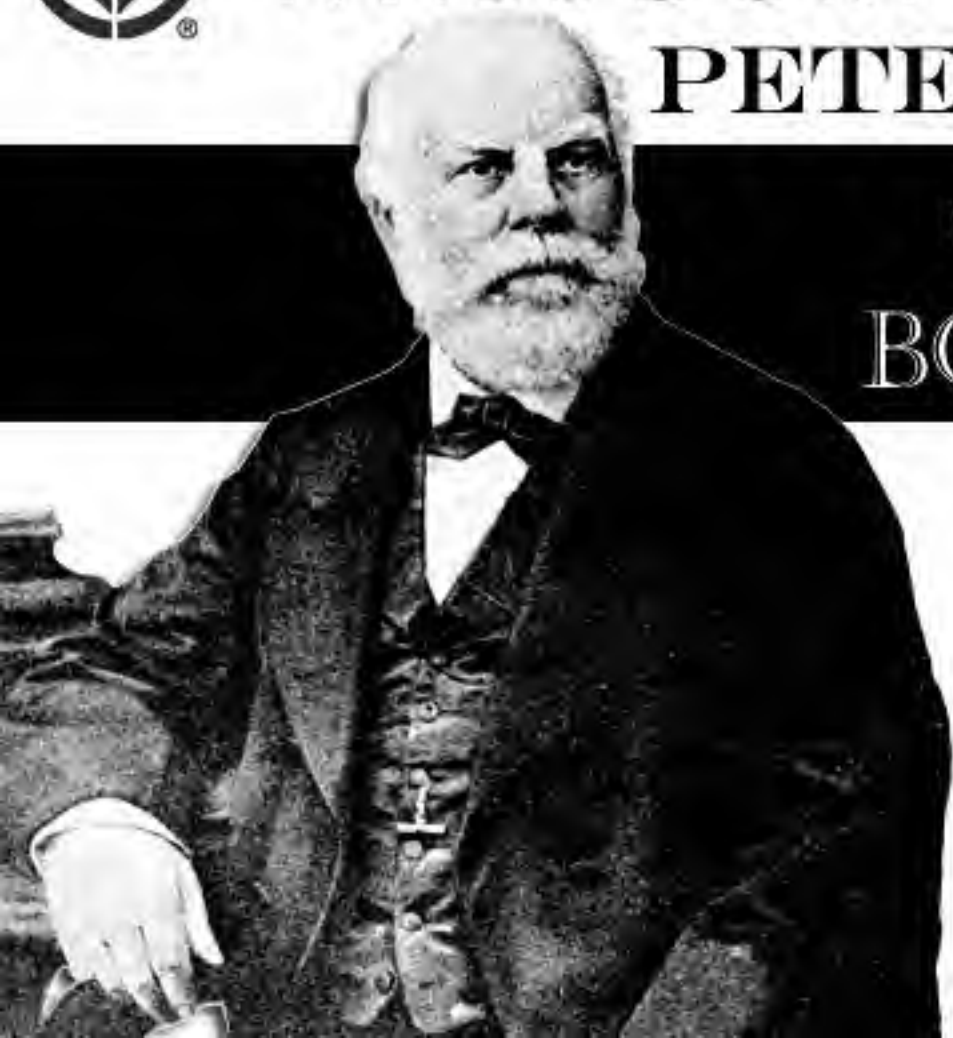




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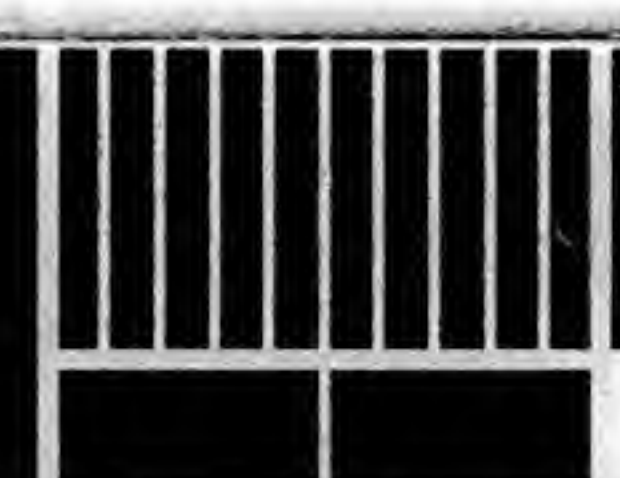
GEORGE ENGELMANN
BOTANICAL NOTEBOOKS

Pagination Note:

Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

72-5

Isotes riparia!
banks of Delaware River



0 1 2 3 4 5 6 7 8 9 10

cm

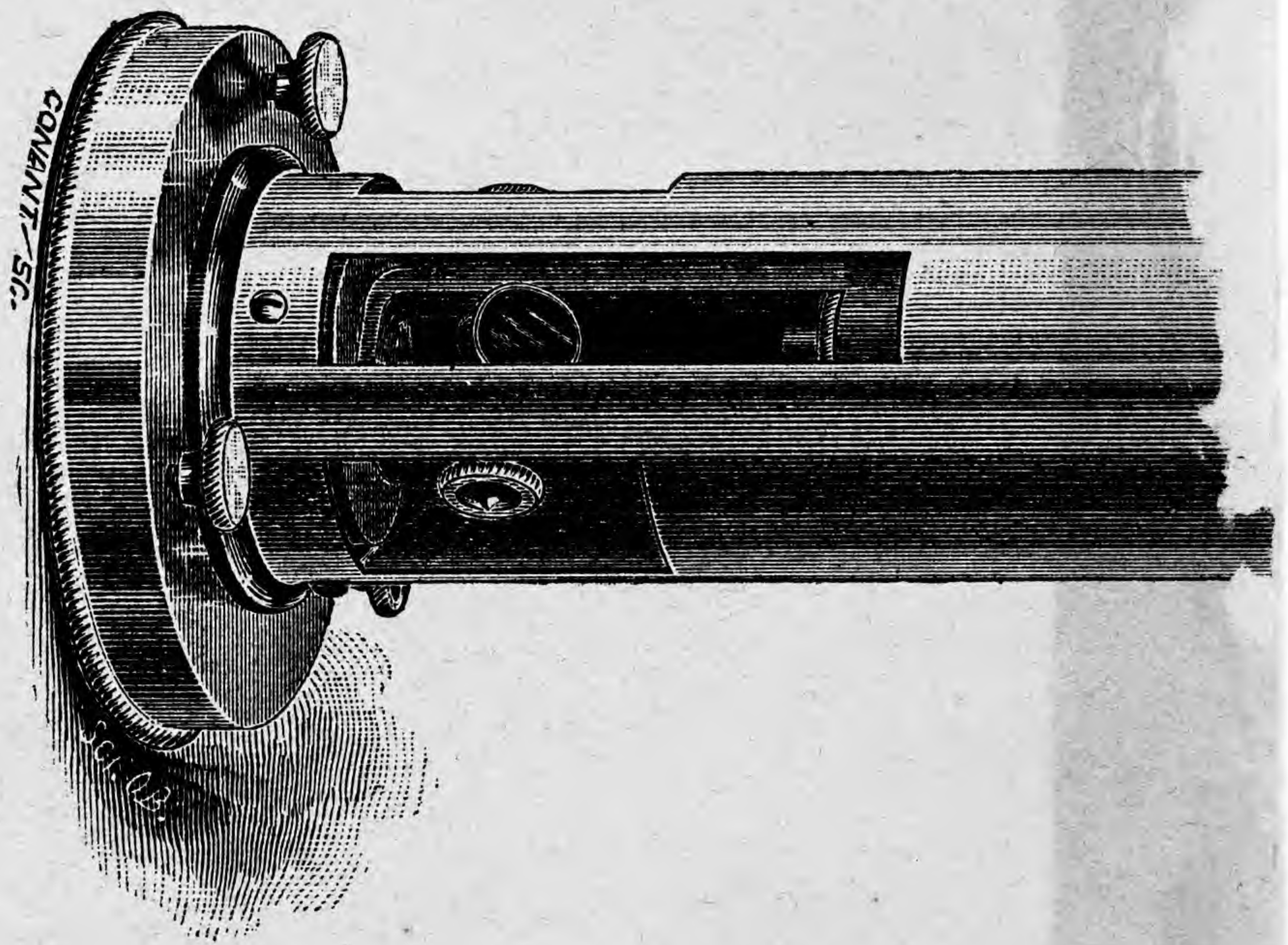
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MISSOURI
BOTANICAL
GARDEN

13697

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS



0 1 2 3 4 5 6 7 8 9 10

cm

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BOTANICAL
GARDEN

re shaken together, the fat globules which are always formed, become surrounded by an albuminous coat." If fat and albumen outside of the body can form vesicles or cells (and this is a fact) it requires no great stretch of credulity to believe that cells can be formed in a freshly exuded blastema in immediate contact with the living organs.

We quote again from Kolliker, page 43: "With regard to the development of cells, we have to distinguish between their free origin and their production by the intermediation of other cells. In the former case the cells are developed independently of others in a plastic fluid. The cytoblastema of Schleiden, containing chiefly protein, fat and salts in solution; in the other or in cell multiplication the existent cells produce the so-called secondary or daughter cells within themselves, or multiply by division—endogenous cell formation, and fissiparous cell formation.

We see that Kolliker recognizes the fact that cells are multiplied by fissiparous generation, that which is almost exclusively contended for by Virchow, yet as a fact contends that they

Riparia

72-4



0 1 2 3 4 5 6 7 8 9 10

cm

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BOTANICAL
GARDEN

and we contend, that so far, facts decide the question in the affirmative. Let further investigations finally decide. We await them with a decided leaning to the blastemal theory as a part of the truth, admitting, of course, the facts of fissiparous and endogenous generation as amongst the modes of cell genesis. Even Virchow admits the endogenous generation in a limited extent; and that fibrous exudations may become organized without the intervention of cells; so that cells are not everything. The theory of Mandl as recorded by Berard, is the prettiest of all the cell theories. It is as follows:

“Anterior to any formation there exists a liquid blastema, containing corpuscles, which Mr. Mandl calls *primitive corpuscles*—(which we noticed above as a blastema and nuclei).

“From this condition, the formation of tissues may take two different directions, from which will result:



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
BOTANICAL
GARDEN

J. Aspin from U x on 13e

188

Spotted
Sporangia

macrospores

microspores

0.47 - 55

0.029 - 34

0.50 - 65

0.031 - 36

0.42 - 52

0.029 - 34

0.46 - 54

0.028 - 31

0.44 - 55

0.030 - 34

0.53 - 65

0.029 - 32

0.51 - 60

0.030 - 35

leaves 12-13

Stomata
spotted sporangia

as per club rates.

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26-9



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6

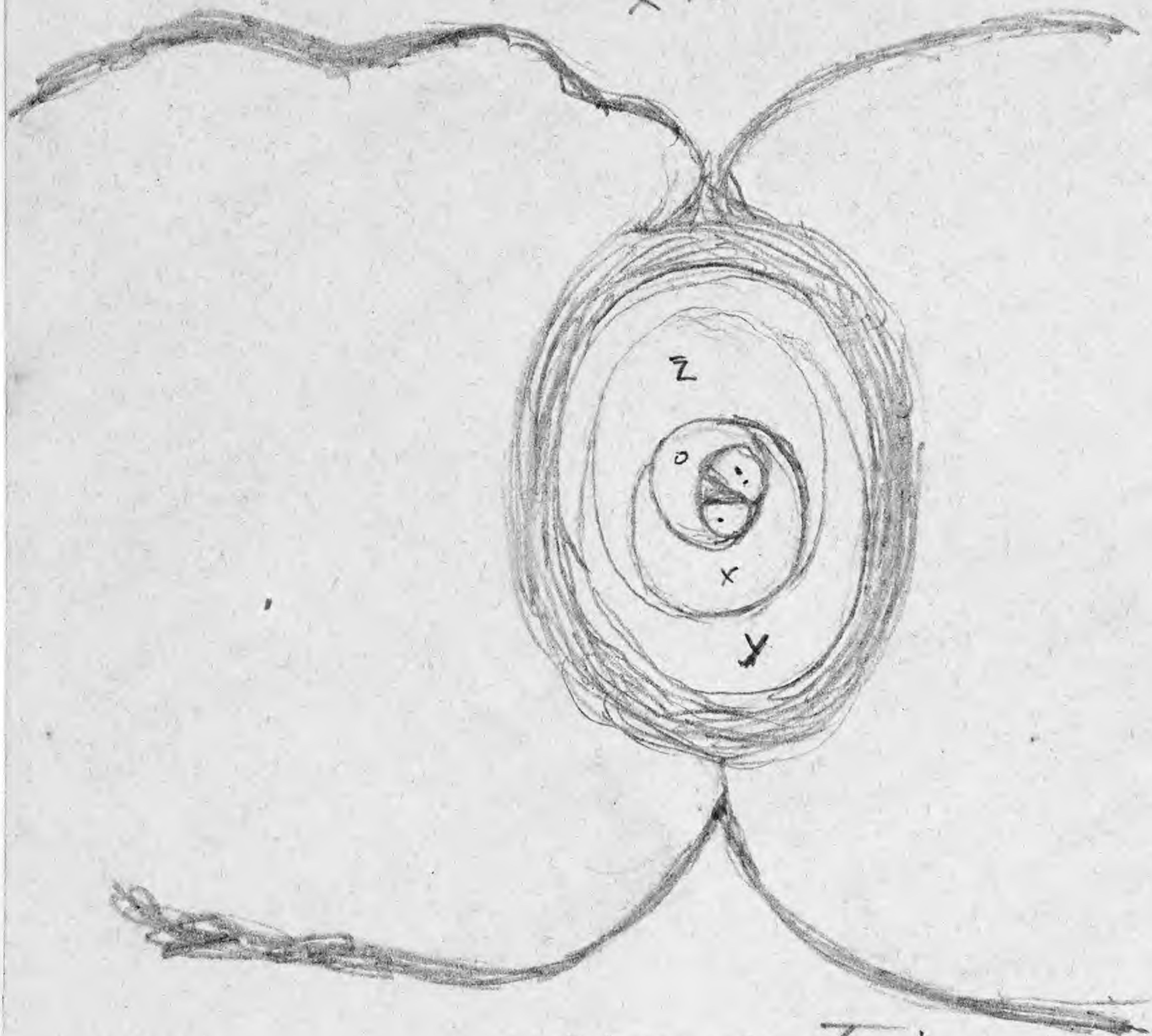
Isotria medeolae

Oct 6 1860

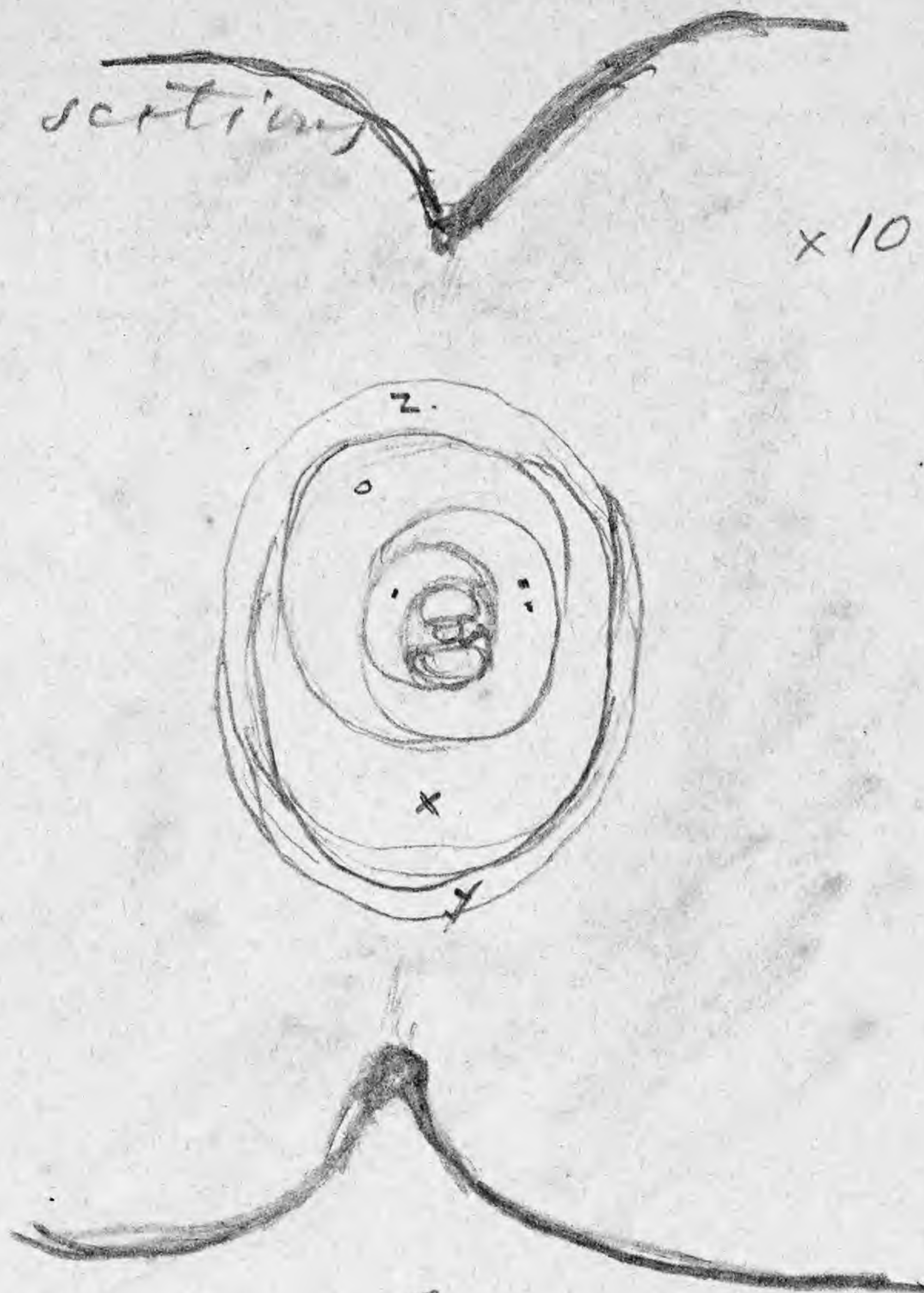
horizontal sections

x 10

x 10



upper section



lower section

the same leaves
 y. z. x. o. . . & . are here larger
 than in the upper section, and several
 new ones appear in the center.



0
cm

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MISSOURI
BOTANICAL
GARDEN

13700

M. W. ALEXANDER,

SOUTH-EAST CORNER OF FOURTH AND MARKET STREETS,

ST. LOUIS.



