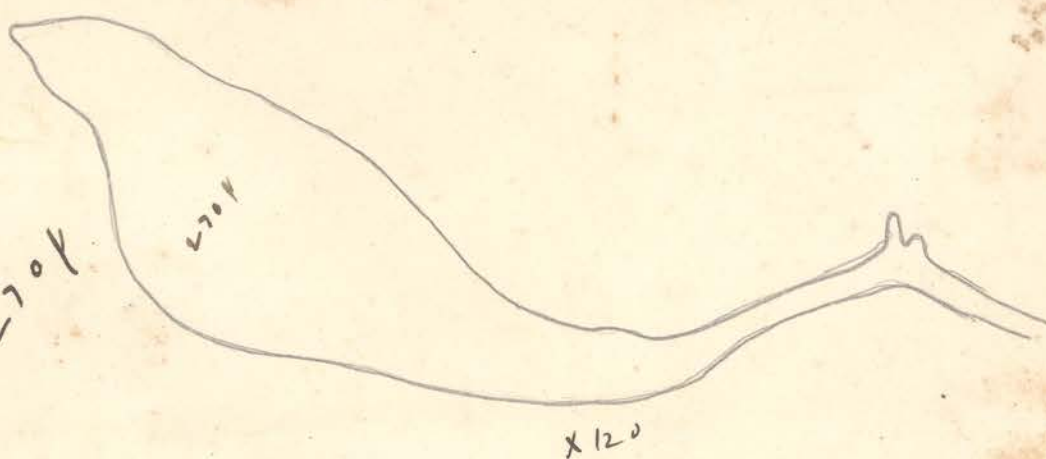
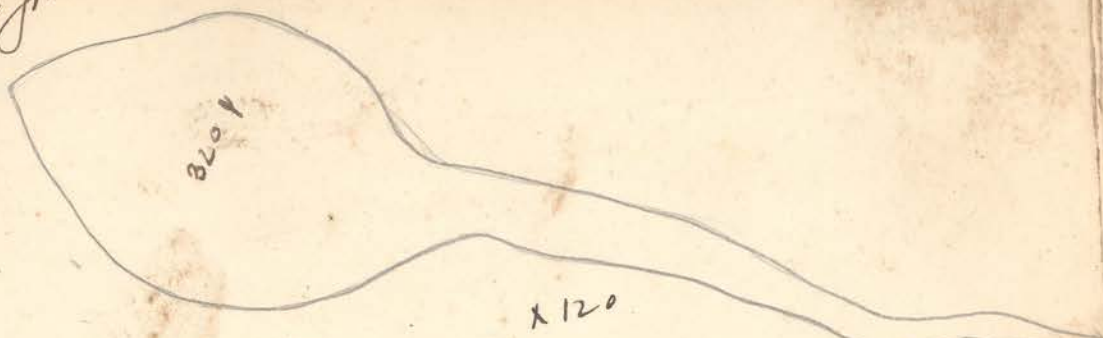
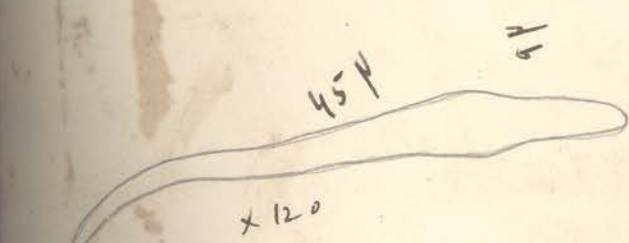


Diagram No I

*Botrydium granulatum*  
 var. *clavae formis*



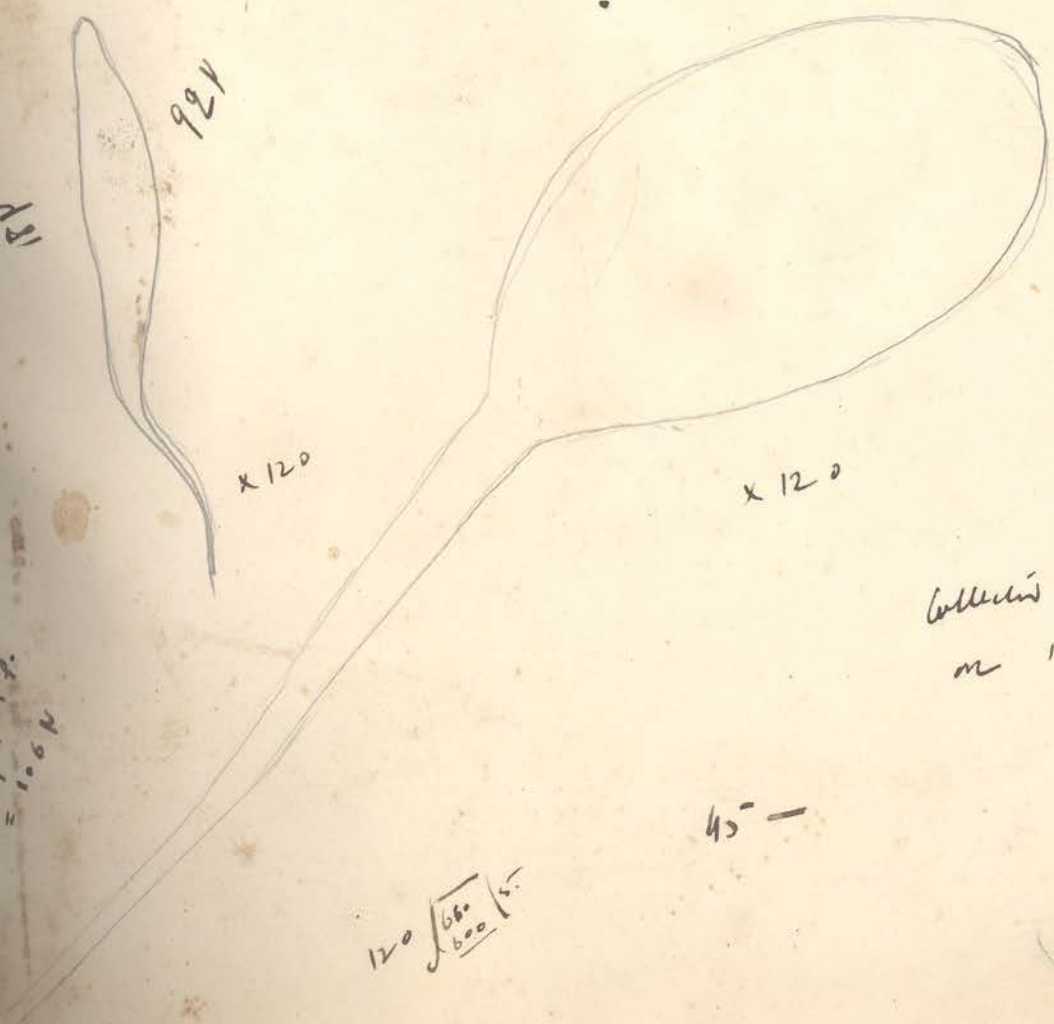
52 μ -



Red film -  
 72-88



15 μ



Collected from Bhadravan  
 on 17th Feb. 1939.

low humidity  
 1 μ = 10 μ  
 1 μ = 12 μ  
 1 μ = 10.6 μ

45 -

120  $\sqrt{\frac{660}{600}}$  15



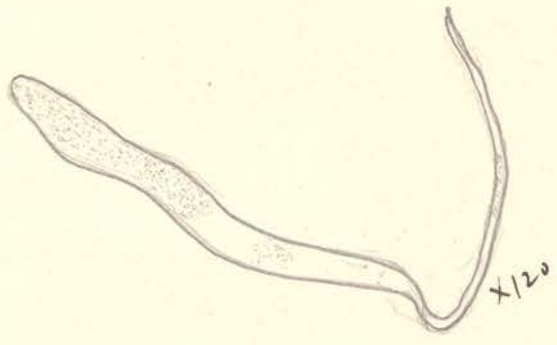
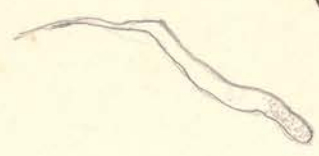
*Botrydium granulatum*

var. *claviformis*.  
var. nov.

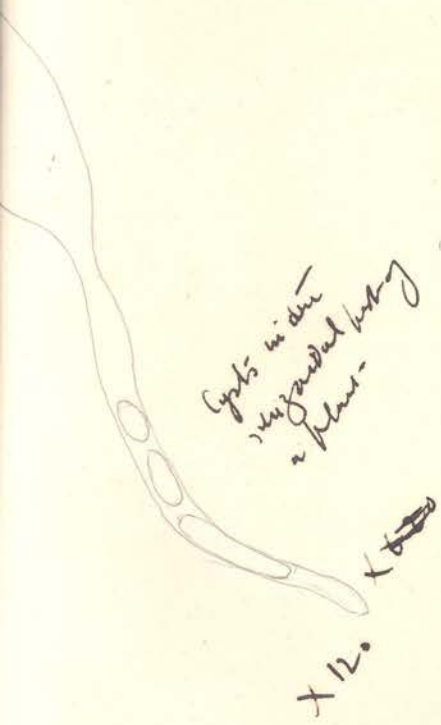
Collected from the  
sides of a pond near  
Bhantranon  
17 mi. Feb. 1939.  
Originally collected  
in end. week of Jan. 39



x120



x120



Cysts in situ  
on granular body  
of filament

x120

x120

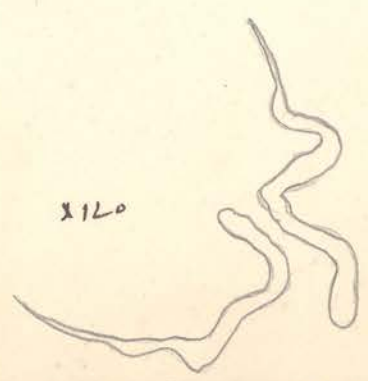


x120



x120

= 800



x120

16-241

young filaments are almost filamentous  
in habit, & appear like the filaments  
of Vaucheria

x62



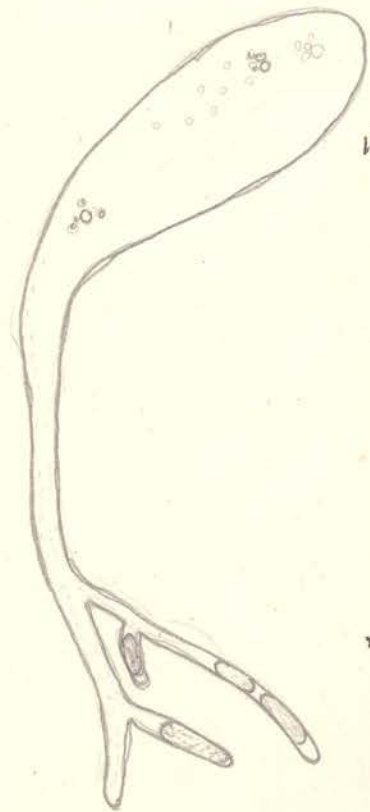
x110



x220

*Botrydium granulatum*  
var. *decajoni*

abundant  
in subterranean



x120

4 cysts in  
vertical host-  
Very long & re-  
dy considerable  
from each other  
on the ground  
not to be seen

Examined the cysts & abundant in soil  
in high houses.



5304

5284

*A. malina* Mart.

825  
39

*Uzoni* *hogyu*  
*hanyu*

X 120

All x120

152



108



154



145

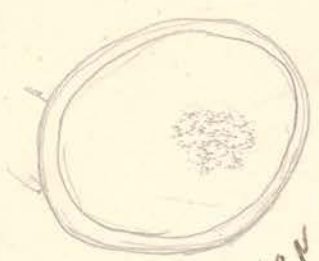


32  
27  
26  
25  
24  
23  
22  
21  
20  
19  
18  
17  
16  
15  
14  
13  
12  
11  
10  
9  
8  
7  
6  
5  
4  
3  
2  
1

So - 590 found  
60 - 600 found

Salmon 54 - 60 found

55 - 57

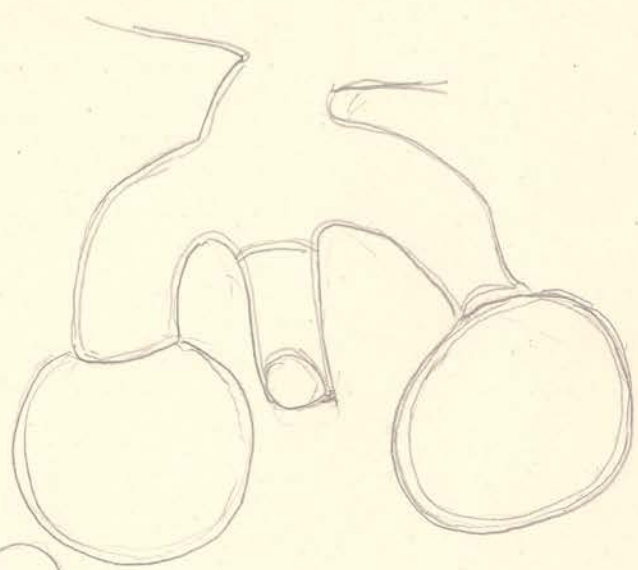


54 - 584 - 604 found  
58 - 664 long

from 1st m.  
-  
m.  
-  
m.  
-  
m.

27  
15  
11  
11  
34

27 m



524



*Vandusia geminata*

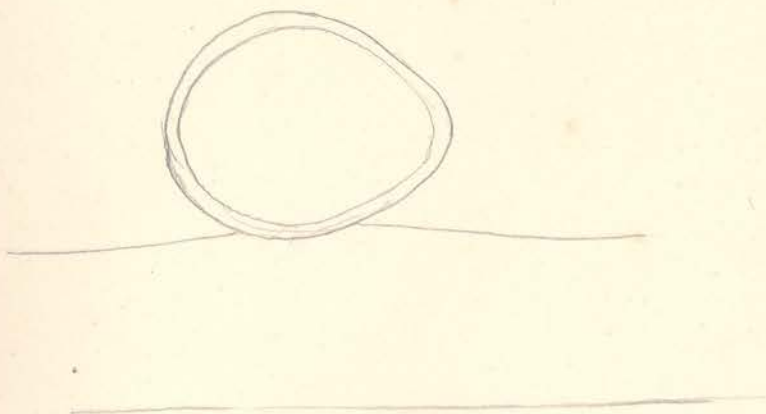
found mixed with *Oestodactium* sp.  
from a pond near V. R. ...  
collected on 16th Feb. 1937.

Vandusia hamata.

52 Y broad

62 Y long

54



Vandusia

No. 19. Cynth.

2nd Rock 31



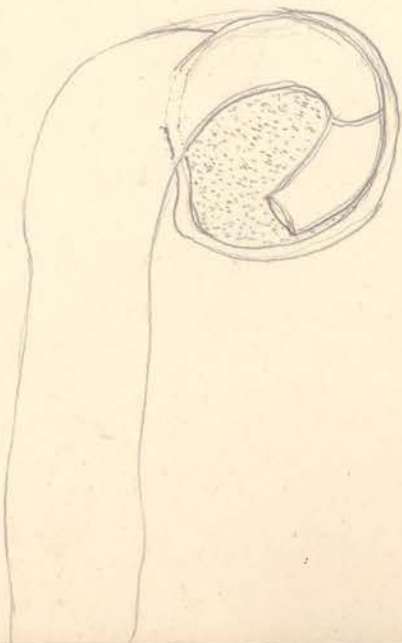
Vankora hamata (Vande.) De Candolle

45

38  
15  
---  
534  
36  
---  
" 684



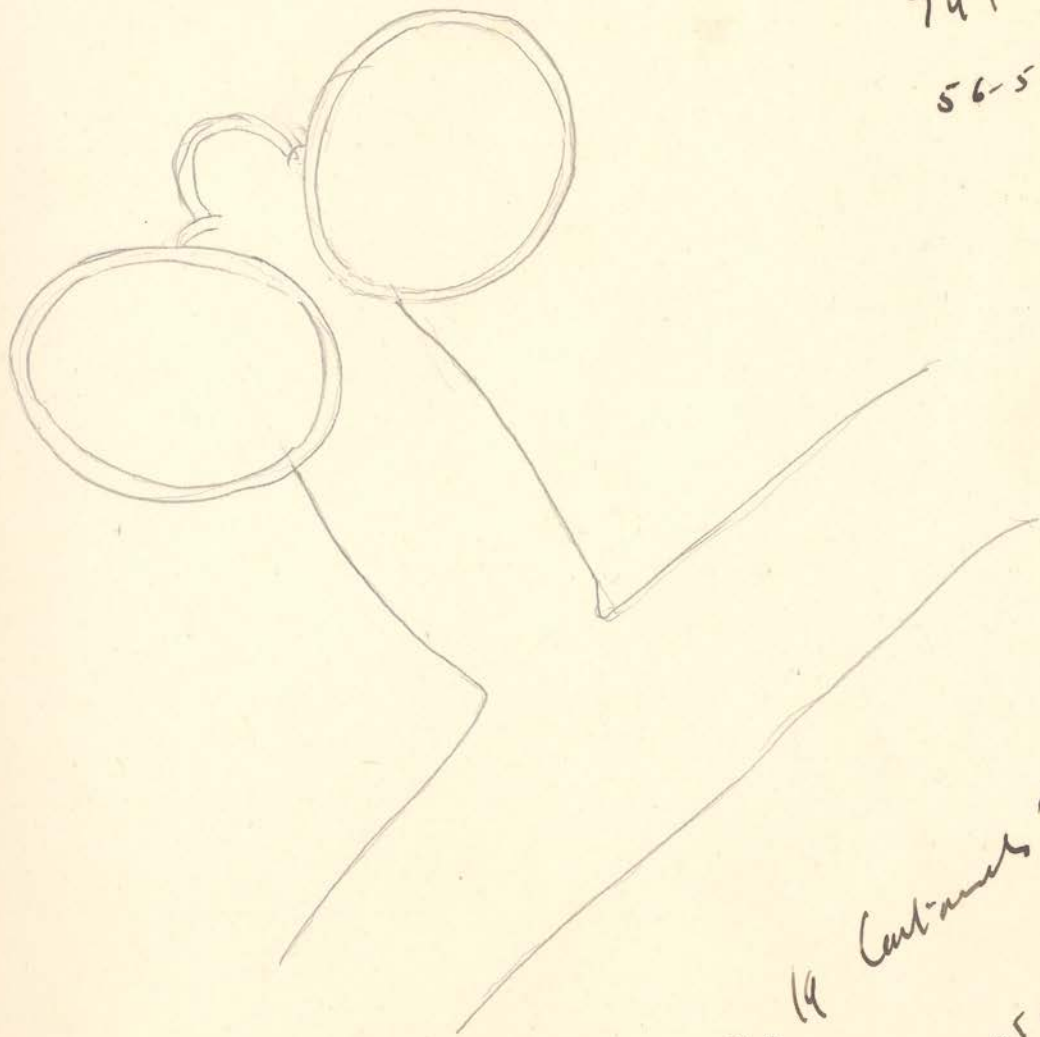
62 N long  
50 N broad



ankoridun  
14 N - 16 N broad

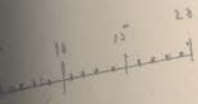
"  
18  
11 x 8  
---  
1144  
33

74 N long  
56-58 N broad



No. 19 Cartmells  
25 - Feb. - 39

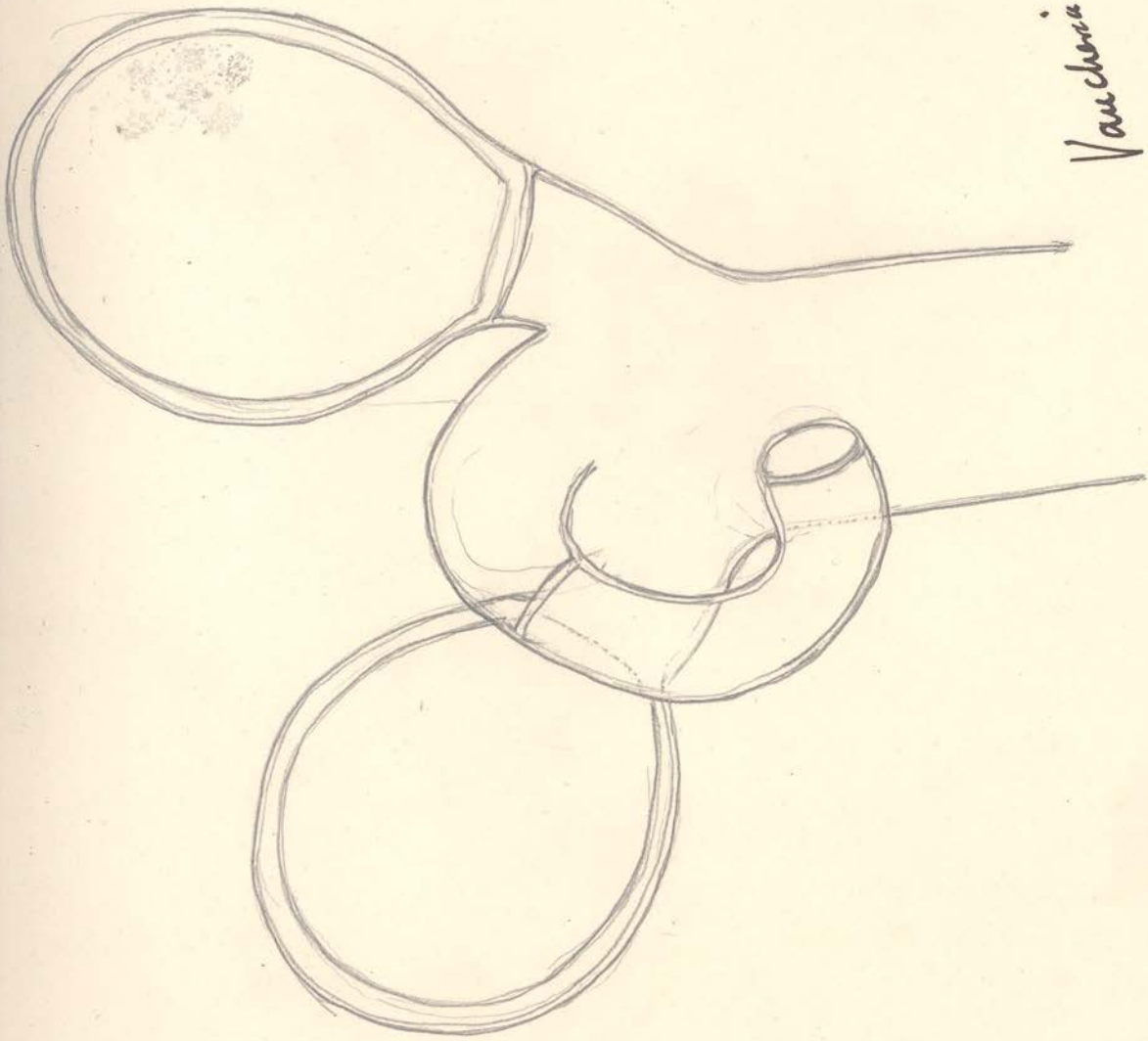
l = 34  
H mm = 154



No intervening space  
in most forms.

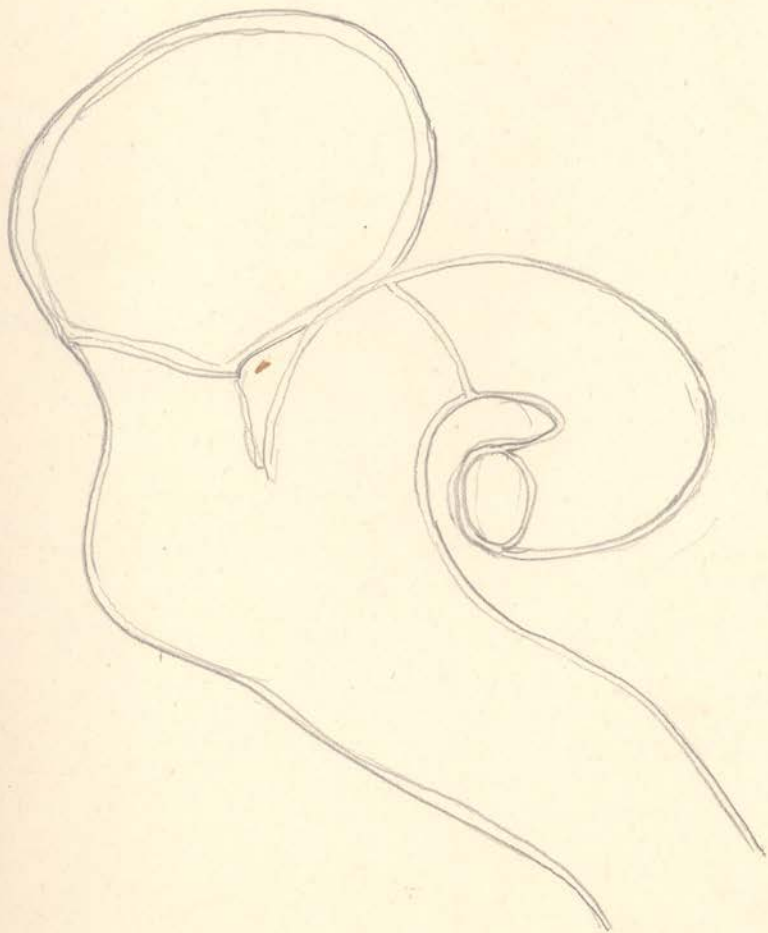
*Vaucheria* *amblybia* sp. nov.

*Vaucheria*



*Vandusia ampliflora*

X 620



X 620



Was there anything

O. opercularis Typing

Oedoclavium Kalkhol-  
186 - Schl. 30  
Puh. Sogulowent  
Oogonia apical loo-  
with starch.

5- 8  
cells.

8 - 144 broad

1.7  
19  

---

188  
17  

---

205

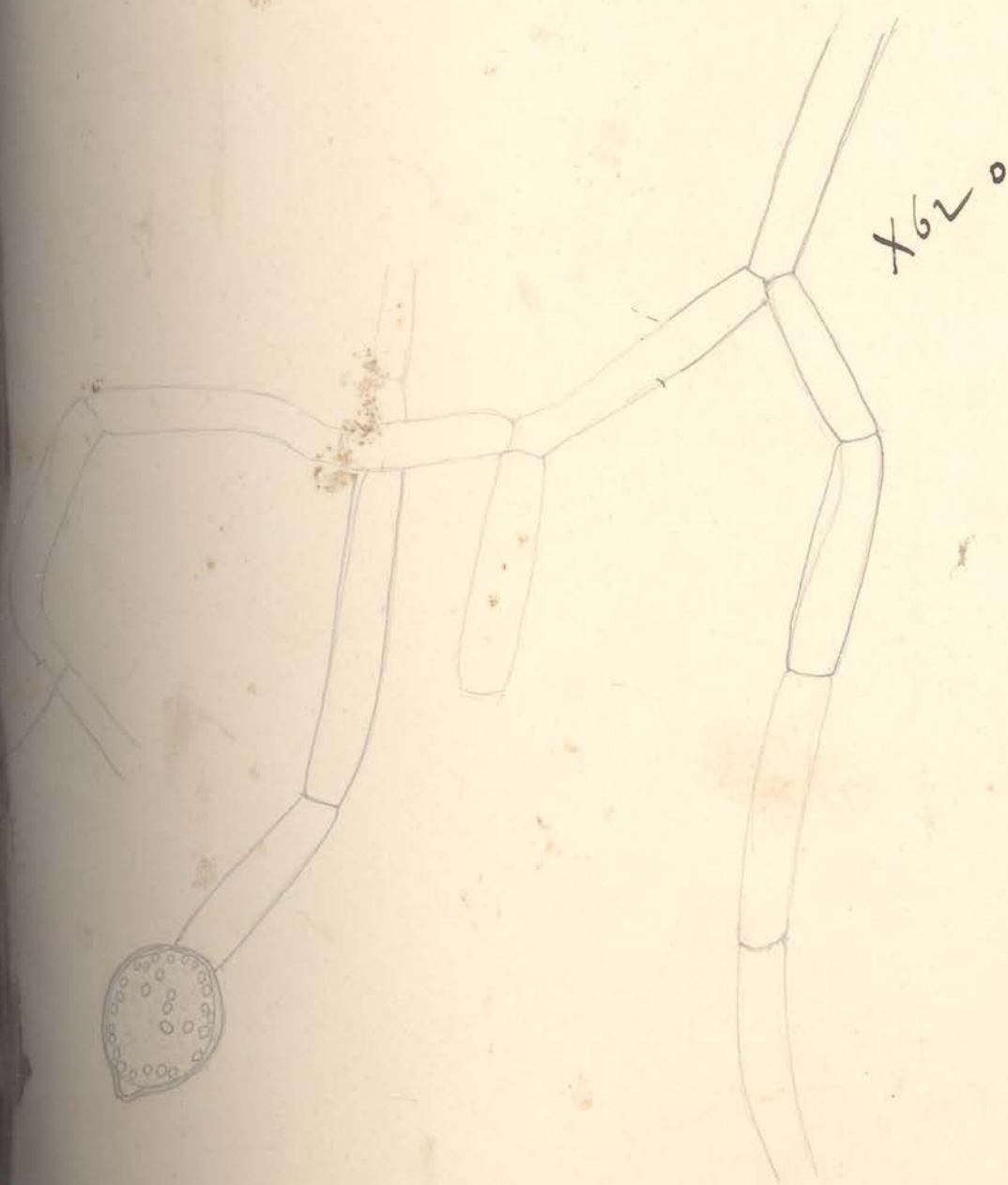
24  
12  

---

168  
24  

---

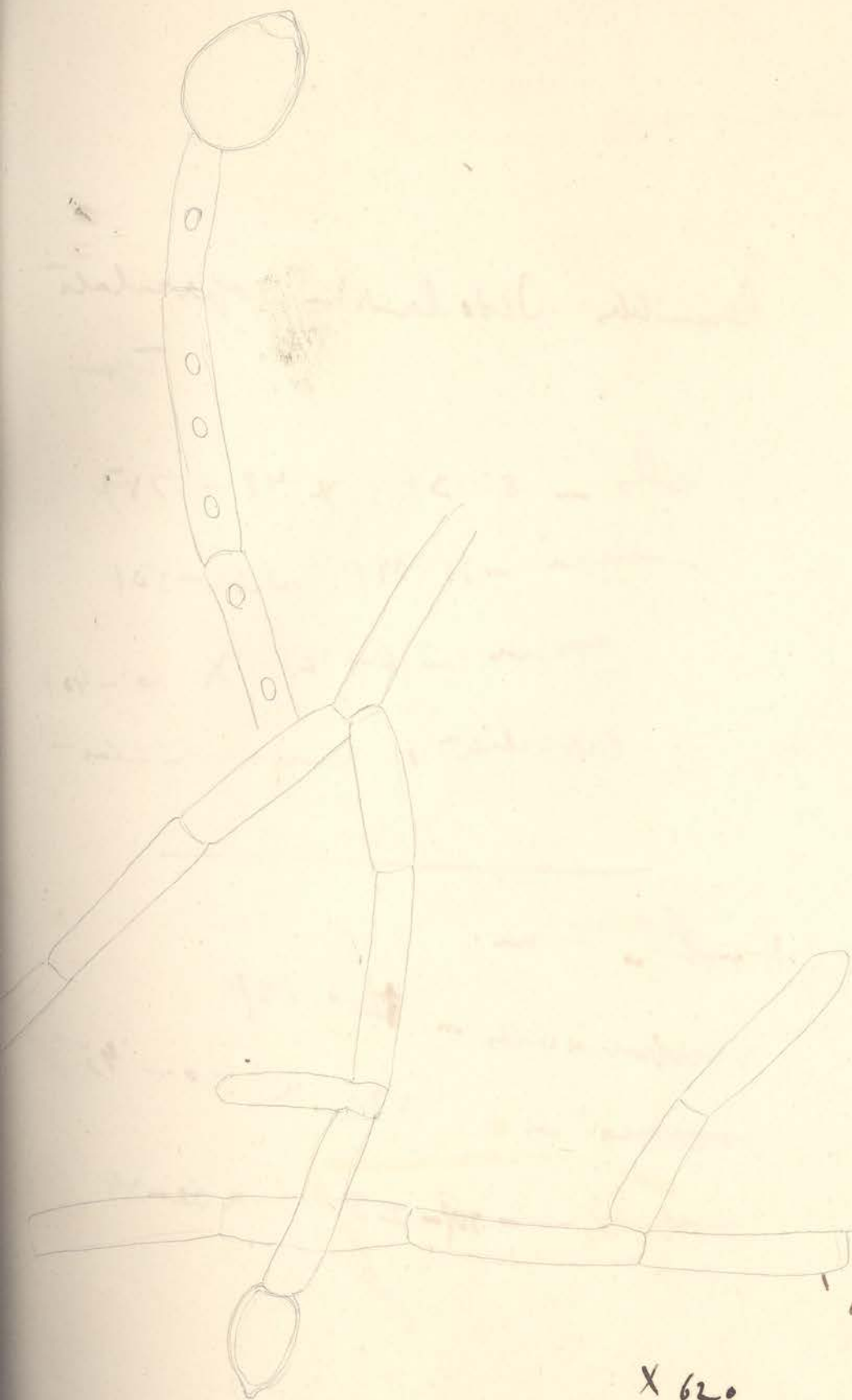
192



Oogonia - 324 broad  
40 x long

*Owocleria - leahol -  
speculata*

13. V. 29



Each cell contains  
numerous starch grains  
as well as 2-3 hyphae  
1 or 2-3.

