micropterus nigricans

2 oocysts of a Tetrahalothrium - The larger when

contracted was 12 mm long by 0.75 wide when elongated

20 mm long by 0.275 wide. Head with four circular



Antenna 0.25 diameter, which would protrude alternately
a pair in advance & a pair laterally giving the head
a trilobate appearance as in figure. When the
head would appear 0.5 long & 0.75 broad.

Echinorhynchus Intestine of *Coregonus*

Body cylindro-conical, thickest and rounded
in front and tapering behind, annulate, and obtusely
rounded at the end. Pulveris clavate, neck short,
12 rows of hooks. Length of pulveris 1 mm, thickens
near end 0.375.

Echinorhynchus striatus from *Ardea herodias* Florida
Dr. Warren No 71. Body clavate, annularly annulated,
anteriorly rounded, minutely striate. Pulveris clavate
with about a dozen rows of hooks. Length 4 lines.

Two *Echinorhynchus* of Black Bass & Rock Bass
See Note Book No I.

Echinorhynchus

Meadow Lake, Stumella magna. Dr. Wm. Florida No 61

Single specimen 6 mm long. Body clavate, annularly corrugated, anteriorly rounded, posteriorly obtuse.

Protheca papilliform as located on long with 6 or 7 rows of hooks; neck broader with 4 or 5



rows of smaller hooks. Length of protheca 0.375 breadth 0.375 neck 0.25 long 0.5 wide. Circumference of body 0.7 wide near posterior end 0.5

In another specimen - 3 worms larger than former 18, 20 & 22 mm long. In one the protheca was somewhat enlarged at the end. Florida

In a third specimen from Chester Co. there were fragments of the body of two worms indicating larger individuals than the preceding.

Echinorhynchus

Rock Bass = *Ambloplites rupestris*, Lake George

6 to 14 mm long, Body white, curved, cylindro-fusiform, not tapering behind, obtuse, Protheca curved,

cylindrical, with 20 to 24 circles of hooks, neck short

unarmed. Protheca 1.25 long 0.3 thick, Body in

front 0.5 thick, widest part 1 mm thick, behind

0.625 thick

See note under No 1.

Lernaea

From a shark, *Lamna*

littralis caught at Beesley Pt., N.J.

Whole length including egg sacs 90 mm

Length independent of latter 70 mm Body 12 mm

Head 3 mm wide Abdomen 12 to 15 long

Mouth 0.375 thick, body 1.75 thick abdomen 0.5 thick

Egg sacs ~~0.25~~ 0.25 thick

March 31, 1888 Examined the entrails of about 50 sharks obtained from Market. Shudders caught from the South. Most of them contained nematoid worms 12 to 40 mm long = *Ascaris adunca*. Always a few. In intestine, stomach & among abdominal viscera, some coiled & encysted in peritoneum mostly attached to stomach. In nearly all there were minute scolices of a *Tetralesthrium* or *Taenia* in upper part of intestine and the pyloric appendages. In all no fresh food was contained in the stomach and only in a few some half digested remains of fishes and ~~and~~ ~~two~~ or three amphipods.

The nematoids appeared all to belong to one, or perhaps two species. In the larger individuals generally the body was thicker from the middle backward and was much tapered in advance. In several of the smaller

over it was more uniformly cylindrical. The
 three lobes of the mouth in all large and
 conspicuous and with a conspicuous papilla
 on the top of each. Oesophagus long and
 cylindrical and apparently at once ending
 in intestine without intervention of a
 bulb. Tail in all short, conical
 and acute, but in some was 2 or 3
 times longer than in others. Posterior
 extremity strongly incurved and more so
 in the male, which was provided with
 two spicules. In all there appeared
 to be pore-like tubes extending through
 the thickness of the integument.

- No 1 Larva female 40 mm long, 0.75 thick tail 0.125
 " 2 Female 30 mm long, tapering most anteriorly,
 " thickness at posterior part 1.125. Tail 0.35
 " 3 ♀ 30 mm long 0.675 thick Tail 0.25 long
 " 4 ♀ 22 mm. width at commencement of intestine 0.4, at
 posterior third 0.5 Tail 0.125 from anus
 " 5 ♀ 30 mm long; width forward 0.5 behind 0.6, Tail 0.125
 " 6 ♀ 28 mm long, cylindrical; thickness at com. of int.
 0.4 at middle 0.5 post. 0.45. Tail 0.375 long
 " 7 ♀ 26 mm. cylindrical, thickness anteriorly & posteriorly 0.45
 Tail 0.375

No 8 16 mm long, cylindrical, 0.3 thick at front & back parts
Tail 0.25 long

No 9 16 mm long, cylindrical, 0.25 thick in advance
0.275 at middle and behind Tail 0.125 long

No 10 12 mm long, cylindrical, thickens for most
part 0.3. Tail 0.175 long

~~No 11~~

No 11 35 mm long, most attenuated in advance,
posterior extremely increased. 0.875 thick at
middle, Tail 0.175 long. ~~Requires~~

~~at the end of the genital aperture~~

~~No 12~~

No 12 Male 30 mm long; most narrowed in
advance 0.5 thick at commencement of intestine
0.55 behind Tail 0.125 long. Two spiracles
slightly recurved from protrusion of genital aperture.