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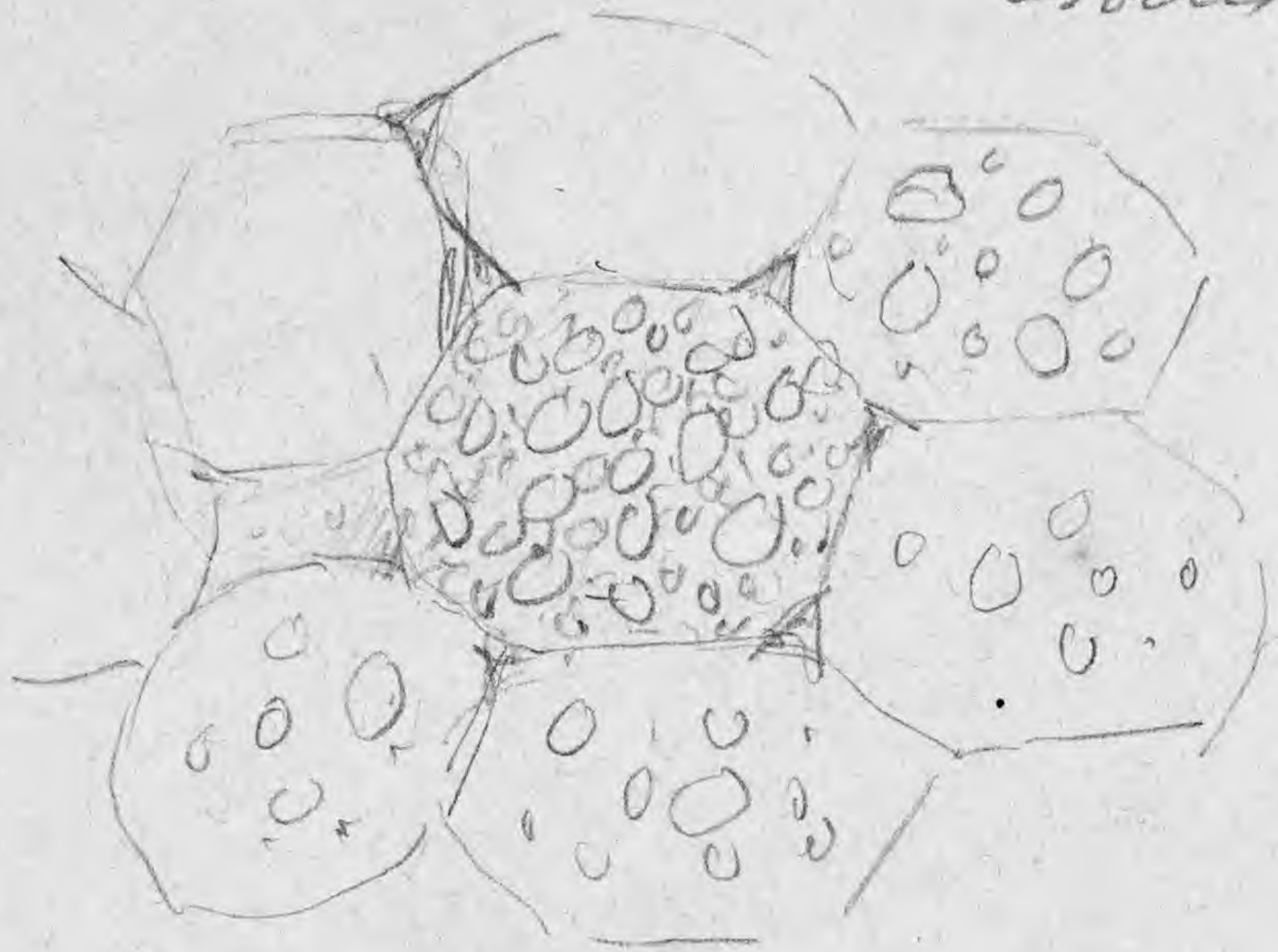
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7

Isotria medeolae

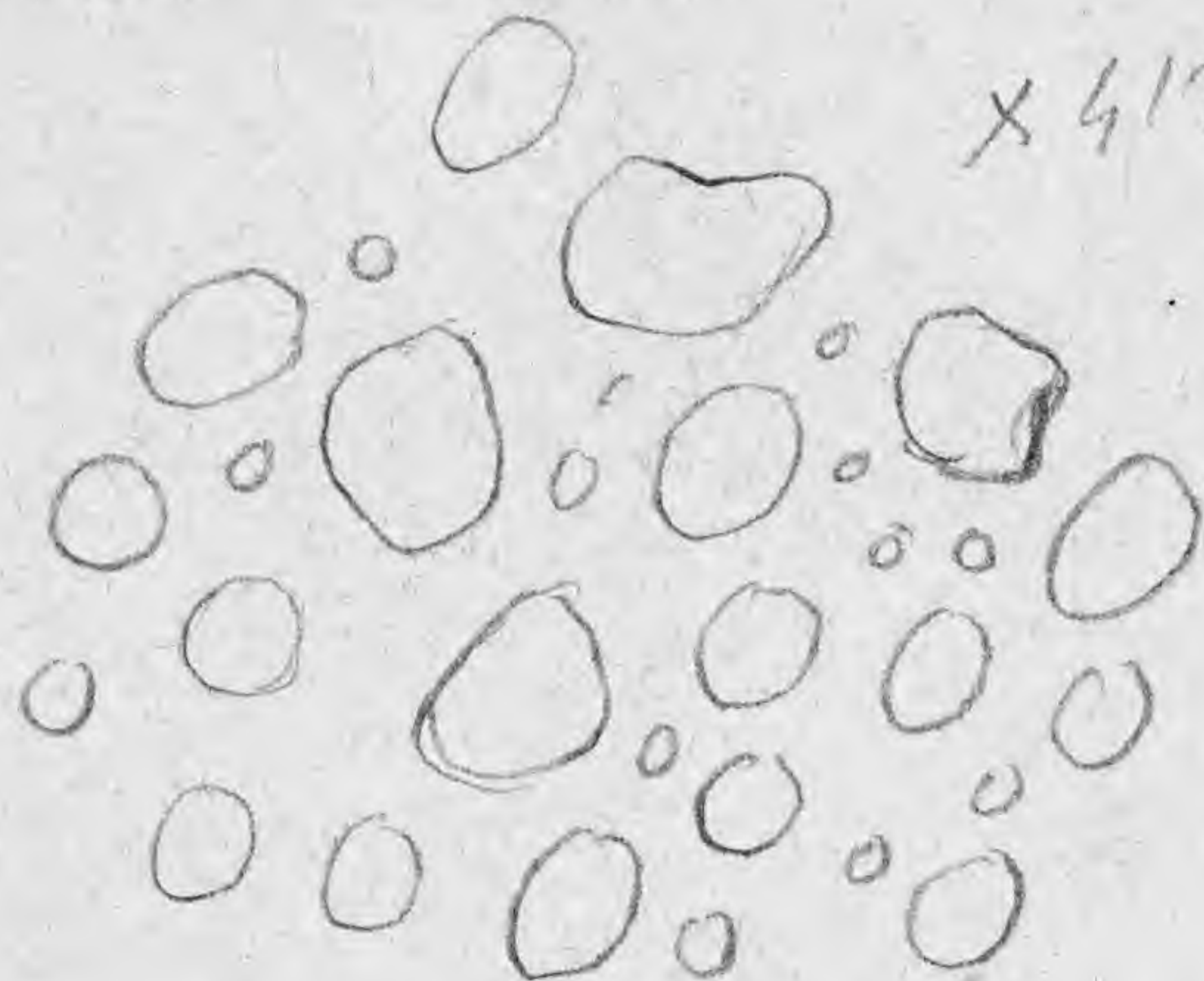
Oct 1860

x 270



cells of bulb

x 412



starch of bulb

Oct 1860



0 1 2 3 4 5 6 7 8 9 10

cm

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13701

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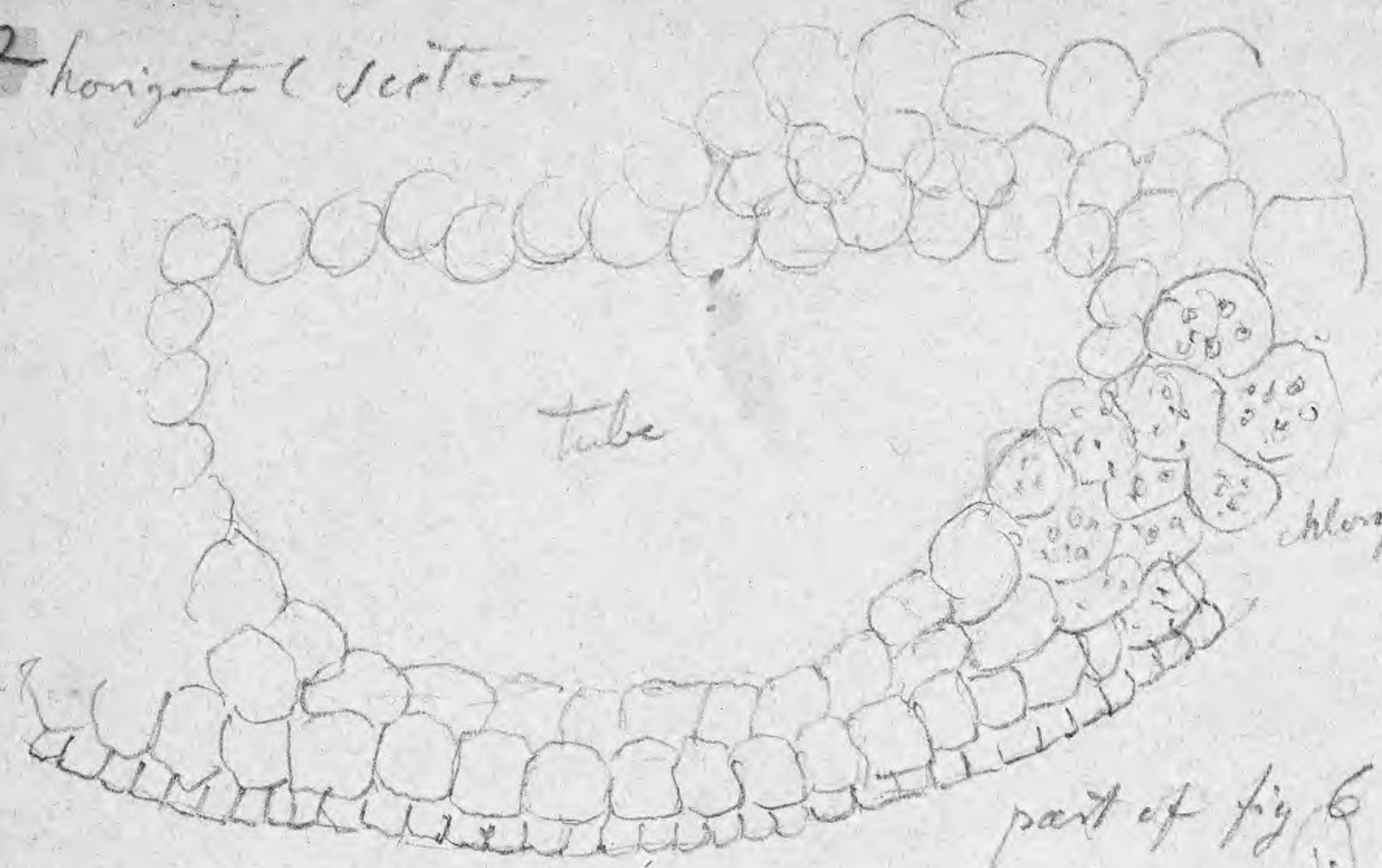