Branches - 2 at a node  
new ones.

Horizontal branches are  
brown in colour.

empty underground cells -

X 620

Resembles *Oedodasium operculati*  
Tipping

cells - 8-12  $\mu$  x 48-175  $\mu$

zoogonia - 18-34  $\mu$  x 52-50  $\mu$

oospores - 16-32  $\mu$  x 30-40  $\mu$

operculate, thin, vertical

---

Hyalozoa Jno.

vegetative cells - 12-14  $\mu$

zoogonia - 32 x 40-45

oospores - 24-28 x 32-34



*Desmodium speciosum*  
 Kappeler

17  
 102  
 17  
 222

both in subterranean  
 external cells are green

Reproductive are yellow  
 in colour with no bicar

also

oocytes

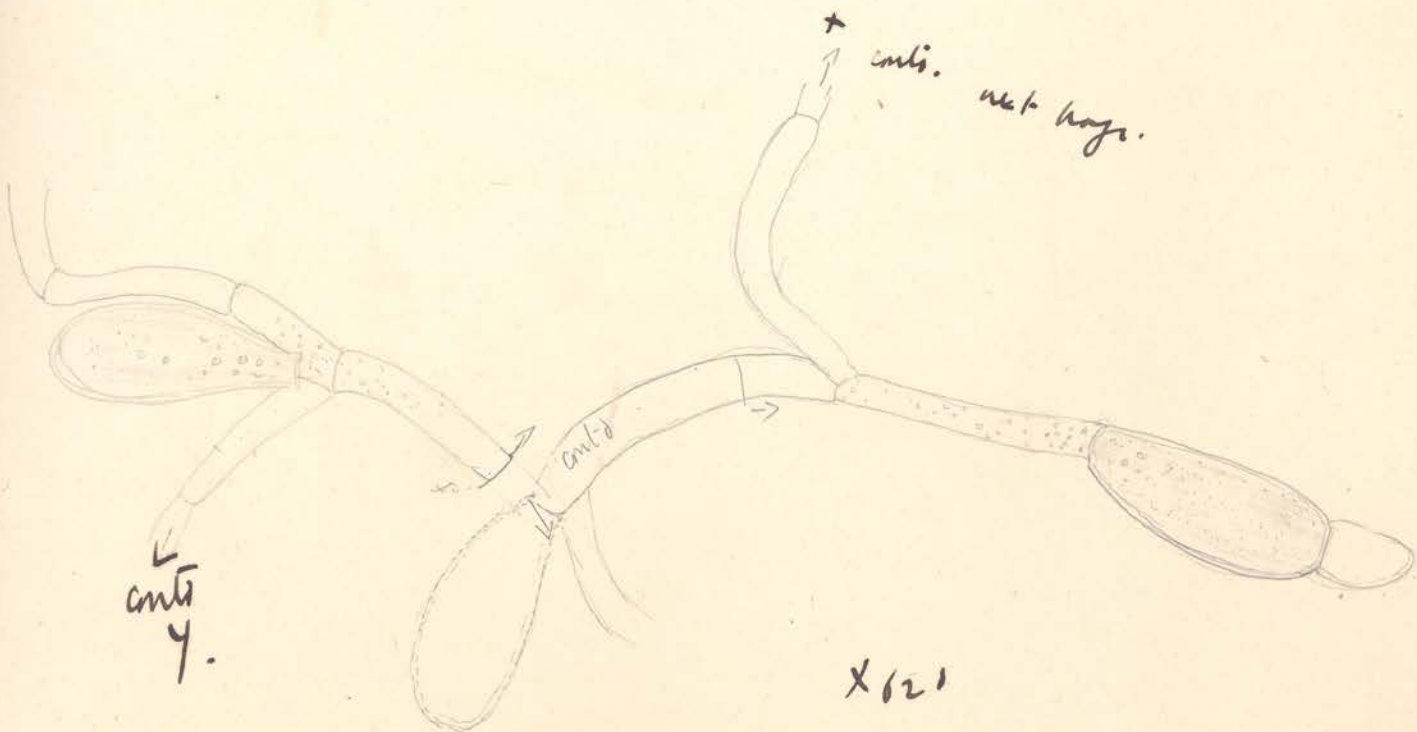
28  $\mu$  broad  
 34  $\mu$  long



ripe oocyte

x 120

Akinets



anti. next large.

anti  
 y.

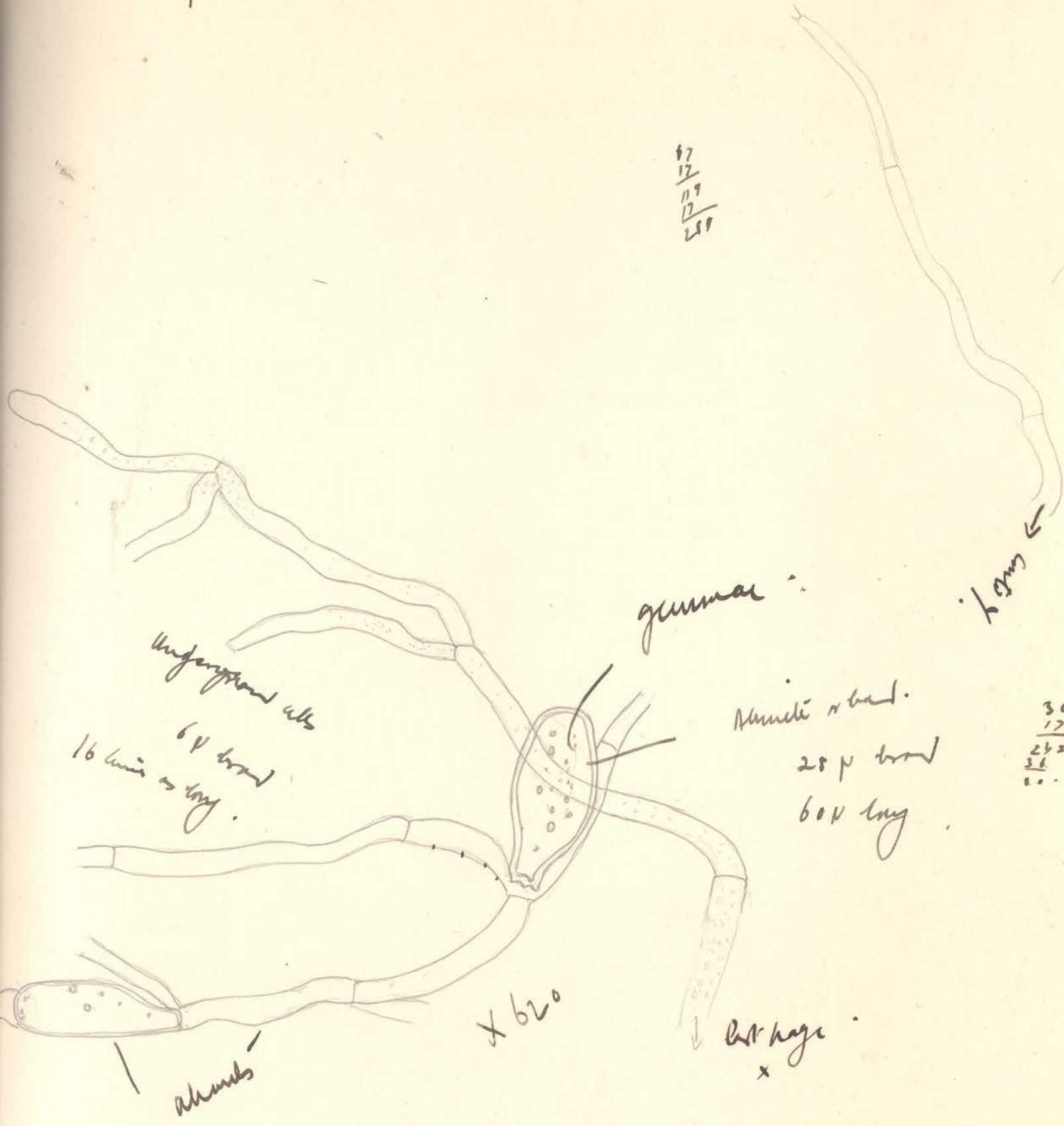
x 121

*Pedicularis*  
*cheuculata*  
Kakhot.

MU x 620

13/X/29

17  
12  
19  
12  
289



36  
17  
242  
36  
100

*Oedocladium operculatum*

Kakhat

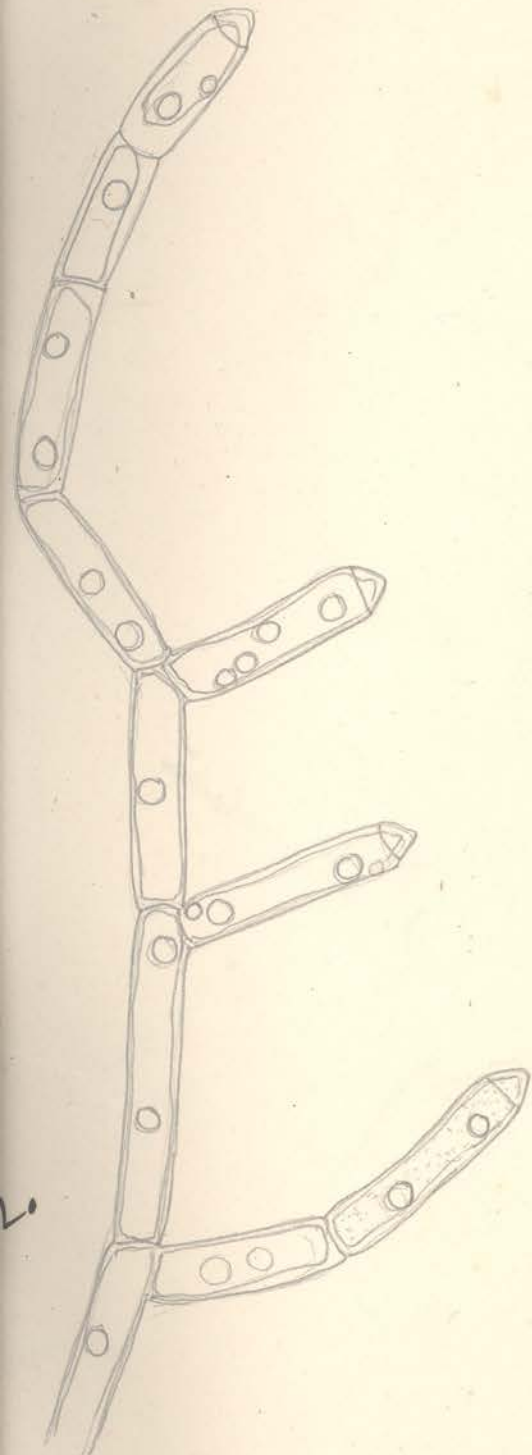
13/IX/31

12 - 14 - bran -  
2 - 4 - 6 times a tray.

White part of a plant:

12

118



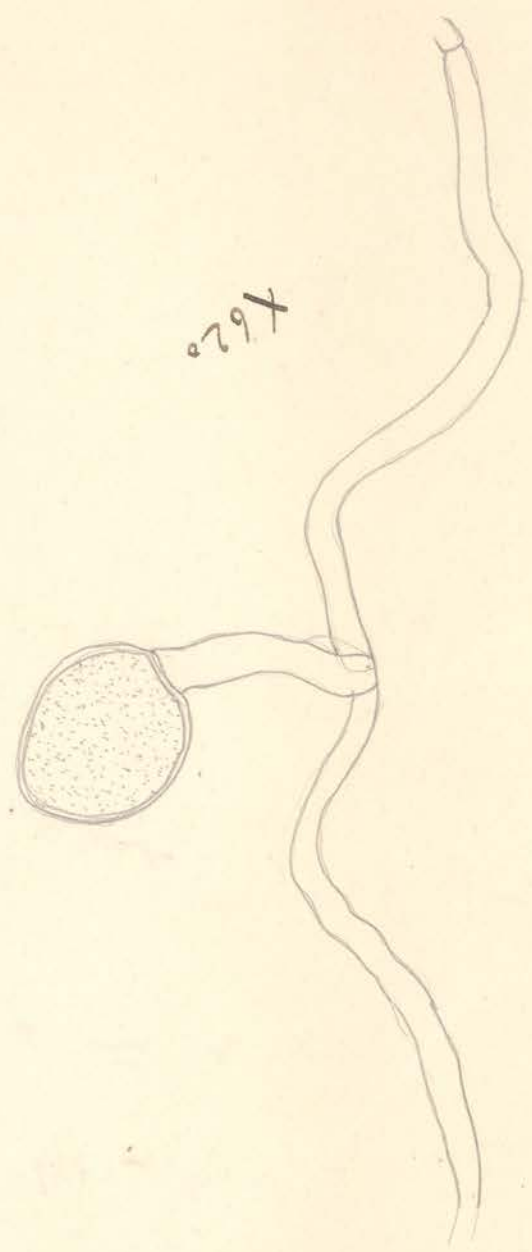
24  
16/11/50

21/11/50

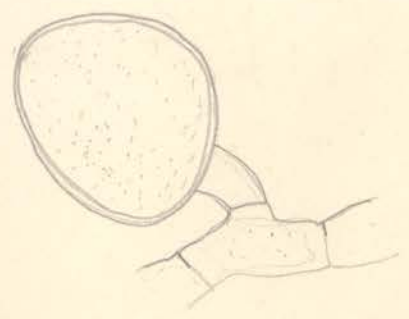
*O. schubertiana*

354  
40  
1

X620



Drawings  
Nos



21/11/50

21/11/50

*O. operculatum*

300 diam  
500 long

17  
16  
36  
17  
53

50/50/6

213.

340 diam  
680 long

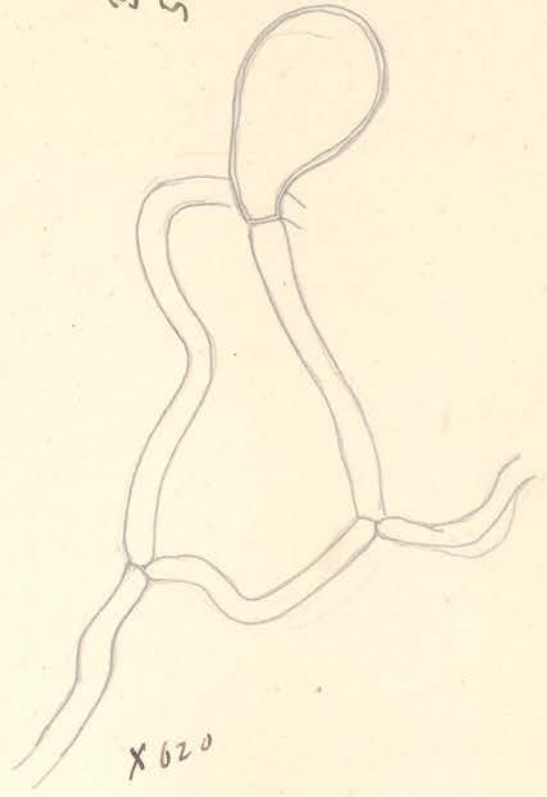
A resting form



2000. 8/11. 1/10

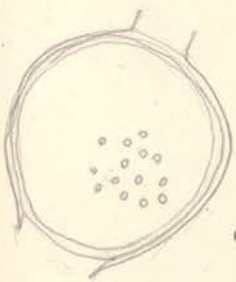
x620

starch.



x620

heads are yellowish - brown in colour



280 in diam

Spore wall is  
stratified.  
Pits about  
14 in diam.

O. operculatum

Oedodatum  
Kahuna  
12/12/38



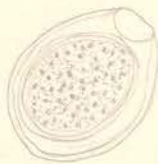
like oval with lid off

broken part of  
anterior wall

Amocum

x66

14th brood.  
30th day.



spine. yellowish in color  
rugose-reticulate.

like spines base  
chordate or yellowish  
brown in color.  
and are distinctly  
sub-biculate.

Anterior like more anterior  
the Sargassum Parvella  
Sargassum - 12th Feb. 38

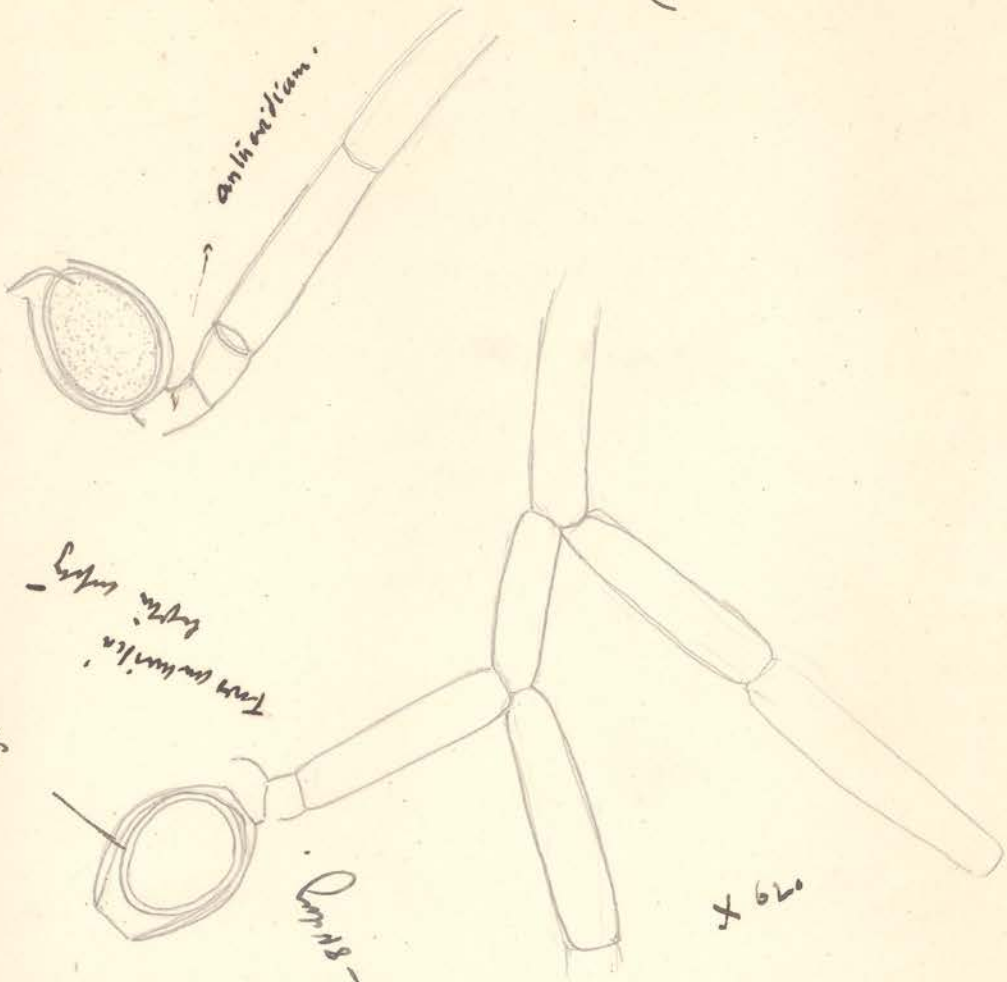
Overlaid separated by a narrow space  
from outer wall, and not completely  
fusing it.

17/12/38

O. operculatum

107/128

17  
15  
12  
68  
157



22-25 μm  
32-  
long 14 μm

Tentacles within

8-10 tentacles - 8-10  
Antheridia

x 60

veg. cells = 2 μm  
12 μm

long 109  
60 μm long

oozomes = broad  
27 μ - 24 μ -  
long  
33 μ -

Caps in apical cells

oozoma - 36 μ long - 45 μ long  
- 30 μ broad

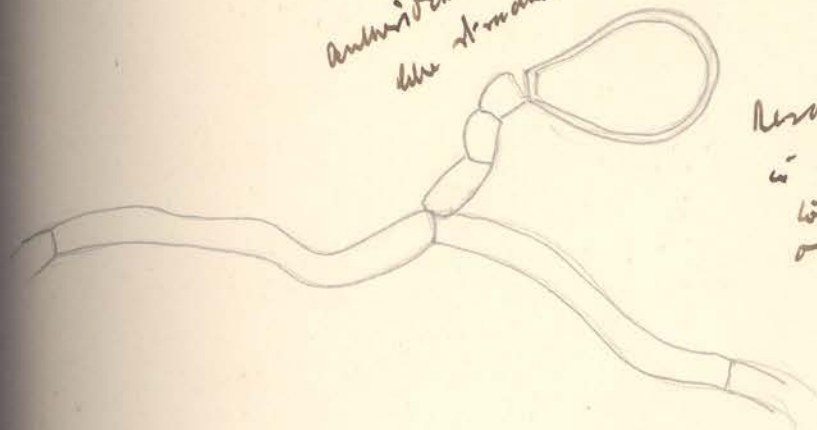
O. operculatum.

Anterior  
like structure - hollow - aments

424 long  
204 broad.

Resembles  
in shape  
to  
others.

28  
17  
120  
92

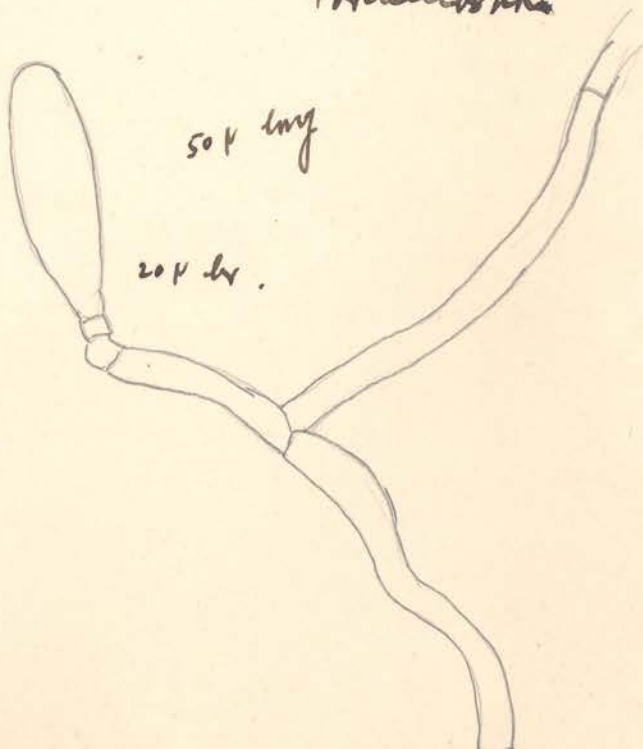


~~204~~

It is possible that some of  
the organs of the sub-ventral region  
subventral in position of aments.  
excepting for the two main respiration  
two organs remain striking.

204/204

Posterior



504 long

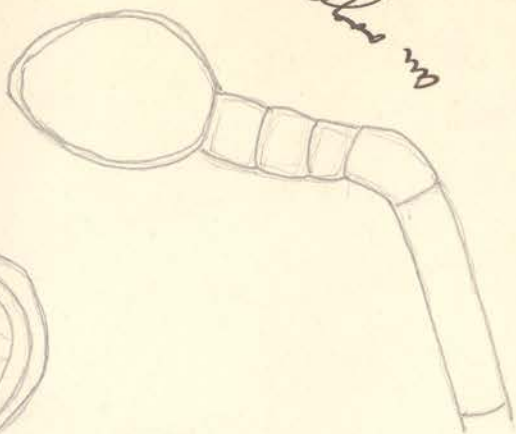
204 br.

Aments.



*G. operculatus.*

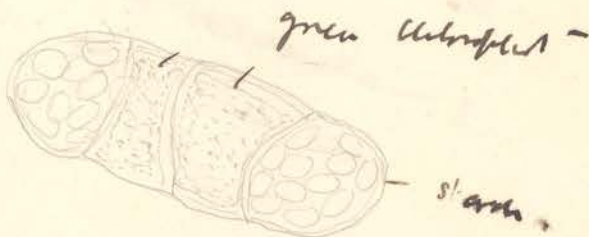
*Am. ... ..  
... ..  
... ..*



797



x 82



*Agerminaly ... ..*

x 820

Wells'   
 covered:

*Oedodarium* ~~truncatum~~ *truncatum*: sp. nov.   
 Himalayas

*O. prostratum* & *O. meso-*   
 *O. truncatum* - all   
 small trees

Resembles *O. wellsternii*   
 size of *ognum*

(found near   
 *O. berrisii*)


Resembles *O. albertanensis* Lewis, but differs

- from it:
1. smaller size of its *ognum*
  2. *ognum* completely filling its *ognum*
  3. ~~superior base~~
  4. smaller than wall

- Resembles above:
1. size of vegetative cells.
  2. Anacross holes.
  3. Terminal angle *ognum*.
  4. Anacross holes.
  5. Similar size of *ognum*.

and out in   
 description of   
 *O. wellsternii*

One decides if   
 aspect of it is   
 different.

Oedocladium from *Shajshwa* *Devadhar* low =   
 bigger, broader & different.

oostrom = 60  $\mu$  br. Next with it is Oedocladium *hermanni*, 125 Sept. 39.

On 27th Sept 39 *hermanni* - broad Oedocladium was discovered

plenty of oostroms in wet pin. head also dots near *Juniperus* *Monarda*  
 in wet *Pinus* *stricta*.

Vegetative cells - 15-20-40  $\mu$  broad - average size  
 60-102  $\mu$  long - above cells - 40  $\mu$   
 oostroms - 62-68  $\mu$  in 2 diameters - lower cells - 15  $\mu$   
 oostroms - 68-72  $\mu$  broad. 29  

$$\begin{array}{r} 97 \\ 17 \\ \hline 114 \\ 37 \\ \hline 151 \\ 29 \\ \hline 180 \end{array}$$

*hermanni*.



$$\begin{array}{r} 2.6 \\ 2.9 \\ \hline 5.5 \\ 3.2 \\ \hline 8.7 \end{array}$$

$$\begin{array}{r} 40 \\ 17 \\ \hline 57 \\ 40 \\ \hline 97 \end{array}$$

$\times 620$  oostroms = 72  $\mu$  br.



65  $\mu$  broad.  
 62  $\mu$  long.

*hermanni* *hermanni*.

1. Look for male branches,  
~~not taking it as succors.~~

40 x 60

Vegetative cells - upper - 20-40  $\mu$  broad  
 60-84  $\mu$  long.

" lower - 13  $\mu$  broad - 15  $\mu$  broad  
 65 - 102  $\mu$  long

Succors - macerated rows, triflorous, how

oogonia - 64-82  $\mu$  broad -

oospores - 62-68  $\mu$  broad

I Anococcus

	Vegetative cells.	oospores
1. <i>O. protuberans</i>	7 $\mu$ broad	45-60 $\mu$
2. <i>O. altemorlesi</i>	25-40 $\mu$ "	oospores angular oogonia 90 x 95 $\mu$ oospores 69 x 69. upper y-shape
3. <i>O. media</i>	12-18 $\mu$ "	
4. <i>O. berrisii</i>	10-12 $\mu$ "	
5. <i>O. hazenii</i>	15-26 $\mu$ "	
6. <i>O. operculata</i>	8-14 $\mu$ "	
7. <i>O. wettsteinii</i>		oogonia 50-60 $\mu$ diameters anococcus, oospores angular

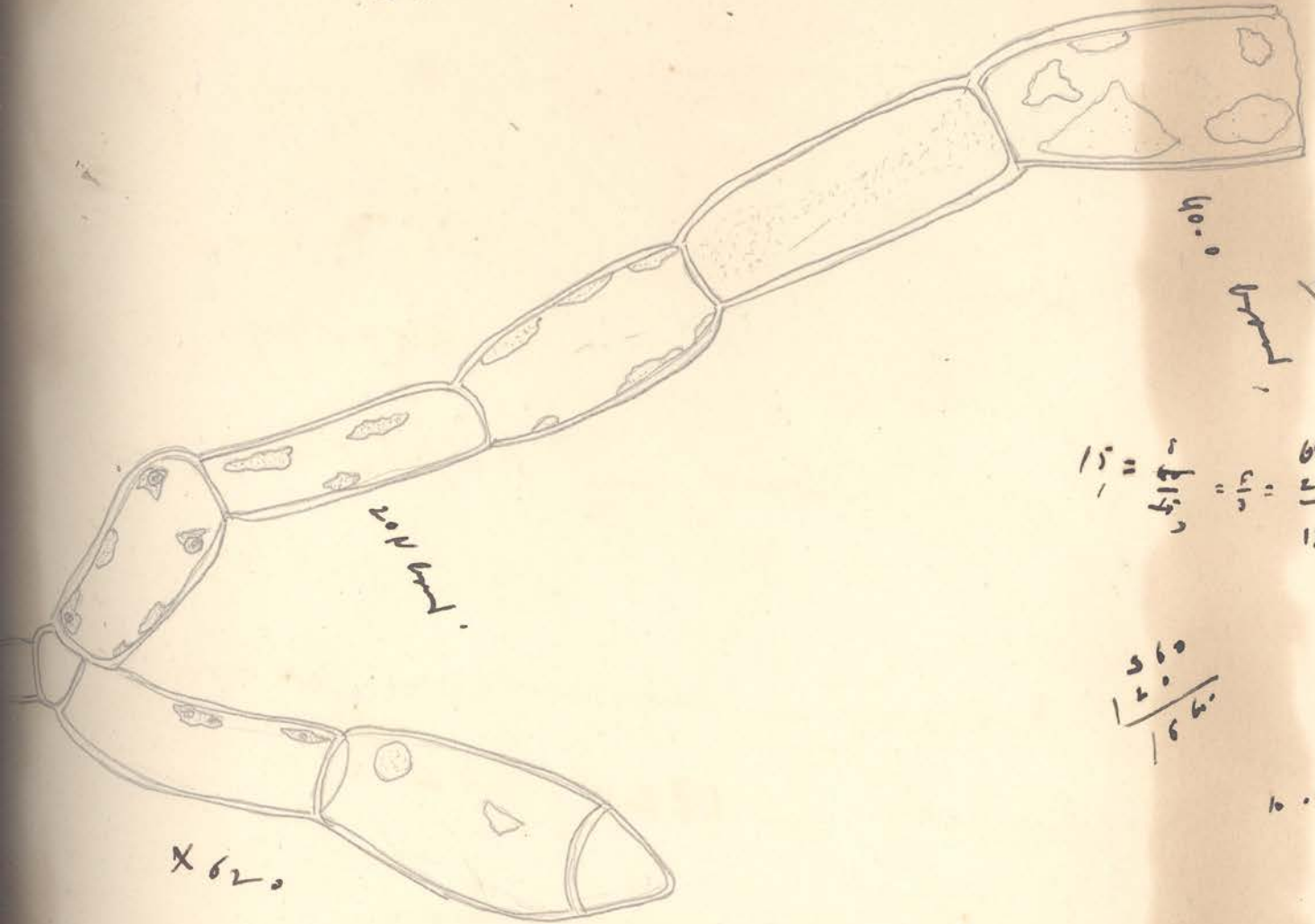
how inferior,

Sordaria . . .