No 13 Male 20 mm 0.375 thick at com. of int.;
0.6 at middle, 0.45 behind Tail 0.125 long
Spiracles not recurved.

No 14 Female 33 mm long, most tapering in
advance, at posterior third 0.7 thick. Tail conical
about as long as thick 0.25 by 0.25 acute,
a slight mucro recurved.

No 15 Female 33 mm long, most tapering in front
posterior third 0.75 thick. Lulia large together 0.15 long
0.2 wide. Tail conical acute 0.125 long. A row of
five minute papilla in advance of anus.

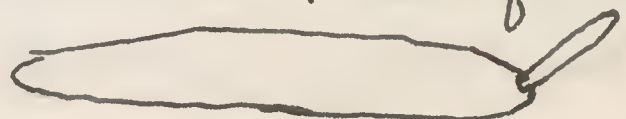
Three smaller slender ones 20 to 25 long by 0.45 thick
at anterior third. Tail 0.125 to 0.25 long.

The above may particularly be *Ascaris adunca*.
See Dieking, Dujardin. but with this *A. acis* we
decided as being equally narrowed both ways while
the *Ascaris* of our study is most tapering in advance
& thickest at the posterior third.

Pickereel *Esoy reticulatus*.

In pharynx two *Distomum longum* light red
2.2 mm long. Oval acetabulum 8.25 ventral
acetabulum 2.25 mm back of anterior end
0.75 diameter Pharynx oval 0.45 long 0.3 wide
posterior end obtuse conical. Elyate to 30 mm.

In intestine seven *Echinorhynchus angustatus*?
white 3 to 5 lines long by 0.5 to 1 mm thick, fusiform
flattened, posteriorly conical; head extremely blunt
pubercis projecting obliquely cylindrical 1 mm long
around posterior 0.8 long with 20 to 24 rows of hooks
neck short unarmd.

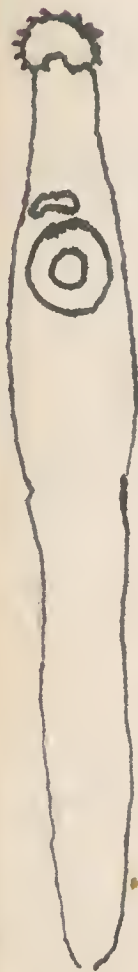


Also 3 small *Echinorhynchus tuberosus*? 2 lines long
0.3 mm thick, cylindrical, tapering behind, posterior
end obtuse. Pubercis short, rounded with 2
rows large hooks & one ^{or two} of small hooks,
neck none. Anterior 0.15 long 0.15 thick.

Tapeworm in small intestine 2 1/2 inches long
 by 2.5 mm broad. Head 0.25 wide with four
 hemispherical epidermal lathria about 0.125 diameter
 Posterior widest segments 0.5 to 0.75 long by 2.5
 wide. Genital apertures lateral. Head unarmored
 A sucker of same 4 mm long by 0.25 wide elongated
 to 8 mm by 0.1 wide. Head same as in adult.
 xx See next page but one.

April 12/88. Parasites from small intestine of a
 Muskrat, obtained by . Malachuk.

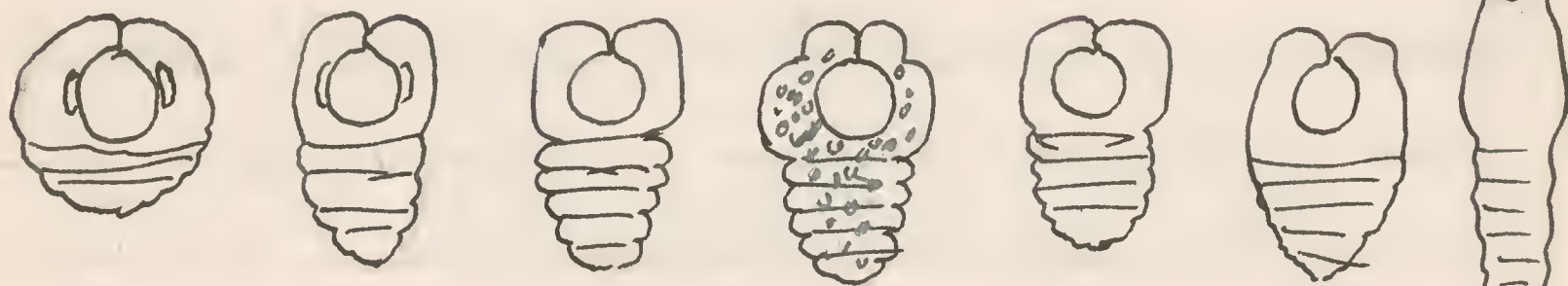
18 Distomum from 18 to 25 mm
 long by 2.5 broad, linear lanceolate, ~~head~~ dorsally
 convex, ventrally flat. Head reniform, ^{anteriorly} with prominent
 border, armed with 35 strong straight spines, neck
 indented behind, finely echinate. Ventral acetabulum
 when large, larger than the head. Posterior
 part of body smooth, obtusely angulate at the
 end. Genital aperture in advance of ventral
 acetabulum. The excreted penis curved,
 annular, trilobate at the end, directed to
 one side, smooth. Head 1 mm broad;
 ventral lathrium 2.5 mm back of summit of
 head, ventral lathrium 1.5 mm diameter;
 width of body opposite latter 2 mm.
 Spines of head 0.16 mm long 0.04 thick; small spines
 of neck 0.04 long 0.008 thick. Penis 1 mm long.