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2 horizontal sections

Isotria medeolae
Phila

Oct 6 1860

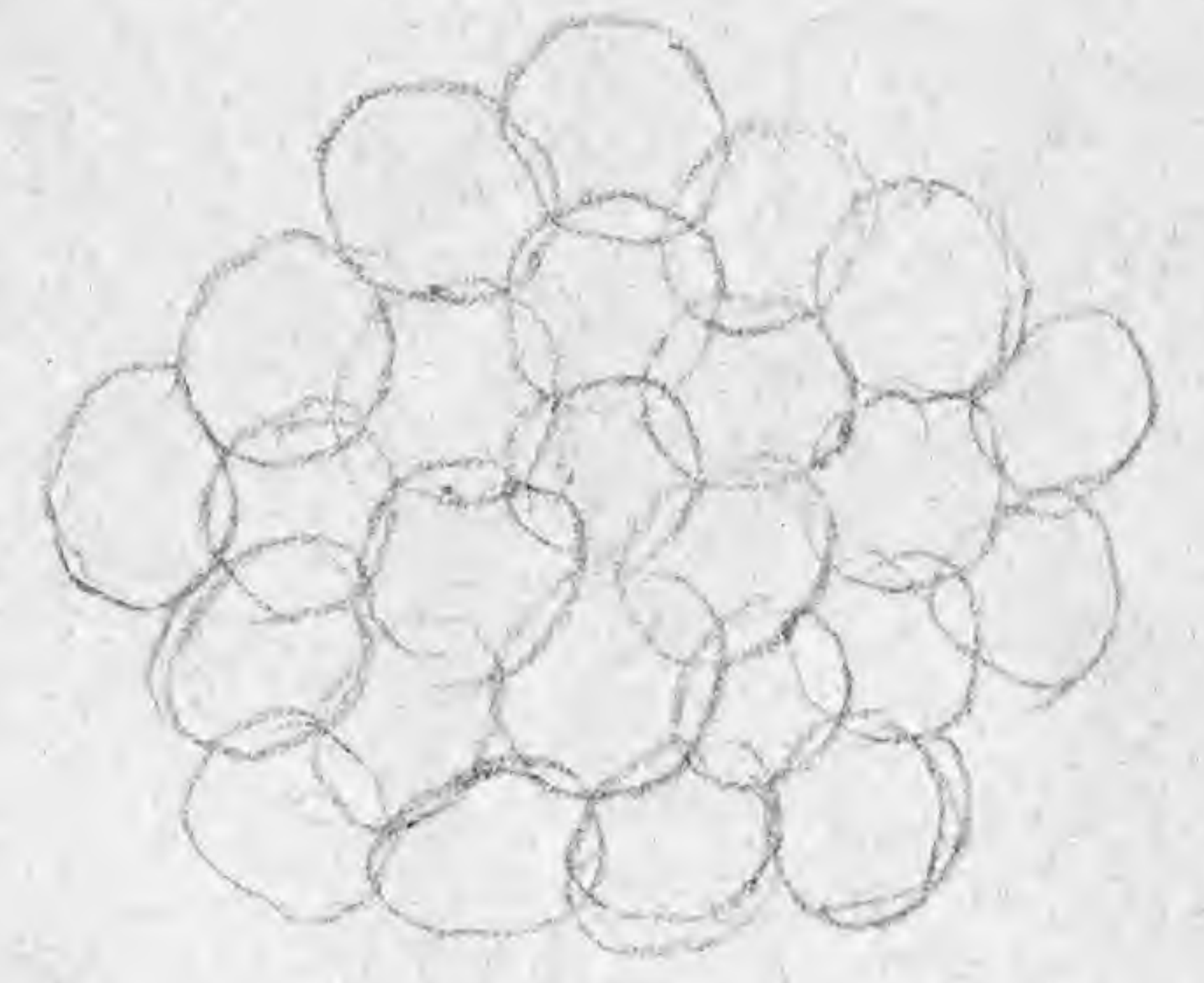


tube

chlorophyll

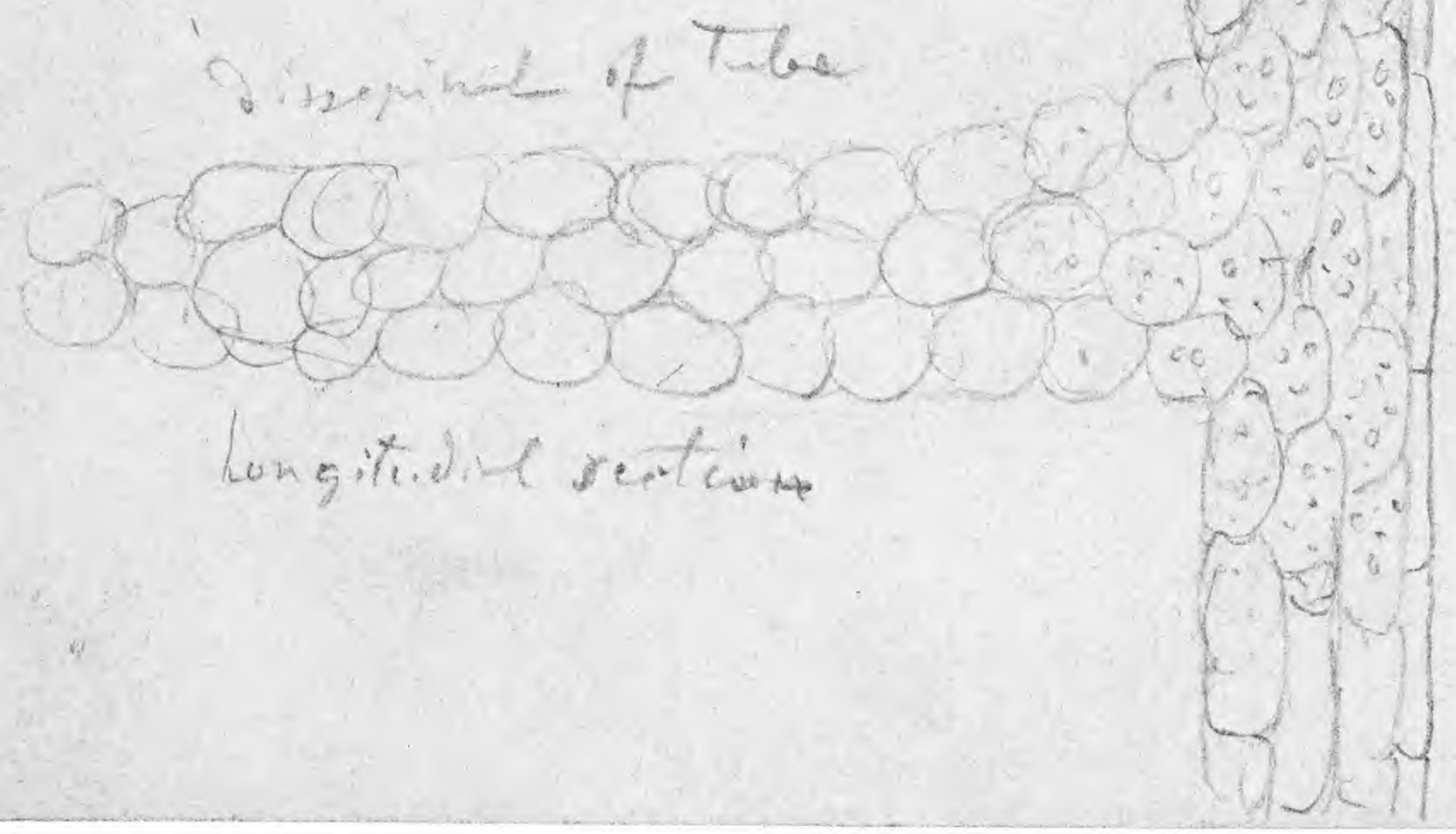
x270

part of fig 6



dissepiment of tube

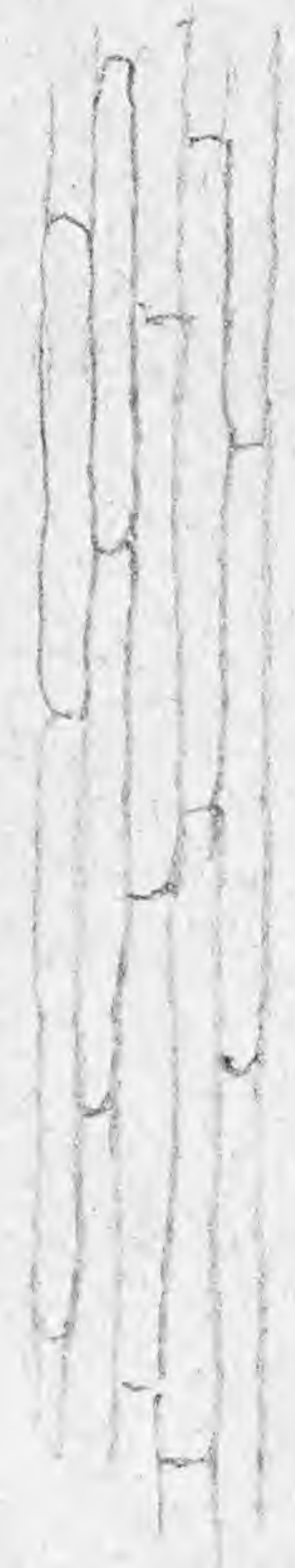
epidermis



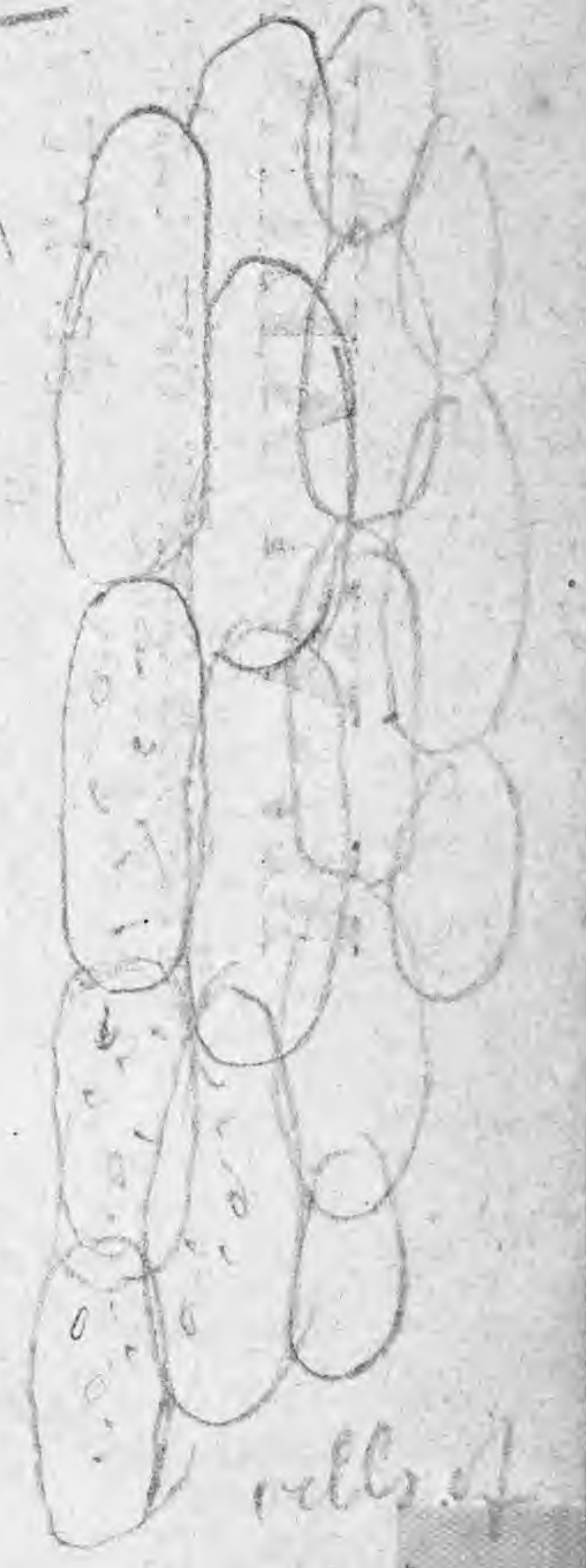
dissepiment of tube

longitudinal section

epidermis
sect.



cells of
epidermis



cells of
parenchyma



0 1 2 3 4 5 6 7 8 9 10

cm

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13702

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ST. LOUIS.



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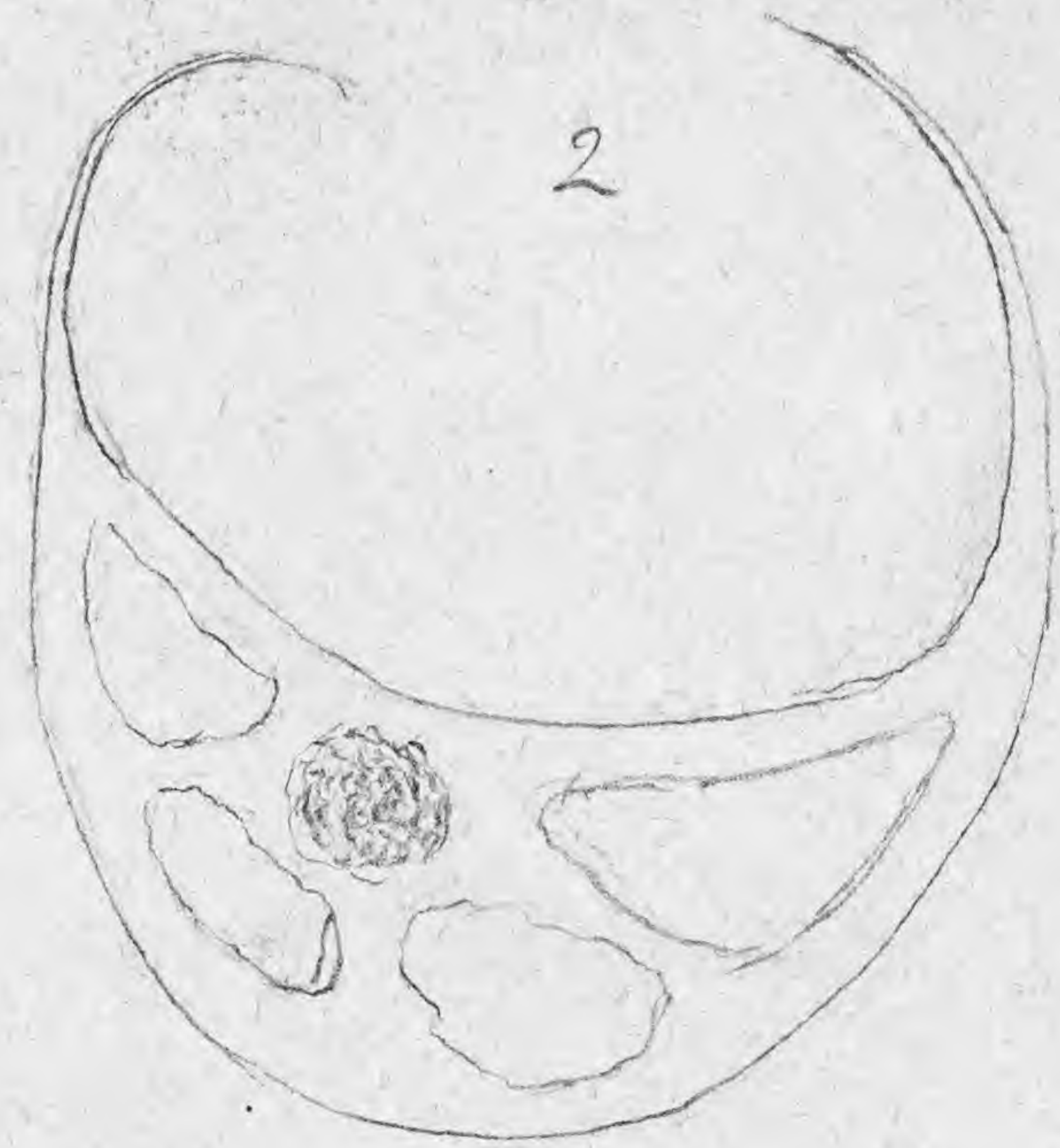
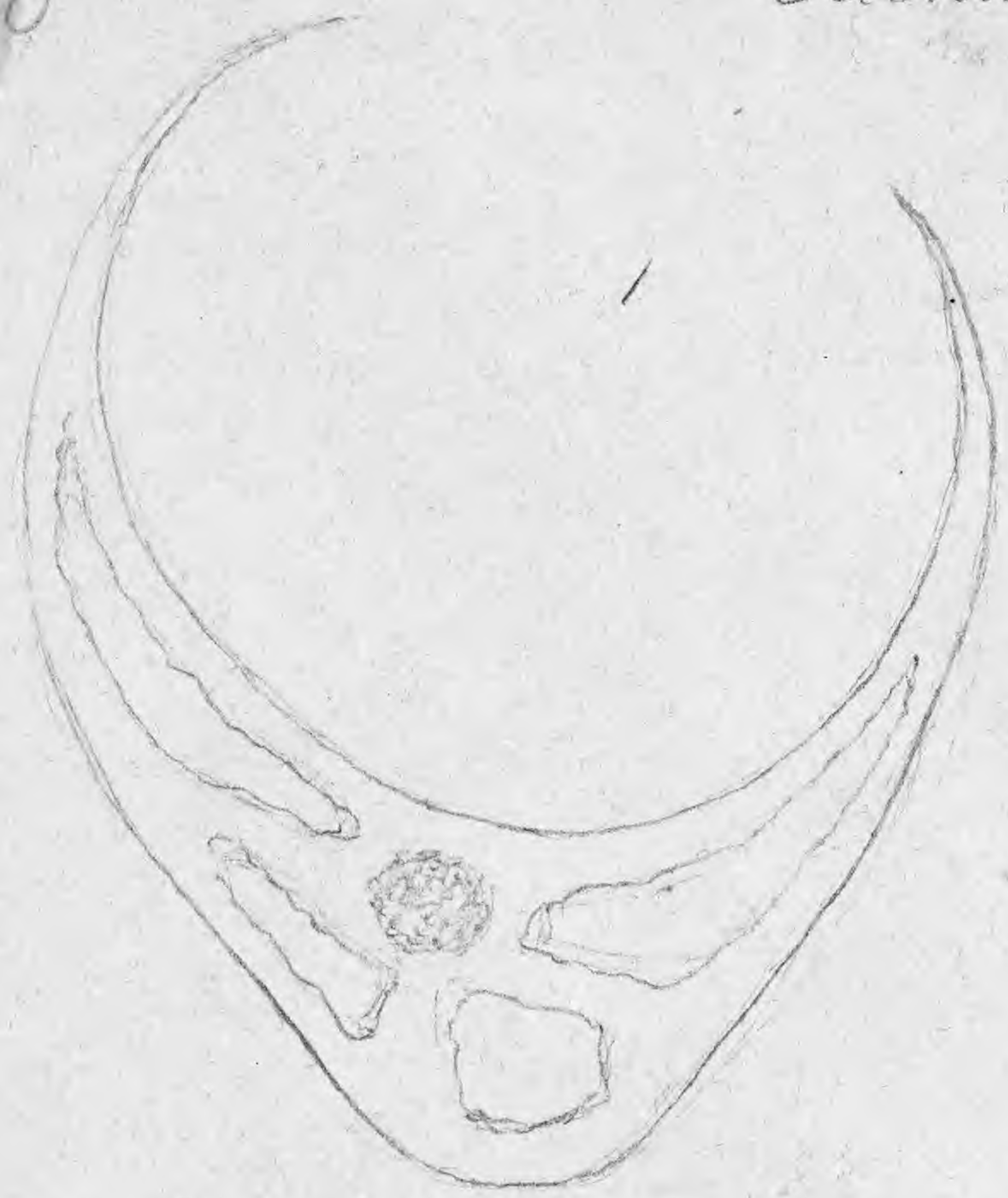
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BOTANICAL
GARDEN

1 X 30

Sections of young sterile leaf

Oct 1860

Isotles riparia
Ph. Carlephi



reversed



longitudinal sections
tubes with dissepiments



0 1 2 3 4 5 6 7 8 9 10
cm copyright reserved



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GARDEN

13703

M. W. ALEXANDER,

SOUTH-EAST CORNER OF FOURTH AND MARKET STREETS,

ST. LOUIS.



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cm

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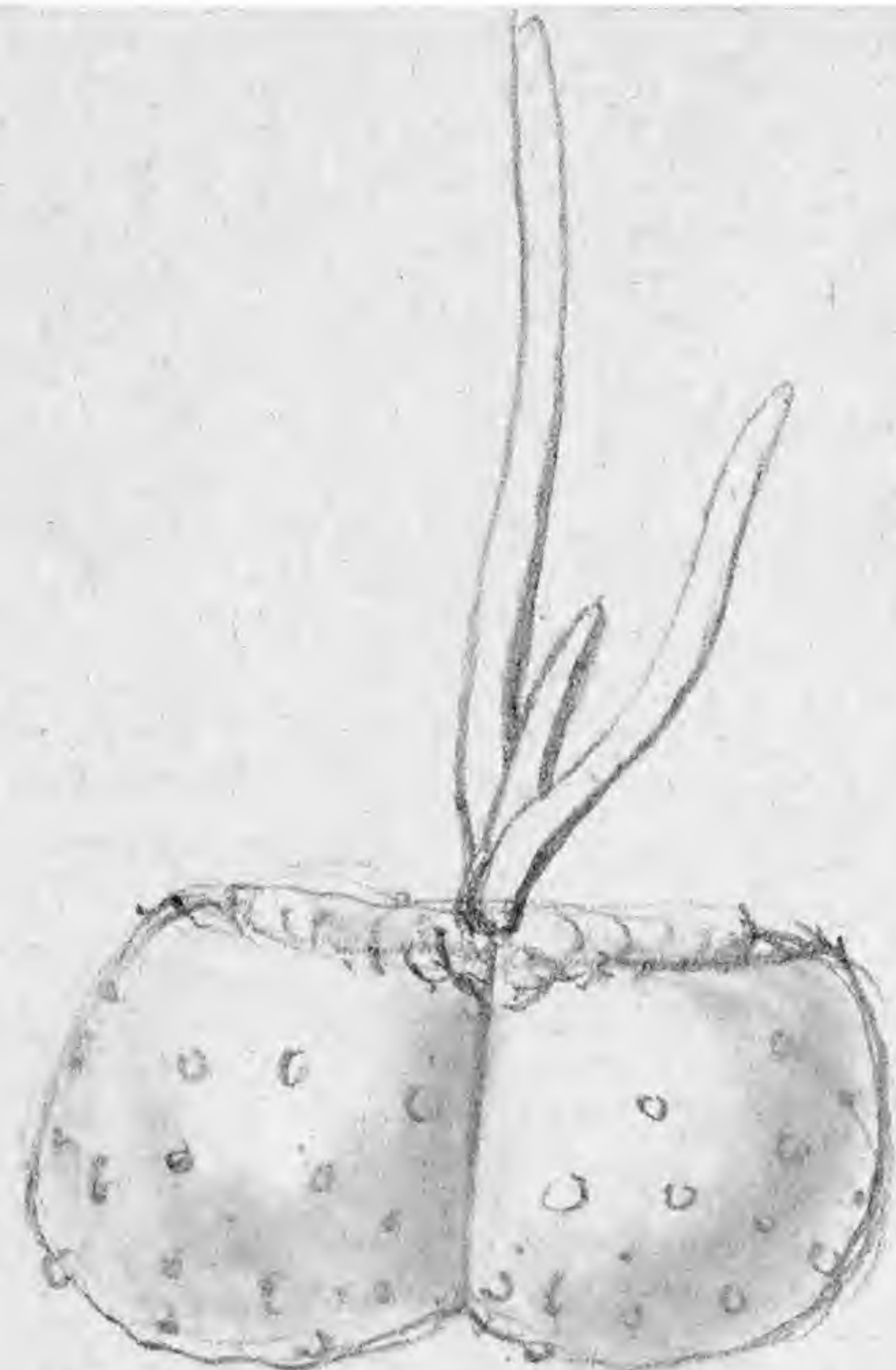
3