*Sordaria foveolarum* M.

12.11.21

*O. tumidogynis*



40.0

$$\frac{2.4}{1.6} = 1.5$$

$$1.5 = \frac{2.4}{1.6} = 1.5$$

$$\frac{3.6}{2.4} = 1.5$$

10.4

X 620

38 μ length

X 620

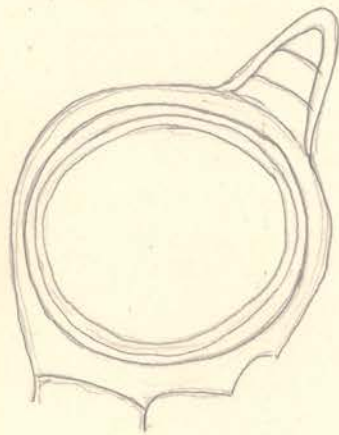
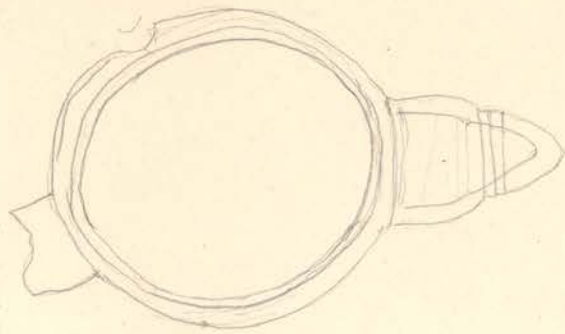
X 820

$$\frac{2.4}{1.6} = 1.5$$

*Oetodarium kumagaii*



*O. himalayensis*



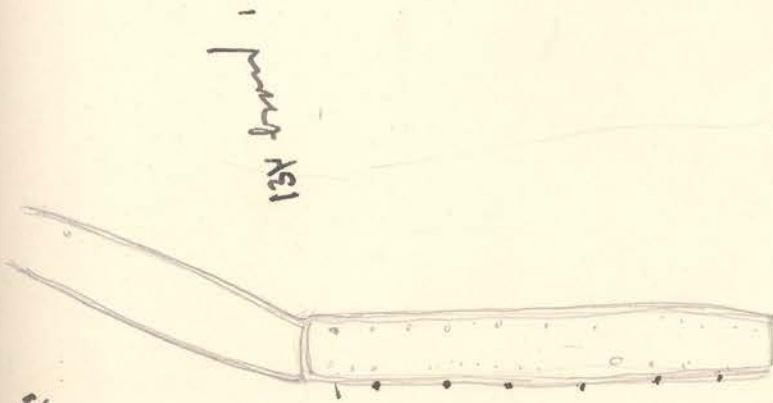
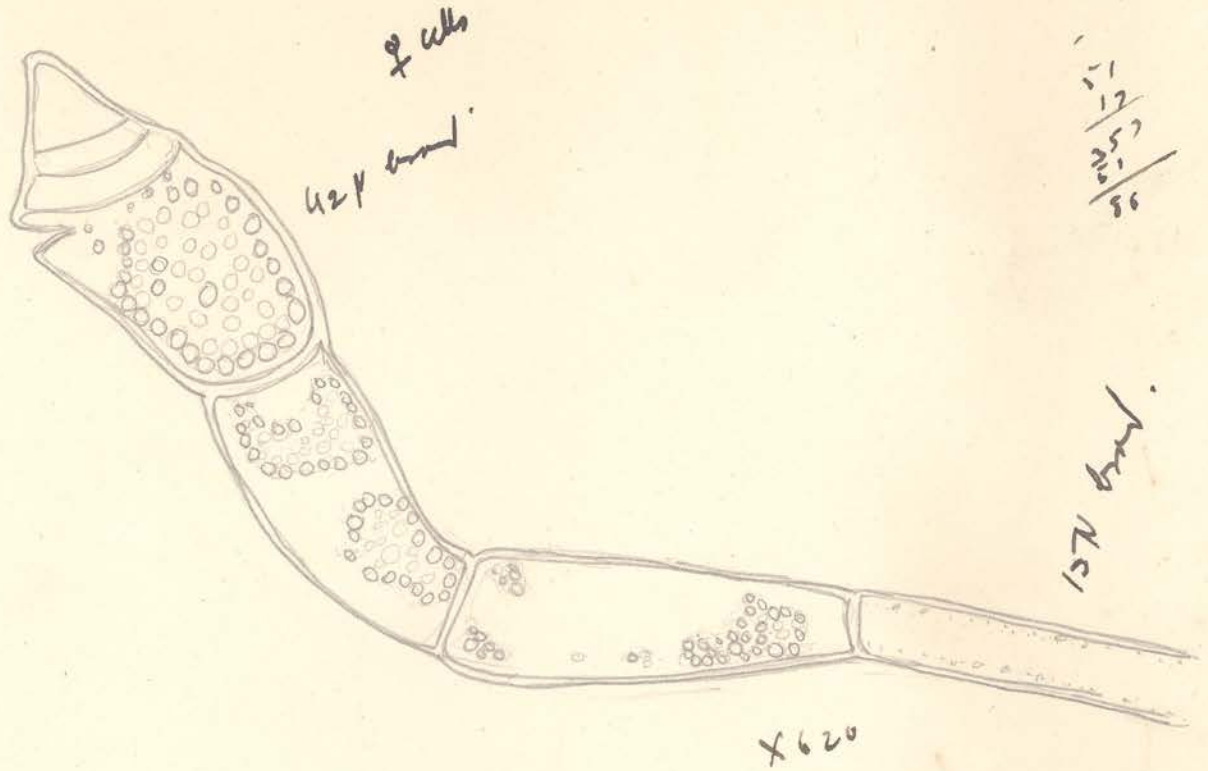
Stone-wall composed of more layers

Line inferior or  
infra-median.

1. Thin hyaline exodermis
2. Thick mesodermis - dark in color  
not let with
3. Endodermis - hyaline.

*O. lineaticeps*

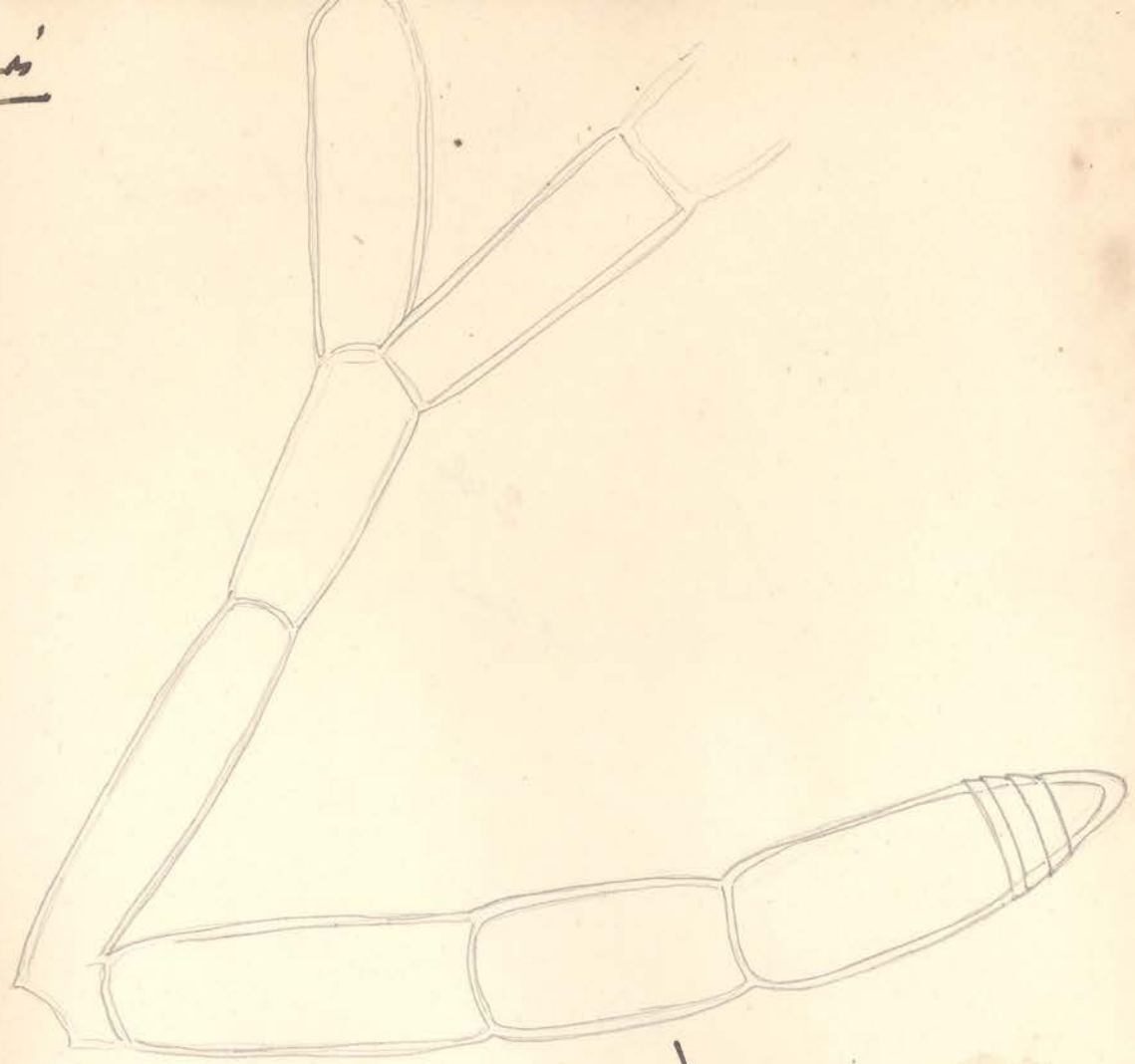
2.  
17  
175  
28  
42



15-21

*Oedodactylus cumacensis*

himalayensis



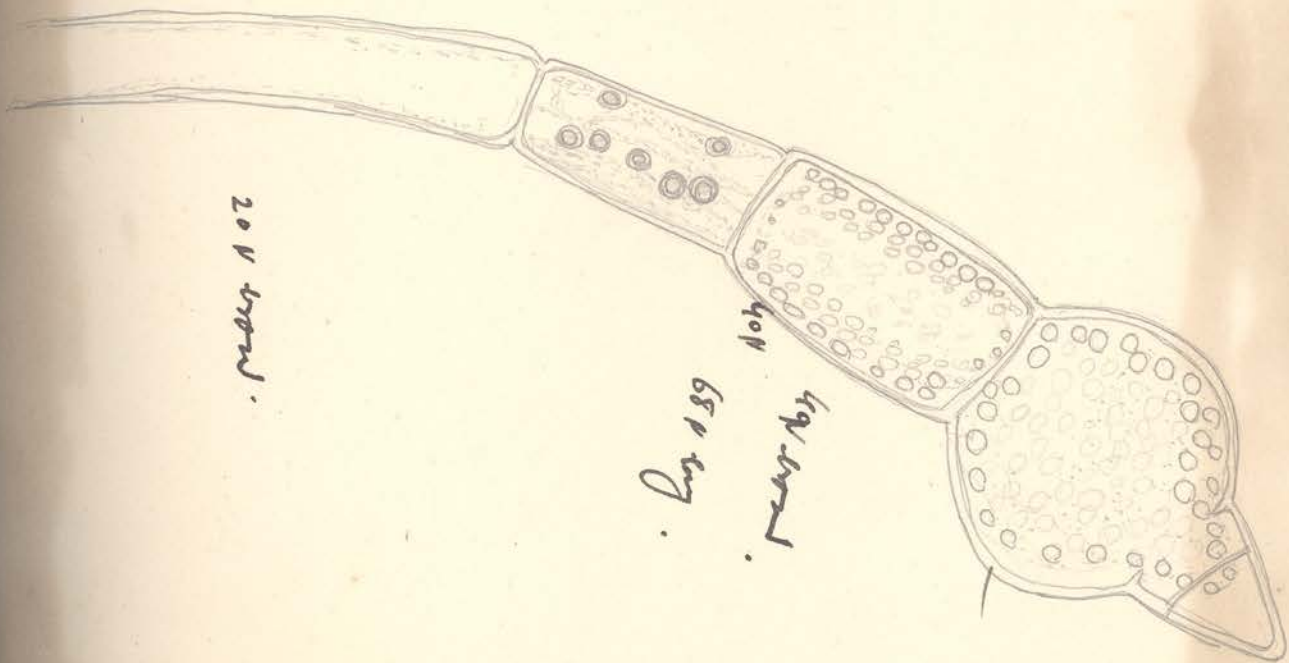
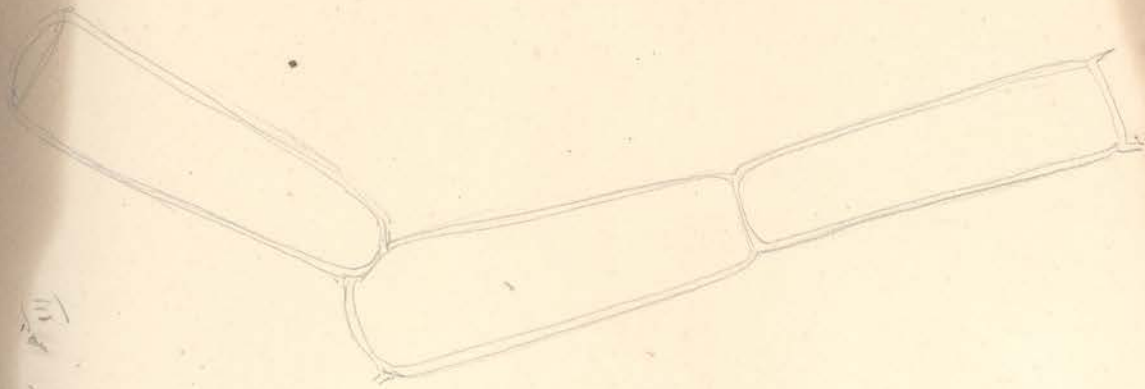
60 V — 1024 1000

— 34 V down .

3/7 3/5







20 x broad.

68 x long.

40 x

near 60 x

68 x broad.

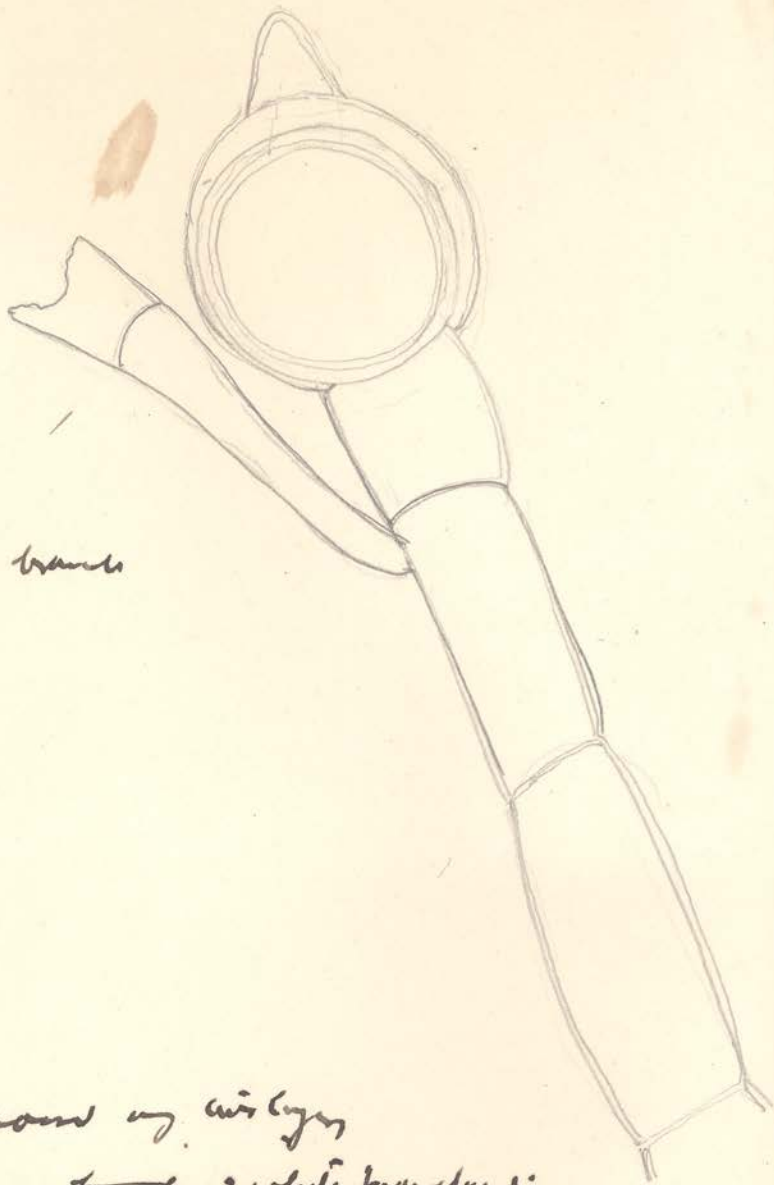
$\frac{250}{41}$   
6

*Oedochelone* ~~lucida~~ <sup>lucida</sup>

$\frac{24}{12}$   
 $\frac{168}{29}$   
6

$\frac{100}{50}$   
2

*Oedocladius ~~hammon~~  
tibialayus*

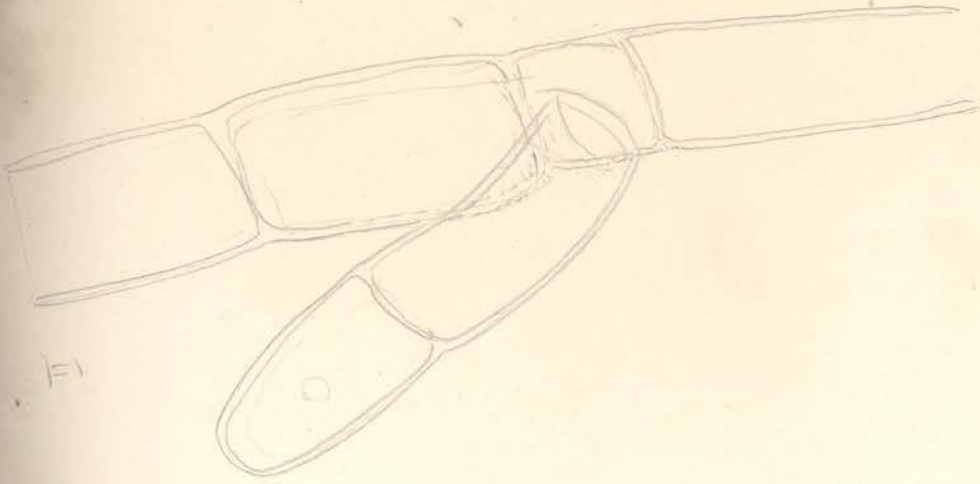


a horrible  
male branch

Stems. wall composed of cuticles

1. Outer layer, ~~cuticle~~ = white translucent.
2. Inner layer ~~cuticle~~.

*Oedocladium* ~~linalyensis~~ <sup>linalyensis</sup>



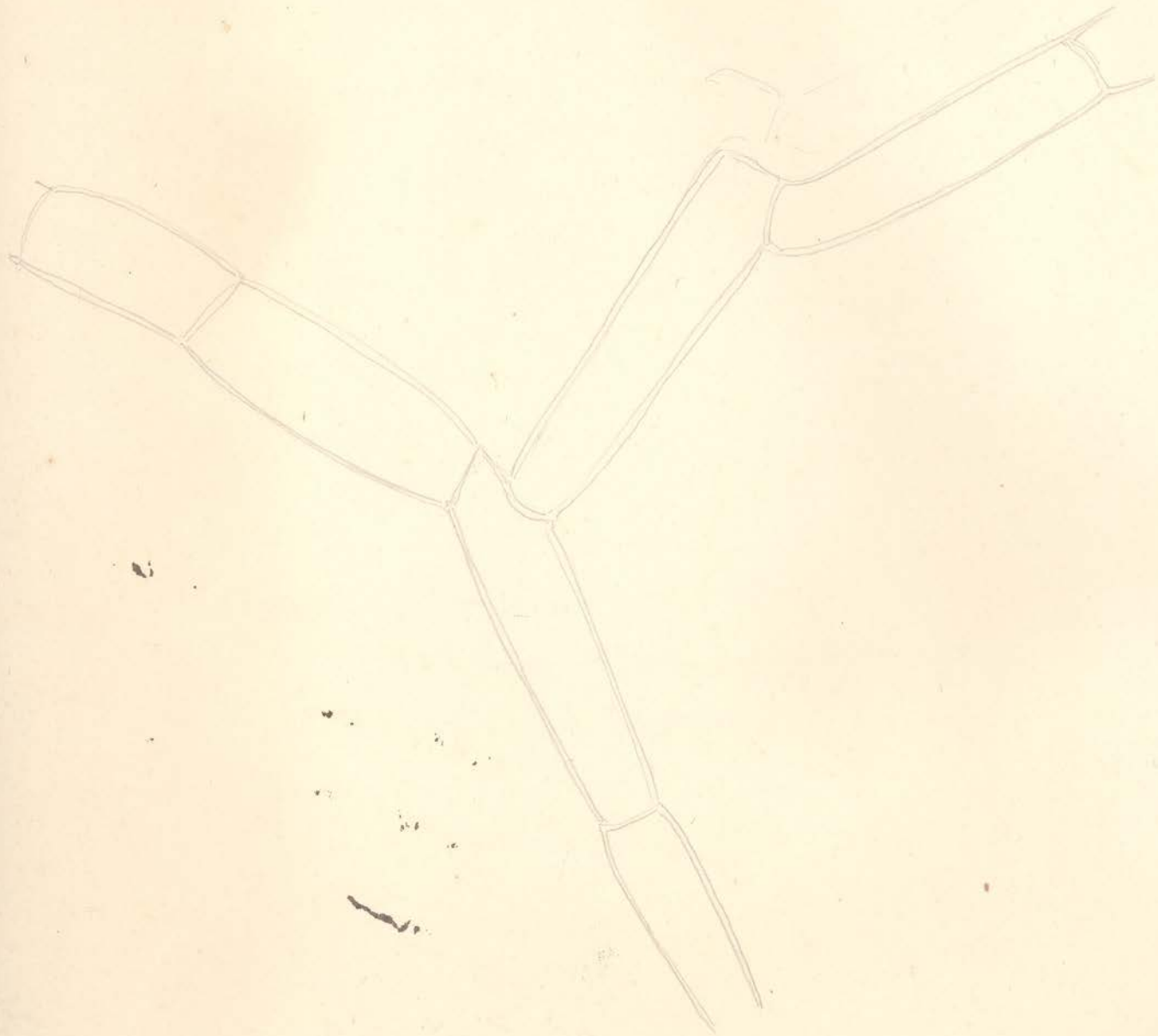
F



Long ves.  
- post 100

I

2/22/52  
2/25/52  
2/28/52



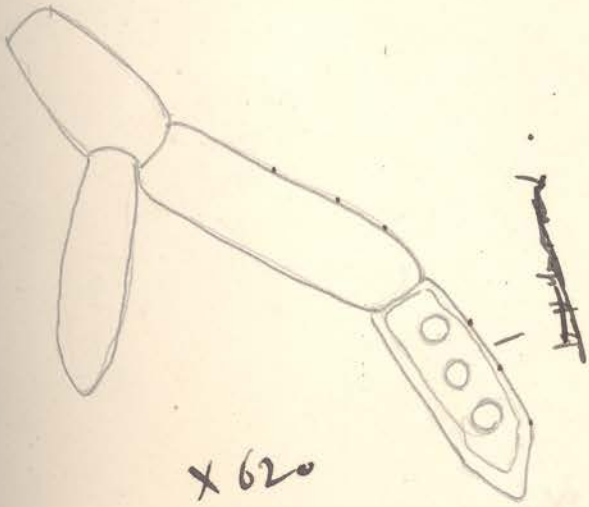
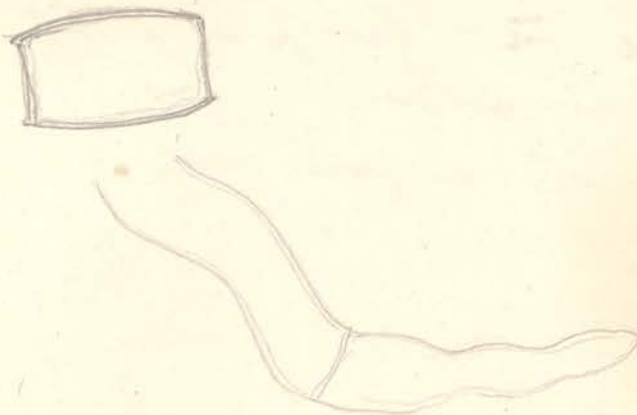
25  
17  
---  
175  
25  
---  
425

175  
105  
---  
15

Oed. sp.

abundant

25 V broad  
42 V long



x 620

bristles. *Oed. maculata* a.  
~~stage of cells, size of cells~~  
~~slightly broader than~~  
~~from~~

175  
105  
---  
15

Oxidation from jarabakali

1. Put a little Potassium bromide in the developer. It will make the image clearer.
2. ~~Soda~~ Sulphate - 10 grains in developer. It hardens the film.
3. After fixing in Hypos, keep in the solution 1:3 for 2 hours & clear the negatives.
4. Place the lamp at a distance of 1 foot at least from microscope.
5. Rub the surface gently.

Parasomatic process  
 $\frac{1}{4}$  size.



X 120

Cells 21 x 4.

450 long

Each cell contains 2-5 hyaline.

25th. Sept. 39

*Zygnema terrestris*

lateral conjugation

*Zygnema* from *Duckhorni* - Lower level road.

17

Vegetative cells = 274 broad

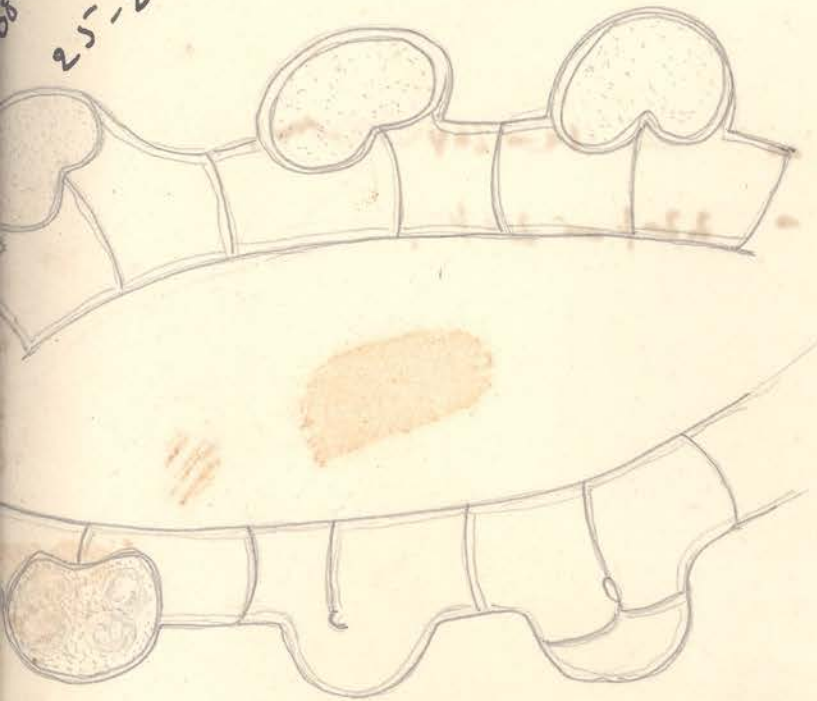
Zygospores - kidney-shaped

25-284 - 38-464

14	-	10
58		15
112		28
14		2
274		285

22 - 26  
15  
37.6

58 - 464 broad  
25-284 long



Zygospore is not cut off by my wall from lower level.

Compare *Zygnema duckhorni* & *Zy. Her. n. illis.*

The subterranean cells are

very much elongated. No definite rhizoids were observed.

Some of the zygospores may even be found within the cells ICA

In some rare instances even lateral conjugation may be observed.

*Z. levestri* — <sup>cells</sup> 18-24  $\mu$  broad  
36-60  $\mu$  long

*Zygospore* — 28-38  $\mu$  X 36-54  $\mu$

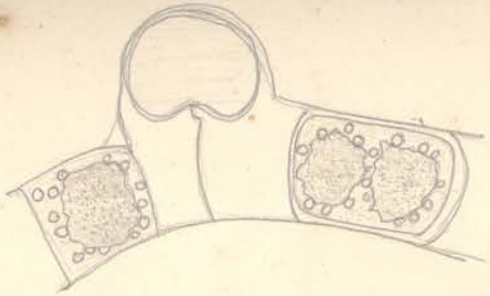
*Zygnema tenuis* var. *Kalorani* — cells ~~scattered~~  
- 22  $\mu$  - 24  $\mu$ .

*Zygnema* (lat-long.) *Planktoni* — 20  $\mu$  - 24  $\mu$



Zygnema terrestris.

Lat. long.



16  
" "  
" "  
" "  
" "  
" "  
" "  
" "

17  
" "  
" "  
" "  
" "

At.  
Zygnema sp.

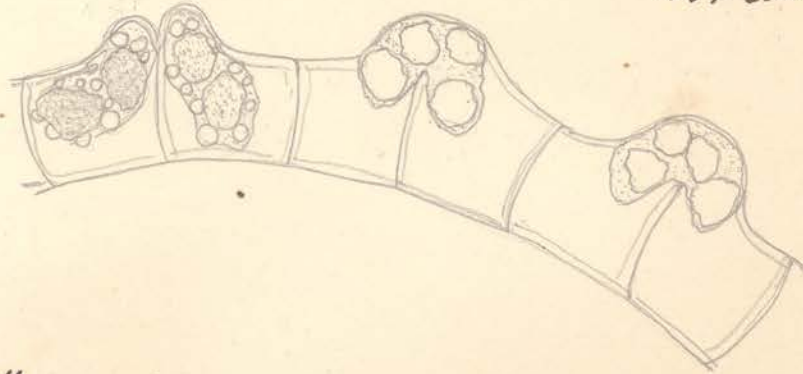
Lotus (West. Marsh)  
Nt.

13. IX. 1931.

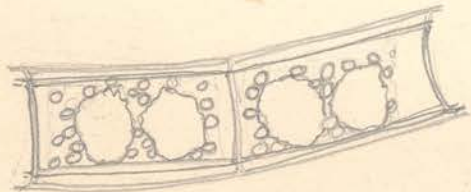
244 W

— gelatinisation of tip.

No remains of brood pipe seen.



cell-wall 84 wide.