Two specimens Amplicistomum sulcatotriquetrum, Elongated
ovoid, convex above, flat below, narrower in
advance, somewhat curved, obtuse at both ends.
Oral aciculation 0.625 mm; terminal aciculation
2 mm. hemispherical. Ventral orifice a short distance
back of the head. Length 12 to 15 mm,
breadth 4 mm. A. sulcatotriquetrum.

Sides of Alosa, in pyruvic portion of intestine and in
appendages also along course of intestine. At rest spheroidal
ovoid or endiform 0.5 to 0.625 diameter or
0.5 to 0.75 long or up to 1. mm 0.75 broad; with the
head inflected and appears as a circular lighter
spot 0.375 diameter, with a red spot on each side.
With head protruded elongating and narrowing and
contracting and widening, when elongated clavate
tapering behind, posterior extremely angulate; elongate
to 1 1/2 mm or more & narrow to 0.25. Body
of two parts; the posterior annular supra, the
anterior half wider, half oval emarginate in
front when the head is inflected. Bothria four
hemispherical 0.125 to 0.15 diameter. Head
unarmed. When animal has head protruded.
The red spots are placed back of the Bothria.
Another less numerous and smaller form 0.625 by 0.3
without the two red spots but otherwise alike; the
bothria a little smaller 0.1 to 0.125.

Interior of the body filled with oval corporales 0.012 to 0.016 long by 0.008 to 0.009 broad.



Worms from Delaware R., Shad Apr. 12, 1888

Agamoneura. - of the Shad. Removed from the coils as encysted in the peritoneum, attached to stomach, pyloric appendages, &c. Worm.

Cylindrical, translucent, narrowed toward extremities, head rounded, with four? small conical papillae, tail short, conical, obtuse.

Verophagus cylindrical widening behind to ~~base~~, second portion of canal or gizzard milk white,

cylindrical, Verophagus 1.875 long 0.2 wide;

Gizzard 1 long 0.25 to 0.3 wide.

Worms 20 to 25 long by 0.5 to 0.625 thick.

xx The tape worm hatched in alcohol had the head 0.375 wide with the hemispherical lathria 0.175 diameter, neck very short and nearly as wide as the head. Segments 2 inches behind the head 0.375 long & 1.25 mm wide.

The Soley had the head 0.225 wide, the lathria 0.1 diameter, the anal part of the body 0.175 wide

the leech part 0.25 wide. Posterior part of body with faint segmental divisions, segments 0.075 long by 0.25 wide.

April 29, 1888 Two individuals *Filaria papillosa* of
the Horse from Dr. W. L. Guill.

Body most attenuated posteriorly, caudal extremity
inrolled. Male with row of papillae on each side
of caudal extremity. Spiculum winged. Tail
short, conical, blunt.

Female 120 mm long by 1 mm thick.

Male 60 mm long 0.5 thick Head conical
papillated.

May 12, 1888 *Gymnosolex picta*. In intestine
of Porgie Two fishes examined.

Scales closely resembling that of the Shad & Herring

With head enclosed 0.75 to 1.125 long by ~~0.5 to~~

0.5 to 0.7 broad. With head protruded elongated

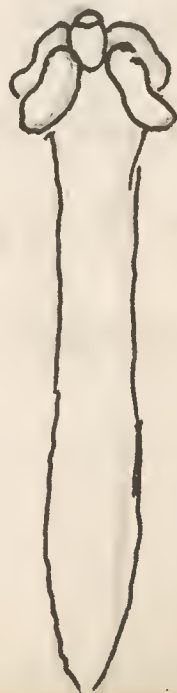
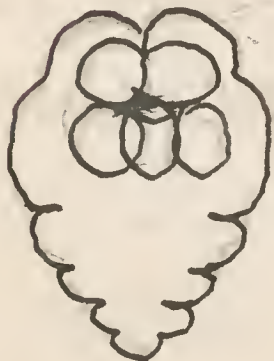
to 2. & 2.5 mm long by 0.25 to 0.2 wide.

Rostrum circular 0.15 to 0.175 elongate to oval

0.2 long by 0.1 wide. Protellum oval, capped

0.15 long 0.125 wide. Red streamer distinct.