Isoetes riparia

Octob 1860

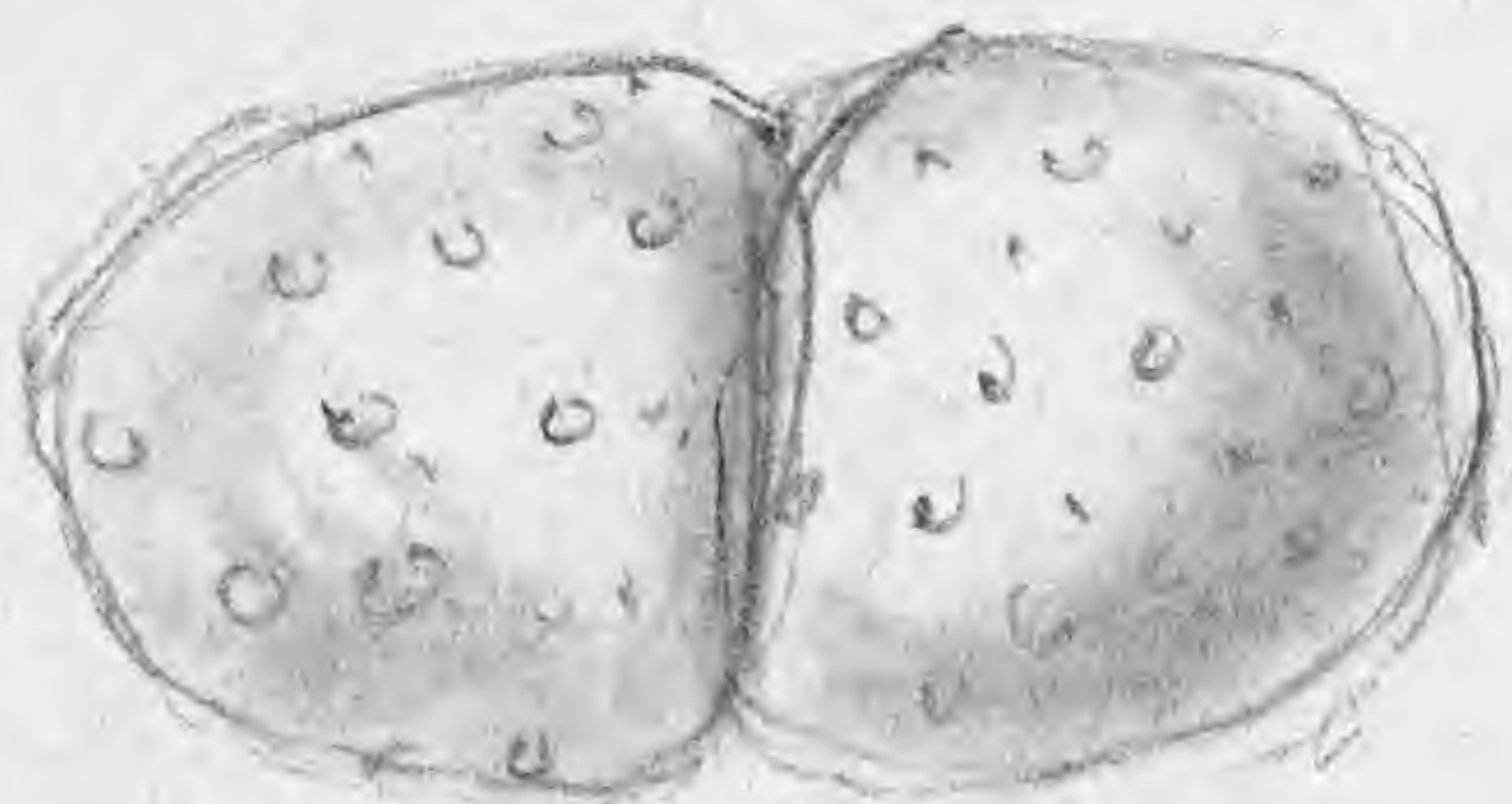
(all x3)