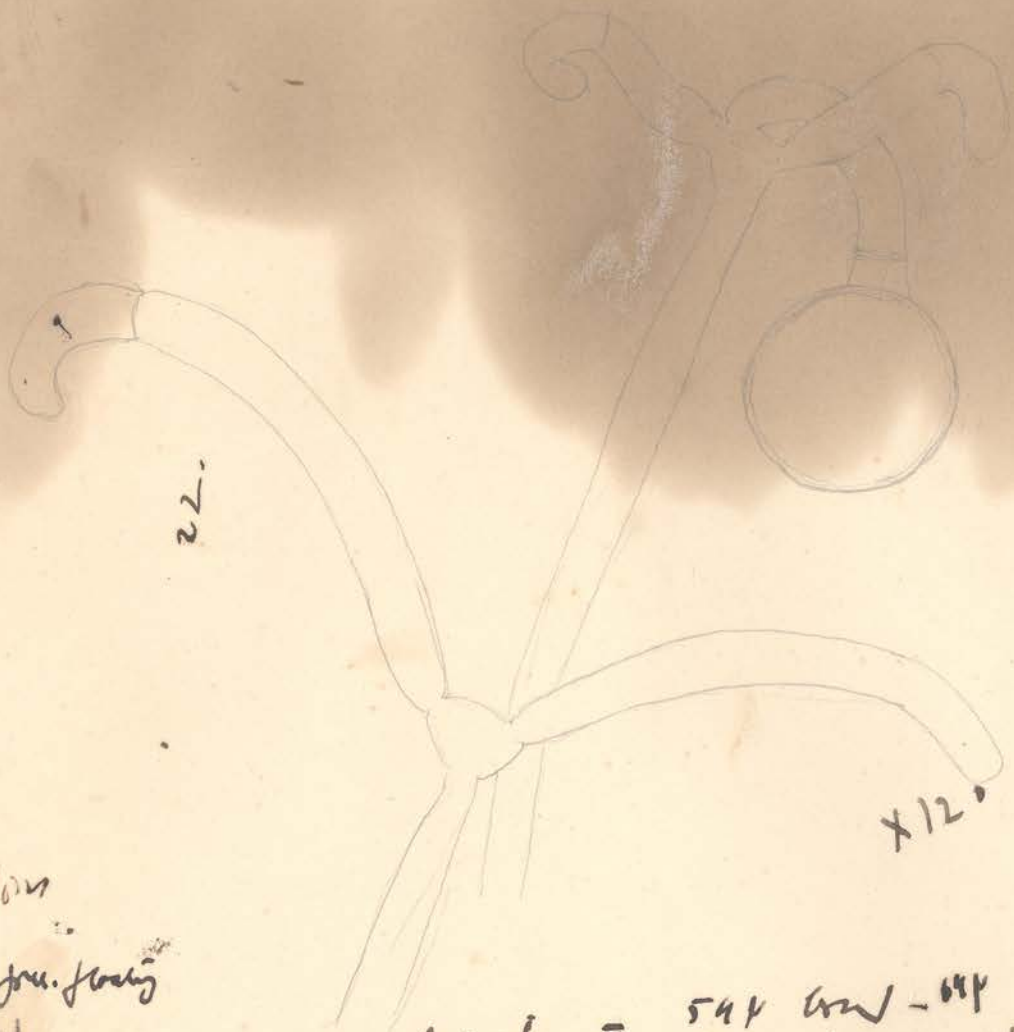
274 W



3x 3/4

76 = 26  
8 = 13

10/8



22.

x12.

2011

- Juv. Juv. Juv.

2011  
Feb. 10.

Antenna = 544  $\mu$ m - 644  
 Oesophagus = 2504  $\mu$ m - 198  
 = 2000  $\mu$ m  
 Stomach = 724  $\mu$ m - 100

2011. Nov 10  
 Laguna.

Juv. Juv.  
 Juv. Juv.

March 1911

*Didotmopsis*

Puyuzo. 3. IX. 39.  
Alcornoque en el agua

oosomas = 360  $\mu$  m  
diámetro



1:40  
5/10/39

X 120

X 120

Anterior = 54 - 63  $\mu$  long  
180  $\mu$  long

Thallos - 108 - 115 - 126  $\mu$  long

Filaments = 112  $\mu$  -

Vandoria -

Dawalshan Tanka.

16<sup>th</sup> Sept. 29.

Vandoria obtusicauda. Linnch.

var. kumanoensis

similis. Juncus obtusicauda

looks up V. senilis

V. obtusicauda

as *ovata* may be  
~~strongly~~ erect or in  
some cases slightly  
oblique.



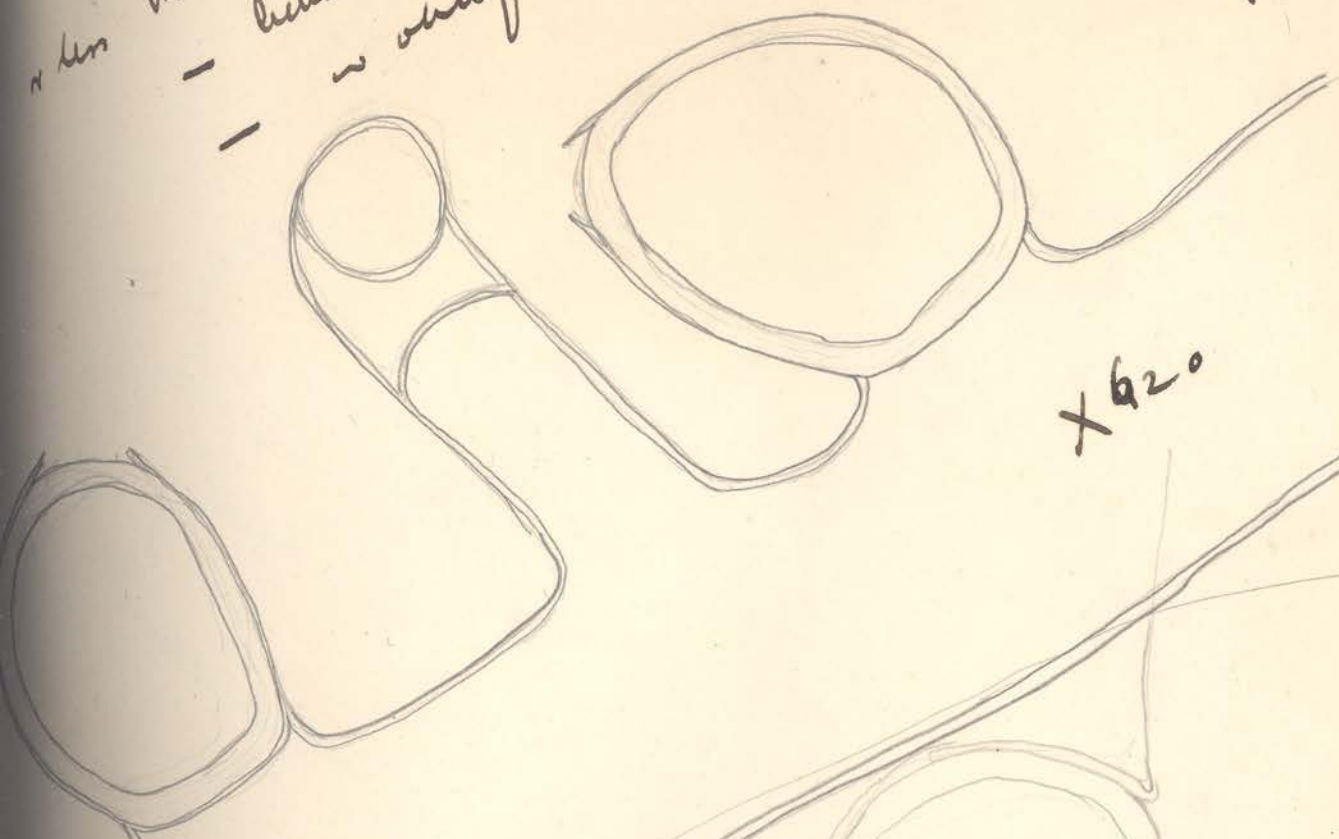
anthers dark orange  
ciliate, hooked  
strongly.

40  
 8.6  
 ---  
 52.0  
 "

Break *T. oregoni* is more  
 vertical & striated -  
 - between vertical & striated -  
 - oblique.

47, 41

✓  
 1=34



X620

*Andromeda* more or less striated  
 or hooked, very rarely circular.

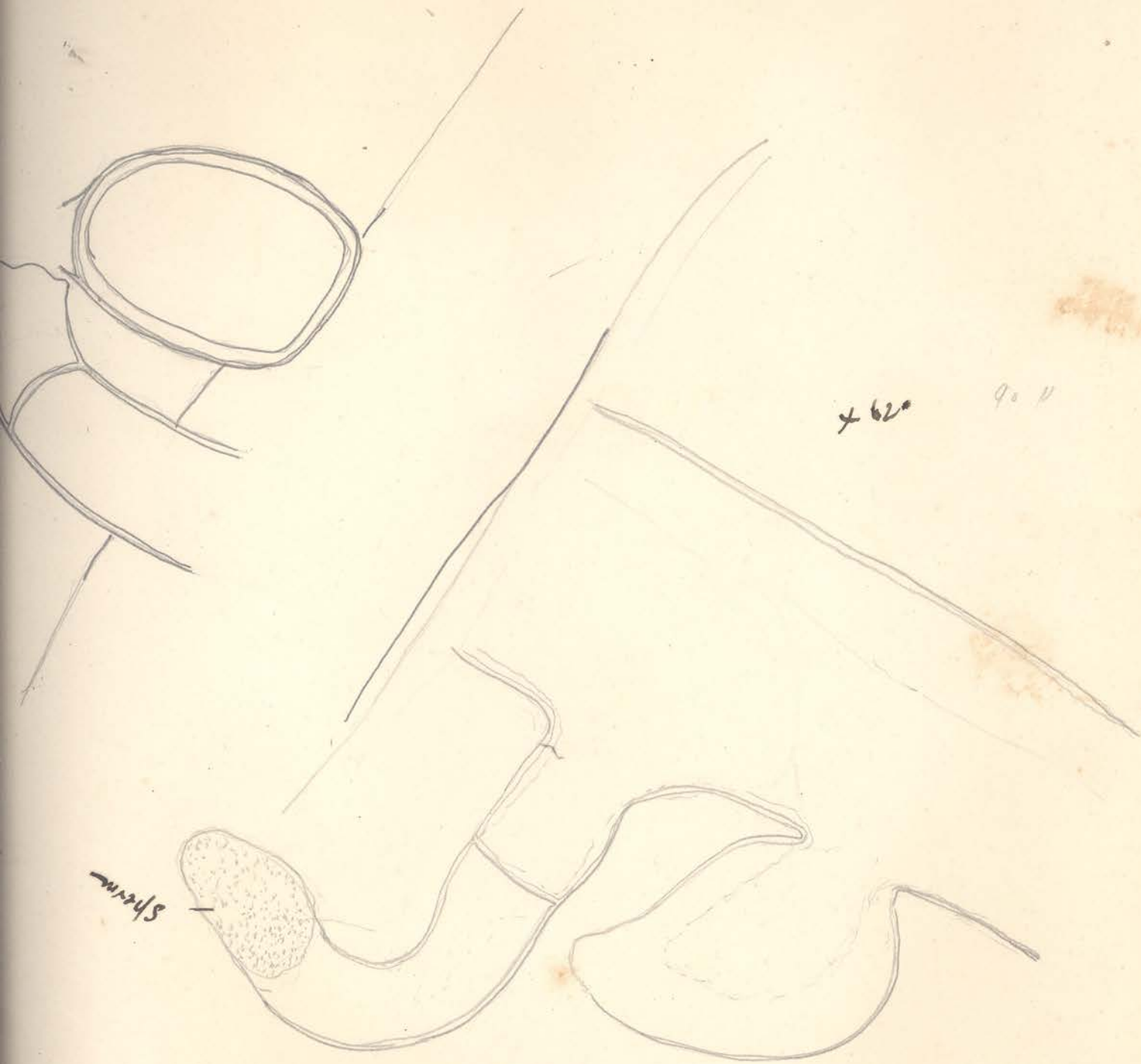
X420

Filaments

814-964-  
 -1054

27  
 54  
 57

V. senilis forma aruiscapa.

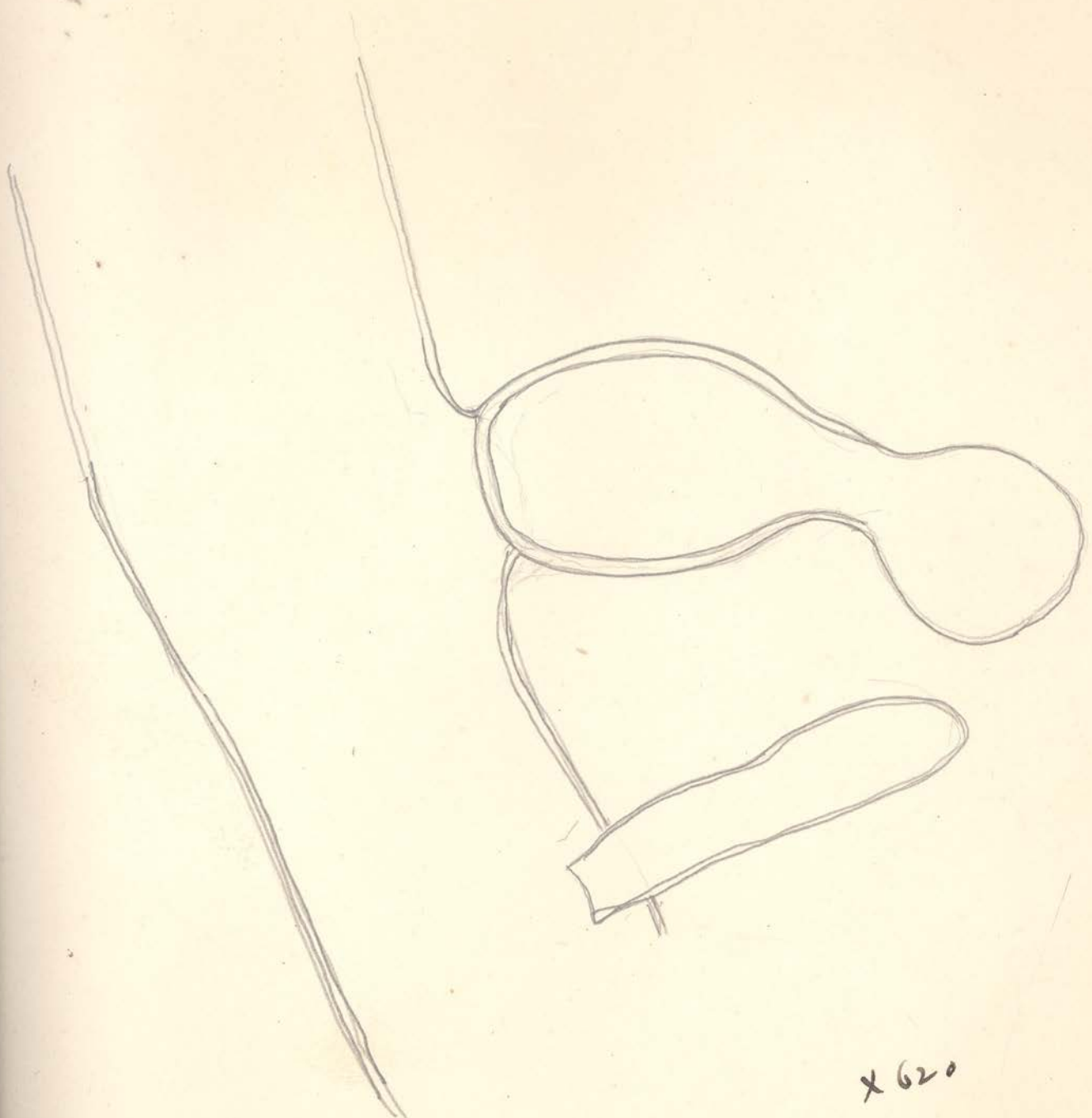


x 620

90 11

unrueloo

V. similis forma ruficornis

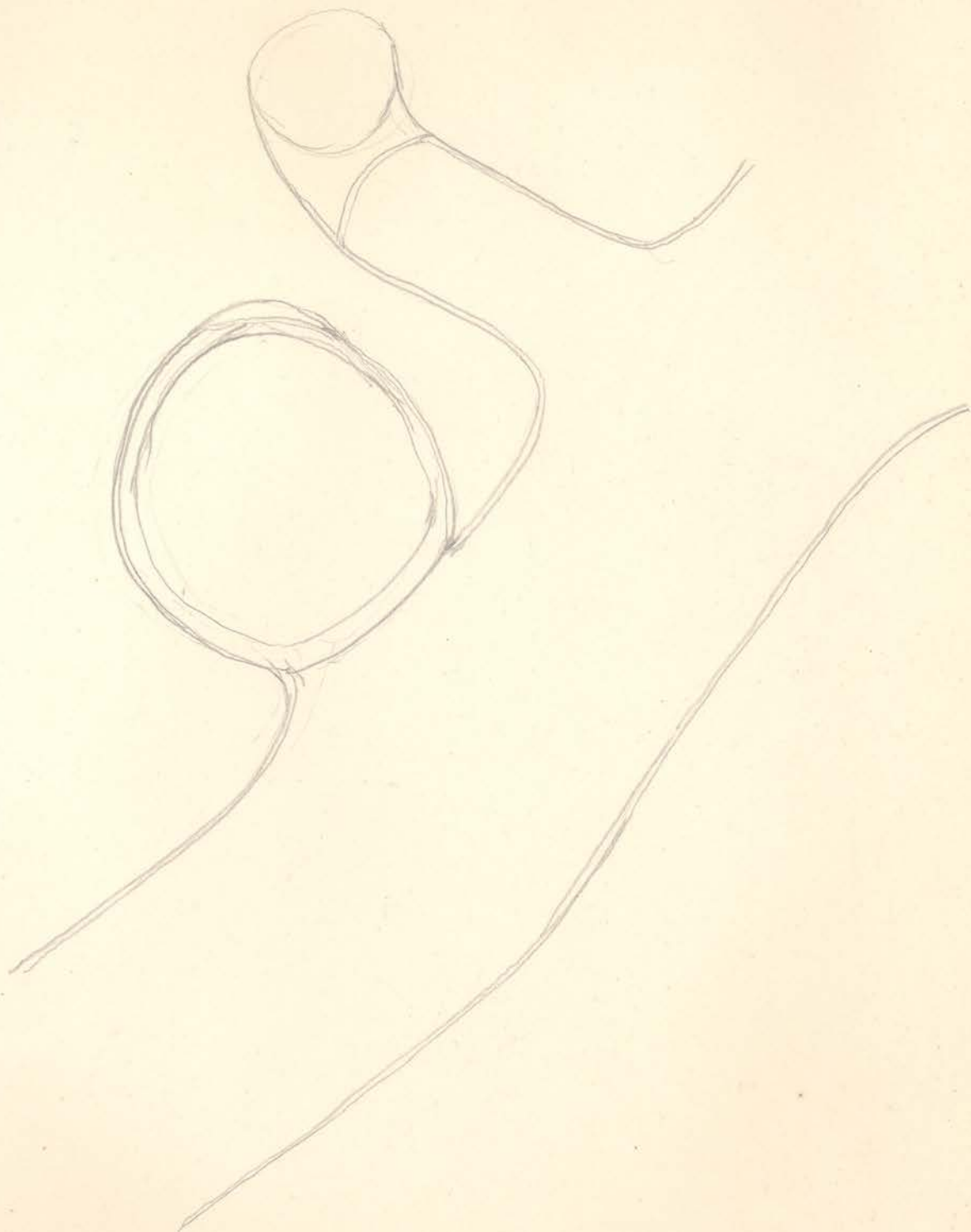


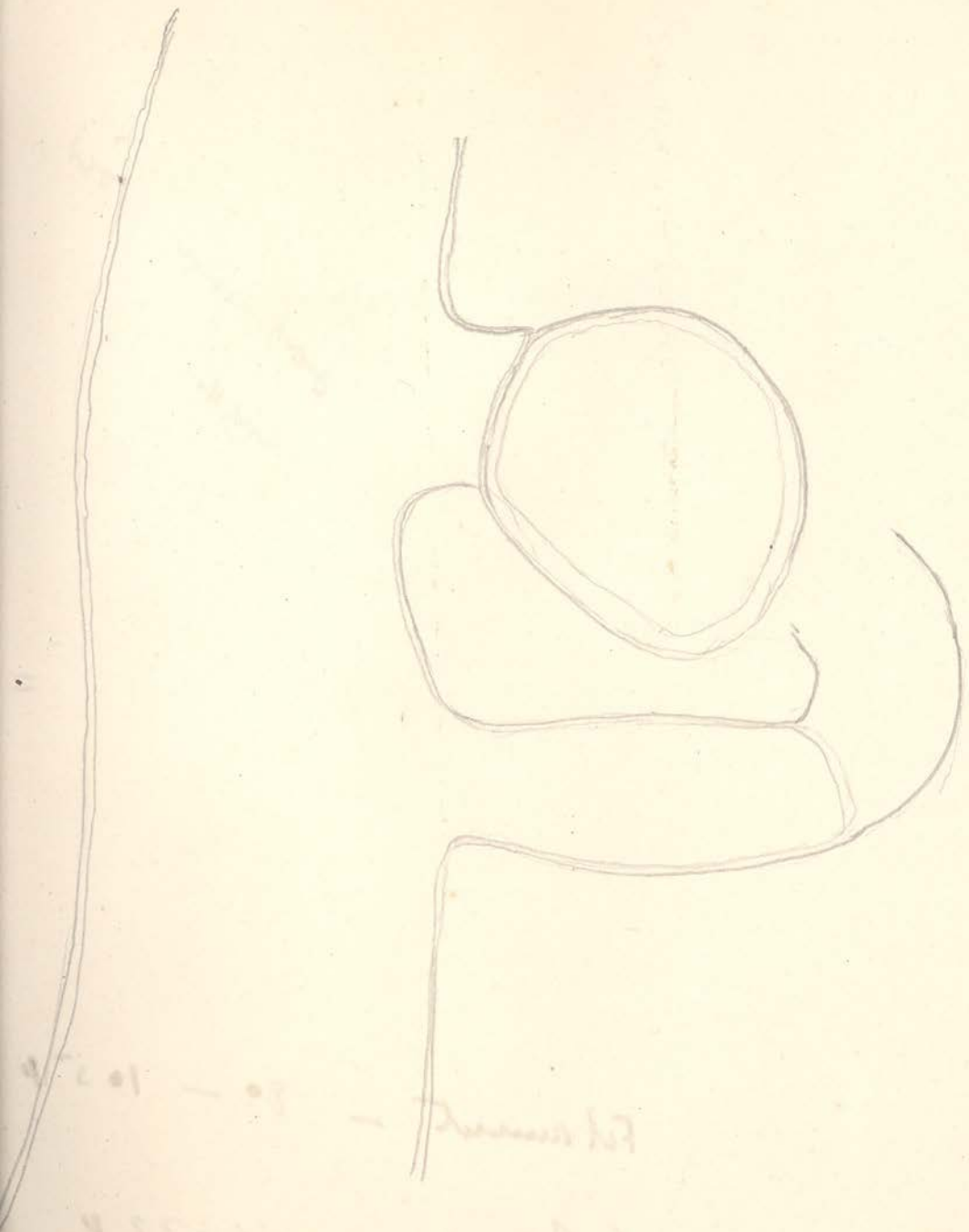
x 620





52  
416  
V. strobilis forma ovuliferæ

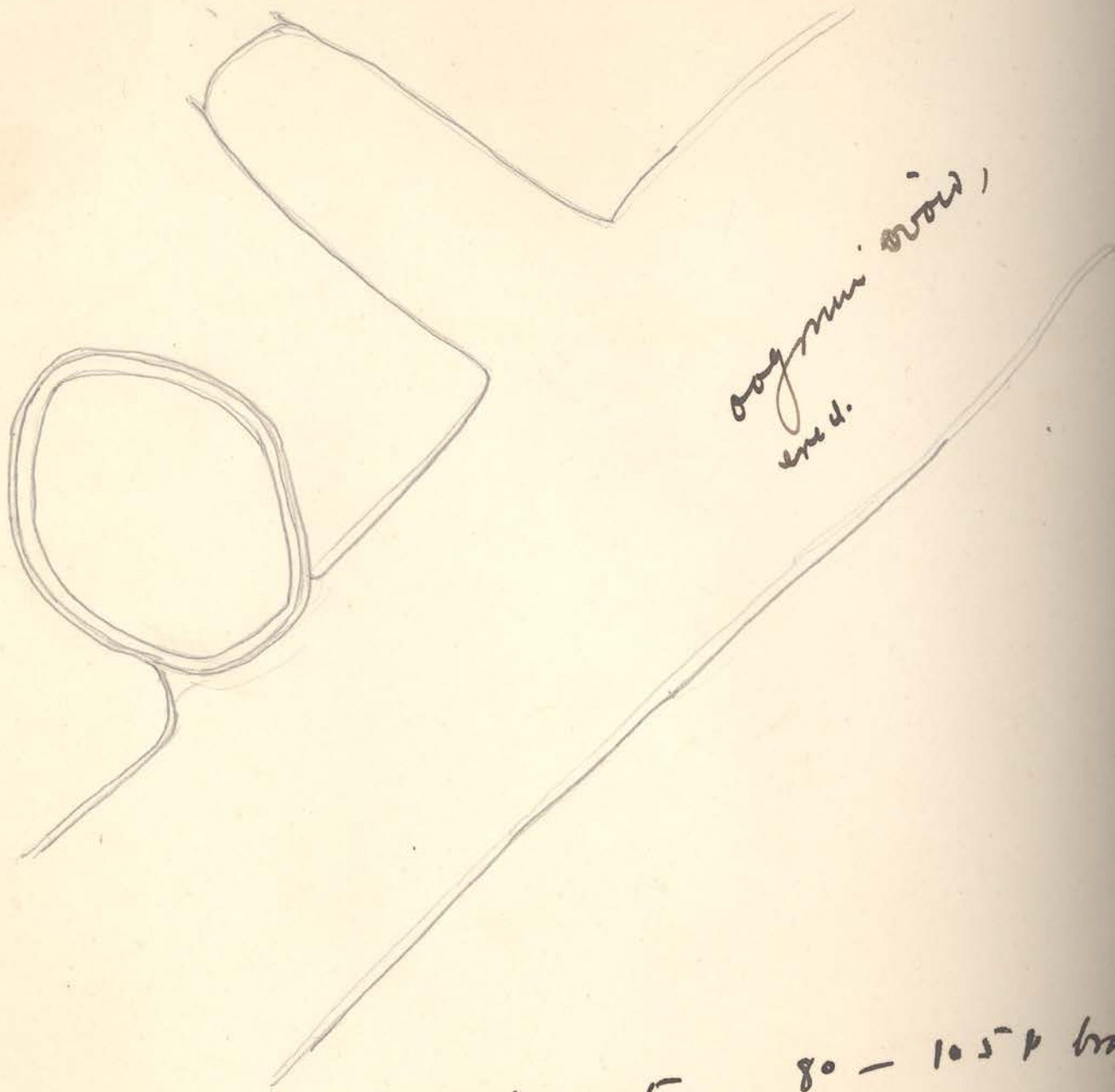




10-10-1907  
Prof. J. H. ...

V. viridis from Alaska

It is a new species of Vaucleris  
which compares in characters  
of V. viridis w V. Alaskae.



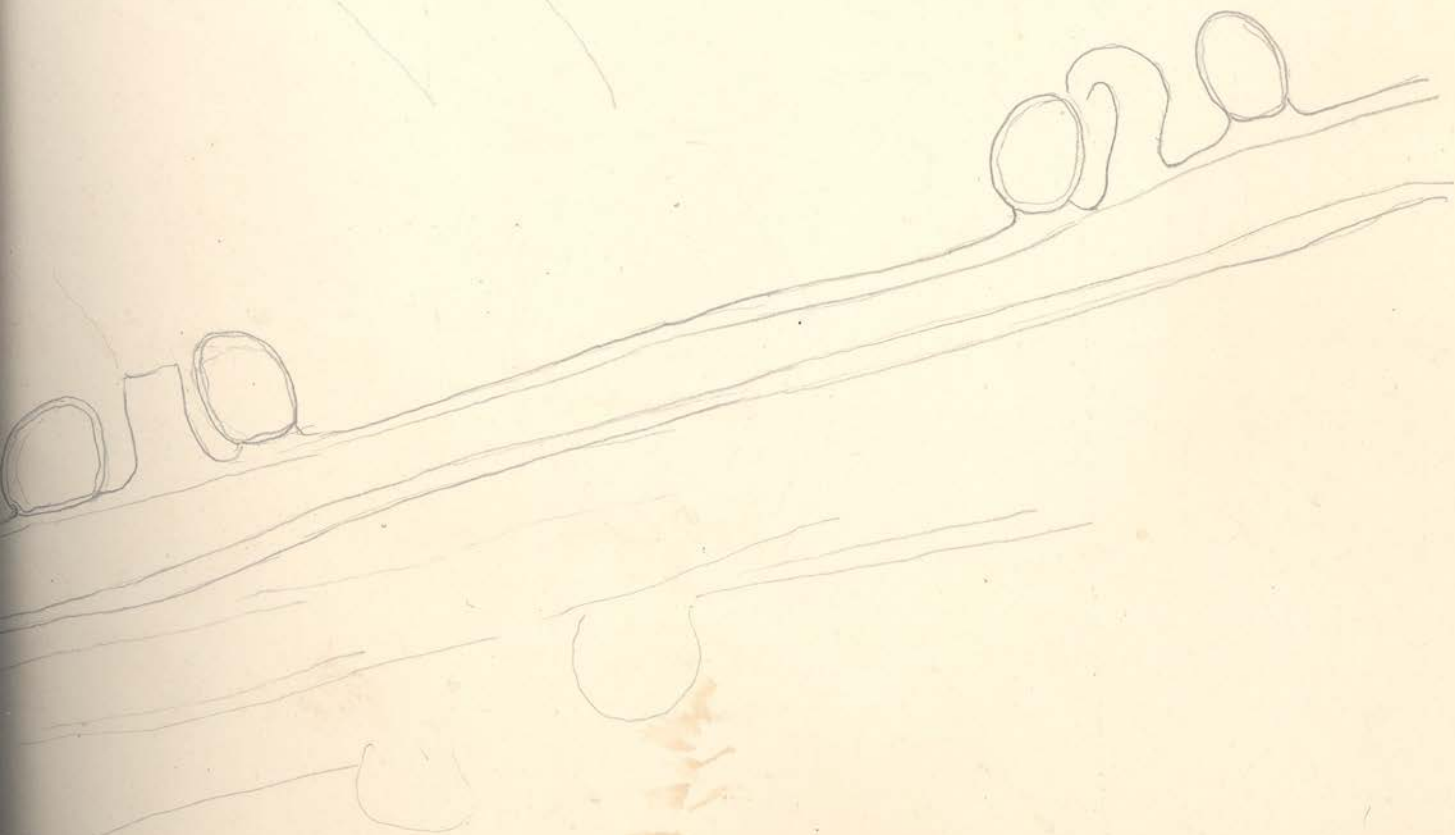
*Pyrenium*  
sp. n.

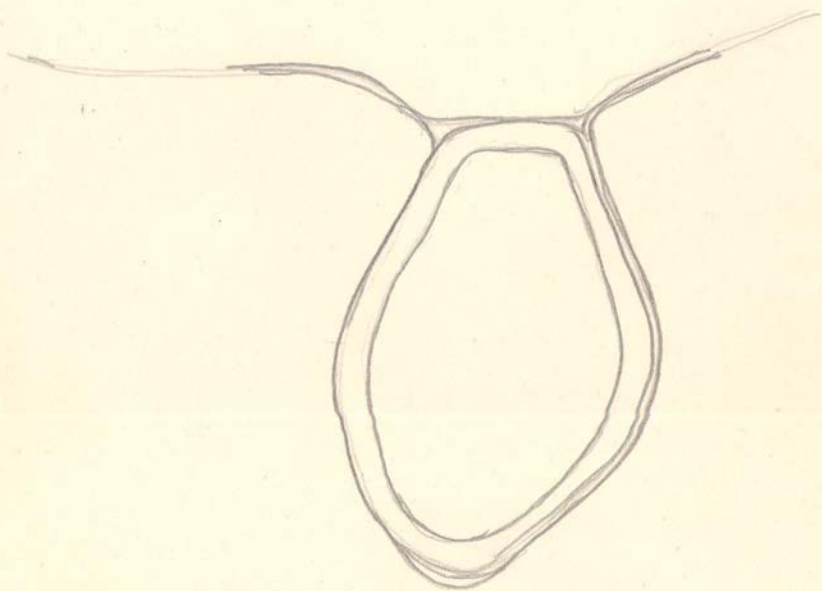
Filament - 80 - 105  $\mu$  long

Spores = 66 - 72  $\mu$

80 - 90  $\mu$

oogonia usually in pairs, rarely single.