= probably *Solex polymorphus*



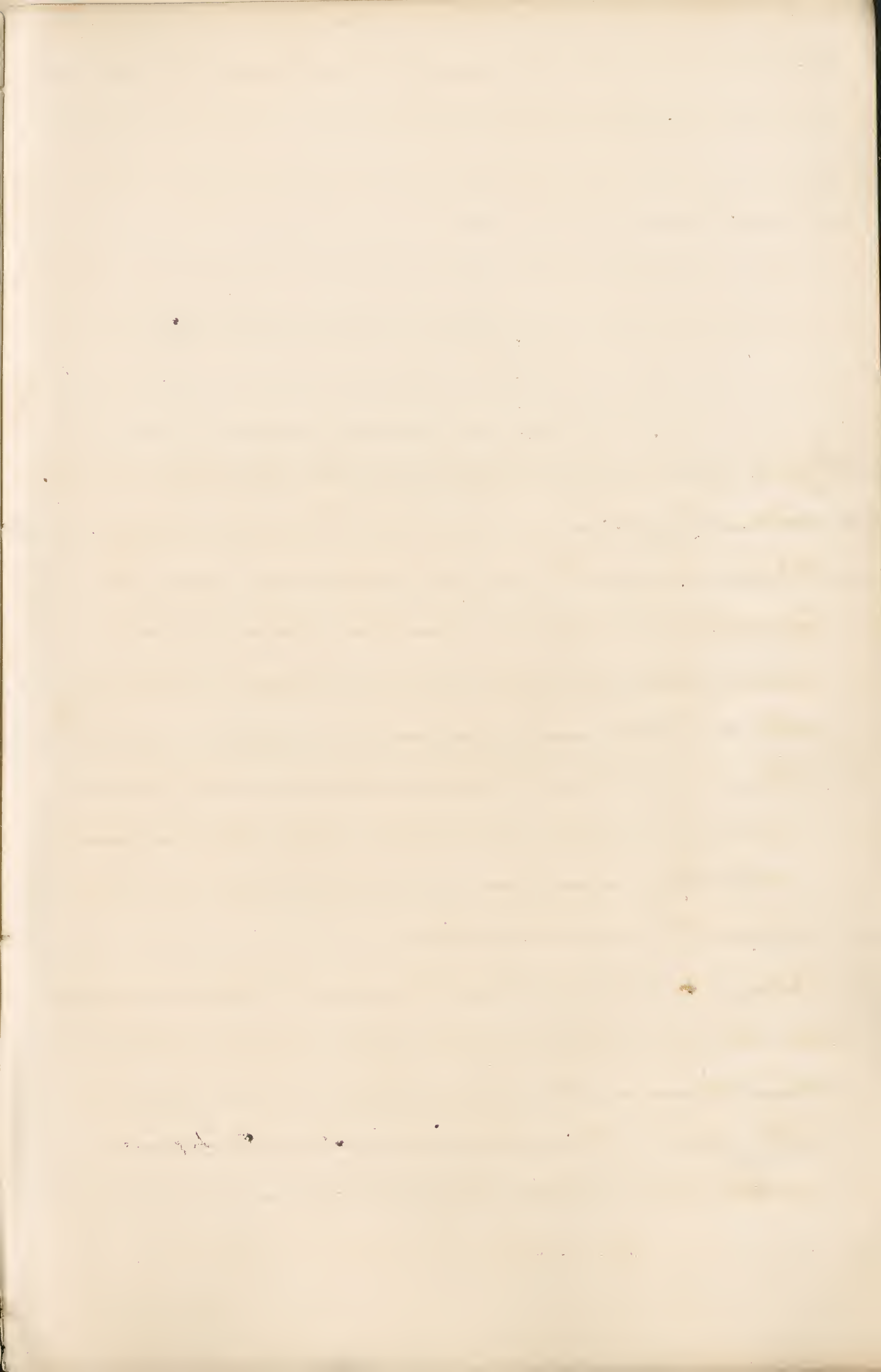
May 22, 1888 Examined a Butter-fish from the market,
Stromateus triacanthus, contained numerous small
nematoids, beneath peritoneum of abdominal wall,
on stomach, and pyloric appendages, Length 13 mm
long by 0.375 thick. Translucent whitish & mostly
with a pale reddish brown intestine. Appeared to
possess all the characters of Ayamoneema capoulavici

April 11, 1882. Observed in Horticultural Hall
under stones &c. a small Polydesmus.

9 lines long with 19 foot bearing segments.
Segments on dorsum smooth, shining, dark
brown with lateral borders cream colored &
with a brown spot beneath on each side,
with a middle transverse furrow. Antennae
brown, of 7 joints including the basal joint,
minutely bisected. Under part of body
& feet brownish white.

Body of 21 segments including head & terminal one.
After the head, first segment with 1 pair of feet;
second segment with none; third and fourth each
with 1 pair; those following each with 2 pair
except last which has none.

Apparently an undescribed species.



Morris 0.45 long 0.225 broad

P. vitrea 0.566 long 0.383 broad

P. vesicularis 0.349 long 0.233 broad

P. diffusa 0.35 long 0.25 broad

P. arethusa 0.399 long 0.266 broad

Newport var 0.35 long 0.25 broad

P. vitrea

.566

P. arethusa

.399

Morris

.45

P. vesicularis

.349

P. diffusa

↓ Newport

.35

General Heichy / Mr. H. J. do

1302 & Albert Ave

city

PHILADELPHIA
JUN 11 1894
1:30 PM



Arctia alata Raf. leiod ?