x3

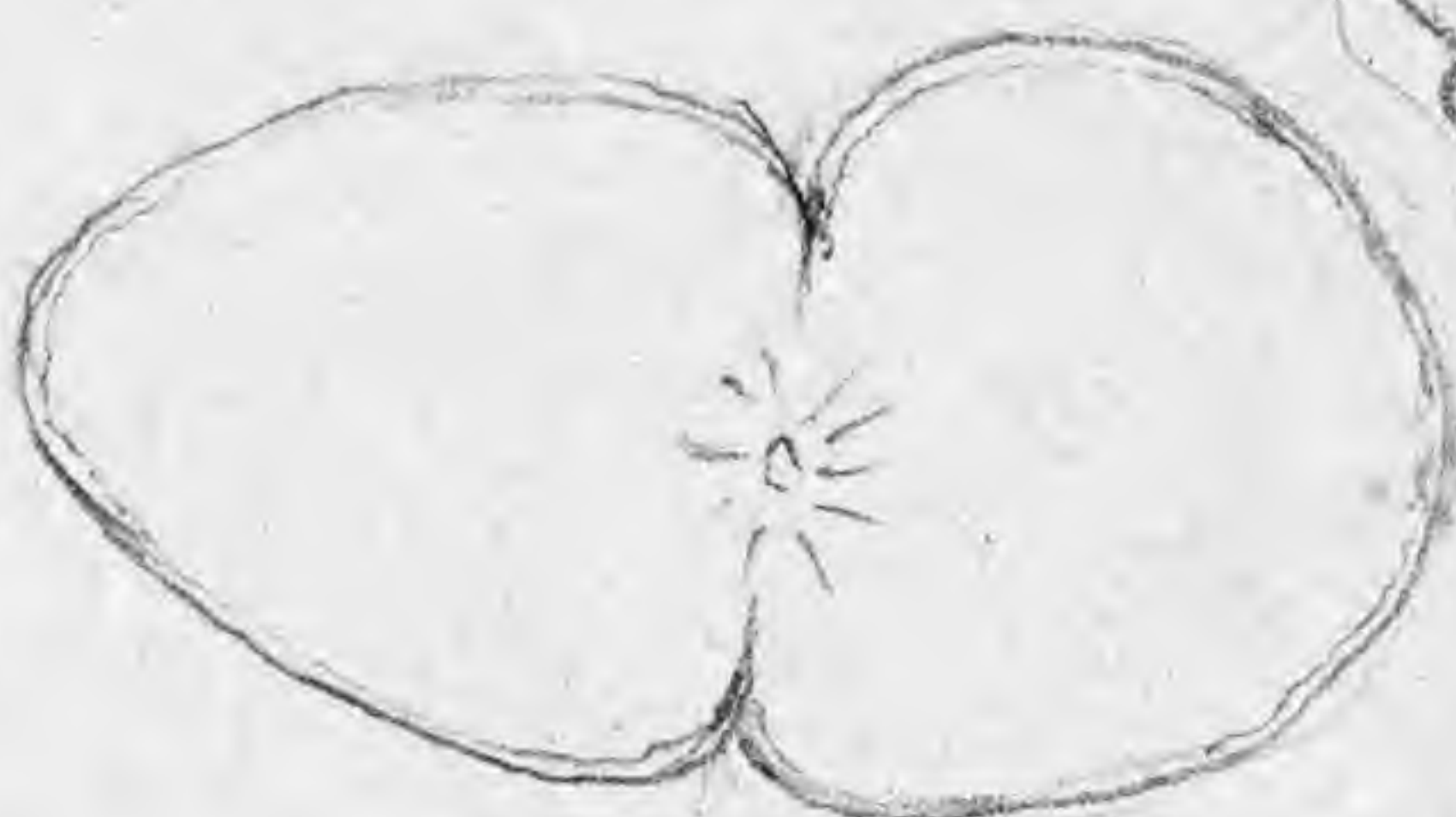


x3

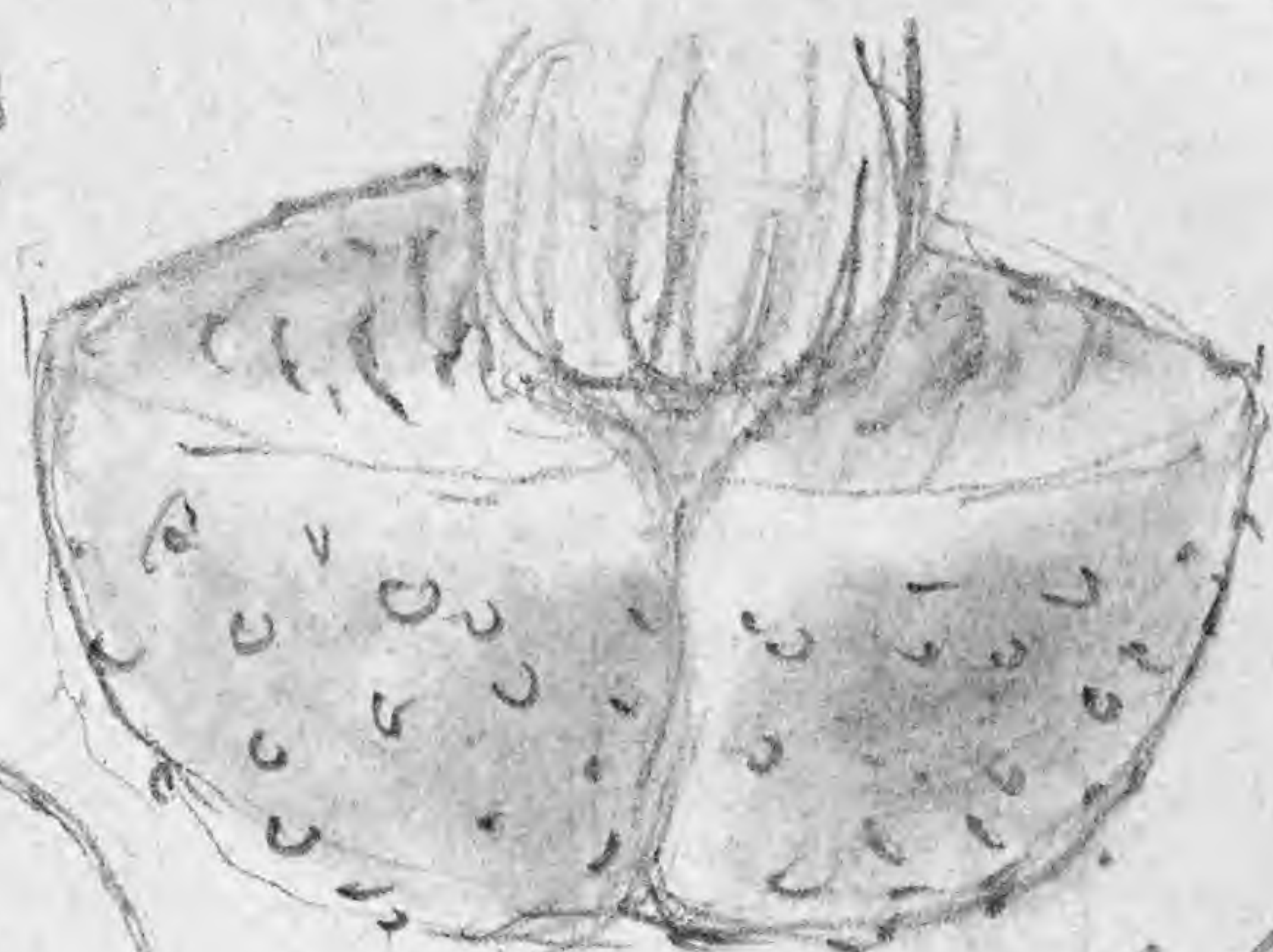
scars of roots, fibres removed



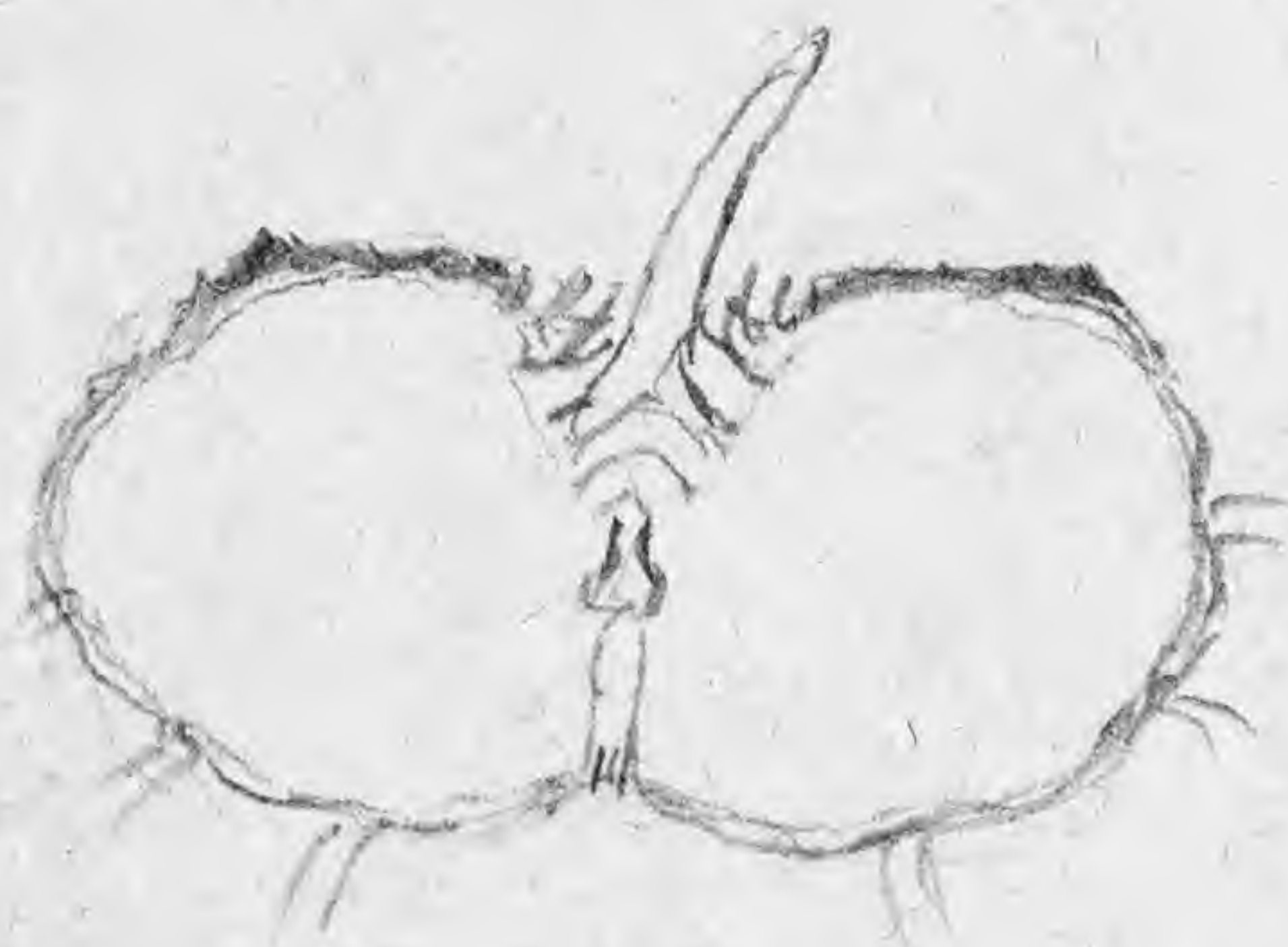
bottom view



horizontal section

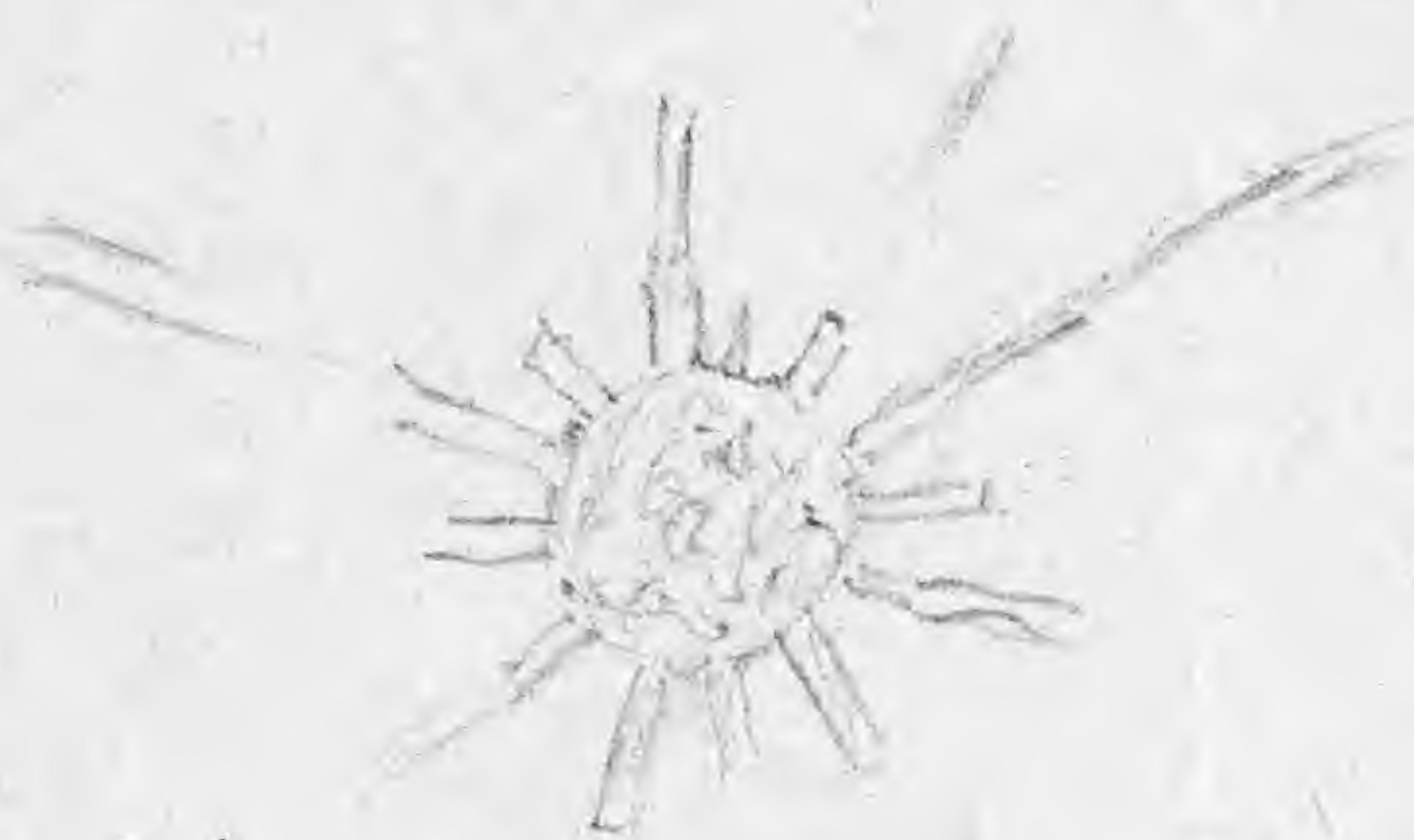


large bulb



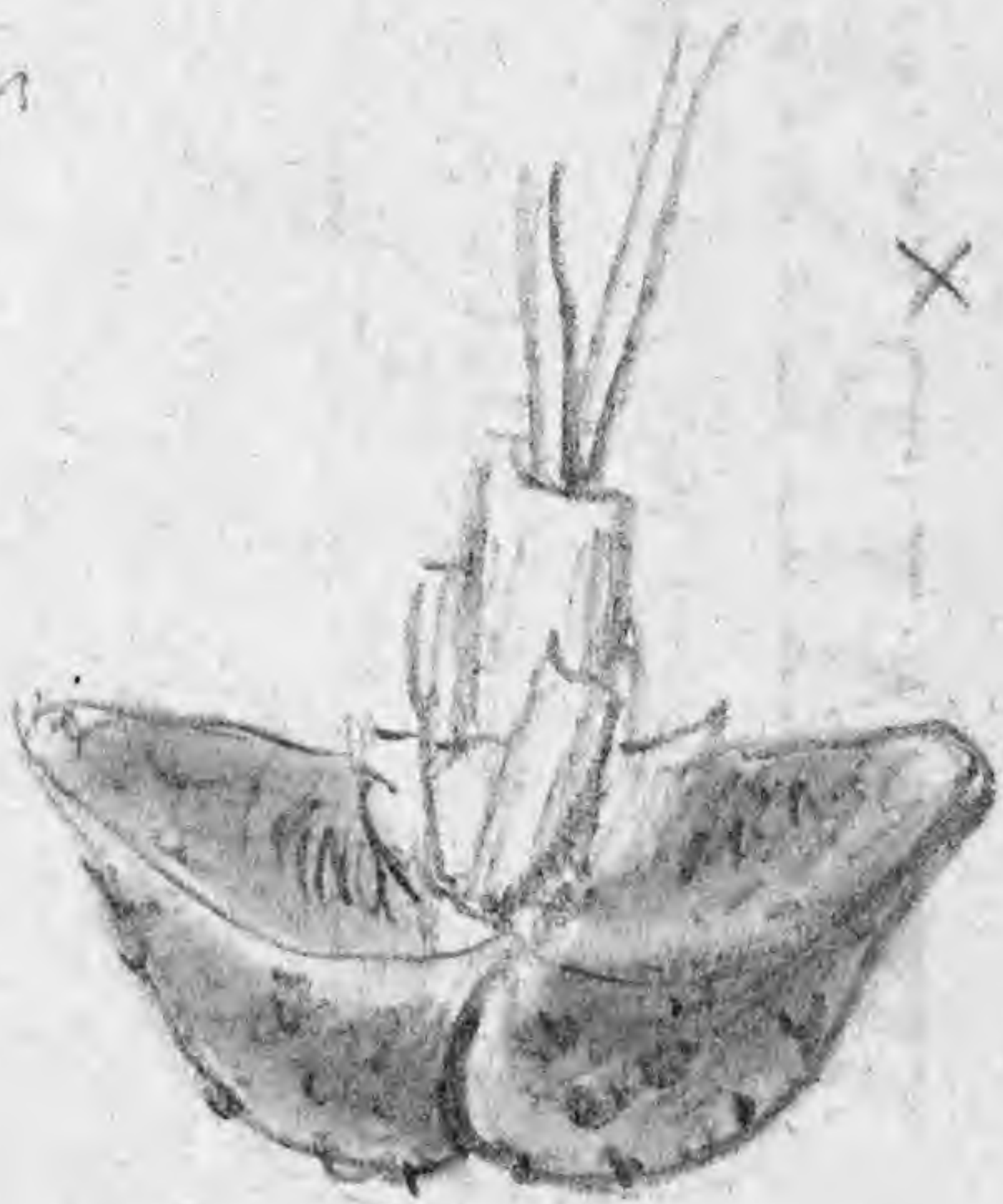
vertical section

see magnified view



x20

centre of bulb,
horizontal sect.
light yellowish brown
with its rays



x3

a younger
bulb, disoid
above, 2 lobed
below



0
cm

1

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GARDEN

13704

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cm

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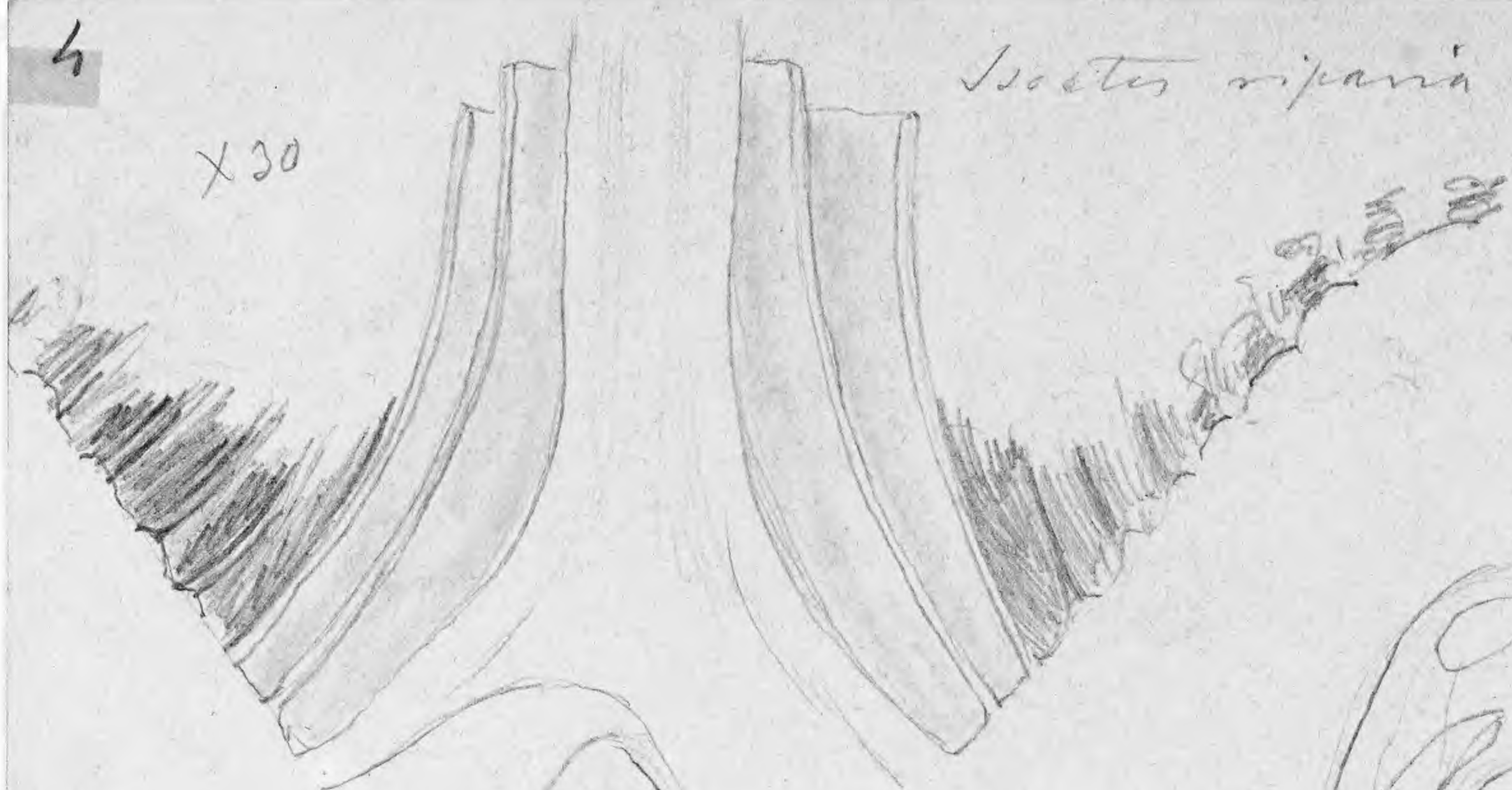
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BOTANICAL
GARDEN

4

Isostes riparia

Oct 6 1860

x 30



x 30

horizontal section

through base of inner most leaves



vertical section

through the center

Diameter of tuber 2



0

1

2

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8

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cm

copyright reserved



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GARDEN

13705

M. W. ALEXANDER,

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ST. LOUIS.



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cm

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Isotes riparia, Canby
Delaware Wilmington
June 29
1866

July 4 1866

Set of leaf
x 10



St Louis July 4 1866

MISSOURI BOTANICAL GARDEN

HERBARIUM

GEORGE ENGELMANN PAPERS

MISSOURI BOTANICAL GARDEN



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

13706

ALEX. LEITCH,
APOTHECARY AND CHEMIST,
Marble Building, Cor. Fourth and Olive Streets,
ST. LOUIS, MO.

[Faint handwritten notes and sketches, including a diagram of a plant or seed structure.]



0 1 2 3 4 5 6 7 8 9 10

cm

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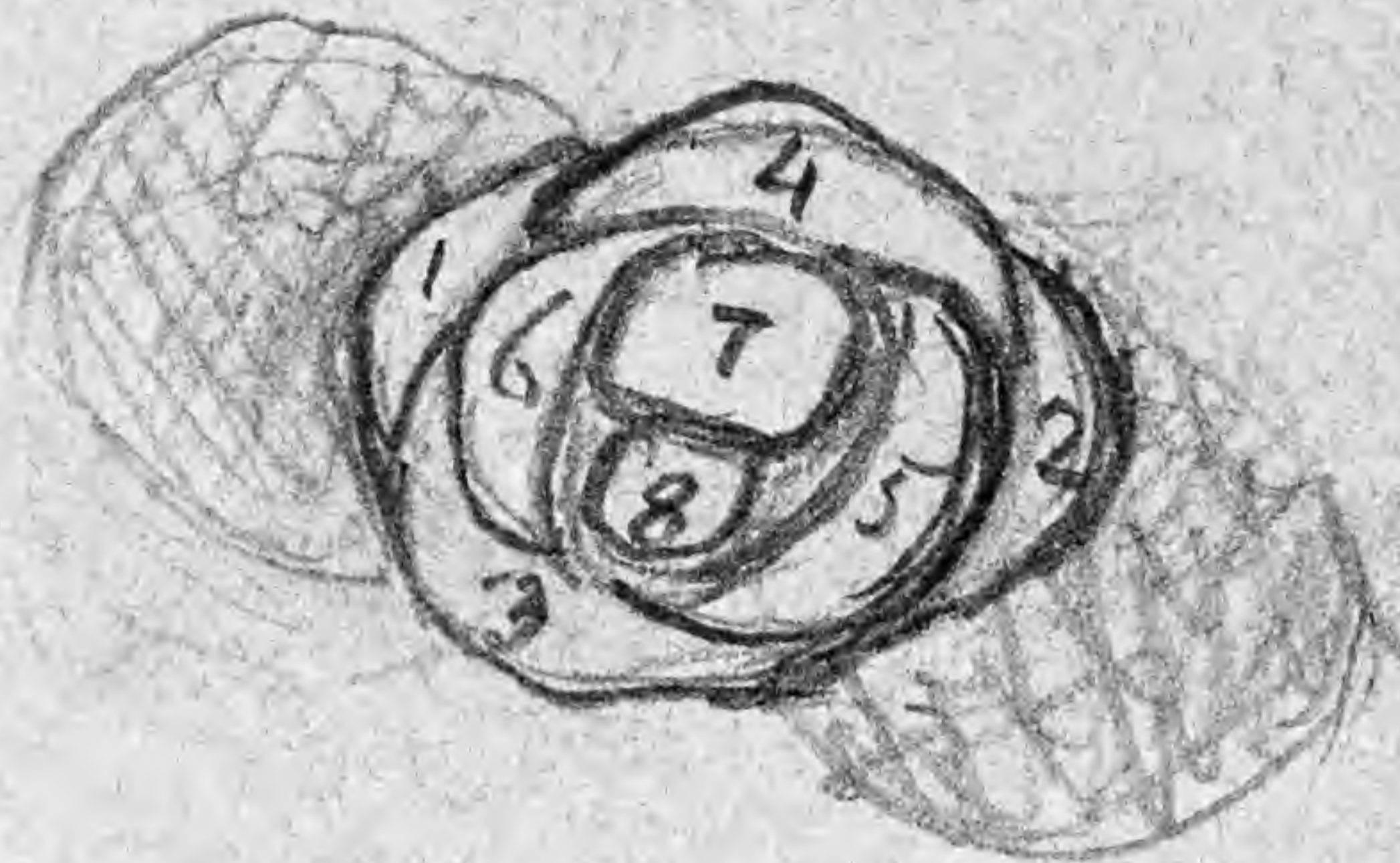
Isotles riparia

from Philadelphia

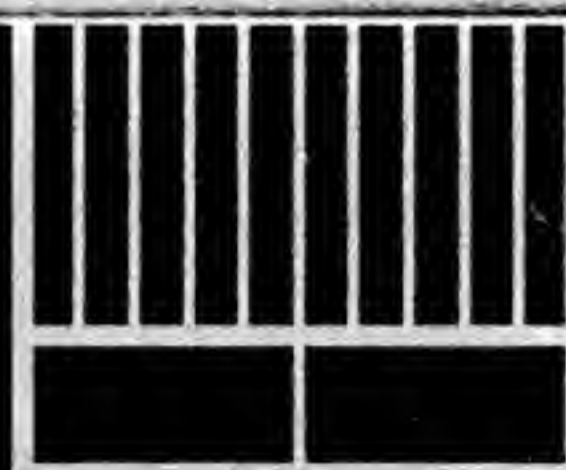
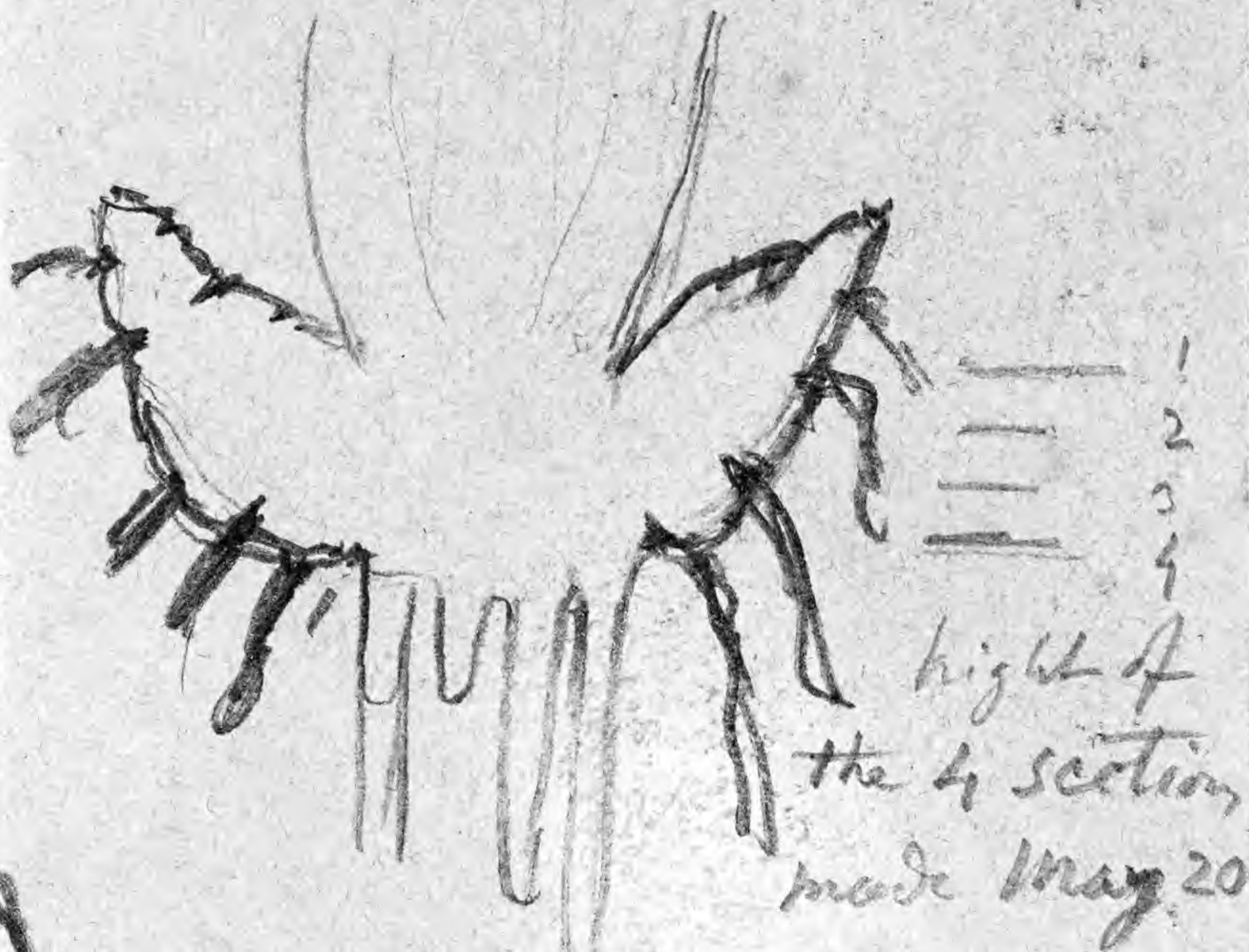
May 19 1855

very young plant

cult, St Louis



x5



0 1 2 3 4 5 6 7 8 9 10

cm

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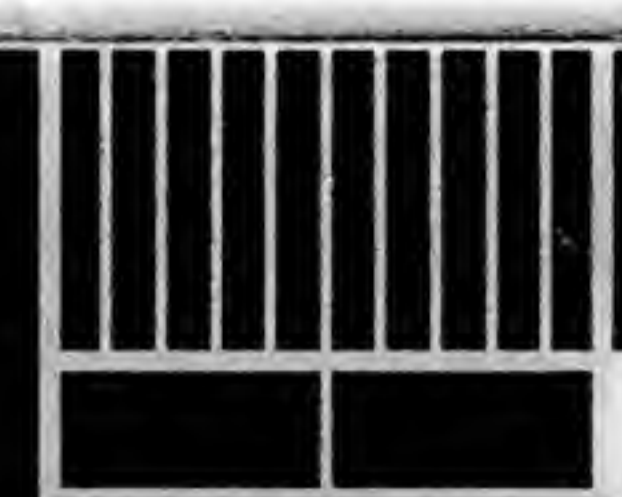
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GARDEN

13707

Alex. Leitch,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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Isotria medeolae