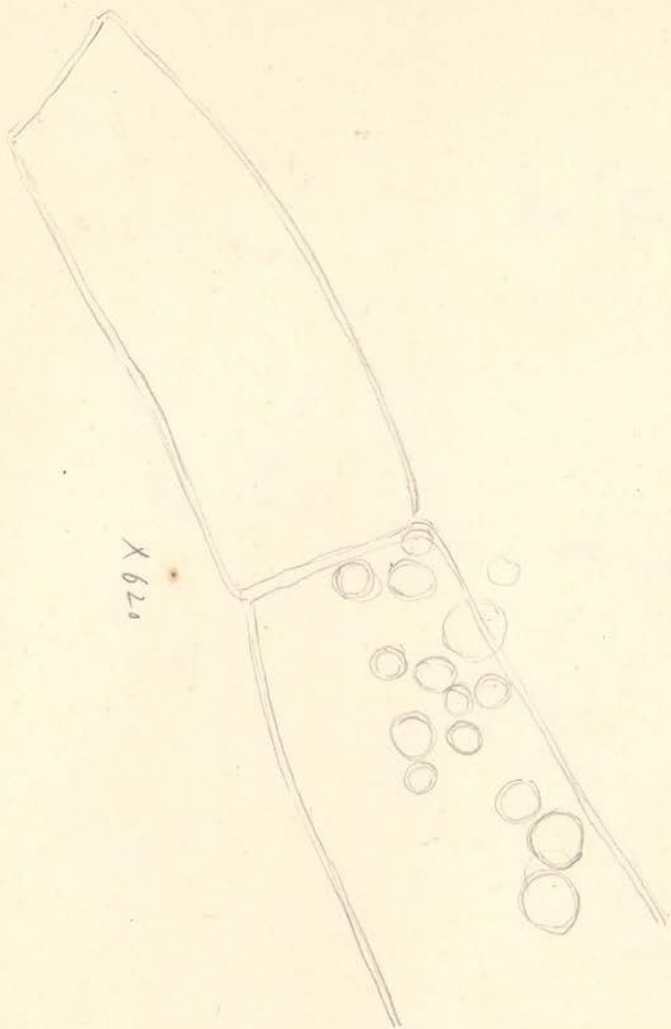


Vegetative structure.

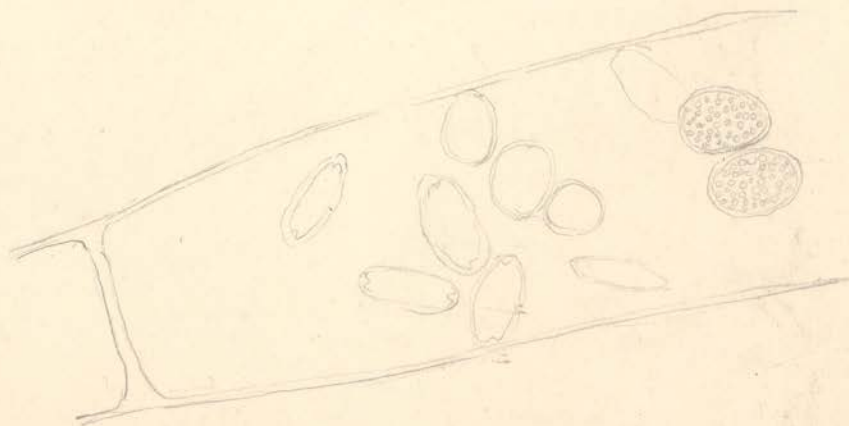
- i. Chloroplast.
- ii. Rhizoids.

Reproduction.

- i. Conjugation.
- ii. Autogamy.



Five spirilla. makes bodies.  
vacuolated when green,  
rest in green, or red in color.

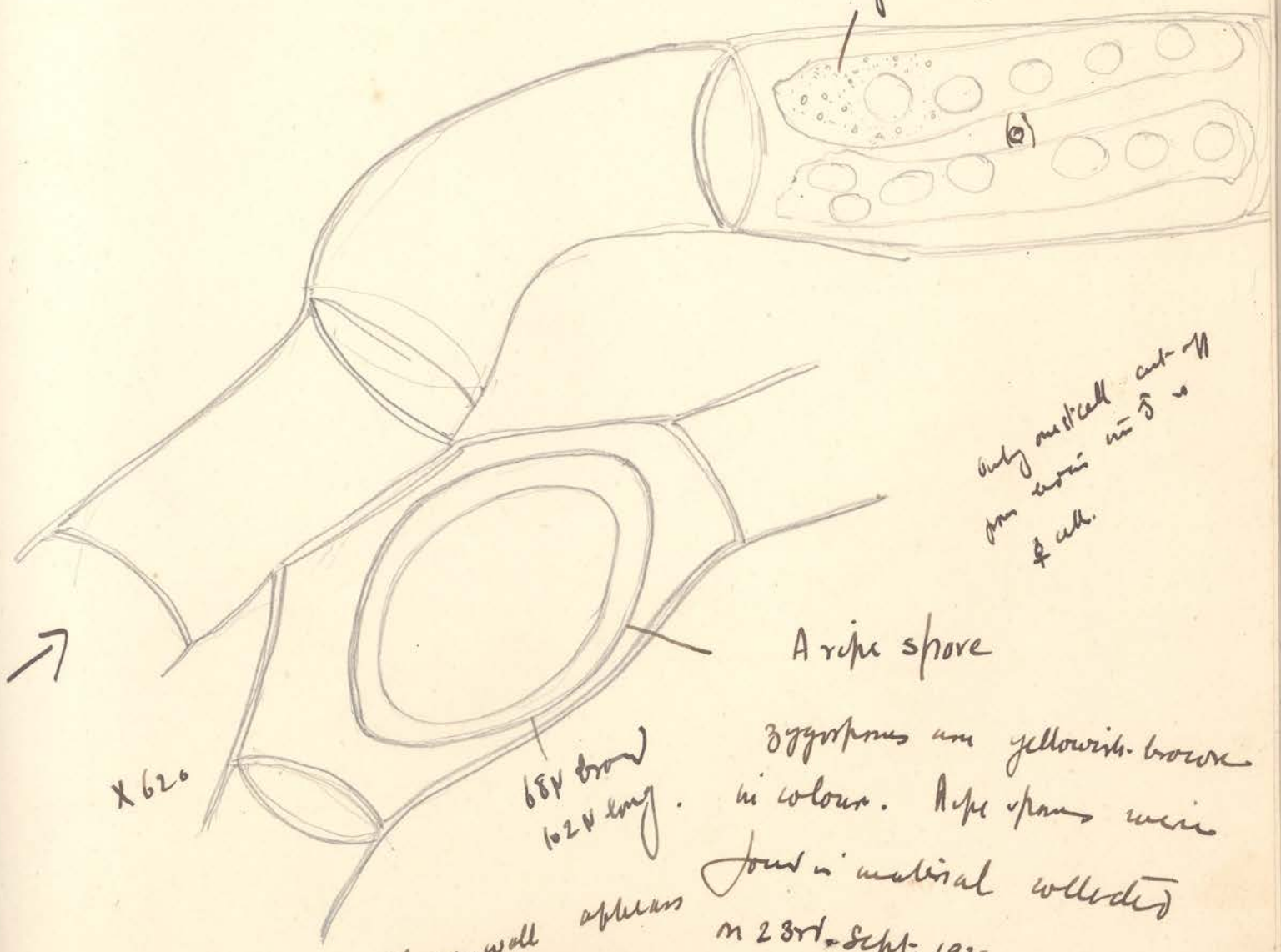


*Sirocladium ganapatiense.*

Collected originally from Ganapati temple in  
 7 mi. S.W. of ... growing in ... in ... diam. ...  
 felt. like patches about 1/2 in. in diam.

Chloroplasts in two rows

granules in chloroplasts



only material cut off  
 from ... in ...  
 & all.

A ripe spore

Zygospores are yellowish-brown  
 in colour. Ripe spores were  
 found in material collected  
 on 23rd Sept. 1939

X 620

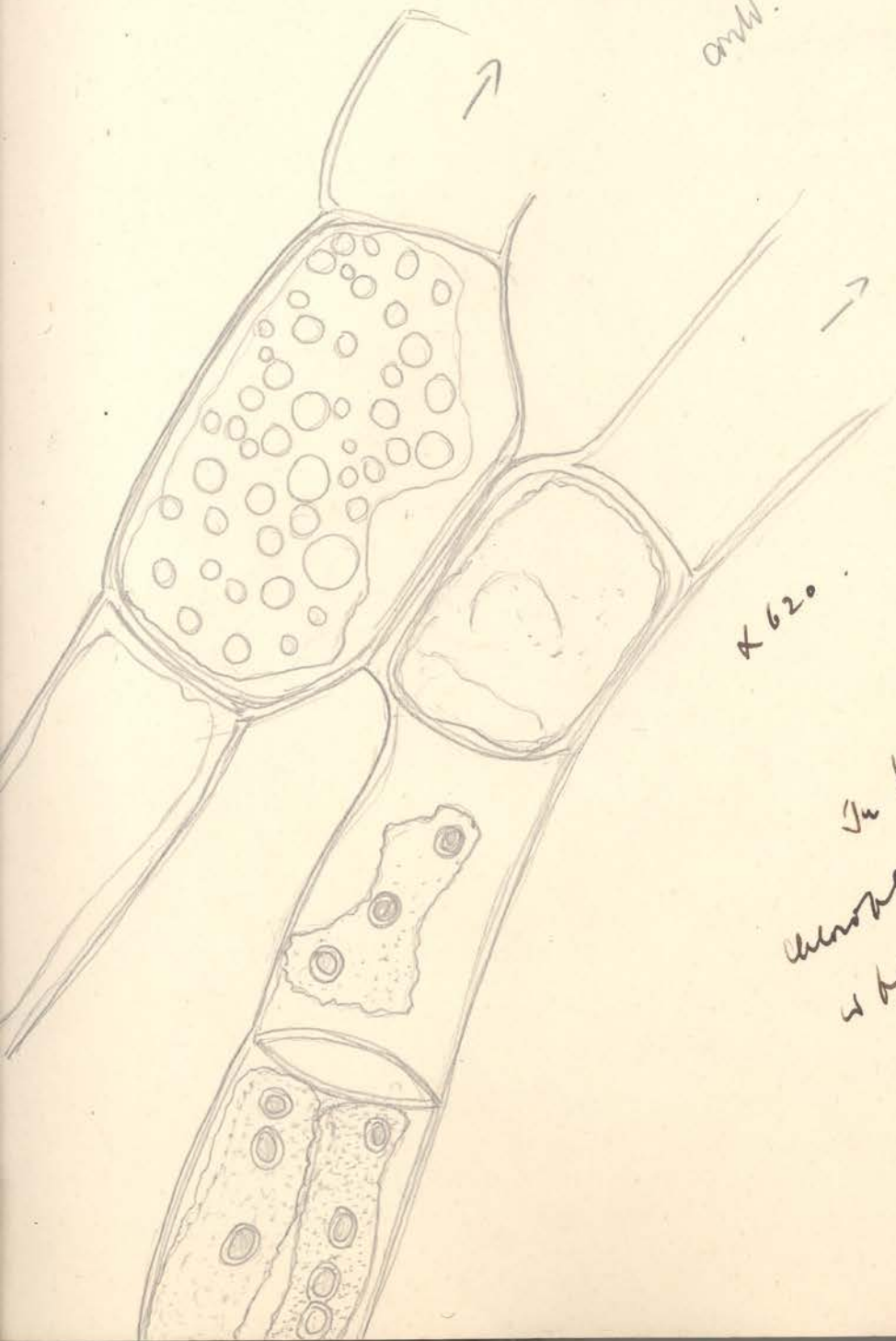
68 μ broad  
 102 μ long

Spore wall appears  
 to be smooth.

66  
 1939

III

amb. next page



X 620

In presence of water  
chloroplasts get detached from walls  
& plasmolyse.

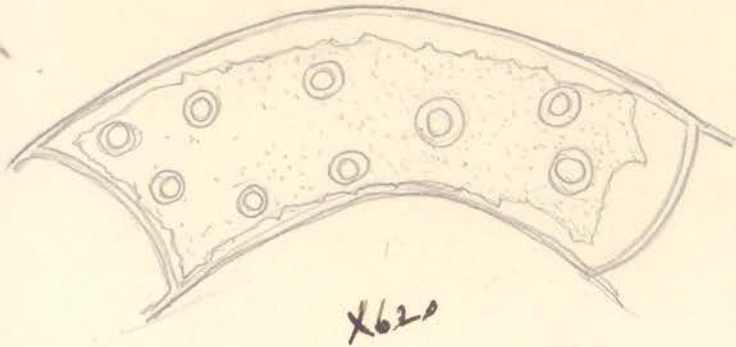


Sporulation from  
Gamanath.

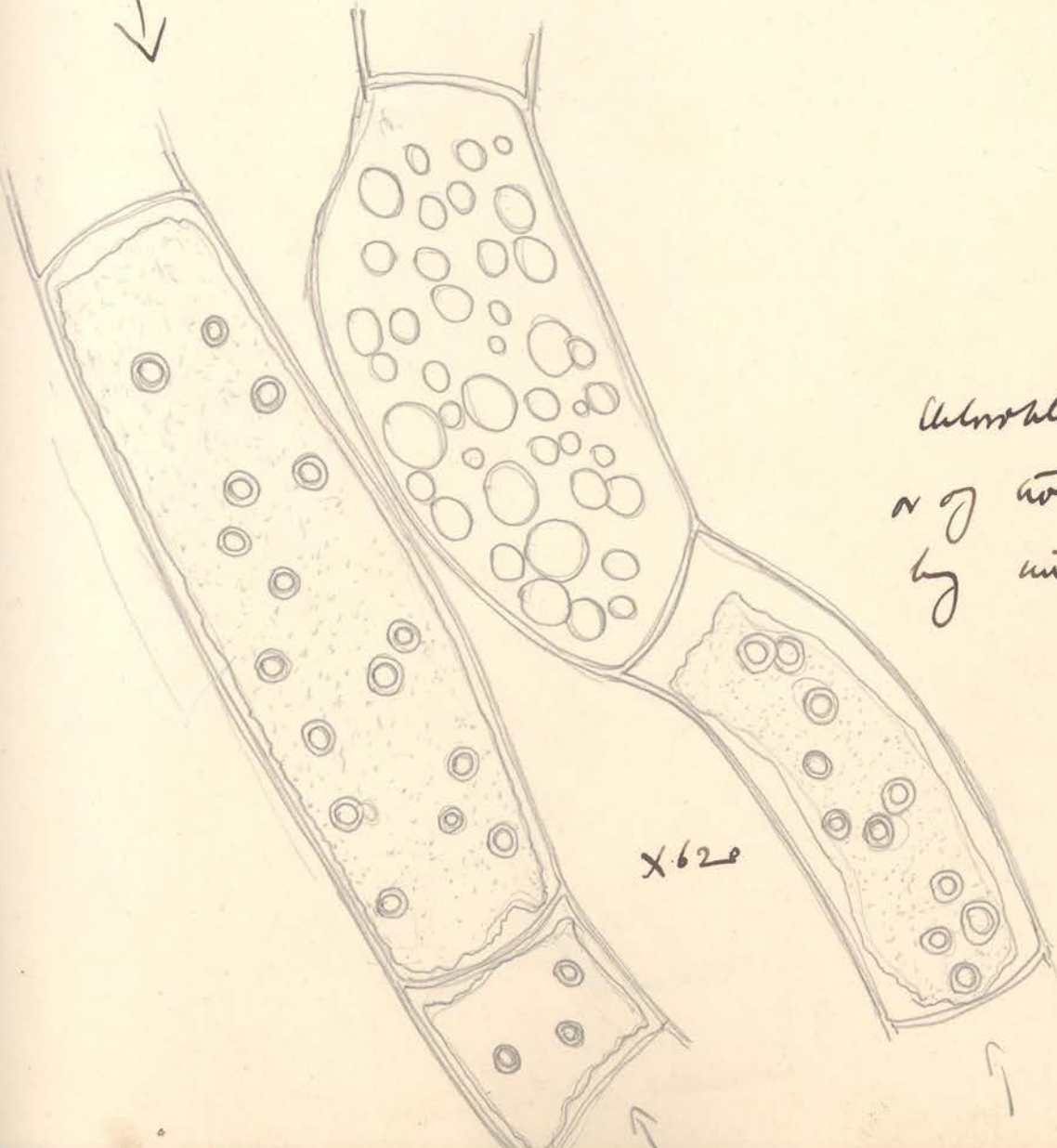
23rd Sept. 31.

like spores

Filament 127 much wider



8-12 hyphae;  
irregularly scattered in a  
plate-like deltoplast.



Deltoplast-plate-like  
n of two plates connected  
by an nucleus.

*Sirocladius* from  
Granunata.

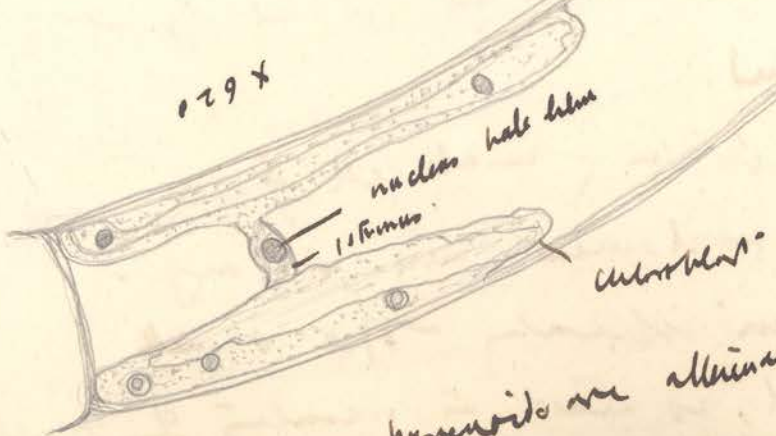
x 120

Hydromedusa - sub-terranean cells



A sub-terranean cell

x 620



The sub-terranean cells  
have usually two  
alternating irregular  
plate-like structures  
formed together by  
a protoplasmic  
with one in which the  
nucleus is situated  
the other empty

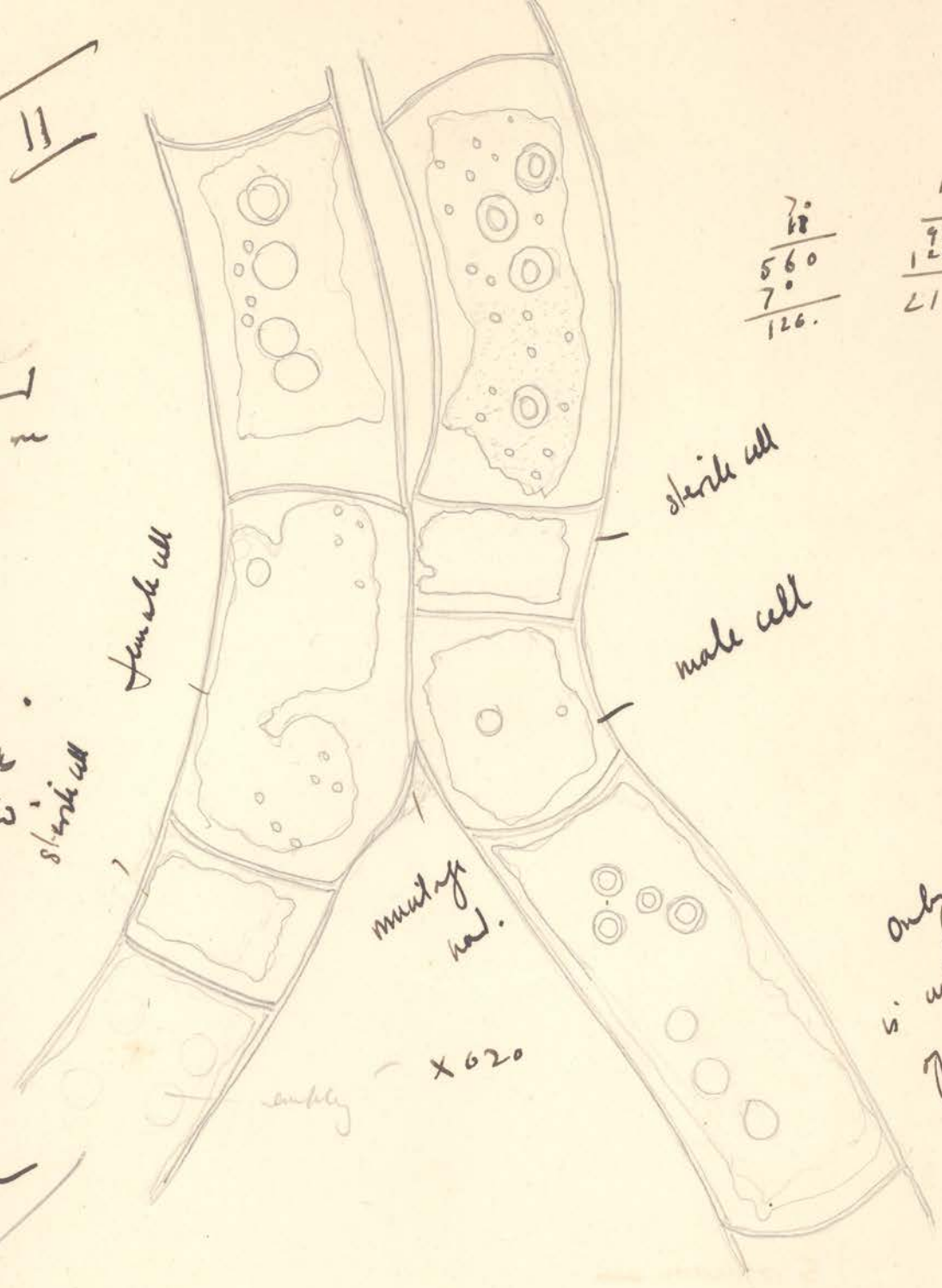
x 620

Hydromedusa are alternating

30 - 35  
 540 35  
 63.

11

leaves cells are  
 to 64 μ broad  
 in average  
 in width  
 4 μ broad.  
 and are  
 to 210 μ long.  
 but are cells  
 are usually less than  
 sterile cell



70  
 560  
 70  
 126.

120  
 15  
 960  
 120  
 216.

only one sterile cell  
 is cut-off from each  
 of the mating cells

~~Instead of making a new genus~~  
~~it would be better if this description~~  
~~is described as a strain of~~  
~~Sirogonia - Sirogonia foveolata~~  
~~and to widen the definition of~~  
~~Sirogonia so far as to include~~  
~~habitats in which it~~

sterile cell may be cut-off  
 on any side.

aggregation is  
 immediately made of  
 to that of Sirogonia

II a

empty broken cell

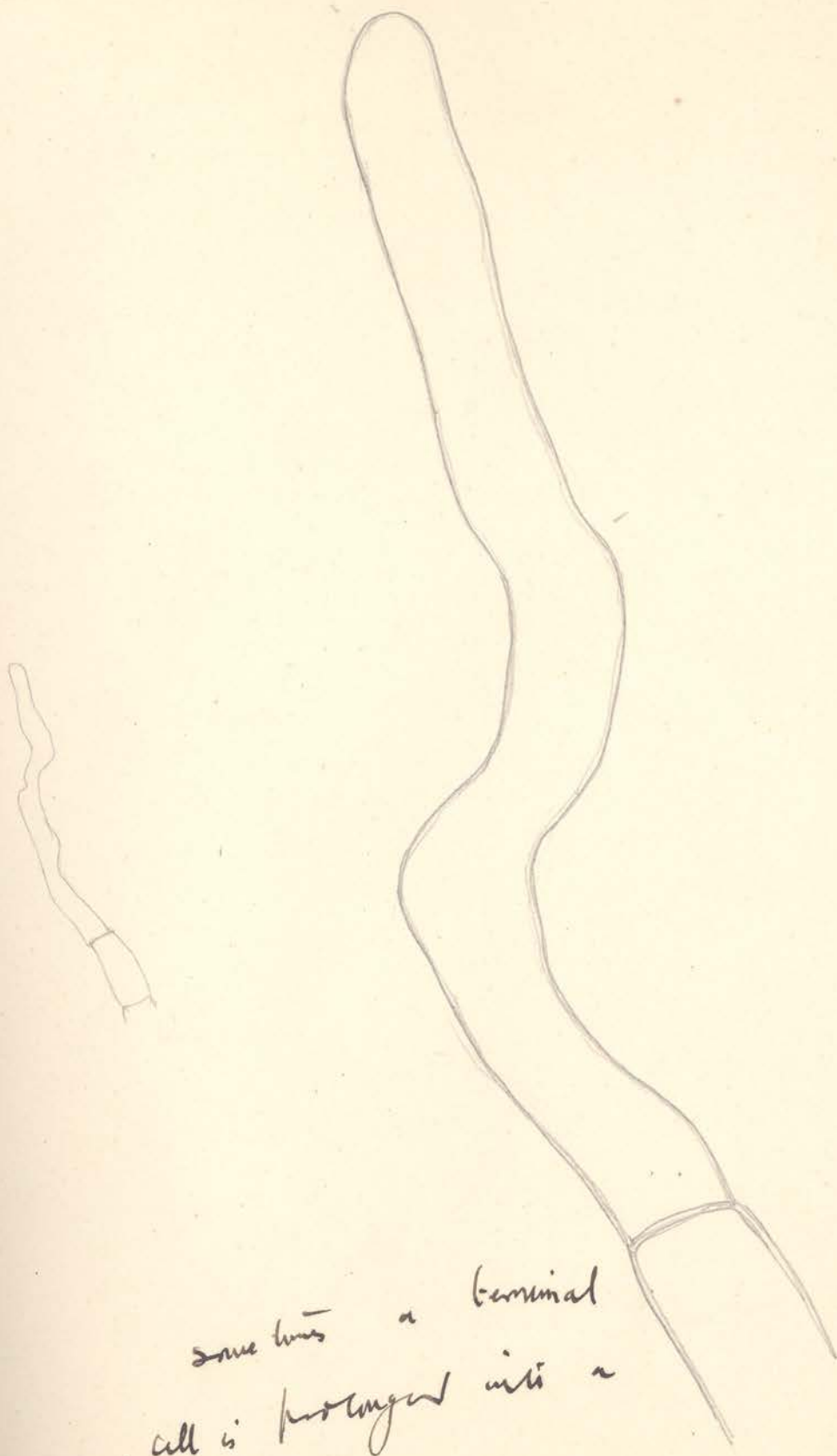
connects with last layer

SL

4 cells are joined together

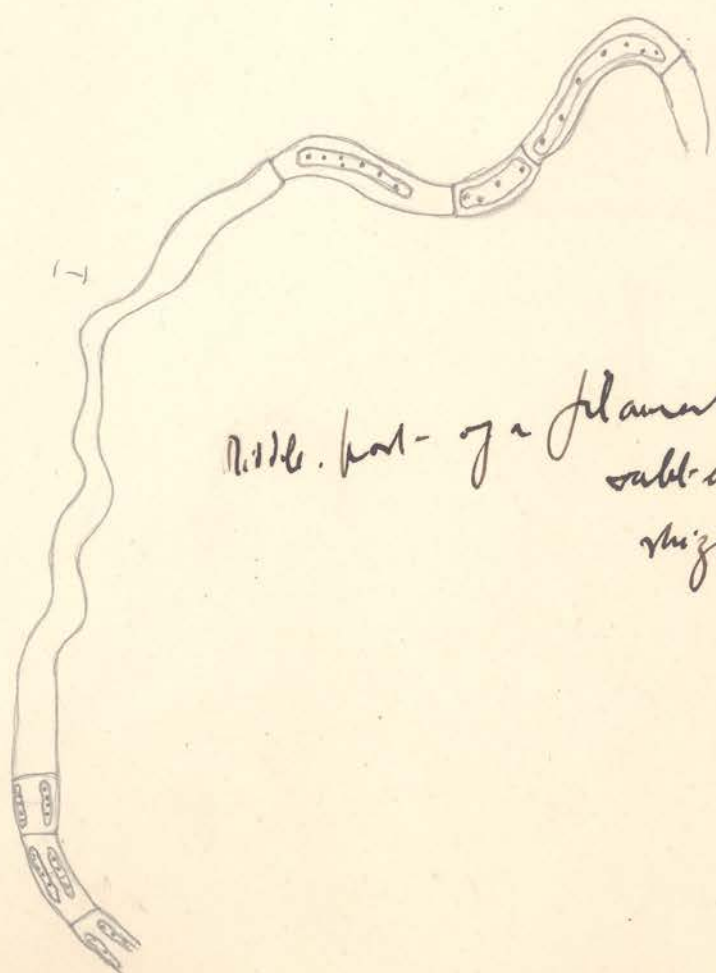
A rhizoid grows off laterally.





sometimes a terminal  
cell is prolonged into a  
stipoid.

The subterminal cells  
are also hyaline or  
contain attenuated chloroplasts.