A. acipenseris Acipenser sp ?

A. siluri glanis S. glanis

Physaloptera striata

Tripidodontus hydus +
Cicinnia allene

P. dentata *Vipera lewis*
Agama +c

P. malleus *Corvus corax*

F. luna rotundata *Otis Macdoni*

F. tricuspidis *Corvus corax*

F. caprae

F. squamata

Phalacrocorax carbo

F. turdi atrigularis *Turdus atr-*

Spizella cyllindrica

Petroica cyanea

Linstow
Parasitic Worms
Reise in Turkentum
A. Festschreiber

~~Parasiten~~

Lehmannia acanthus hispidus Fed

Sus scrofa fura

Agamumema rotundatum fish

Heterakis curvata *Pardip gracilis*

H. tenuicauda do

H. macroura *Megaloparis*

H. gracilis *Agama sanguinolenta*

Aspilis inflata *Pterocles arenarius*

Gordius stylorum - *Otis* n 2

G. palustris

G. maculatus

Linton

Parasitic Worms

Mormis paludicola

Ad radicis humilis

M. acuminata

M. rotundata

M. Brassi

Echinodermis plicatus

Embriza Fucus Saxicidate

E. acanthotrias

Adus palumborum

Distomum pleurostomum

Perdix quaca

D. choleochum

lira q Anas

D. nigron

Corvus corax

D. lupiscinum

Ardea stellaris

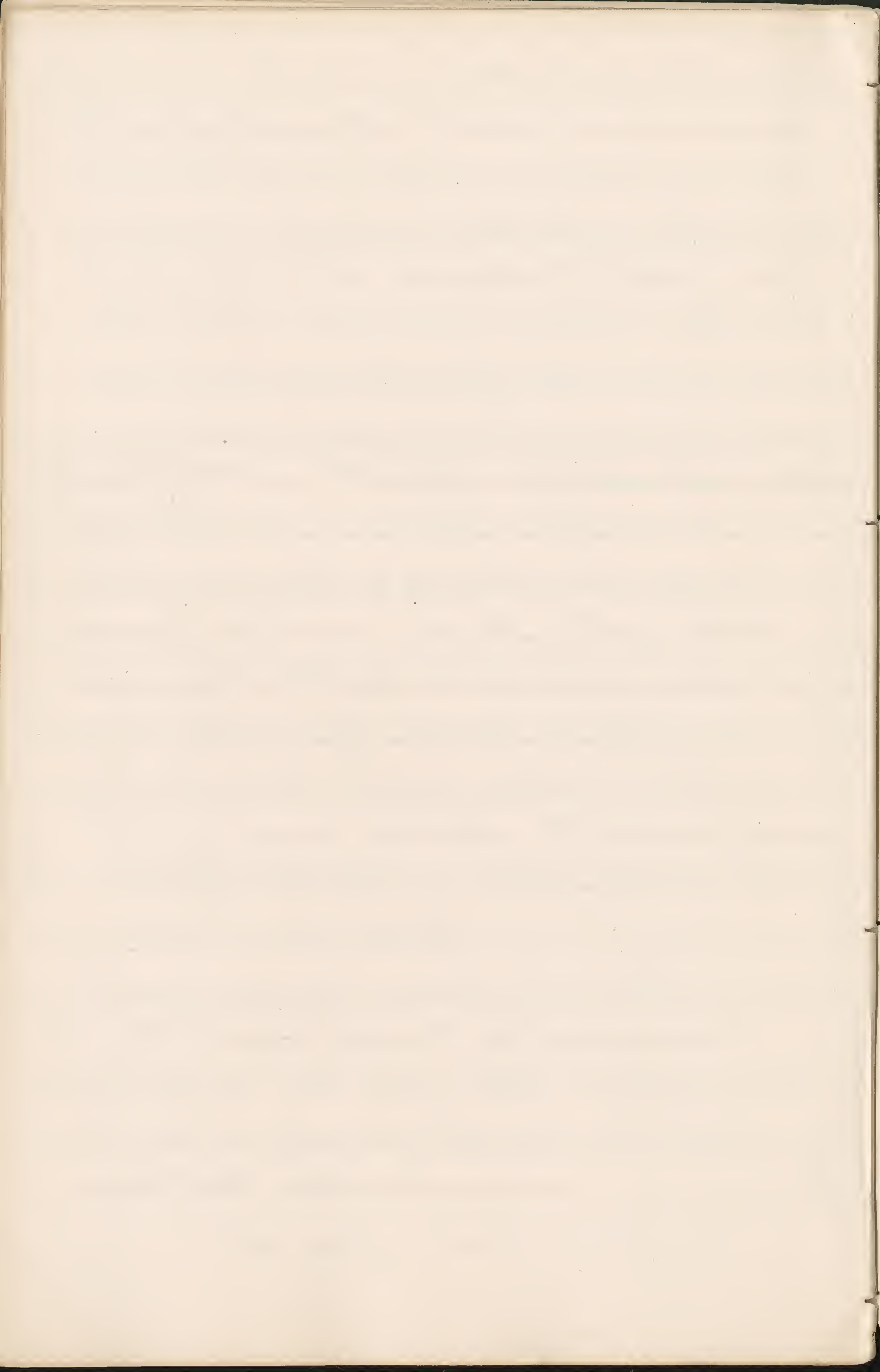
D. subcatum

in lira

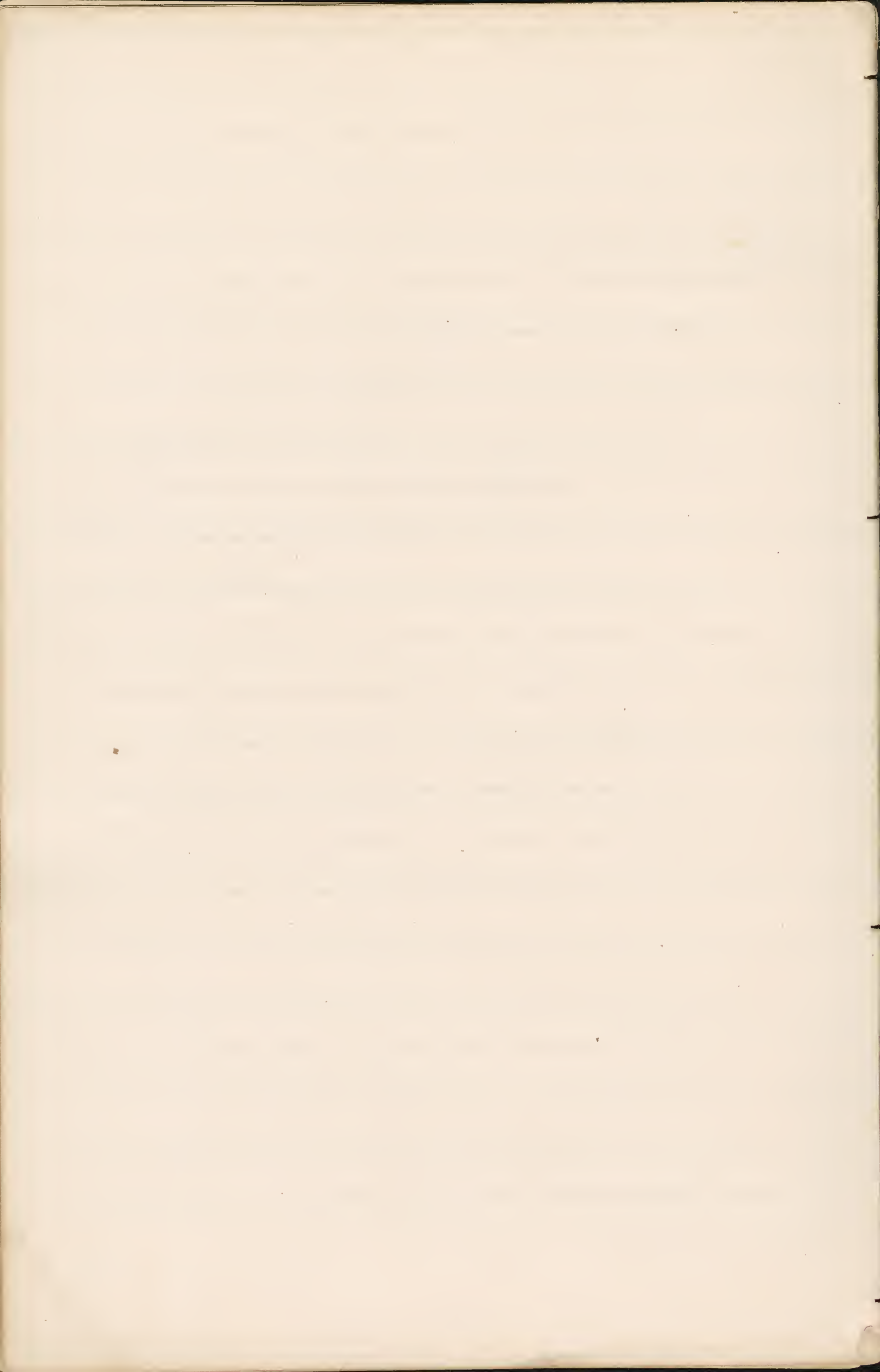
Perdix quaca

Murstonium nigro punctatum


lira










1875

May 2. an oval egg like body, apparently attached
to a coniferous filament. 35 diam long, 22 broad
1000 magnification. Colorless, granular, everywhere
reticulate with short hair-like spines, apparently
equidistant and about 5 diam long. No movement
observed.  What is it?


Two *Arceuthobium vulgare*, observed together 
18 long 12 high (1075x) one shell faintly visible
than the other. Linnel section color plain
than the other.

 Observed with a small opening, about 1/2 inch in length
 except in a flattened finely granular body, color
bottom. Total 11 by 5, diam. tubercles, 3, (1075x)

Arceuthobium minutum 25 long, with 2 tubercles, 15 long
+ 2 wide, body 3 wide - after 5 hours clear
30 long with one tubercle 15 the other 10 (1075x)
one shell had been a while clear & white
under a glass cover on re-examination was
distorted by slight pressure, when the anterior part
of the body separated as if crushed off & was easily
entirely covered by small tubercles. The escaped granules,

cuticle exhibited lively molecular movement
I was rapidly swallowed by the cells. The remainder
of the body enclosing the vesicle & granular
disk moved away apparently without.

A brownish *Promia*? lat oval, truncate in front
12 by 8 (10 by 5 H) fine granular substance from
not much larger than the test. This had
an irregular granular appearance as if granular
test.