May 20 1866

from Philadelphia

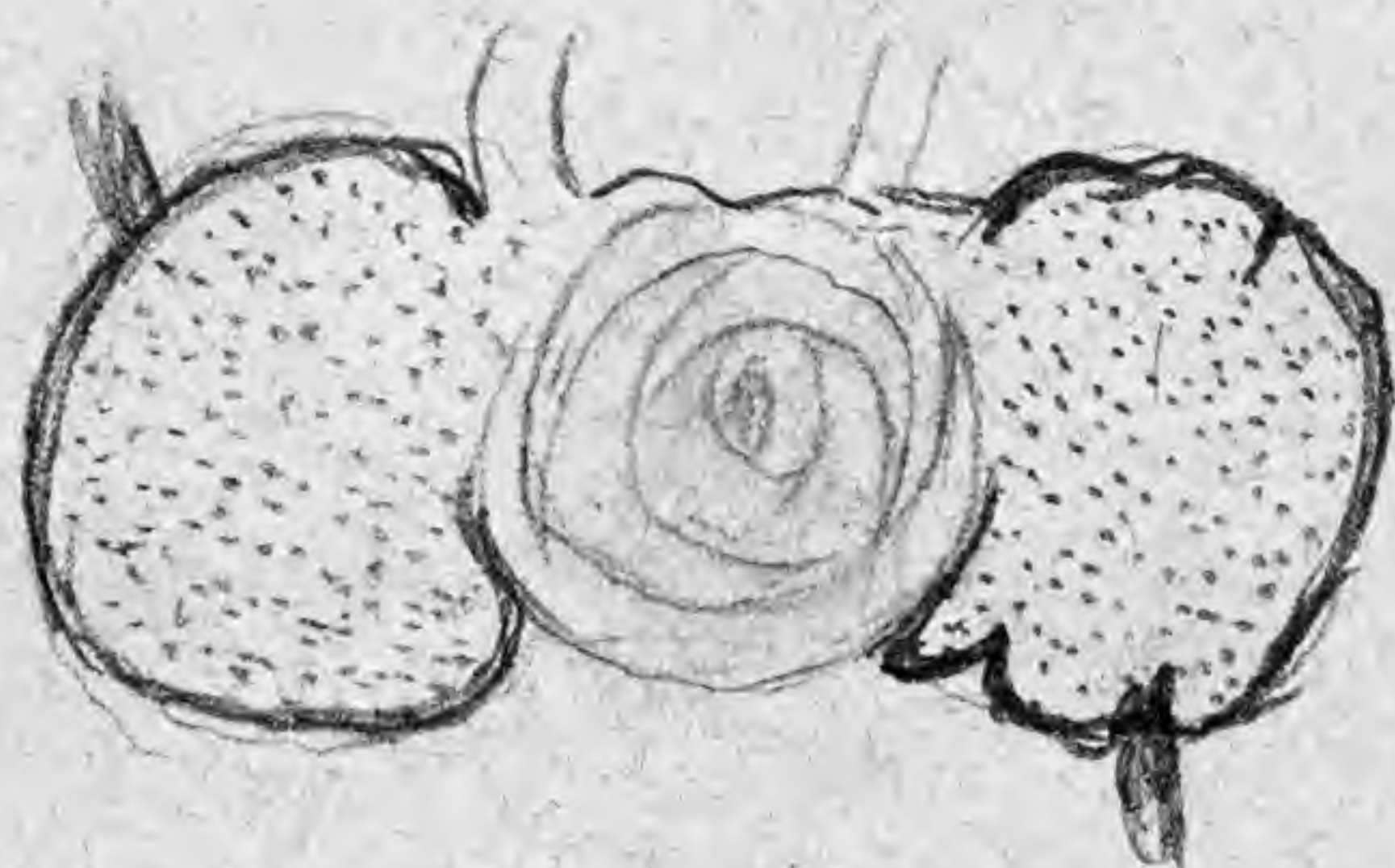
horizontal sections

Cult. at St. Louis

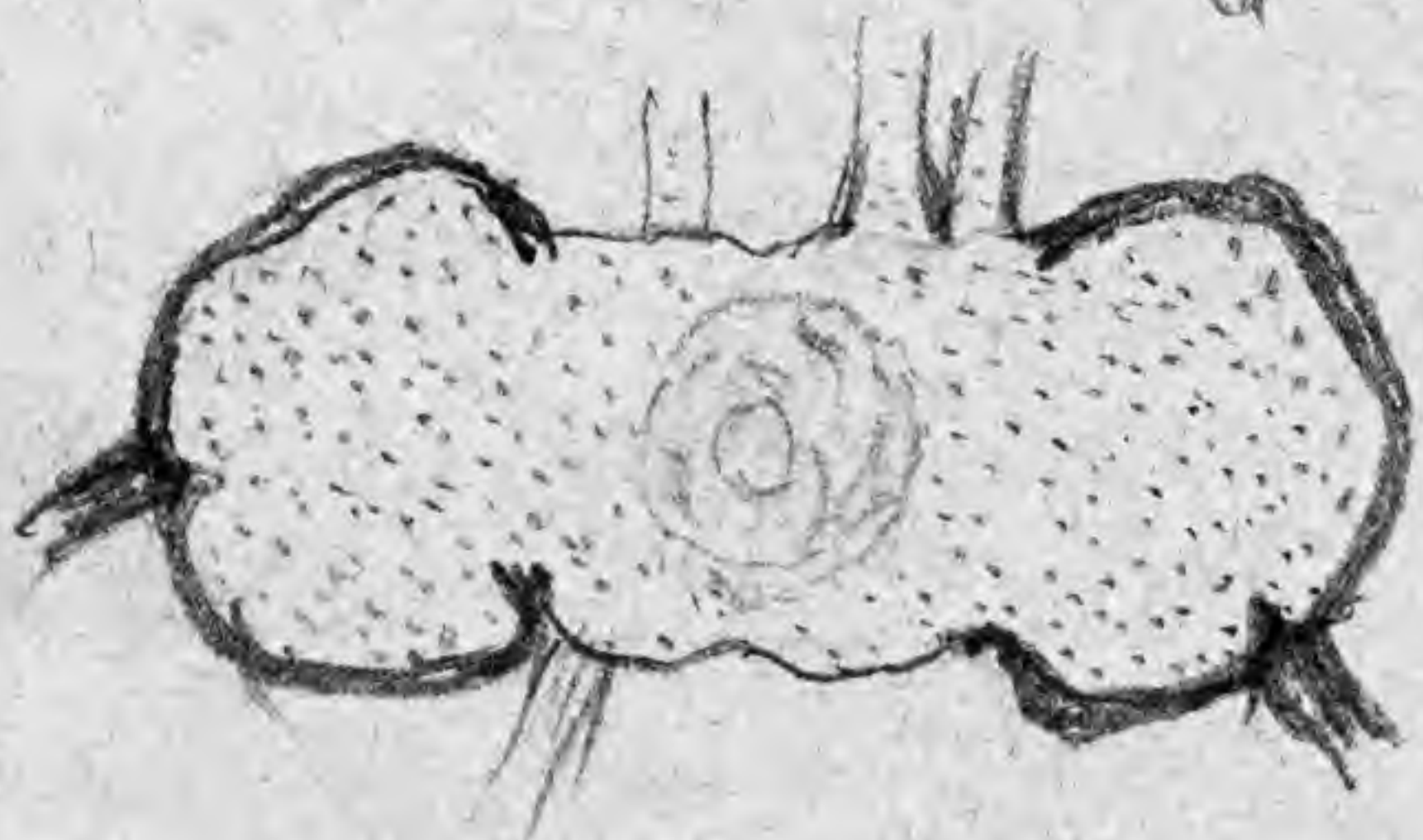
x 5



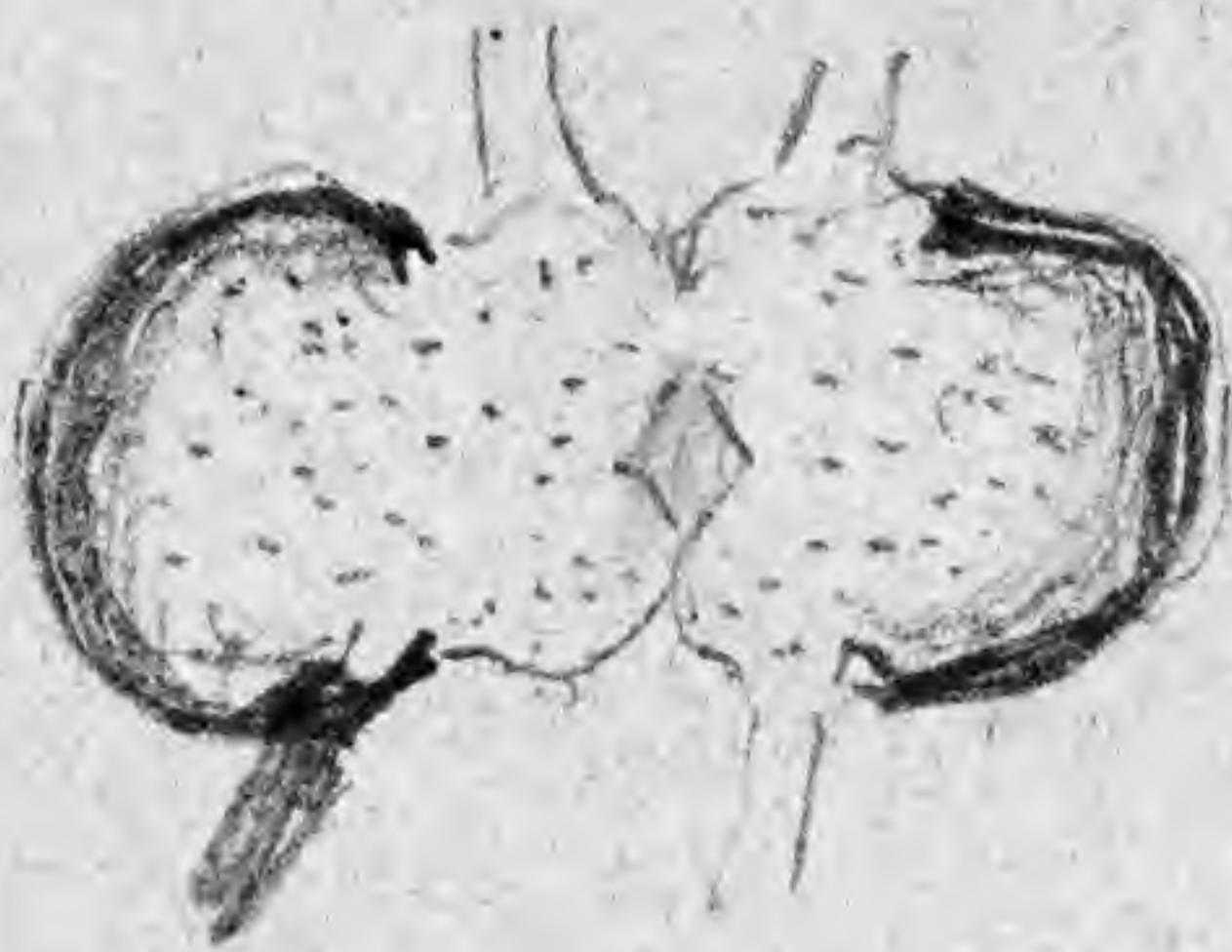
sections of tuber
separating from the leaves



sections tubers
cohering with base
of leaves



only lowest part
of innermost leaves
visible



0 1 2 3 4 5 6 7 8 9 10

cm

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13708

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Cor. 4th & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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27 leaves 6-7 inches long

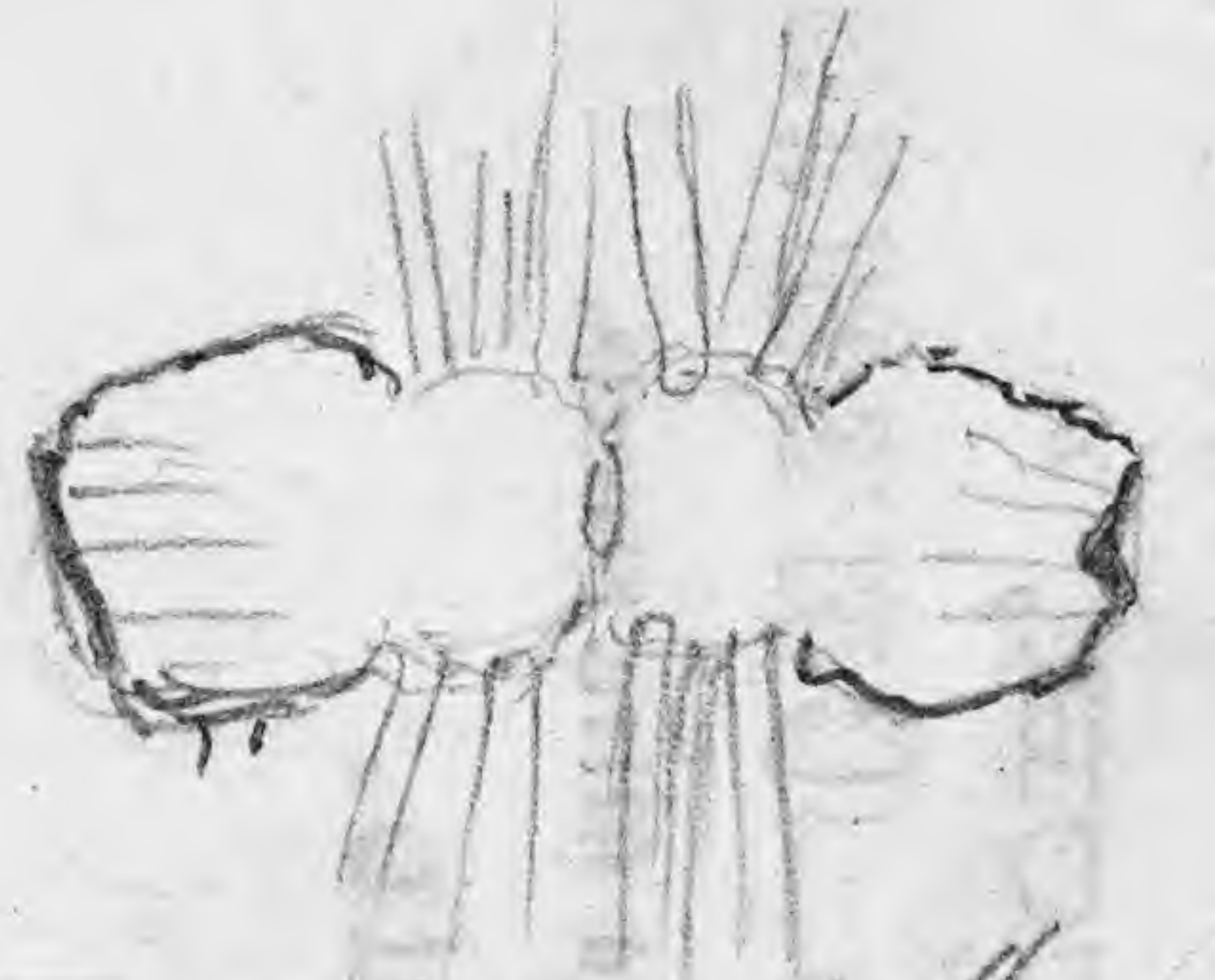
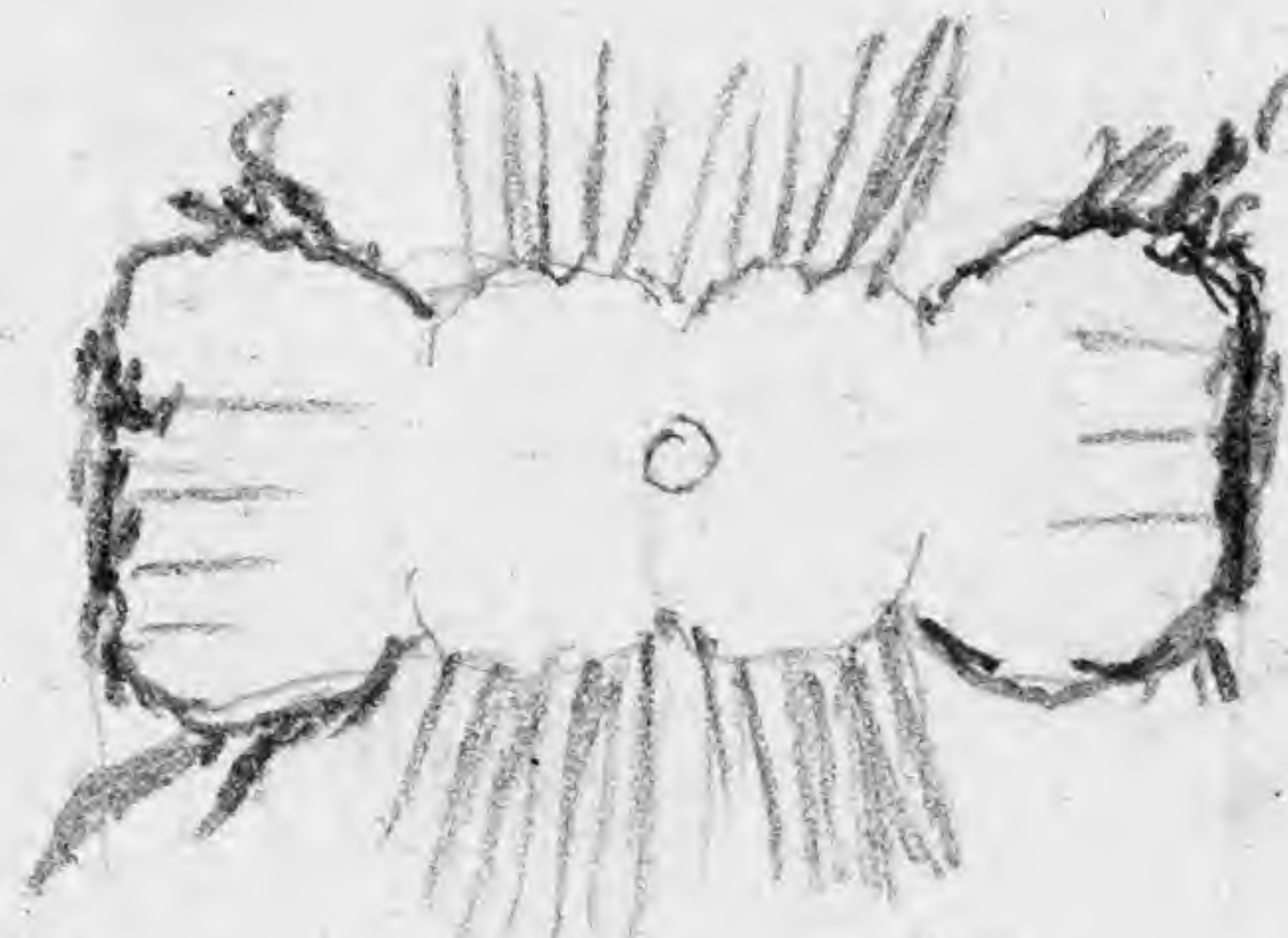
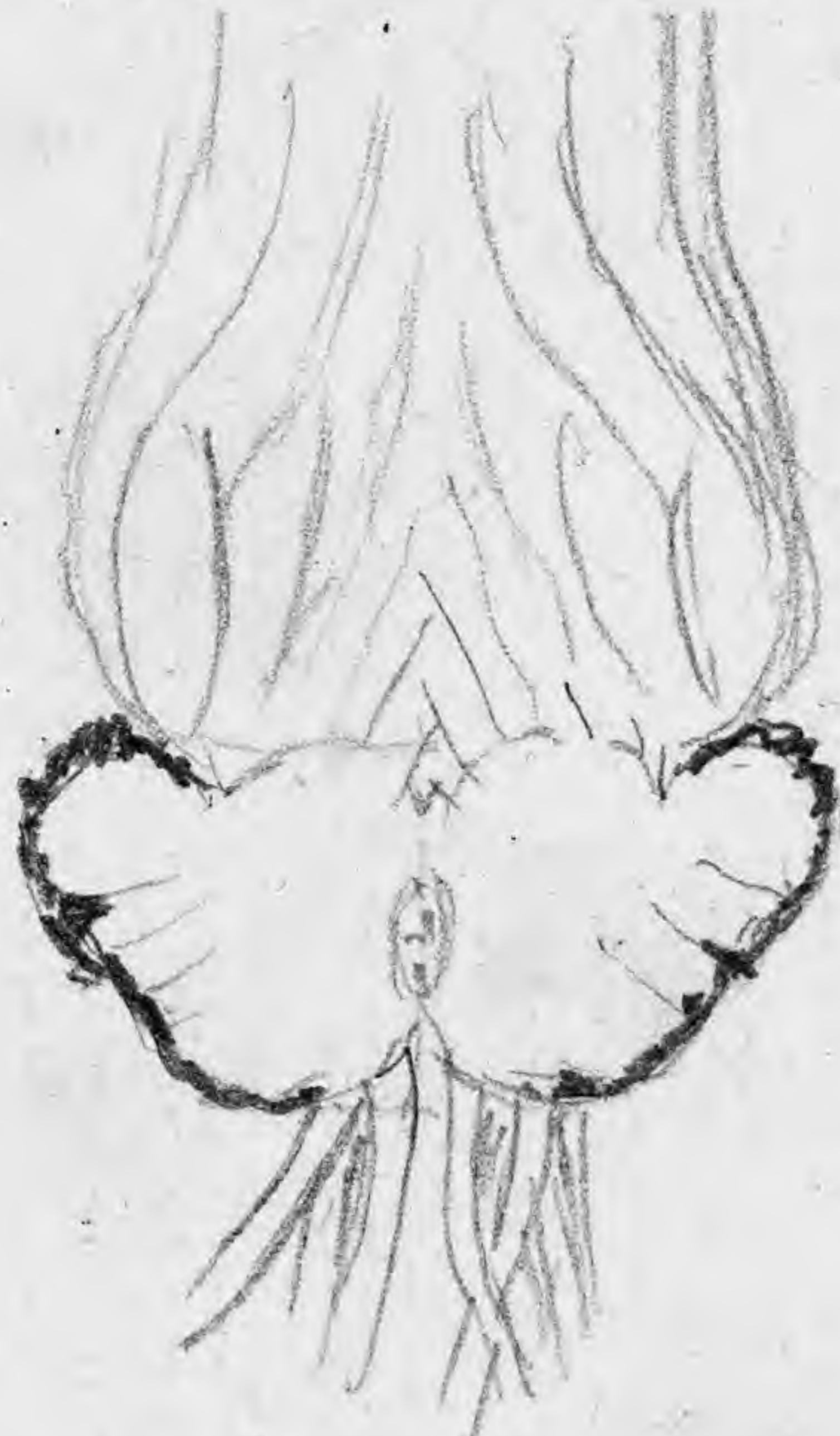
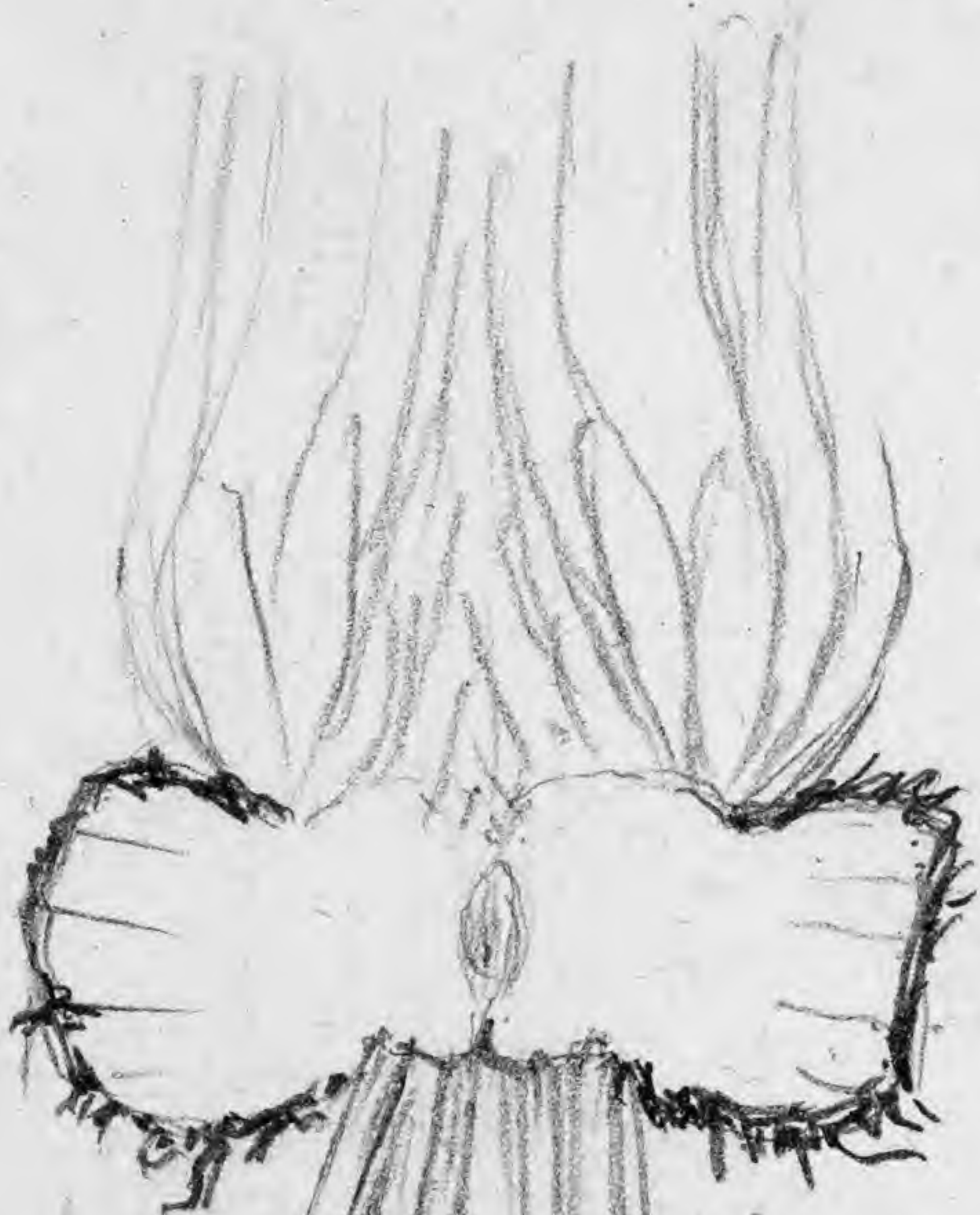
Spartan riparia fresh