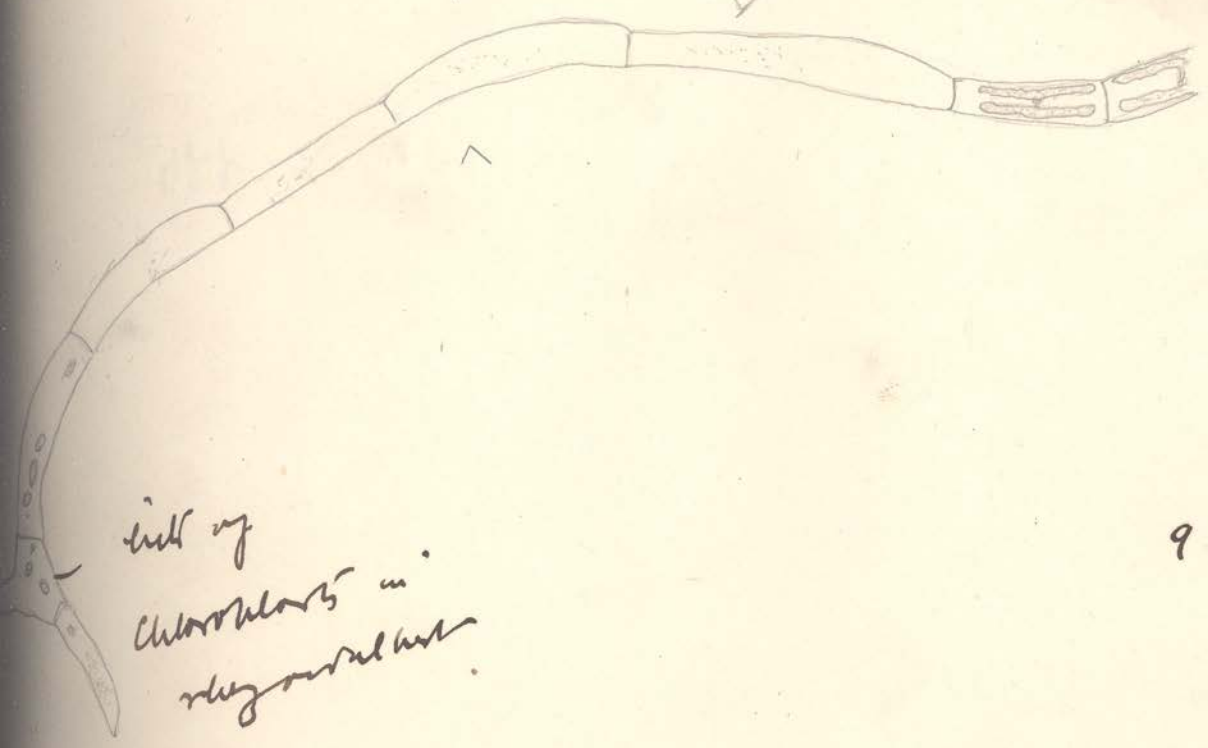
Cells as in  
 are usually double & cell-walls  
 above but -

little part - of a filament  
 sub-erect  
 straight -

12.5.1911

Bygonia

From Bygonia - Costa



list of  
chloroplasts in  
regional cells

9 hyaline - cells

with growth in diameter -

a kind of vascular

A kind of vessel in the vascular

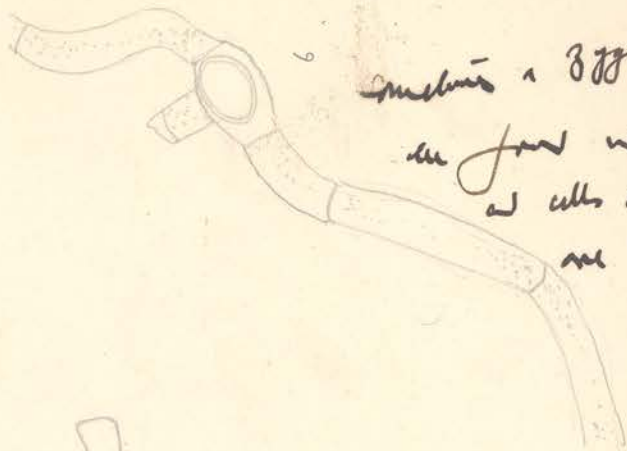


424 X 105K

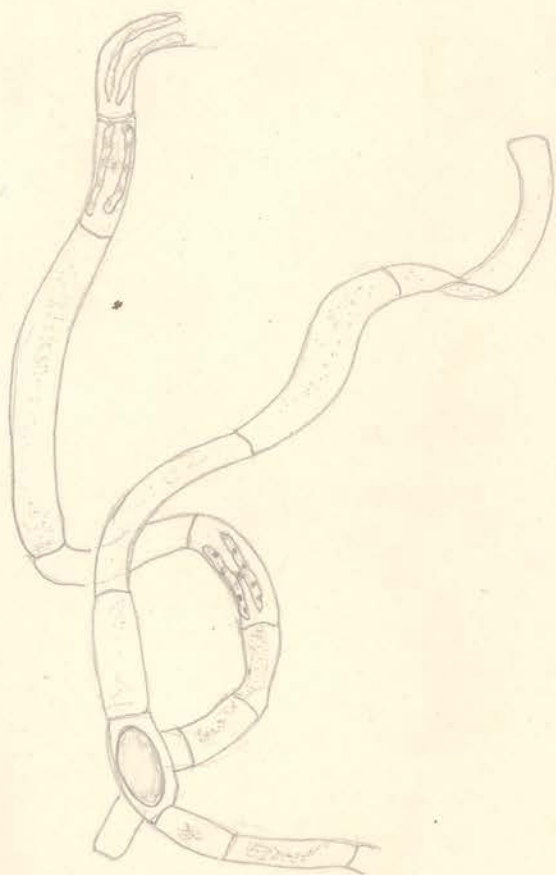
34  
18  
272  
34  
41

180  
480  
1080

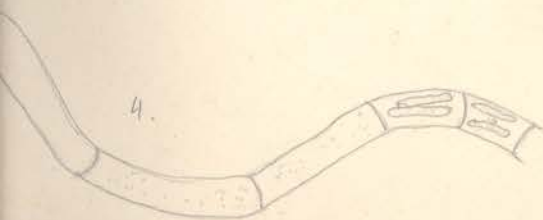




sometimes a zig-zag form may  
 be found in ground  
 and cells in all sides  
 are empty



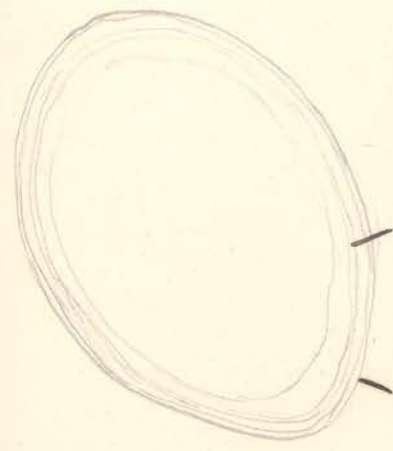
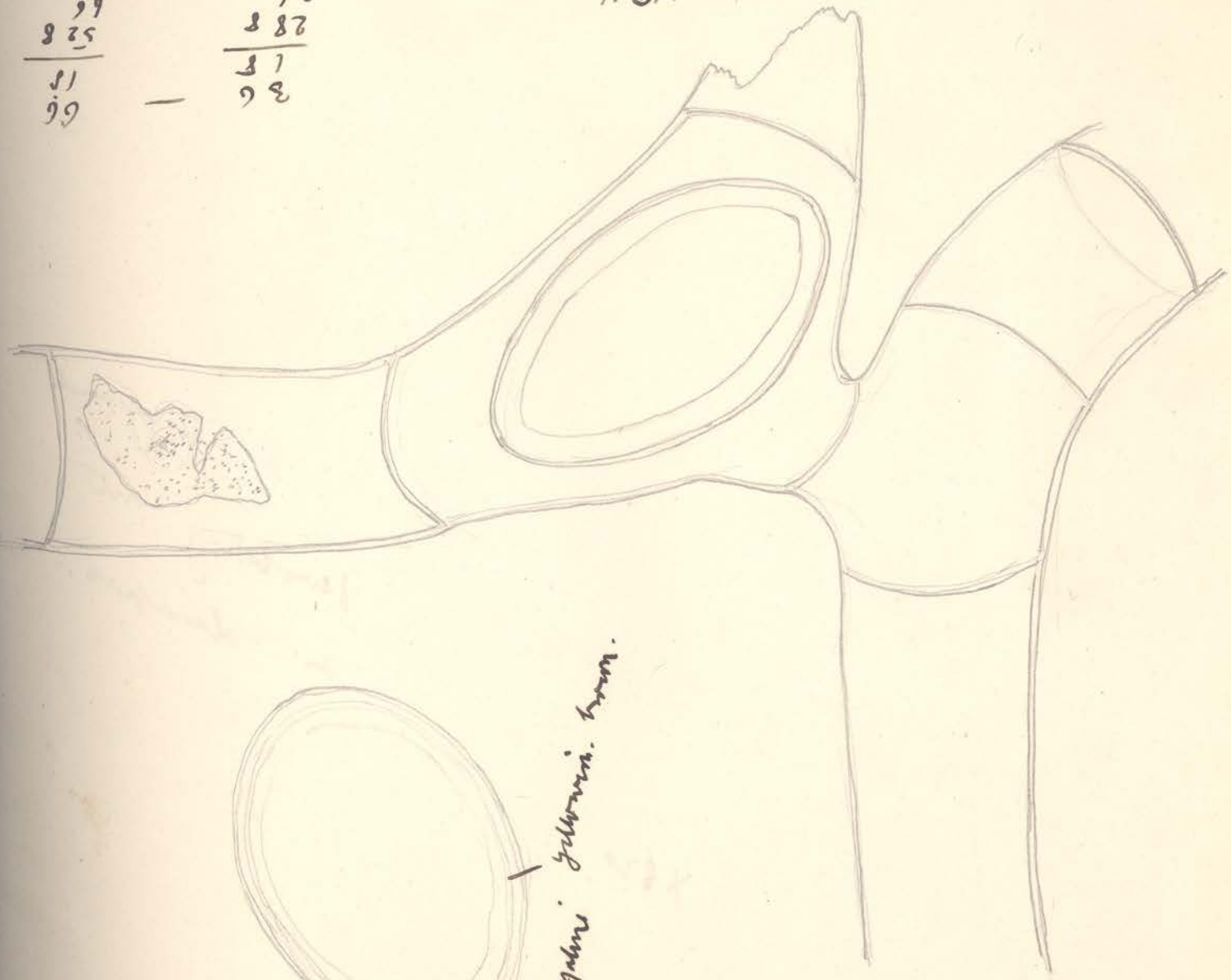
Cells in the lower  
 parts of filaments  
 usually contain  
 plate-shaped chloroplasts  
 which are in the  
 upper half of the  
 usually a single  
 broad plate-shaped  
 chloroplast.



$$\begin{array}{r} 1185 \\ \underline{29} \\ 528 \\ \underline{11} \\ 66 \end{array}$$

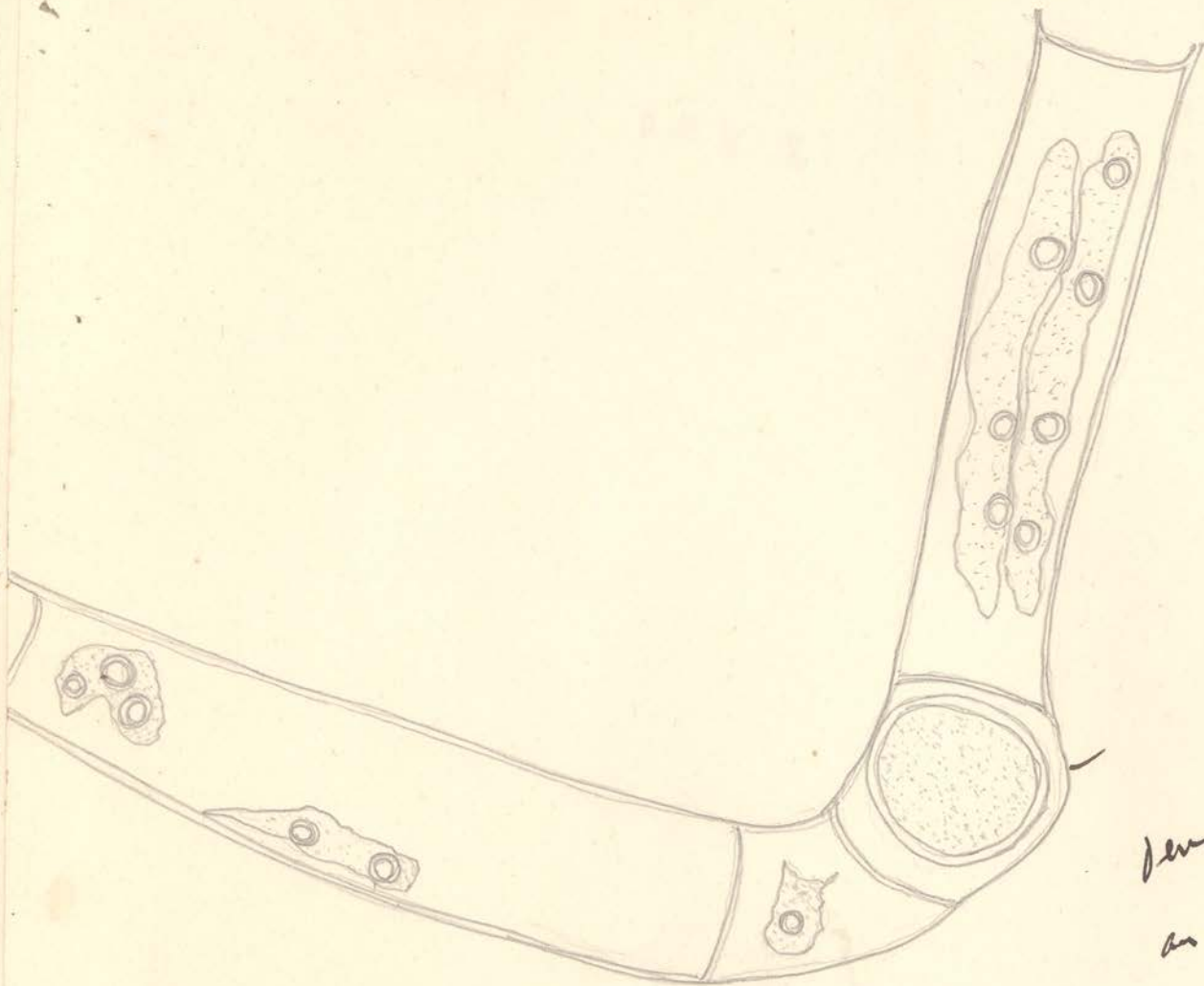
$$\begin{array}{r} 849 \\ \underline{93} \\ 882 \\ \underline{15} \\ 93 \end{array}$$

1811 X 179



*Hydnium gelatinosum* Karst.

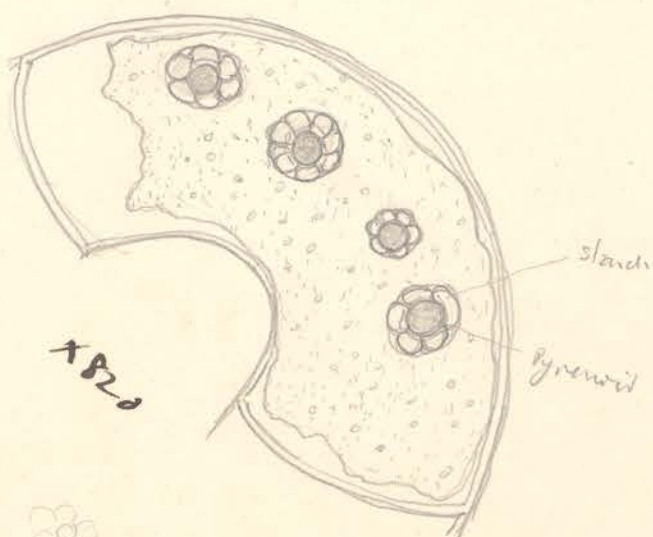
$$\begin{array}{r} 1185 \\ \underline{29} \\ 528 \\ \underline{11} \\ 66 \end{array}$$



A male gamete  
developing into  
a blastopore.

x620

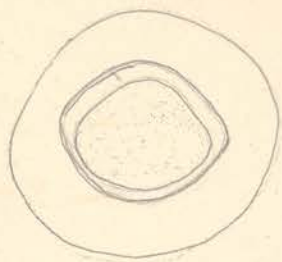
Note - The alga originally collected from  
 Bonaire - possibly a terrestrial species  
 of *Ulva*. There is a single  
 pyrenoid & an chloroplast  
 appears in the following notes.



Pyrenoid  
 4-8  
 -12

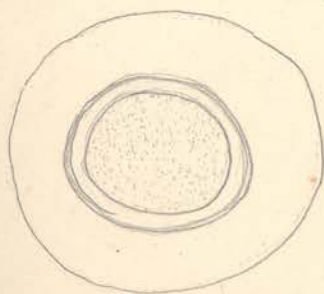
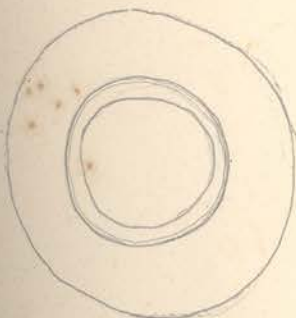
Sometimes two plates  
 chloroplasts over. looks cloudy  
 that may be present in  
 appearance of single plate.

I	Procladius - reductus	—	5	sems.
II	"	—	2 1/2	"
III	Bisarcella	—	5	sems.
IV	"	—	2 1/2	"
V	"	—	5	"
VI	"	—	10	
VII	Procladius	—	5	
VIII	"	—	2	
IX	Procladius	—	5	X 2 1/2
X	Leitz	—	Petromax Lambert	win pres
			10	sems.
XI			5	"
XII			2	"
			—	0 —

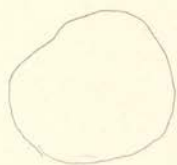
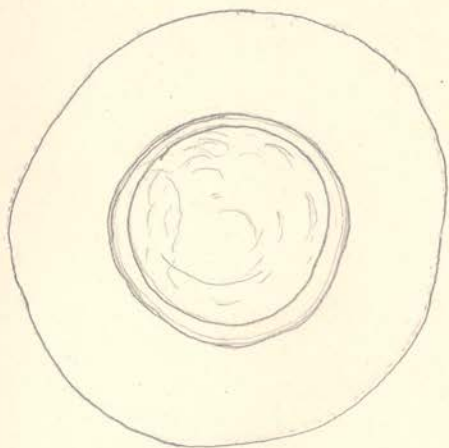


x 620

x 620



x 620



# Zygnema himalayensis

From chloroplast  
in some cells.

Zygnema mexid  
Jerdoniam from  
soil - Cimanati  
7th Oct.

Kaput - 14th

Pearlari labral  
Cup



x 640

131 = 770

x 12 + oil and  
= x 1100

$$\frac{25}{30} = \frac{820}{23} \times \frac{31}{23}$$

Vegetative cells = 21

3-6

Zygospores - 40 P  
45 C

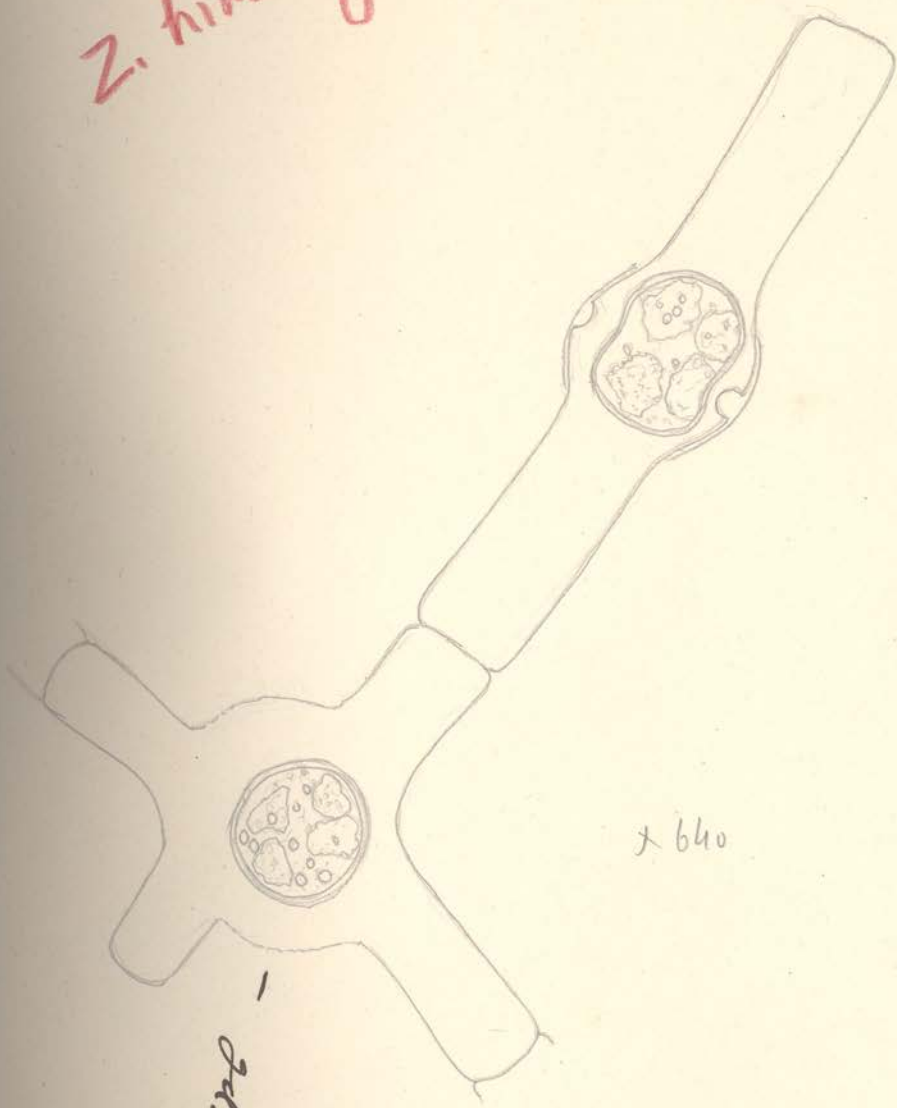
$$\begin{array}{r} 820 \\ 30 \\ \hline 23 \overline{) 24600} \phantom{00} \\ \underline{160} \phantom{00} \\ 160 \phantom{00} \\ \hline 39100 \end{array}$$

$$\begin{array}{r} 820 \\ 31 \\ \hline 23 \overline{) 25420} \phantom{00} \\ \underline{24} \phantom{00} \\ 24 \\ \hline 23 \phantom{00} \\ \hline 1100 \end{array}$$

$$\begin{array}{l} 40 \times 45 \\ 36 \times 72 \end{array}$$



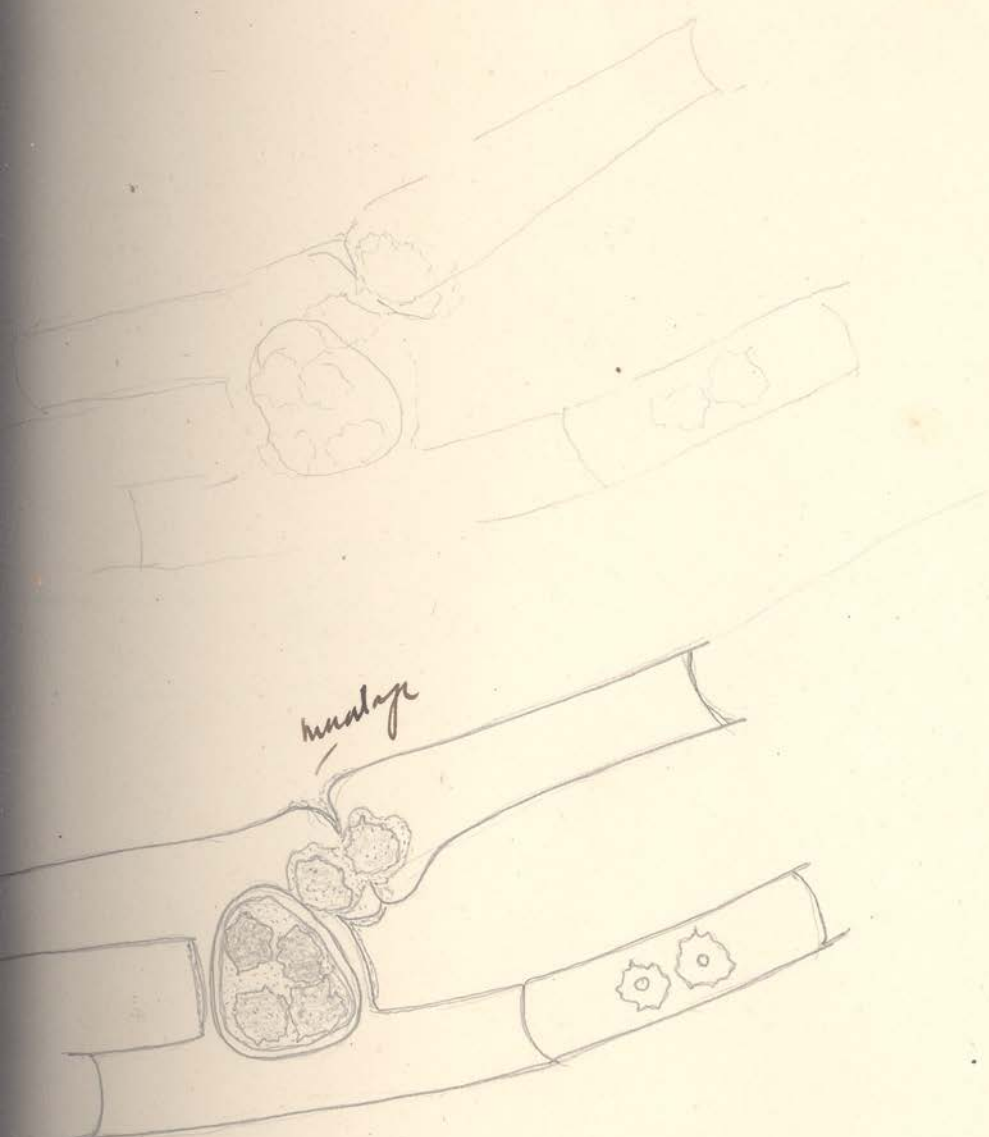
*Z. himalayensis*



x 640

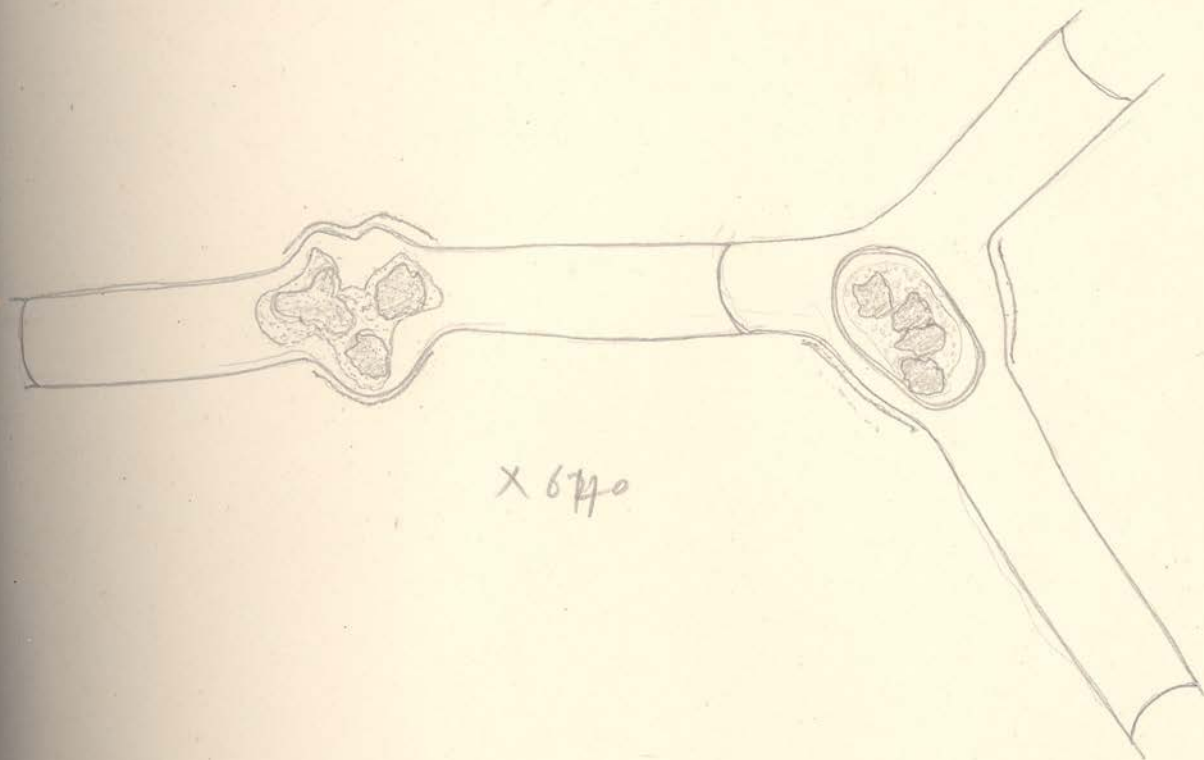
*Z. himalayensis* - 2 cells.

2. himalayensis



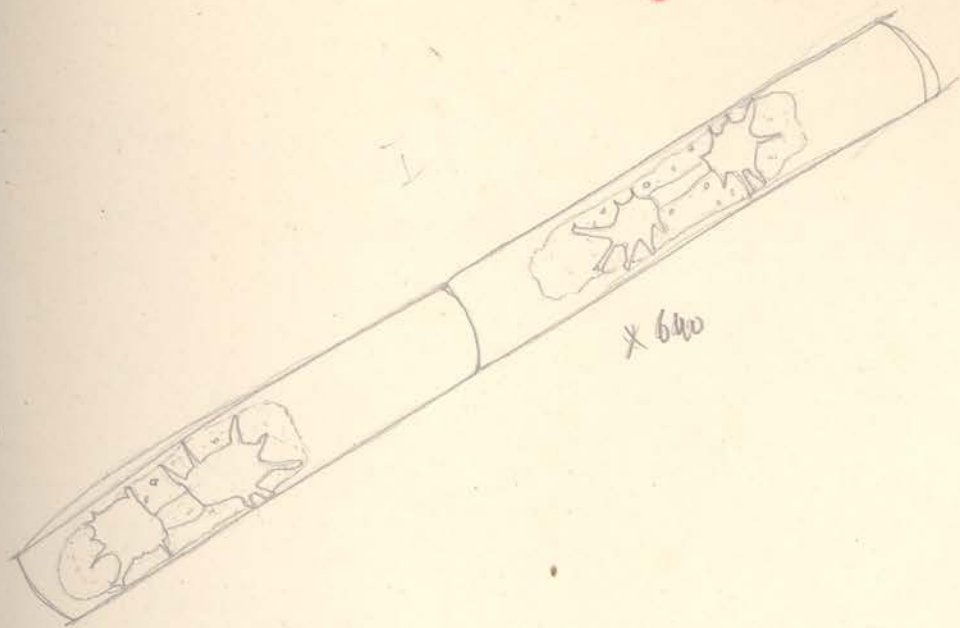
X 640

2. *himalayensis*

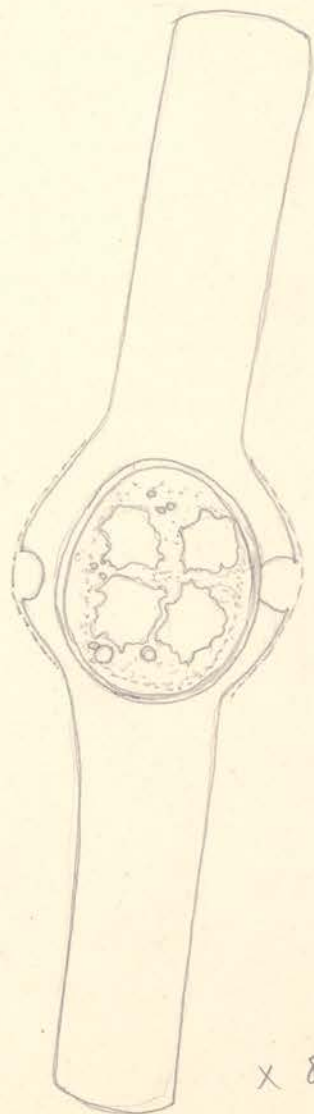


X 6740

2. himalayensis



20



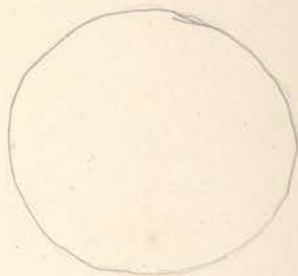
$\frac{1}{2}$

x 820

# Z. himalayensis

x 500

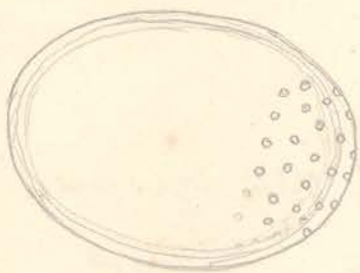
60 μ in diam.



Pls. 1-1 1/2 μ in diam.  
3-4 μ diam.

Pls. 1 μ in diam.  
1 1/2 μ  
3-4 μ diam.

Spores 36 μ diam.  
72 μ long.  
x 820

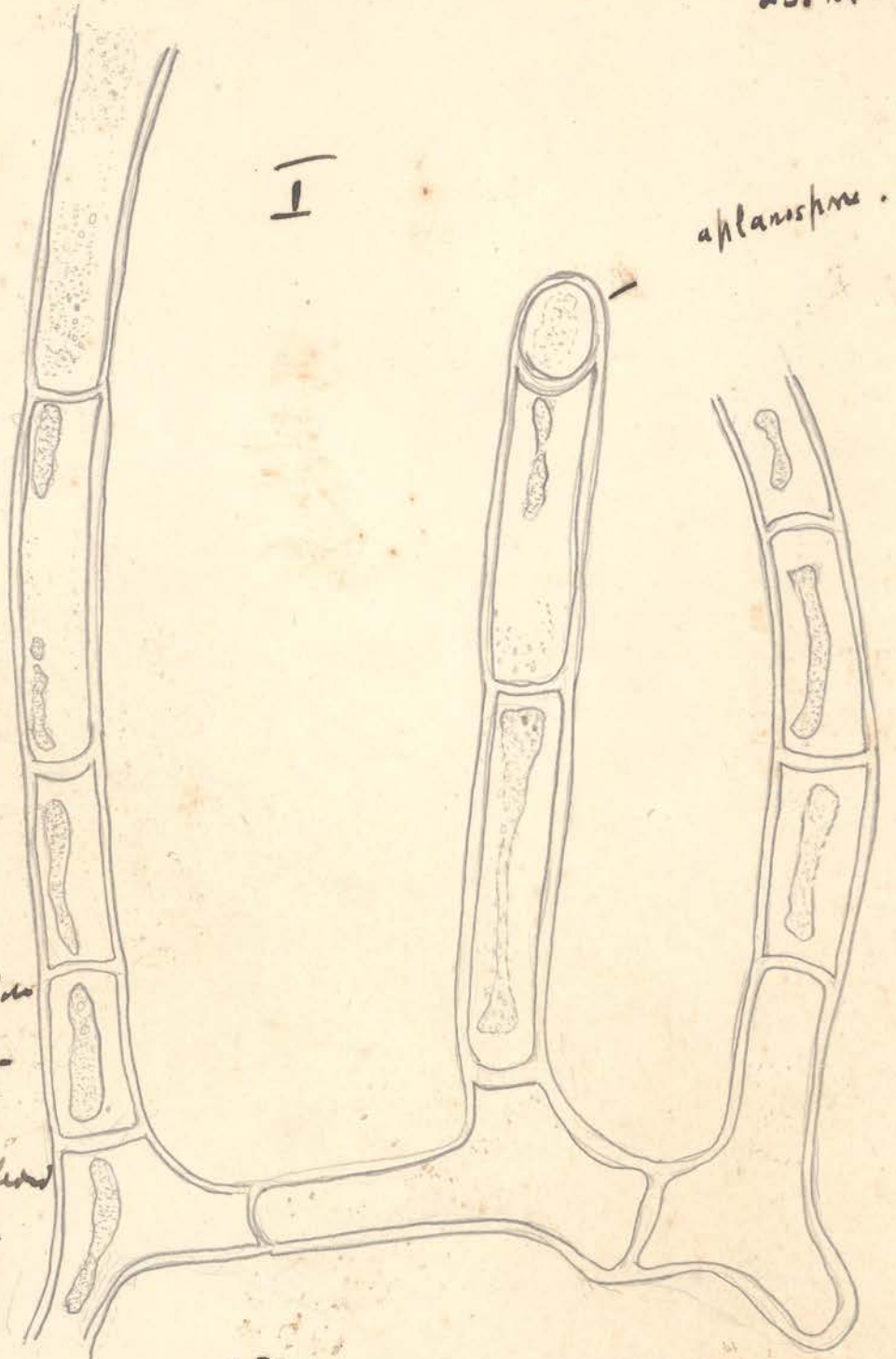


Like spores are found in water.