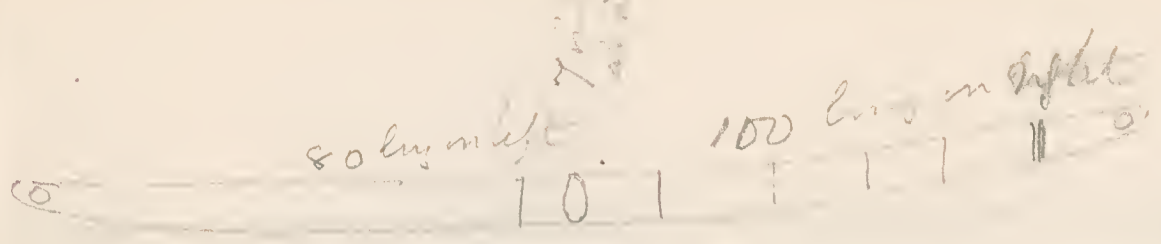
Arella vulgaris also with 6 pointed points


Power of movement of a *Navicula* which measured from
8 by 1 to 10 by 1 (10 by 5 H) moved a quartz fragment 12 by 25-

~~Form of *Navicula* - species?~~

May 7 *Actinoptera* Eichen. 48 dia. 1/5 H (observed)
a single ray. Some articulation of other
but did not explain the distinction of small
cells & cuticle.

T. ...



Adsterium 180 long, with a line of divisions 2 left + 6 to right

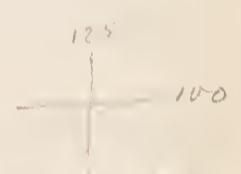
May 22d *Amoeba* Irregular globular mass, with many
dead p. luteo-punctulata - oval 40 x 30 diam (N. 7. 5H)
Long tuft 30 diam, thin but tuft 10 long. Long tuft
of six rays. Short tuft of 3 rays.

June 8 *Amoeba variabilis* one occupying space of
100 x 125, body part 40 x 60

nucleus 10 x 6

contractile vacuole 10 central + diaphragm

four small vac. upper in the plane of nucleus + other
with out center. (N. 7. 5H)



A fine granular spindle like thin
9 pieces. Body, 6 by 5 - length 20 diameter
largest diam 15 width 12 center (N. 7. 5H)

(In one amoeba some nucleus 14 x 9
N. 7. 5H)

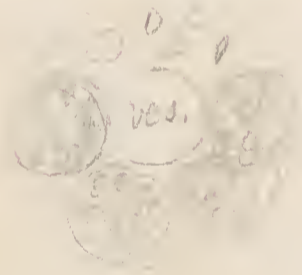
Feb. 7, 1875 Minute Amoebae abundant with
a floating pea-green or yellow-green alga on the
surface of water in a dish with sediment from
Dawley, Crake pond. The alga consisted of
globular cells, the smallest about 3 div. No 10
apparently with from 2 to 4 endochrome masses
adherent to interior paries of cell. Largest
cells 20 div No 10, with numerous endochrome
balls adherent to the interior paries. Upon
the smaller of these the Amoebae mainly
fed. Frequently the Amoebae were found
dragging a large alga or several smaller ones
floating as many as 20 alga could be pushed
on one Amoeba.

Amoeba limaciformis in water with a
contractile vacuole, sometimes 2 or over three.
Among the Amoebae, occasionally an
individual detected with 1 or 2 large granular
nuclei. These were usually without green
food contents & occasionally only brown balls
which were probably changed from green
No
Exhibit B. Several hours after placing some of the same
Amoeba in the animalcule cage, saw one described
the crystals distinct but the Amoeba vacuole 10 div No 10

remaining entire. Another almost dead with 2 granular balls remaining entire.

Most of the other Anomoea appeared to be dead and had been in a quiescent condition and circular, measuring 12 to 15 diam. with 100%.

Feb 13 One of same kind of Anomoea observed, after having been in shell for several hours, apparently dead, circular 12 dia. with 100% granules nuclei each 2 dia., vesicle contents about them:



Another 25 by 10

long, had three granular balls each 4 dia. with 5% and still alive & moving.



Feb 14 I found one Anomoea 12, 107 diam with five granular nuclei 4 dia. in diam. ves. 4 dia.

Another one 12 dia. with 10 granular nuclei 6 dia. each, ves. 12 dia. diam. of vesicle 12 dia. 3 dia. diameter.


Nuclei ordinary circumstances no distinct nucleus like that of organic cells is visible. Occasional absence

a distinct globule about 1/100" diam. with contents
the appearance of being enclosed in a vesicle measuring
about 2 diam. situated in vicinity of central
vesicle, or near centre of this structure.

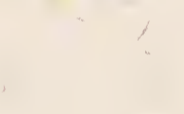


Carminic stain brings into view a central nuclear
globule, sharply defined & highly colored red. This appears
to be enclosed in a vesicle so little larger than
the nucleus that sometimes gives the appearance
of being on hair, or short pedicel structure, at
other times appears as a pale red hair around
the nucleus. The whole measure, for 2/3 of
diam. with 100x.

Measurements of the nucleus, to wit 100x S.P.R.
Stained nucleus about 2 1/2 to 3 diam., nucleus involved
3 to 4 1/2 diam. diameter.





Carminic solution appears to stain the
contents of the white body, or large red, the
contents is somewhat crystalline & smaller than
the contents, but the nucleus & its vesicle
appear as a small red spot, the nucleus
appears as a bright red spot, generally spherical,
nucleus irregular, & sometimes with several
conspicuous granules, for one within it.

Feb. 17 Saw one of the Anurida which was well
 & quiet. The entrance was somewhat
 restricted & between it & the periphery of
 the Anurida the space  of swimming
 was occupied by an active swimming motion.
 Also saw an Anurida with 6 granular balls
 of which a drawing was made.