June 21

1866

Philas Burnet June 18

24 leaves 5-6 " long



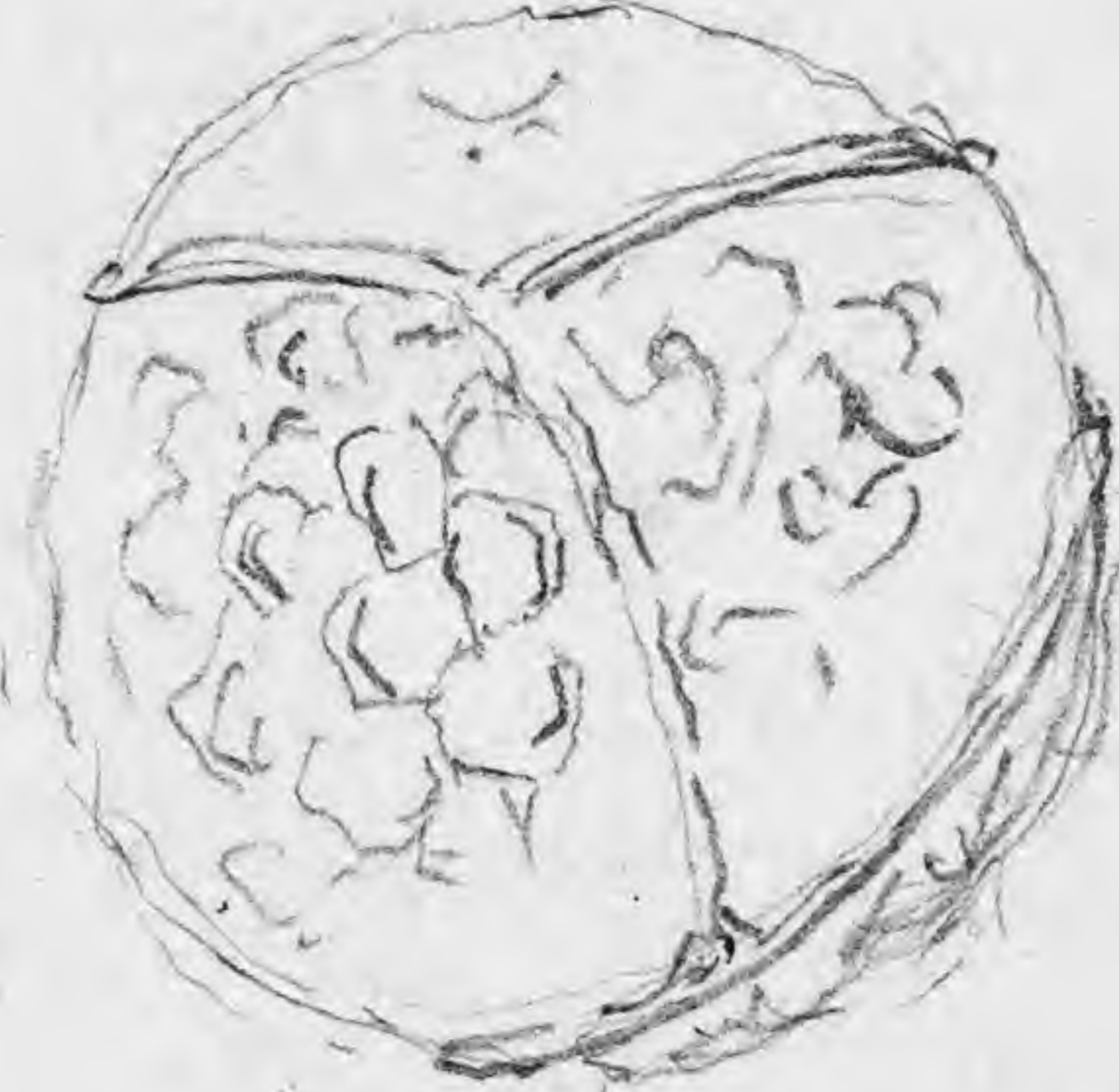
horizontal sections of two different plants with 21 & 23 leaves

all sections x2



young sterile plant throwing off old bulb rotting

12 leaves 4-5 " long



fully ripe spores of last year, adhering to plant 32-33 mm

young spores, not yet fully grown, 25 mm

0.42 - 0.54 mm young full grown



spores x 415 margin smooth



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI BOTANICAL GARDEN

13709

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Marble Building, Cor. Fourth and Olive Streets,

ST. LOUIS, MO.



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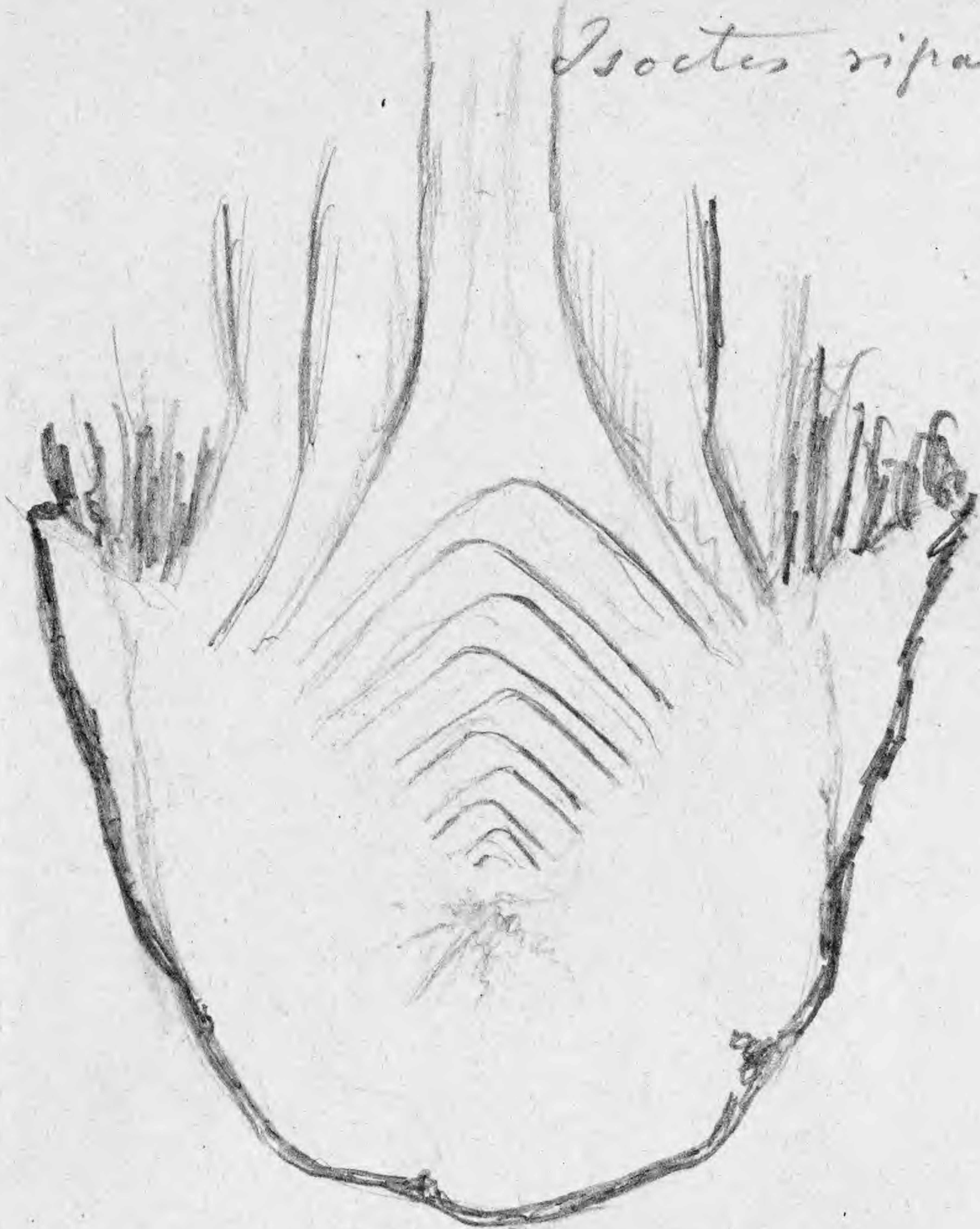
MISSOURI
BOTANICAL
GARDEN

5

Isoetes riparia

Octob 1860

x15



vertical section through
the stem or transverse
diameters of bulb



0
cm

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7

8

9

10

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13710

M. W. ALEXANDER,

SOUTH-EAST CORNER OF FOURTH AND MARKET STREETS,

ST. LOUIS.



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cm

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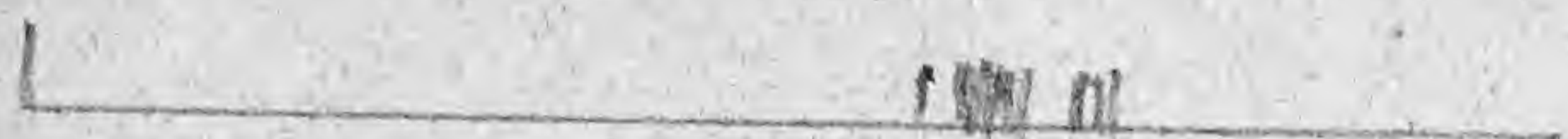
MISSOURI
BOTANICAL
GARDEN