~~Phragmites~~ sp. nov.  
Zygozoum kumavasi

A.  
 Kew Gardens  
 Jun 1884  
 25. IX. 39

Ered. branches.



x 980

Aeroblast have  
 no pyrenoids. Food  
 material stored in  
 in form of oil which  
 stain dark with  
 osmic acid, & show  
 very little reaction  
 with iodine.

- x 6 + H.P. = x 620
- x 6 + O.S. = x 820
- 12 + H.P. = x 980
- 6 + L.P. = x 120
- 12 + O.S. =

Aeroblast stain  
 with osmic acid

*Zygozoniaceae* Kumaonensis.

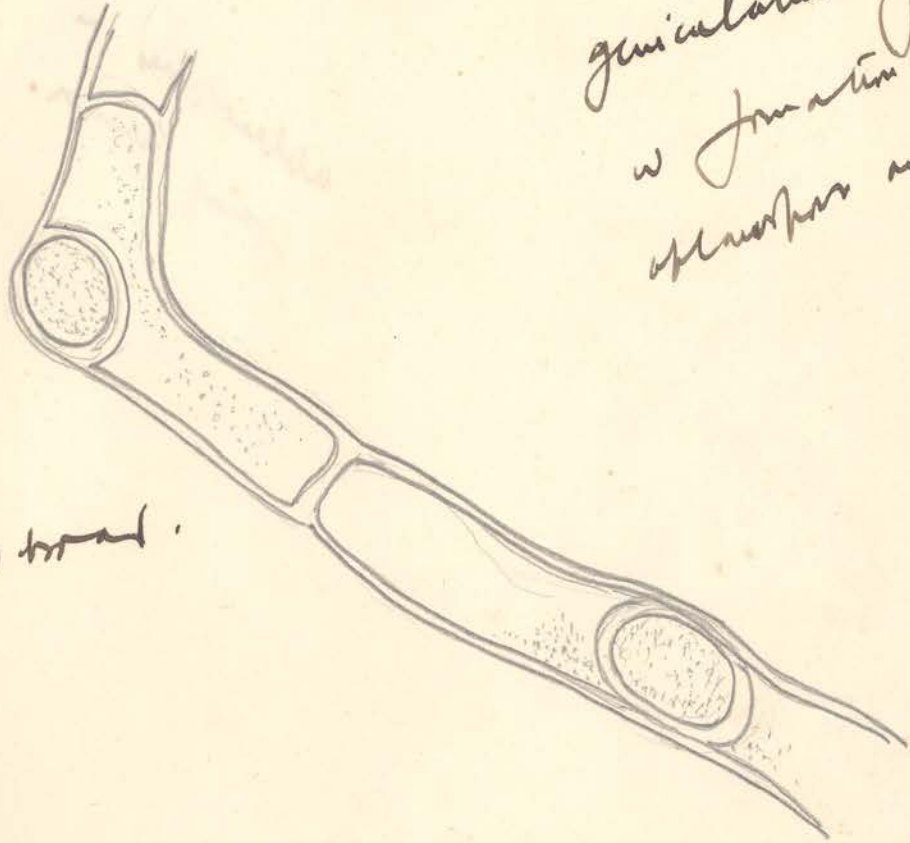
- Zygonema talgubhense* - 17-20  $\mu$
- 2. *Hansyigi* - 8-12  $\mu$
- 2. *calense* - 16-20  $\mu$
- 2. *Hezoniellii* - 20  $\mu$ .
- 2. *mirabilis* - 12-14  $\mu$
- 2. *erictorum* - 12-33  $\mu$

~~*Zygonema talgubhense*~~

*Zygozoniaceae* - 12-14  $\mu$

8.

Cell. caps. is not  
marked.



geniculation of a filament  
w formation of  
aplanospores on the side.

cells = 14  $\mu$  broad.

Filament = 10-12-14  $\mu$  long.

on the average 12  $\mu$  broad  
may 14  $\mu$  broad

Aplanospores = 15-20-24  $\mu$  long

12-15-17  $\mu$  broad

25-55-120  $\mu$  long

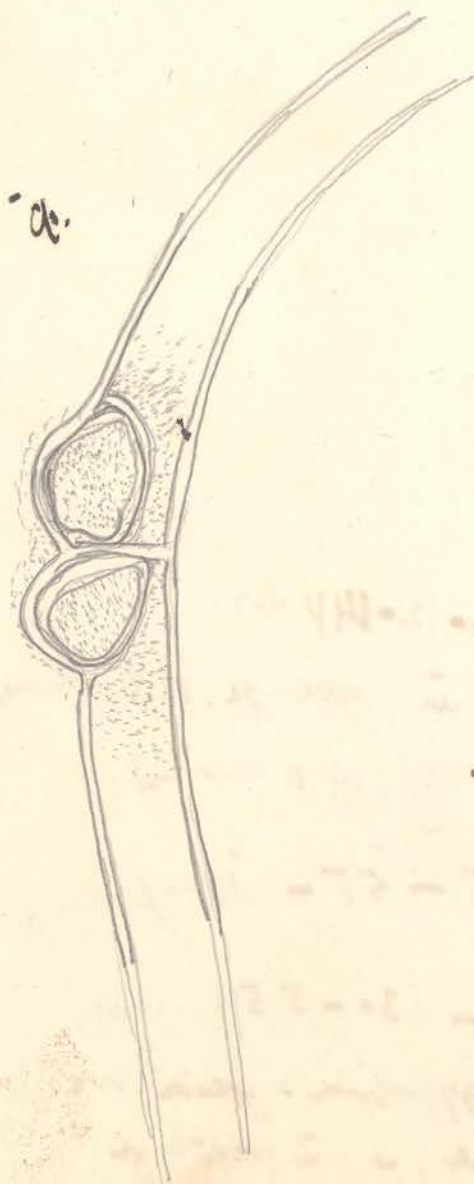
Aplanospore form. oval.

i. Differs from *Z. talgubhense* in the average - 30-55  $\mu$  long,  
smaller size of its cells, w position of aplanospores which are

ii. Differs from *Z. calense* in the smaller size of its cells, w the granular  
contents. *Z. calense* is formation of aplanospores at the ends of cells

The alga resembles cretaceous grass

Aphanizomenon in rhizoids  
fairly common.



x 980

Branching in family

In one case a chain of  
aphanizomenon found at an  
end of cells was seen.



Zygogonium Kumaonensis

~~Zygogonium Kumaonensis~~

an early stage in the formation  
of an accumulation of  
detrital material of  
trophoblast  
in end.

6.

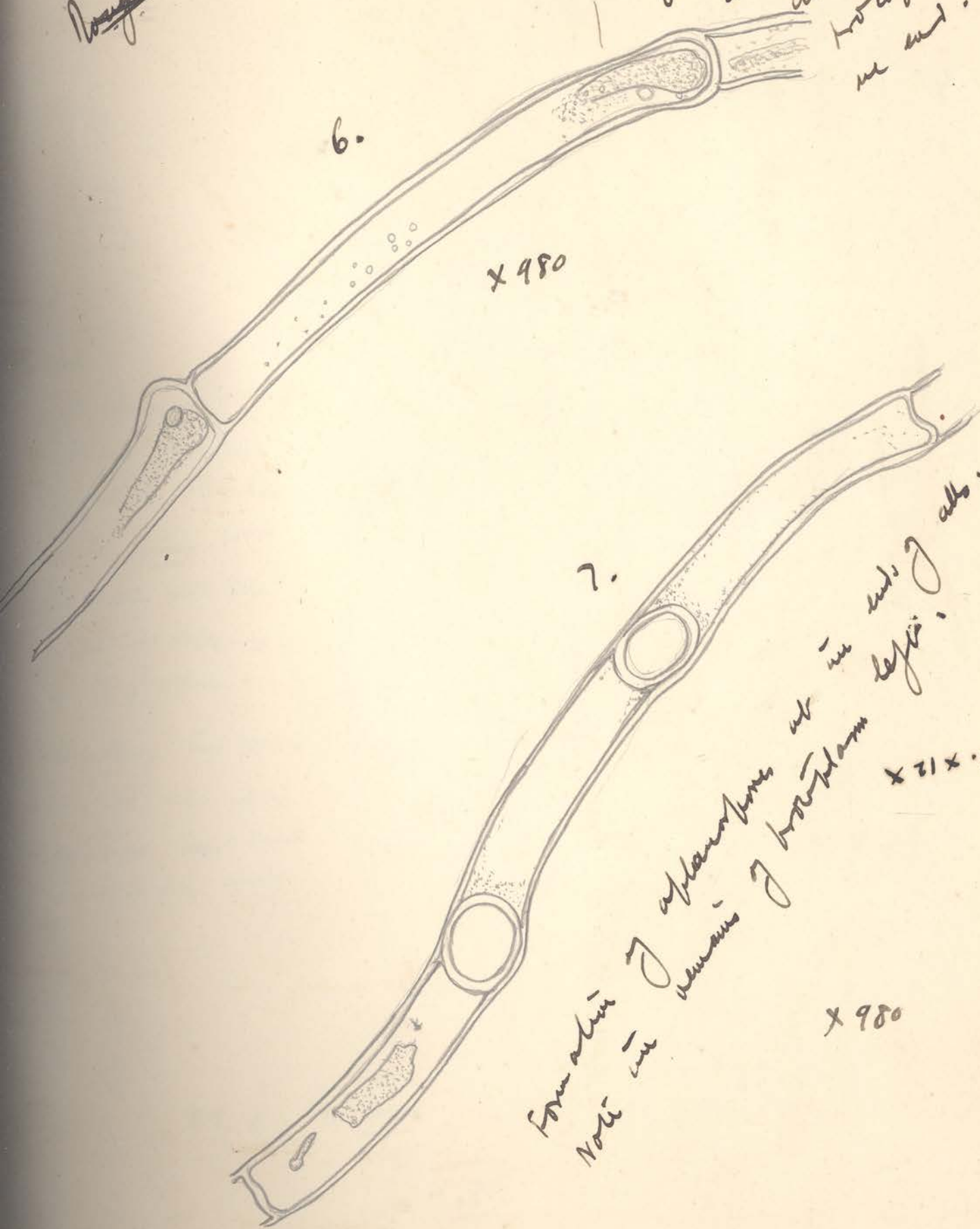
x 980

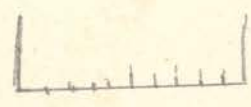
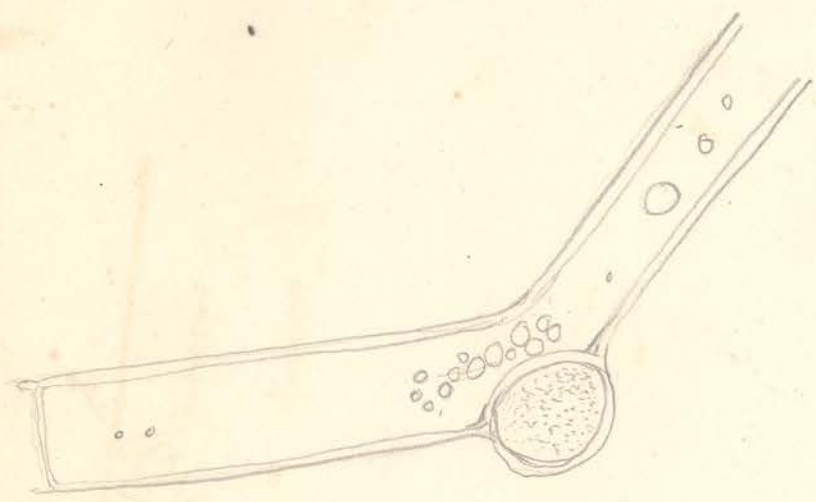
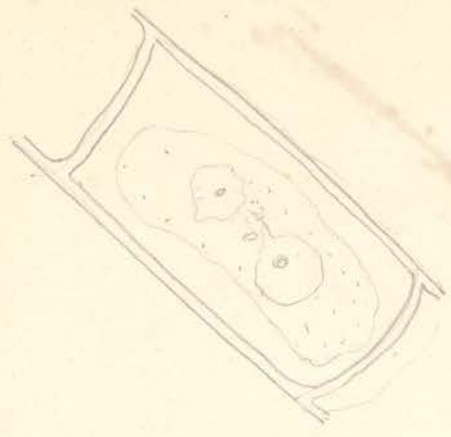
7.

Formation of aplanospores at the ends of cells.  
Note the remains of trophoblast left.

x 980

x 21 x 12 x





19 <sup>mm</sup> = 30 mm

20 = 3.

19 = x 4

~~Hydrodictyon limneticum~~

Zygogonium Kuetzingii

Chloroplasts -

- 1. Structure as irregular plate - movable
- 2. Sometimes central disc in the middle with two dark. lentic. like bodies at poles → in Zygogonium.
- 3. Sometimes two round bodies are seen at the sides <sup>each</sup> with a small pyrenoid. like body.

A.



Remain of protoplasm left after division of chloroplasts.

Chloroplasts are not  
 x 980 seen in all cells, in  
 most being one subpyrenoid  
 and very protoplasmic  
 seeds.

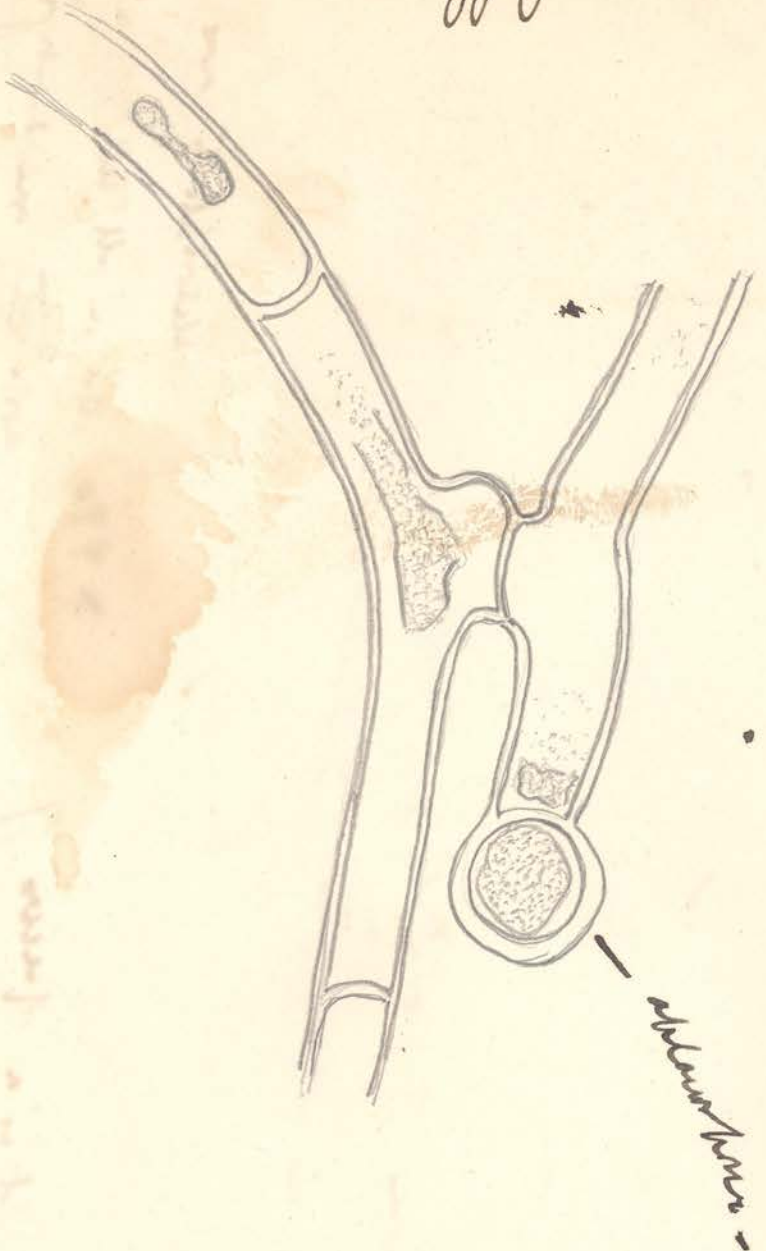
It is a species of  
Zygogonium

x 978

$$19 = \begin{array}{r} 31 \\ \times 622 \\ \hline 19 \end{array} \times \begin{array}{r} 30 \\ 31 \\ \hline 90 \\ 930 \end{array}$$

$$19 \overline{) 18600} \begin{array}{r} 620 \\ 30 \\ \hline 171 \\ \hline 150 \\ 133 \\ \hline 170 \\ 152 \\ \hline 18 \end{array} \quad 978$$

Zygogonium



Chloroplast

400x

Zygogonium

Only willow of a conjugation  
 tubes being formed. However  
 no conjugation of chloroplasts  
 seen - have taken place.

~~Paraglossogaster~~

an oplanthid  
found in the  
middle of cell.

*Zygo-gonium kumawense*

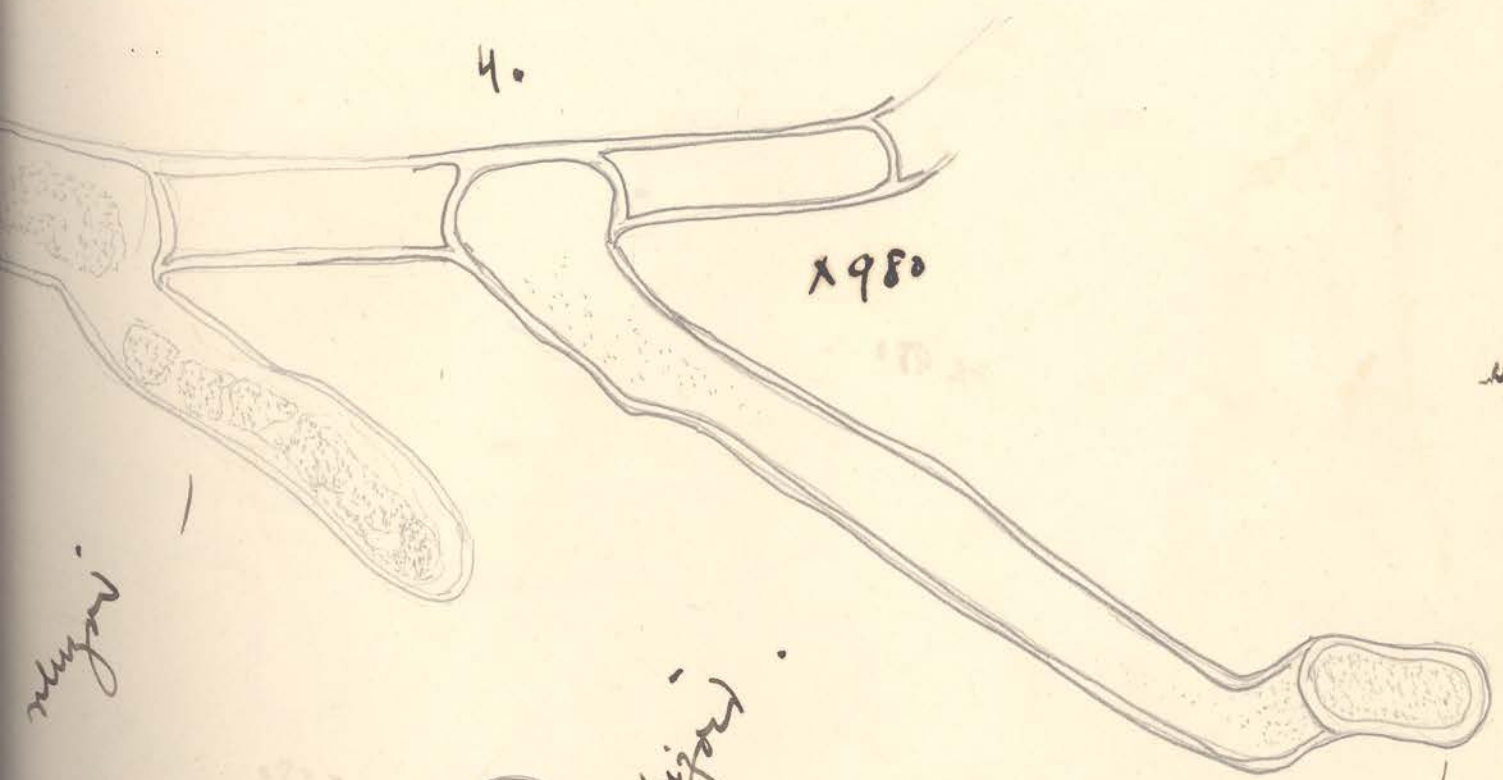
x 980



Product of assimilation  
is oil.

4.

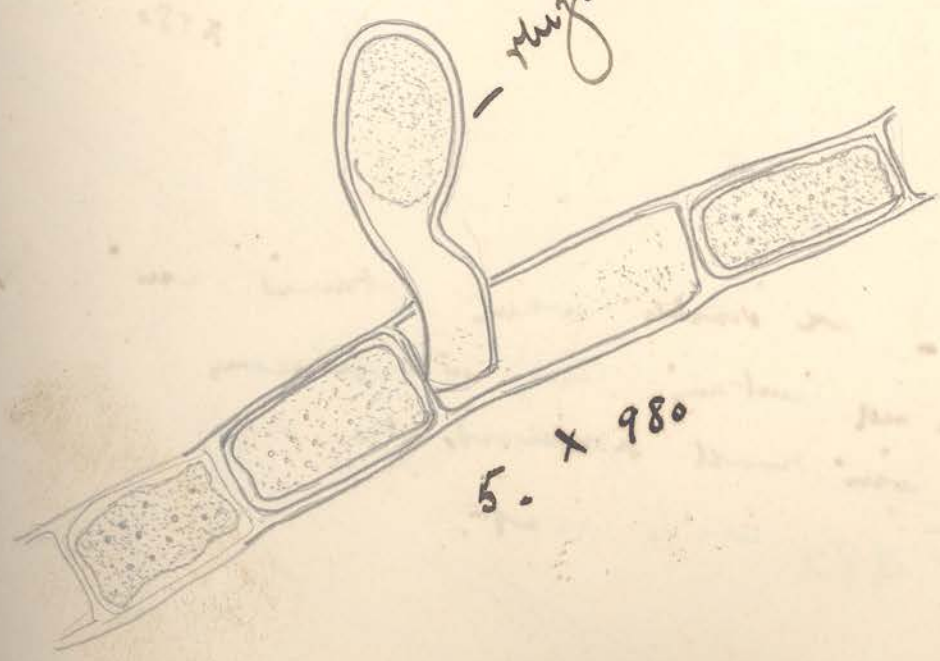
x 980



rhizoid

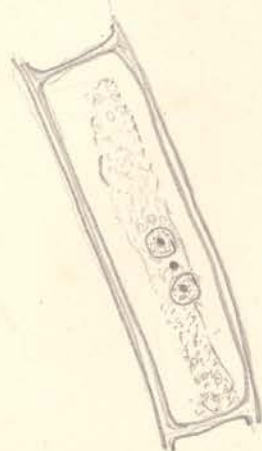
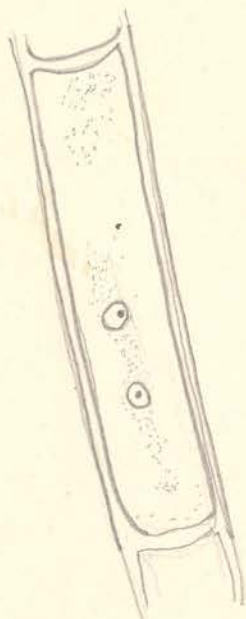
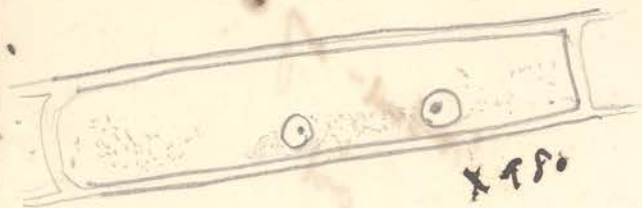
rhizoid

5. x 980



abundant found  
w/ growth at the  
tip of rhizoid

Zygozoum



Chloroplasts - are visible when stained with  
Nile blue. Each cell contains two inconspicuous  
rows of small granules, they may  
be close together or wide apart.

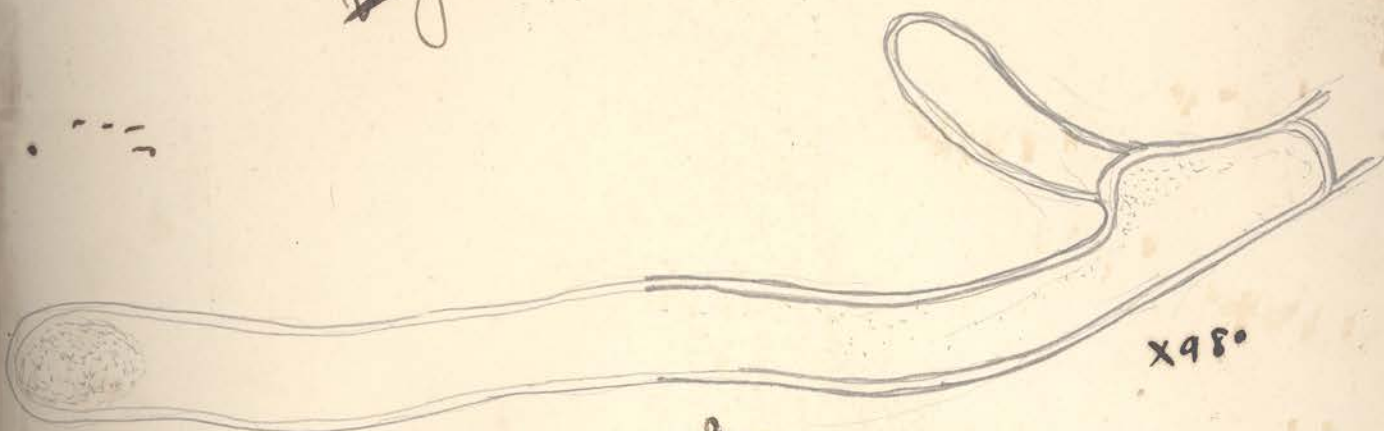
Zygogonium Kumocuró

No. 10

No. 10

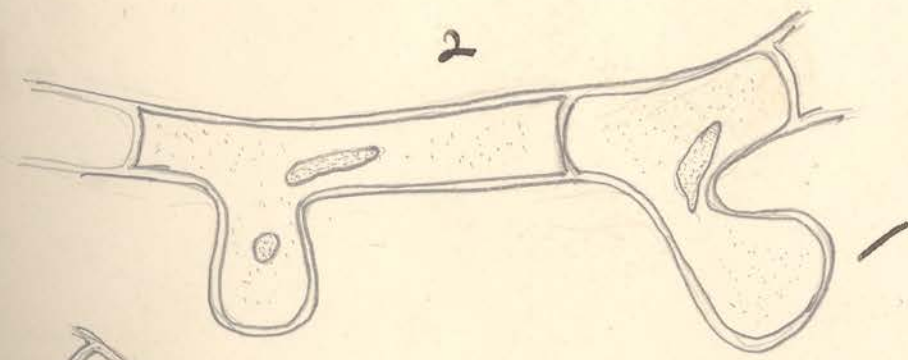
~~Zygogonium Kumocuró~~

Schleier zygogonit



x 980

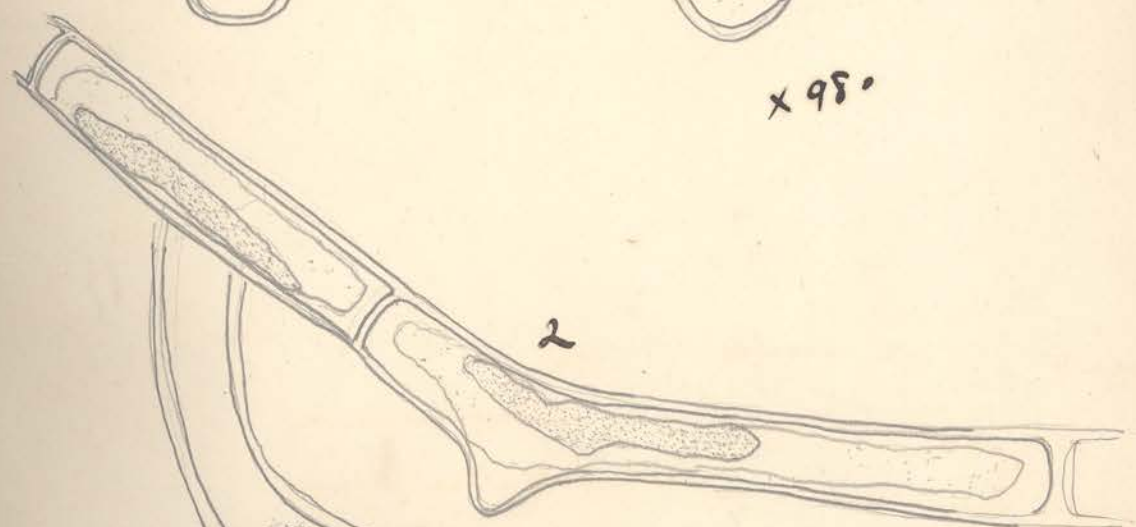
30



2

zygogonit

x 980



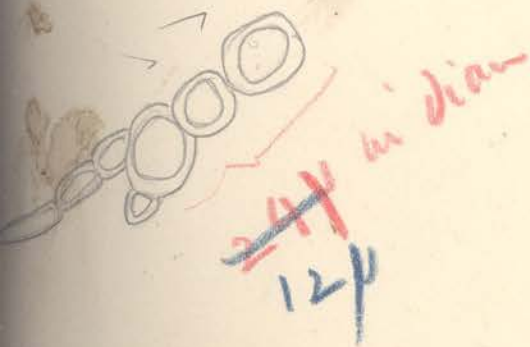
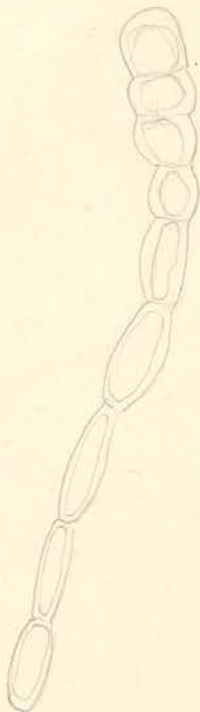
2

x 980

*Swanopsis* sp.



Terminal cells  
have a blind-  
apex.



All x 880

10 μ ev.