Also saw an isolated ball a little over 5
 units long. It appeared to have a delicate envelope
 & was greenish.

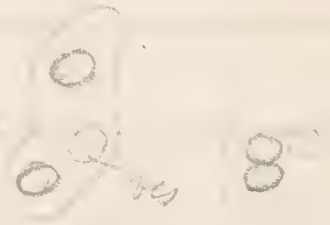
Feb. 20 The same Anurida species &
 unmanipulated  20 by 15 with green
 shrapnel, and  3 a few small granules
 and but none 30 (10%).
 when the 20 by 15 and most of the  there.

During activity in the same Anurida colored the surface a
 red color & under the brown grains which are about
 black & the green grains yellow, but are evident blue
 when grains were observed, which should appear
 to be about. Green grains appear to become brown.

At the moment of examining a slide over
 the Anurida emitted by a  ^{small}
 narrow entrance, thus:  ³  ²  ³
 12-10 12-10

Sack contained 2 imp. but not clearly defined
 globules looking like viscid oil, besides a carbonaceous
 vesicle, besides the usual contents of a few green
 + brown granules, fine granules & spores.

After 10 minutes the two separated thus



Shortly after the sight heard one in course of a few minutes
 divided themselves into two



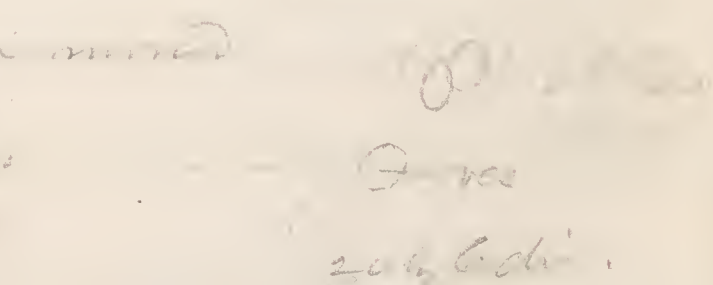
thus: the smaller 8 divided

The larger 10 & 12 contained

the oil like globules. At first no vesicles seen in
 the smaller division but some appeared after a time

itself, 2 in division. The larger moved

of in linear like form thus




First time I ever saw an *Amoeba* divide
 Feb. 20 views with 1017.

Indica made cuticle deep yellow, was covered
 & the oil like globules were stained yellow.



Feb. 27th 1875. Dish with green scum kept in my study from May 20th. ~~At~~ A few days previously there appeared in midst of the green scum a patch about 4 inches by from 1 to 2 of a golden bronze hue. This depended upon minute apparently ciliated zoospores, probably derived from the green chloroperms. The amoeba fed upon them. Many of the amoeba appeared different from the former condition, at least, instead of the crystals they contained minute darkly & thickly contained bodies of various shapes, concretions, dumb-bell form &c. See drawing of date 27th. Acetic acid slowly dissolved them without visible evolution of gas. Under 20th were seen to gradually diminish in size or melt away from outside to inside & entirely disappear.

March 16, 1875 *Nehela numata*, dead test observed in
Sphagnum water  entire, but no areolae distinguishable
apparently as if destroyed by maceration. measured 30 by 22 and
7 at mouth with No 7.

Euglypha compressa, an empty test, hisute on all
sides from bottom of oral scales to fundus. Exceedingly hisute
in appearance, measured 22 by 14,

Some date noticed one without a single hair
in any position, also an empty test.

Another in living condition with long lateral hairs,

Observed an active living *Diffugia* like *N. numata*
but test not areolated or lined in usual manner, but it
exhibited a somewhat irregular granulate and crinkled
aspect with apparent adherent smally minute irregular
transparent particles. 3 or 4 digitiform, papillate, & branching
pseudopods protruded together - measured 25 long and 2 to 3 thick
with No 7 Test 40 long 26 broad at mouth 8 wide.

Animal attached by threads to fundus, full of yellowish
food including one long diatom.

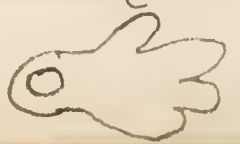
Large empty test of *Loricula acinus* 27 long 18 broad in side view
with the preceding.

March 18, 1875 *Actinosphaerium* with sphaerium of *Alveum*
Eldular, colorless 73 in diam No 7. Spines extend about 7
in surface, appeared clear of an atmosphere.

Diffugia spiralis. Test very variable in position, at
times a transparent irregular marked or wrinkled
membrane with a few scattered quartzose
granules attached. One noticed of this kind alive &
active from Lake Hattacarsamma Mar. 28, 1875.

A colorless *Actinosphaerium* in company with it.

Diffugia corona, abundant in Lake Hattacarsamma.
March 28, 1875 two large dead tests found, old and several
of the spines broken off. One measured 80 by 80 with 7 spines
the mouth apparently had but 6 serrae separating
as many sinuses. The other 75 diameter with the
mouth apparently with only 4 serrae & sinuses. In
both the mouths were slightly mutilated, & doubt
was felt whether they exhibited the perfect condition
in the few serrations.

Amoeba princeps found with *Actinophrys Eichelhornii* &
Actinosphaerium (colorless) in L. Hattacarsamma 150 long, 120 broad
vesicle 15  with No 7 March 29, 1875.