~~x 16 μ x 20 μ broad~~

~~32 μ long~~

All x 620

x 16 μ



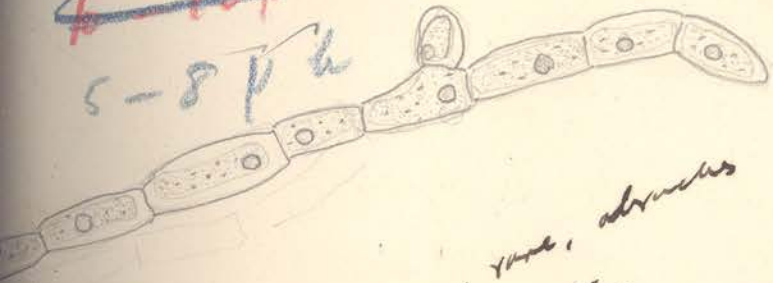
Iwanoffski.

11 - 20

~~22 - 40 x long~~

~~16 x br.~~

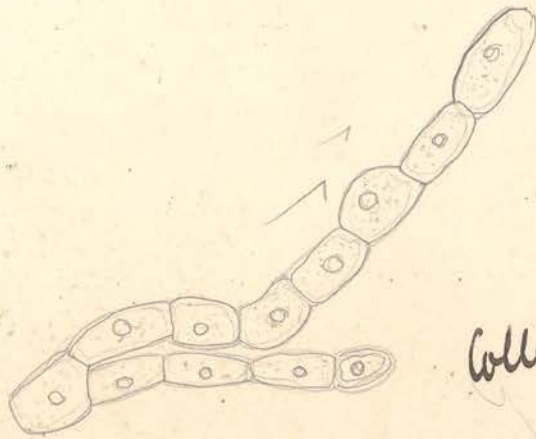
5-8 x h



Branching very rare, always  
always alternati.  
Terminal cells were -  
blunt apex.



Jan. 27  
Jan. 29.

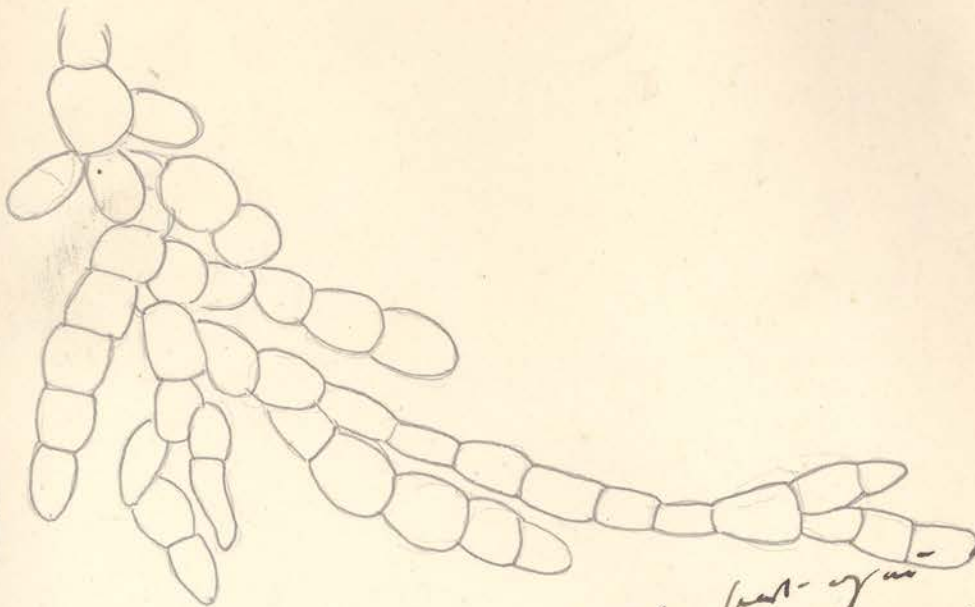


All x 880

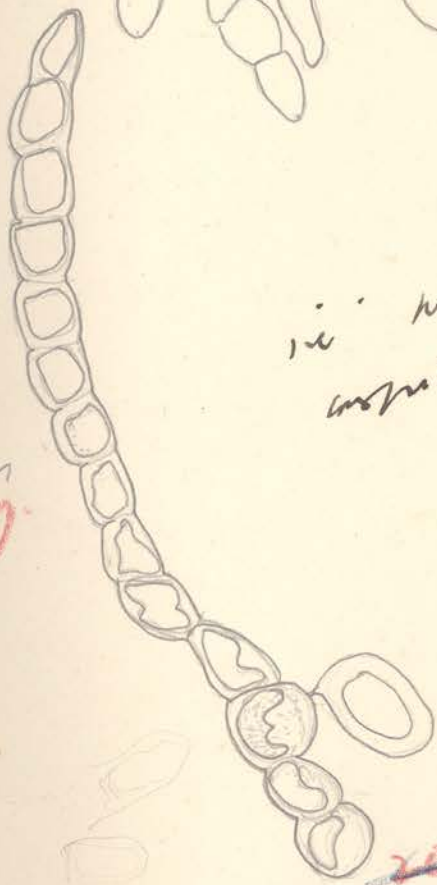
This alga was found growing on the  
sides of a bridge in the town of  
a greenish yellowish-green covering.  
its protoplasmic. On the middle of  
the sides where it was greenish  
yellow. It was yellowish green in  
it was yellowish green in  
color. On a lateral branch  
of Pleurococcus seen in  
most cells. Some:

Collected again on  
27th. April 4. on the way from  
Fossil to Allentown. Was collected  
at the base of  
sides of  
ditch & sides  
in color

Labrial arthra - April 27



The lower part of the algae  
in the prot. part was more  
inspiration to dead.



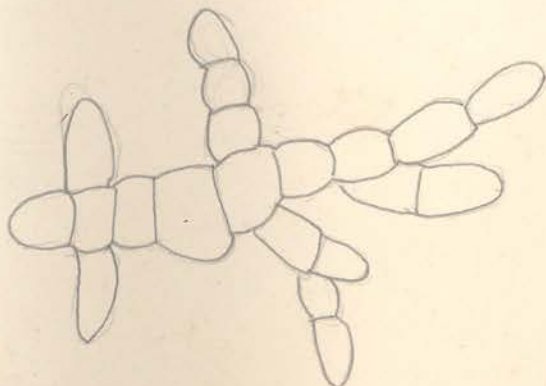
~~11 x 100~~  
top  
7 x 80

Some of the cells  
lost their green color  
as the same algae.

The heart becomes  
yellowish in color.

~~20 x 240~~  
in detail.

10 x 120

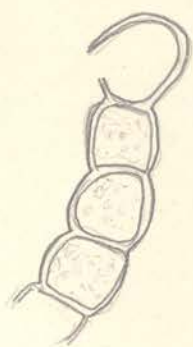


10 x 880

~~820~~

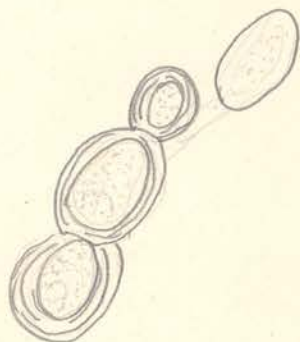
x 660





some of the cells were  
found substituted  
with.

long. rounded cells of  
the prot-radiophyta.



cells of the prot-radi.  
system which were  
stratified walls.

However contents  
were dark green, and  
new yellow size.

A cell of the  
system getting involved into a spore.



All x 88.

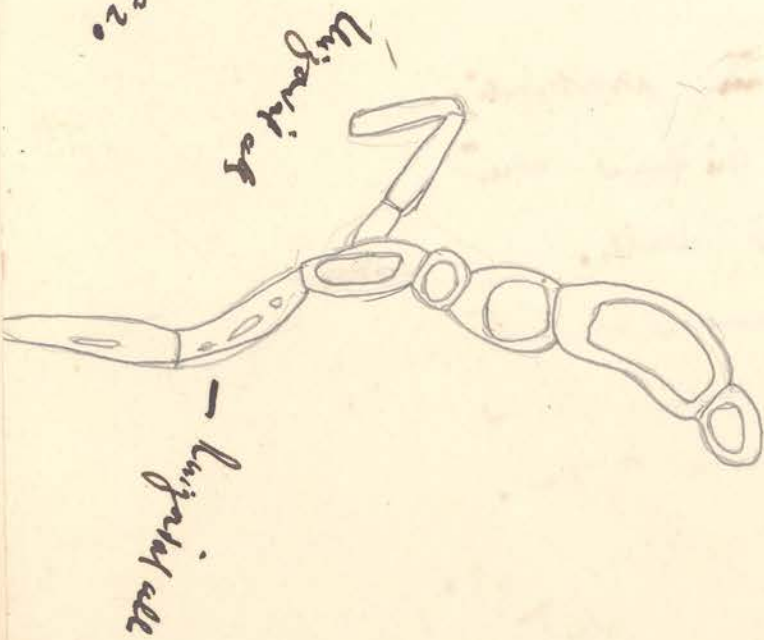
W. M. M.

The first medical  
 was in a very old  
 building in  
 the city of  
 London.

Lunges, system  
 or cut in - fingers  
 with the

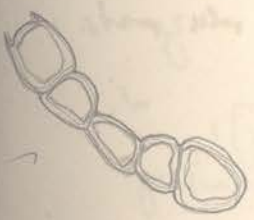
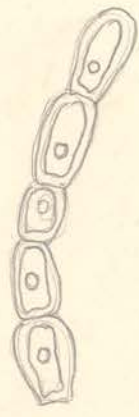
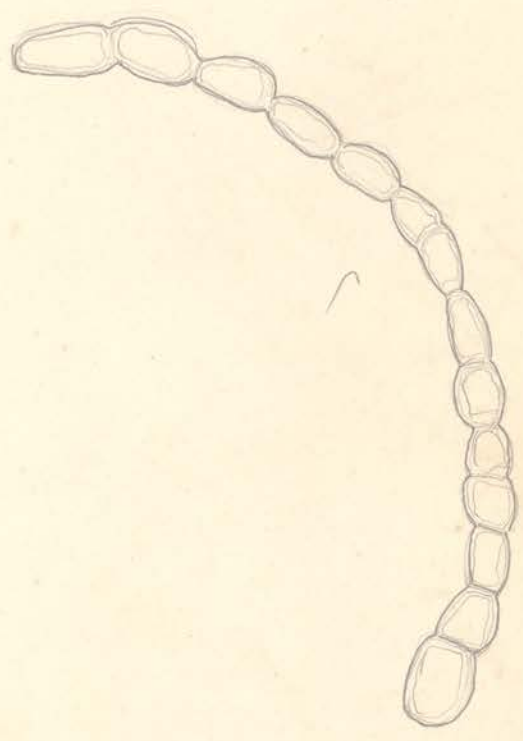
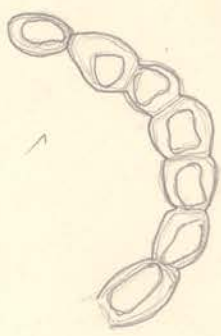
seen in  
 the  
 medical  
 system  
 in  
 the  
 city

x 220



Filaments usually  
with a ... very young  
... ..

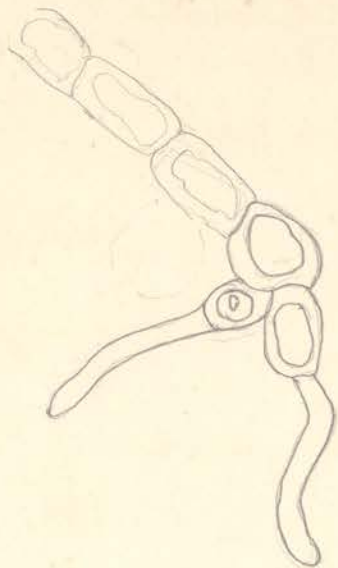
Young filaments are  
usually curved.



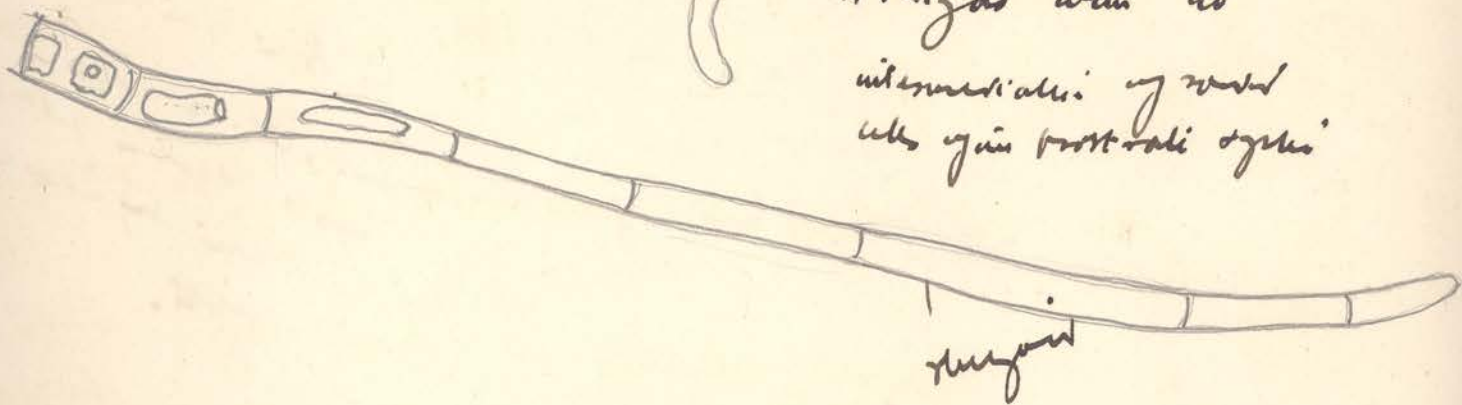
14 - 16  $\mu$  dia.

All X 880

2000

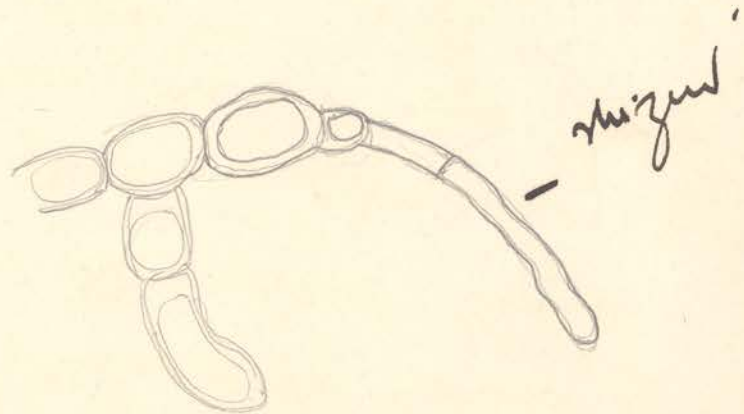


Arthizoid with 40  
intermediates of root  
lets you protrude eyes



rhizoid

and - leaves



rhizoid

*Glucosiphonia*

Collected from Tantalus Point Canada, on the 6th. units  
Canada. September 1937, November 1937, Dec. 1937,  
March 1939. On Nov. in alga appears in  
of brownish flocculent masses from floating  
water & epiphytic on the stems of water plants.

Cysts are yellowish to deep orange in  
color.

Material collected in March 1939 was dark  
bluish-green in color when in culture and was found  
in bundles only. Cells resemble more of *Glucocystis*  
or *Glucosiphonia* in shape.

The chloroplast is a massive parietal  
body green in color when in the young cells fills  
the whole cell. In fresh material, the chloroplast  
is green, yellowish-green or dark green in color  
In grown up bigger cells the chloroplast becomes  
reticulate.

In the middle of each cell is a  
pyrenoid. The body. Some cells were seen  
full of starch. hercules. Cells become deep  
blue or black in color when stained with  
iodine, which shows the presence of starch.



The cell-wall is composed of a number  
of thin warty unilaminar layers, which  
become irregular in appearance in growth  
cells. Test in nature of cell-wall with  
chemicals -

Some of the cells were found empty,  
the cell-wall being ruptured on one side,  
perhaps due to breaking of cell contents  
in the form of a warty body.

In some cells, the  
contents were seen rounded off in the  
form of dome-like bodies, which  
appear to be unincised buds.

Cysts. — The contents of most  
of the cells were found to be deep orange  
in colour, like the cysts of Protozoa  
diatoms, and were slightly granular in  
appearance. The whole protoplast becomes  
contracted into a single cyst. The size  
of the cyst varies from the smallest  
to the largest. — The mature  
cells are depressed. globose in shape (fig)

The cells seem to divide laterally, and  
the older cells remain enclosed in

Common sheath giving the alga *Cladocapsa*-like appearance. Falls  
 on due to the growth of daughter-cells, the common outer multilaminar  
 sheath breaks, and in some cases its remnants may be seen at a distance  
 on the side. (Fig. 1). Ultimately the daughter cells round off, and  
 may be seen attached to each other in a linear  
 fashion like a string of beads (Fig. 2)

This material was again  
 collected from Torotal pond  
 on 12th April 1917. The chloroplasts  
 are deep green with a  
 thick folded margin. Some  
 of the cells contain granules  
 which look like starch  
 granules.

The chloroplast stain  
 deep blue with iodine  
 due to presence of starch.



347 W  
 17

x 820 .

407 diam

However the cell division is not strictly  
 linear, but may take place in any direction  
 in depth all being attached at all points  
 of angles in each row. This gives rise  
 to a peculiar <sup>type</sup> of branching (Fig ).  
 In some cases the alga resembles the  
 palmella stage of certain species of  
 Stigeodermis.

Affinities — This alga shows some  
 resemblance at least in outer appearance in  
 of smaller dimensions with 'palmella stage of certain  
 Chlamydomonadae like Chlamydomonas braunii. But  
 the absence of contractile vacuoles, at red spots and  
 presence of narrow parietal chloroplasts, and  
 thick stratified cell walls, and peculiar  
 type of growth and branching preclude any  
 connection with Chlamydomonadae.  
 The cells of this alga resemble  
 those of some species of Lythidrocapsa in their  
 hexagonal covering, and narrow parietal  
 chloroplast.

Natural color in NW. sec. was  
 pale yellowish. red in color, which was collected  
 in April was dark blue-green to grayish  
 green in color. Included Gloeodictyon sp,  
 Ninospora indica, Perisporium sp. Oosporium sp.  
 Asterococcus sp. numerous species of Desmou-  
 lins Cosmarium, Staurastrum in situ.  
 Sphaerocarpus, Scenedesmus

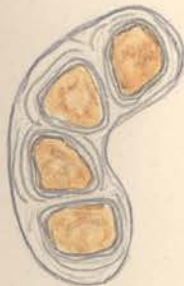


x620

The middle part-staini deep black  
 with color. green iodine.



x620



x620

Externally this form resembles *Dinobryon*,  
a filamentous member of Dinophyceae, in which  
form also, all cells are capable of division,  
there being no differentiation of base and apex  
but - in green colour of the chloroplasts  
in presence of starch granules of relationship  
with *Dinobryon*. A similar superficial resemblance  
of this alga with *Prochloris crescentiformis*  
also be marked. Parallelism in development  
as shown in *Chlorella*, *Chlorella*,  
and *Gesleria*.

veg cells 13-18 μ

35-48 μ x 28-40 μ  
plus 10 μ in the beak  
layer.

*Rougetia*

*Rougetia oesognusoid*

*Rougetia gelatinosa*  
with outer envelope

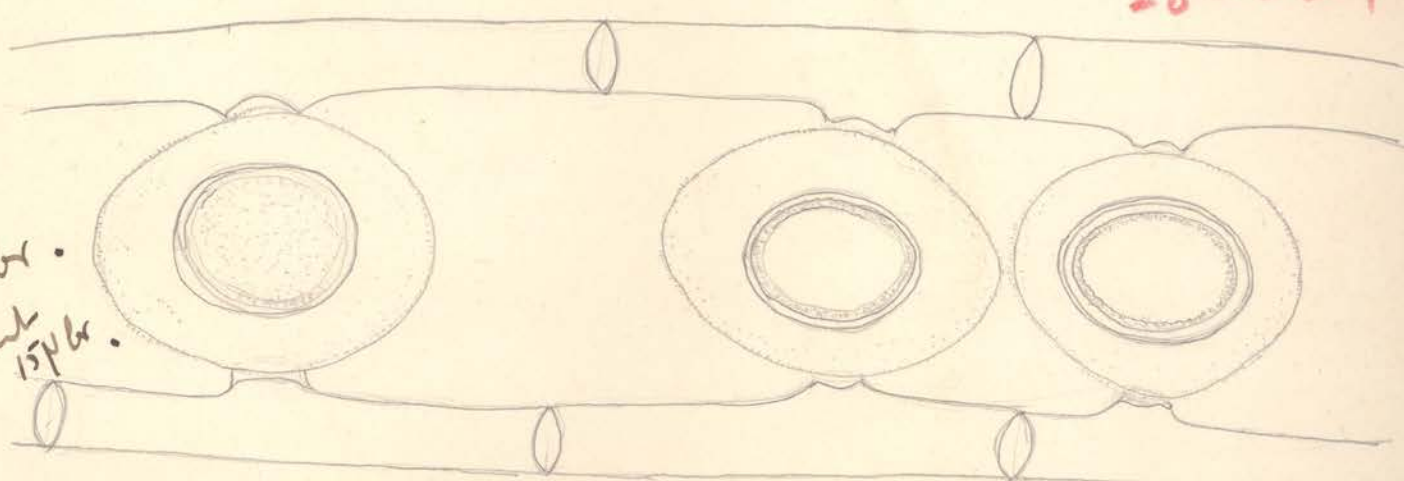
1. cells are 16-18 μ broad  
2. conjugation geniculate  
3. Zygotes, rounded or elliptical  
with mic. brown. tuberc.  
41 μ by 40x50 μ

broader annulations  
bigger zygotes  
caps of annulations  
in gametangia

108  
18  
227  
15 v 20  
16  
Tuberc. Tub.  
darkish, 10 μ in diam  
m 6/2/37  
with *R. pinnata*

spores = 60-72 μ long  
50-58 μ br

some spores  
36-41 μ long  
28-32 μ



spores  
60 μ br.  
gelatinous wall  
15 μ br.

12-16 μ

annulations Vegetation all 12-  
33-36 μ br.  
33-39 μ diam.  
9 μ in diam  
outer gelatinous envelope  
63 μ - 68 μ long

The gelatinous envelope  
is quite transparent and  
is visible due to  
accumulation of dust-  
particles in its outer regions.  
x 620



$$H.P. = 1m = \frac{1}{2}m$$

$$1mm = 2\mu \quad 0.5$$

$$1mm = 3\mu \quad H.P.$$

$$0.5 = 1mm = 1m$$



$$1 = 2\mu \quad 0.$$

$$1 = 3\mu \quad H.$$

$$1 = 1.5\mu \quad 2.1$$

$$20 = 20$$

$$20 = 30$$



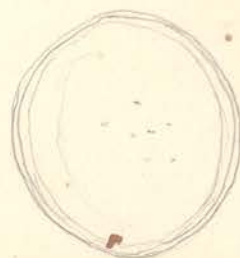
$$11 = 20\mu$$



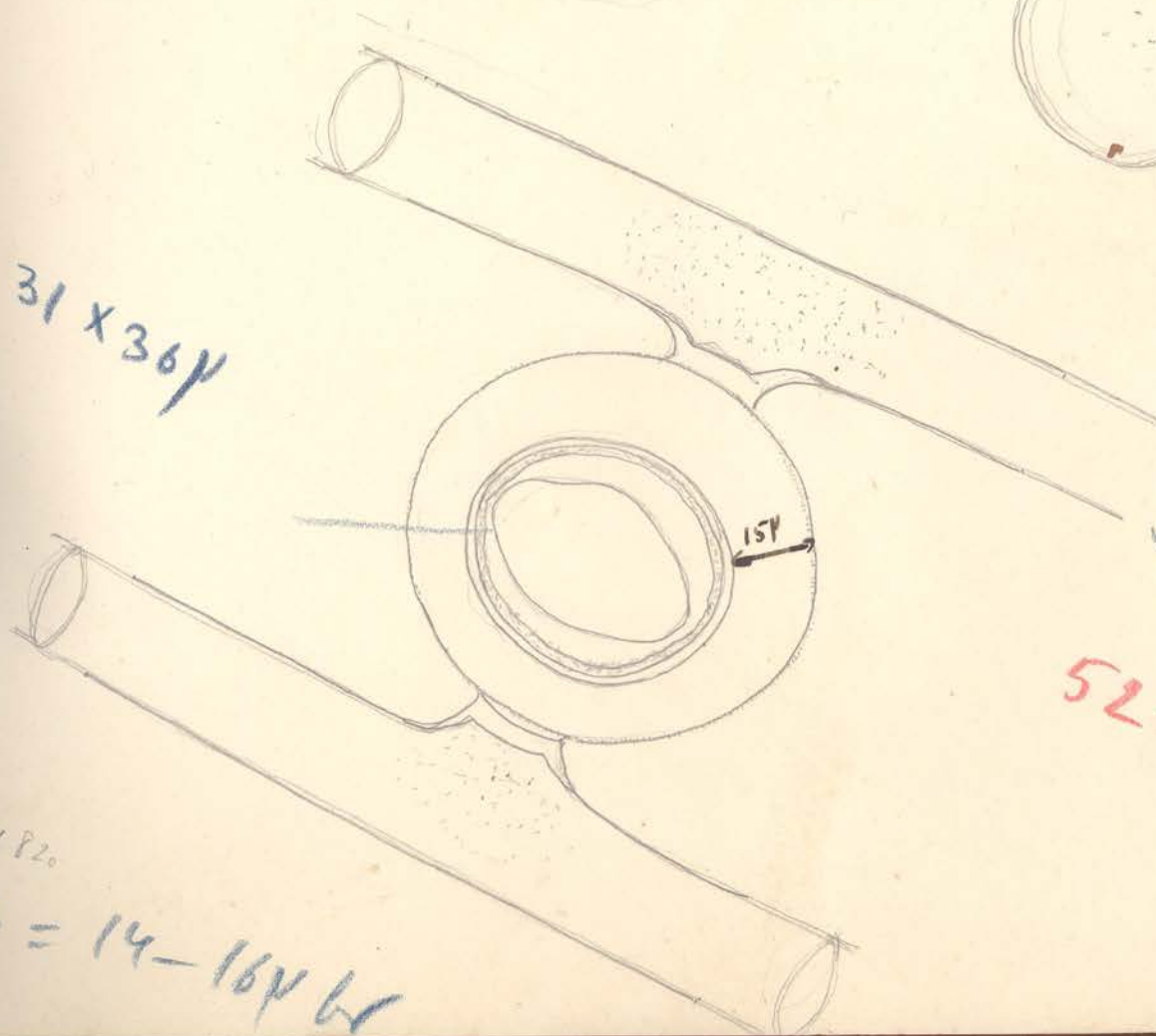
Spores yellowish. some  
pink  
Hyaline



Spores - many  
hyaline



31 x 30 μ

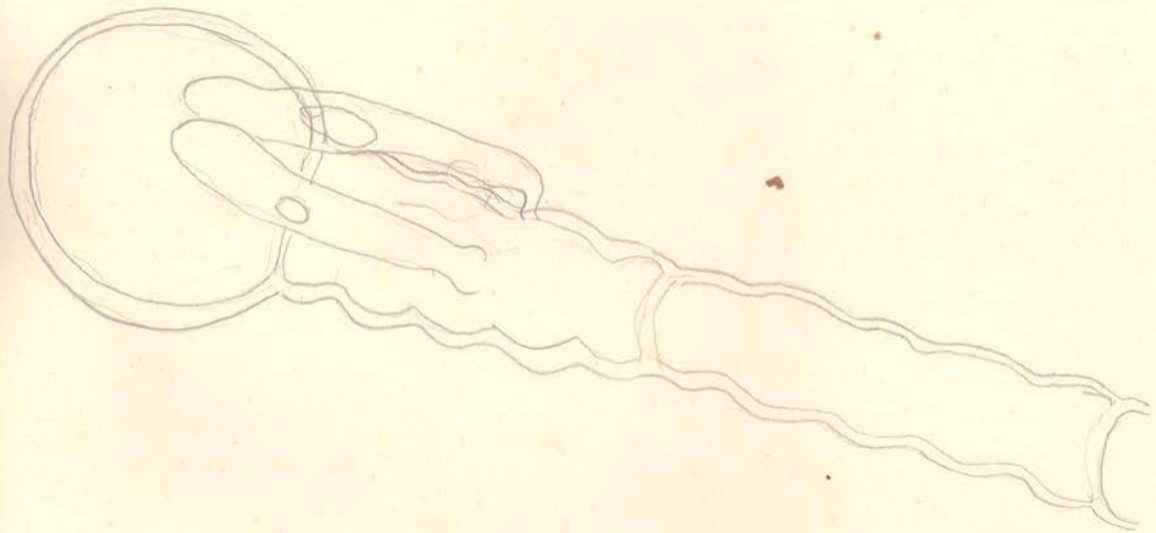


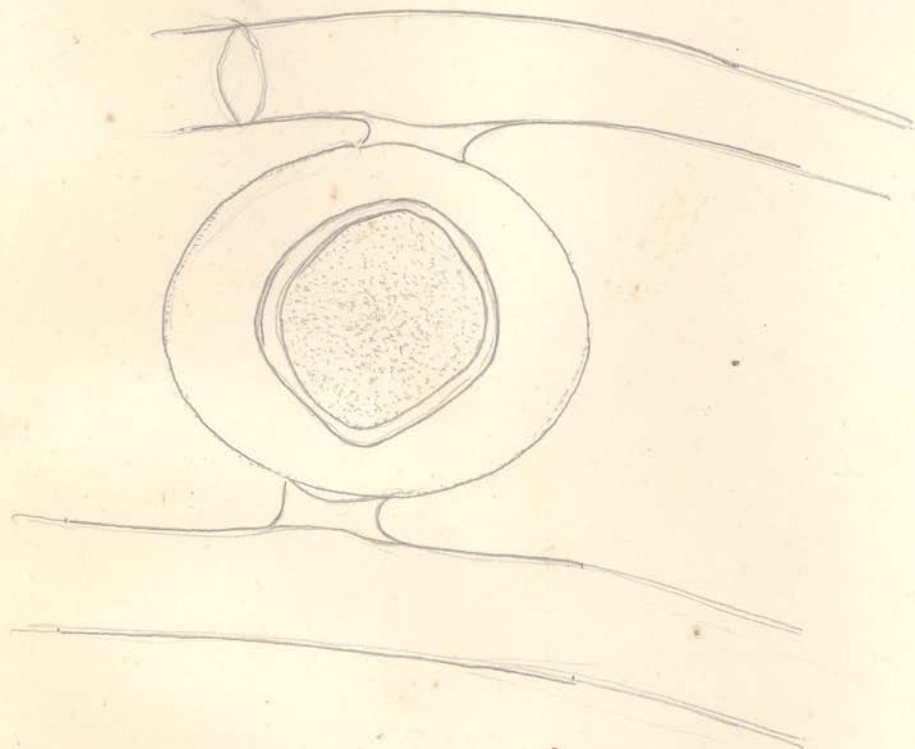
45 x 75 μ

x 820

15 = 14-16 μ







46 x 57  $\mu$

veget. cell = <sup>x 100</sup> 13 x 15  $\mu$  diam.

Differs from *C. moolleli* w  
*C. gemmilla* in its shape of  
 cells, which are elliptical or  
 rounded in one.

*Cylindrocapsa*  
*scytonemoides*

cells 1 granit  
 18μ - 21μ - 24μ - 27

Arthrodes  
 horizontal;  
 polygonal;  
 w/7-8 cells

Arthrodes  
*C. conferta*  
 in size of cells  
 but cells are  
 larger.

21-26 x 12-20  
 24 x 30 μ

*C. oozonoides*  
 resembles *C. gemmilla*  
 in size of cells  
 but differs in its  
 specific oozonia

*Cylindrocapsa*  
*minor*

cells 18μ - 21μ - 24μ

Arthrodes -  
 irregular  
 & stellate

(5-6 in size)  
*C. gemmilla* →  
 cells more  
 much too long

Similar to  
*scytonemoides*

differs

*Cylindrocapsa*  
*crassa*

cells oval or  
 hexagonal

15-14 μ

Arthrodes  
 horizontal,  
 in shape of  
 cells.

Single capitate  
 hypnozooids.

Arthrodes *C. conferta* in  
 size of cells.

*C. madrasensis* - has  
*C. scytonemoides* - has  
 cells



22420