J. W. Robbins No 7

J. riparia

Dec 28 1866

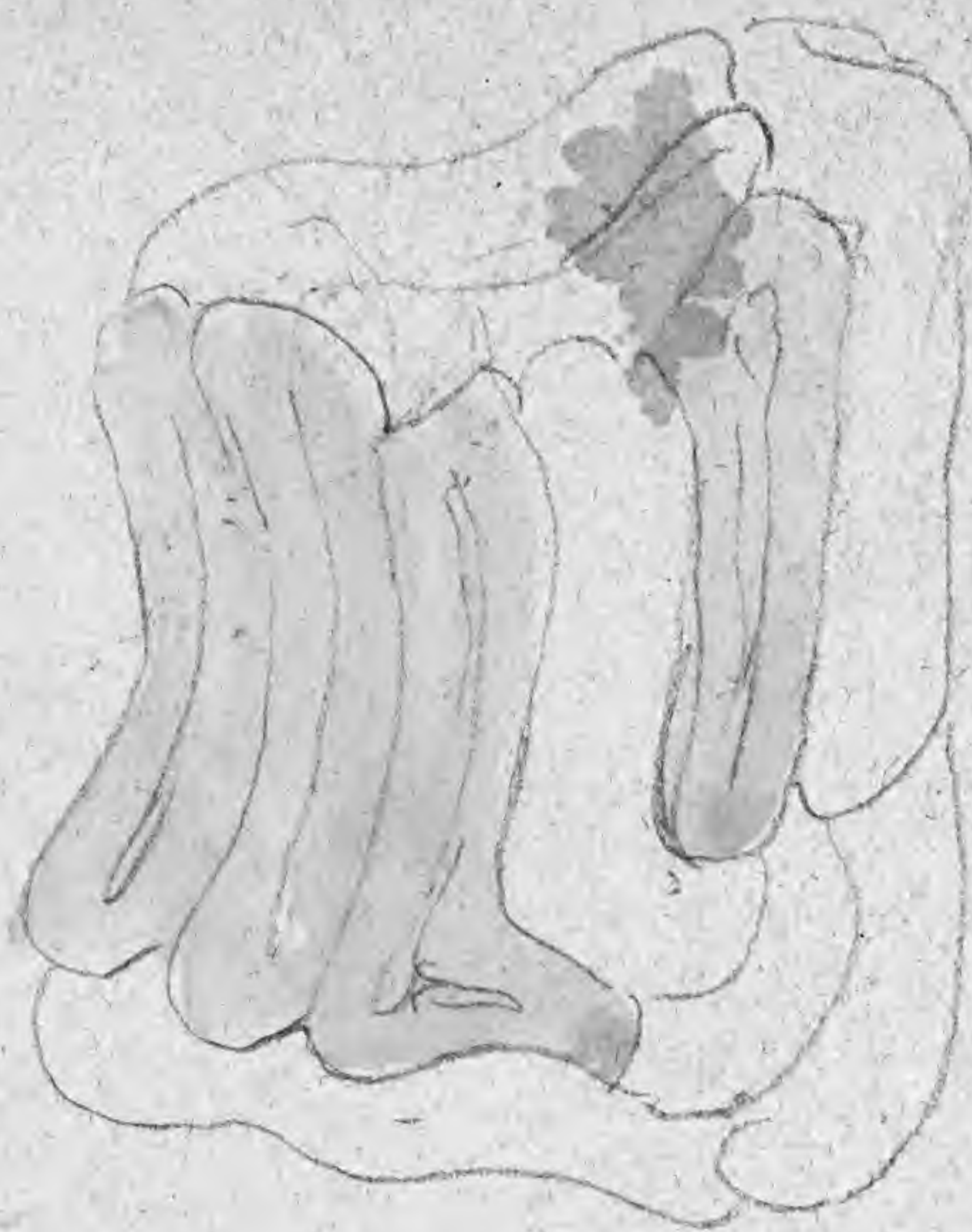
Weybridge 1848



$$\frac{25.0 - 31}{60} = 0.42 - 0.52$$



$$\frac{12 - 14}{415} = 0.029 - 0.034 \text{ mm}$$



x 280

Sporangium cells



0 1 2 3 4 5 6 7 8 9 10

cm

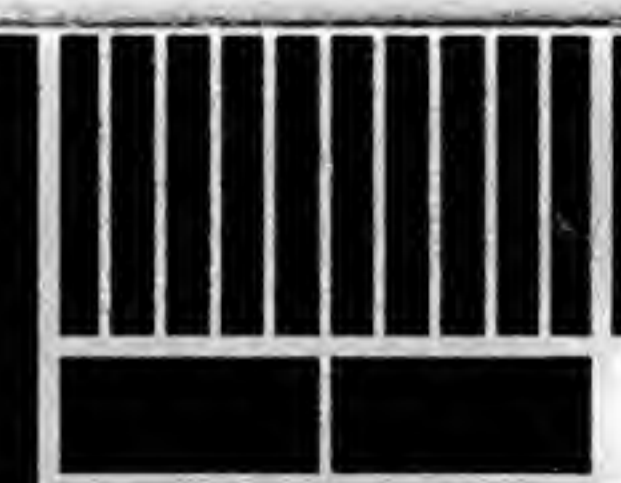
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BOTANICAL
GARDEN

13711

ALEX. LEITCH
APOTHECARY & PHARMACEUTIST
COR. 4TH & OLIVE STS. ST. LOUIS



0 1 2 3 4 5 6 7 8 9 10

cm

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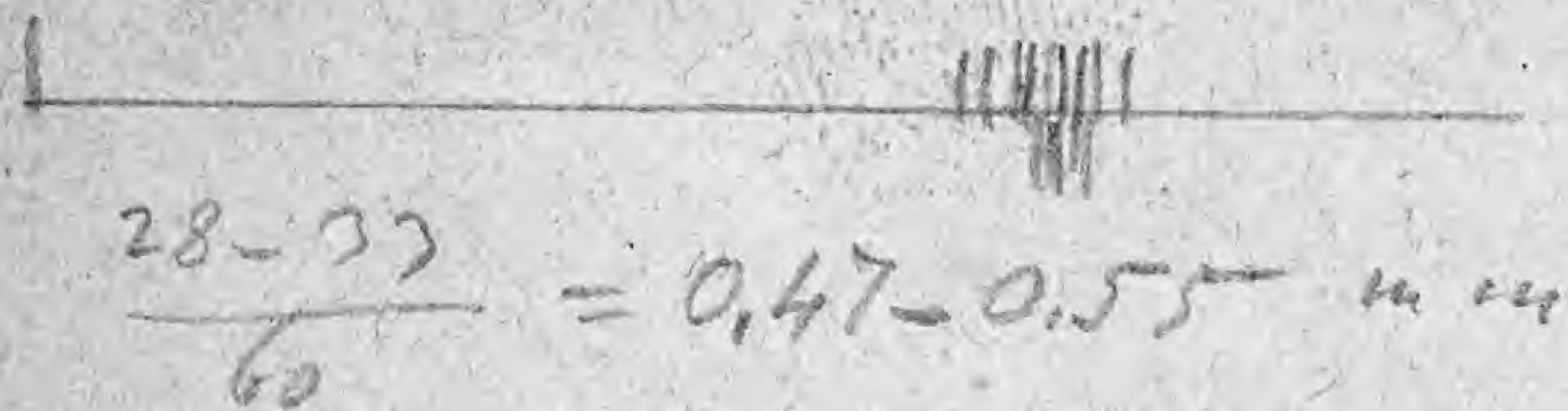
J. W. Robbins No 9

J. riparia

Dec 25 1866

2x bridge in a millpond 5 feet deep ³⁰ 1845?

Diam of macrospores X60



macrospores with much
meandered sculpture
leaves full of stomata



0.029-0.034
mm

X415

leaves 8-12

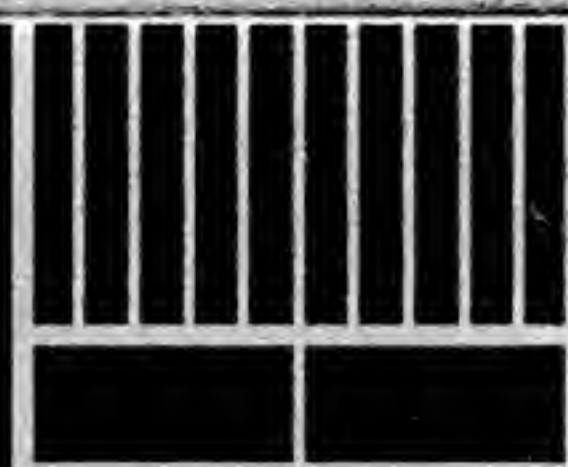
15-20 cm long

X2



brown
sclerodermis
abundant in
spongy

microsporing



0 1 2 3 4 5 6 7 8 9 10

cm

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13712

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COR. 4TH & OLIVE STS. ST. LOUIS



0 1 2 3 4 5 6 7 8 9 10

cm

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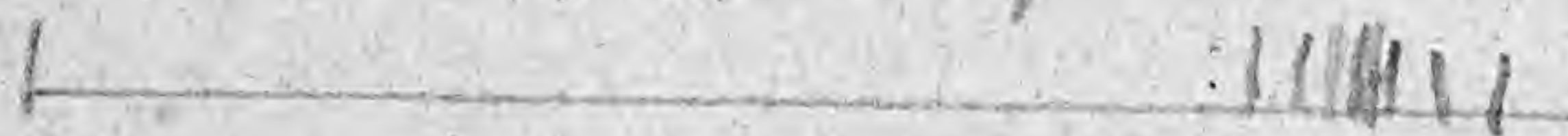
J. W. Robbins, N. S.

Soetes riparia

Dec 28, 1866

W. H. Bridge 1843 ?

Diam. of macrospore, markings between Equatorial
and Laminar



$$\frac{32-39}{60} = 0.53-0.65 \text{ mm}$$

Same as "Robbins 1866"
in Hb. A. Gray
see fig. Dec 14



$$\frac{13-15}{415} = 0.031-0.036 \text{ mm}$$



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



MISSOURI
BOTANICAL
GARDEN

13713

ALEX. LEITCH
APOTHECARY & PHARMACEUTIST
COR. 4TH & OLIVE STS. ST. LOUIS



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
BOTANICAL
GARDEN

Proctos riparia
J.W. Robbins No. 11

Dec 25 1866

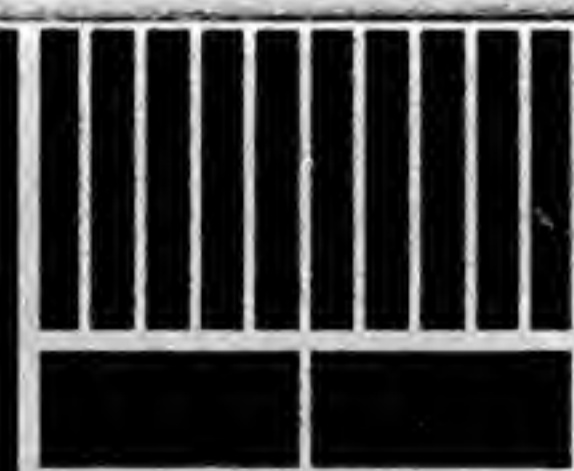
Nxbridge 1848

Spores subtirulatis
 $\frac{27.5 - 32.5}{60} = 0.46 - 0.54 \text{ mm}$



0.028 - 0.031 mm

Also seen cells
embryos



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
BOTANICAL
GARDEN

13714



ALEX. LEITCH
APOTHECARY & PHARMACEUTIST
COR. 4TH & OLIVE STS. ST. LOUIS



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
BOTANICAL
GARDEN

J. W. Robbins N^o 14

Aug 30. 1866

Isotria medeolae

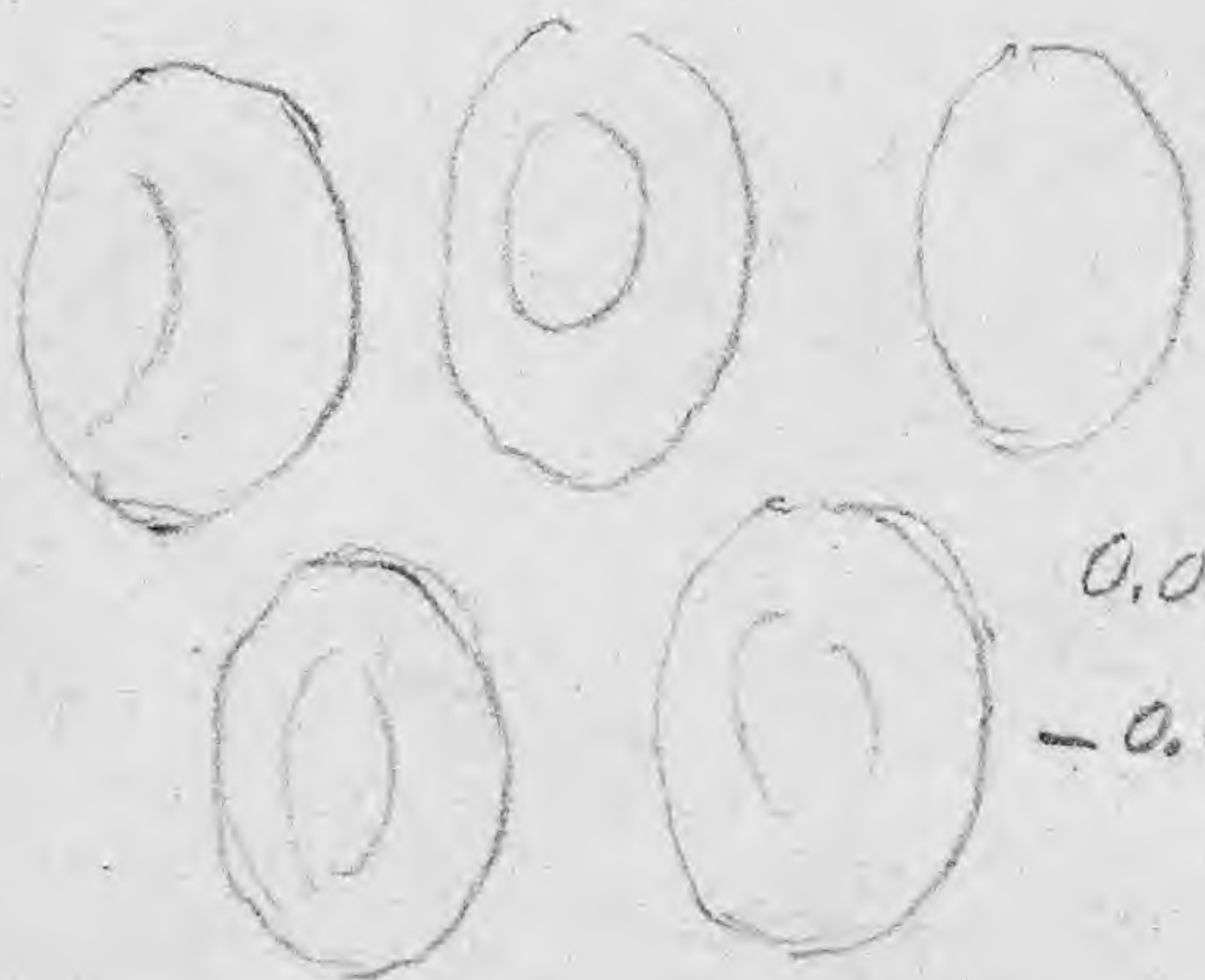
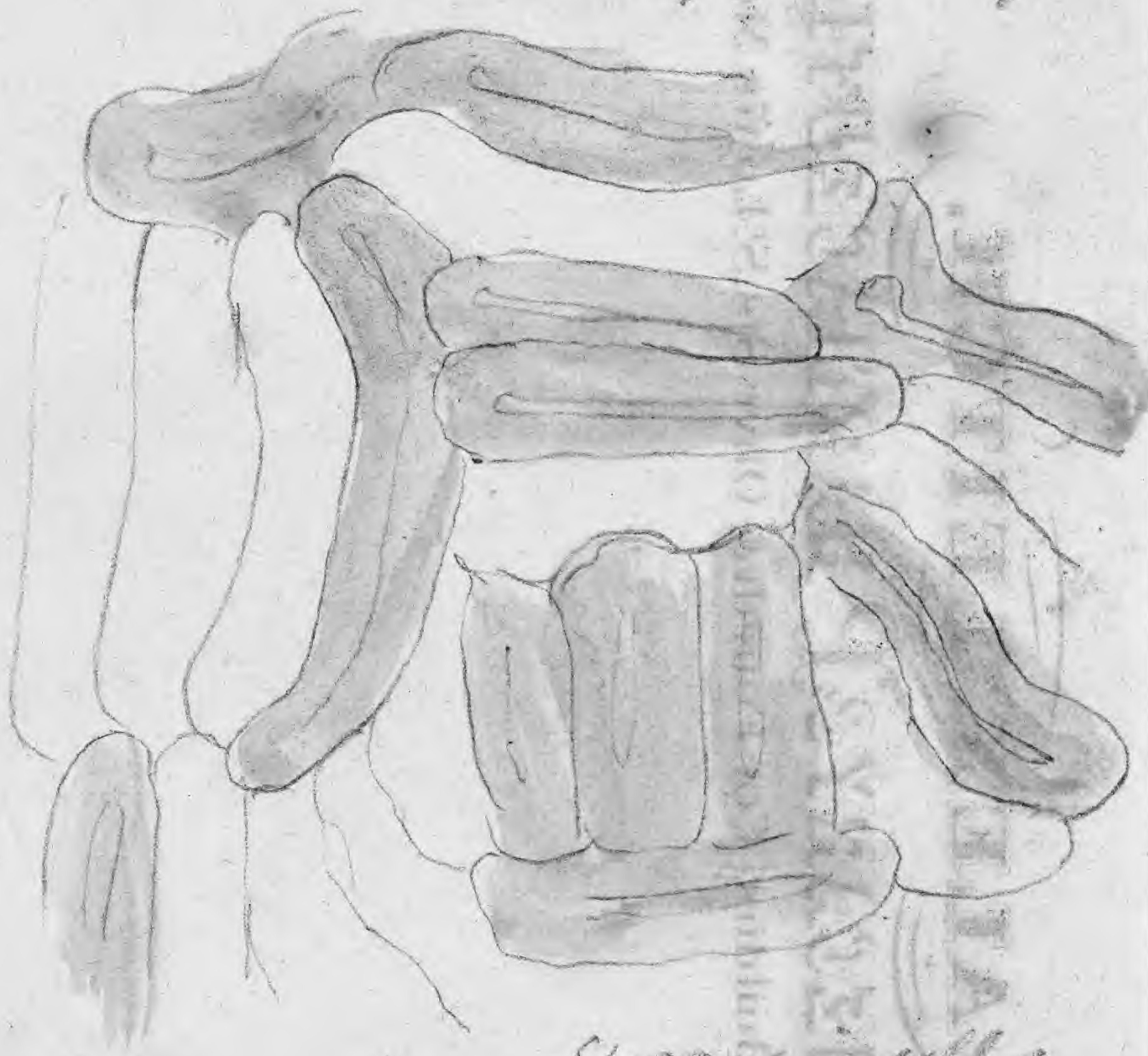
Dec 29 1866

millpond at - Newbridge Mass
2-3 feet deep

$\frac{265-33}{60} = 0.44-0.55 \text{ mm}$



disc of
macrospores
spores exactly like those of N. 10
meandering ridges
on lower half



x280
stomata in
some parts not rare
in others impossible
to find

0.030
- 0.034 mm

Spore cells
x280



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
BOTANICAL
GARDEN

13715

ALEX. LEITCH,

APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10

cm

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J. W. Robbins No. 10. *Isotria medeolae*

maxima

Dec 28. 1866

Dec 30

Nx Bridge 1845?


 Form indeterminate between *virginica*
 and *longicaulis*
 $\frac{32-29}{60} = 0.53-0.65 \text{ mm}$

leaves 15-18

28-32 cm long

12-13 inches

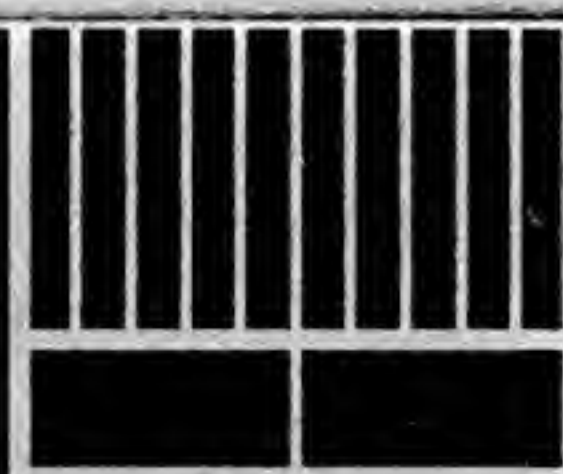
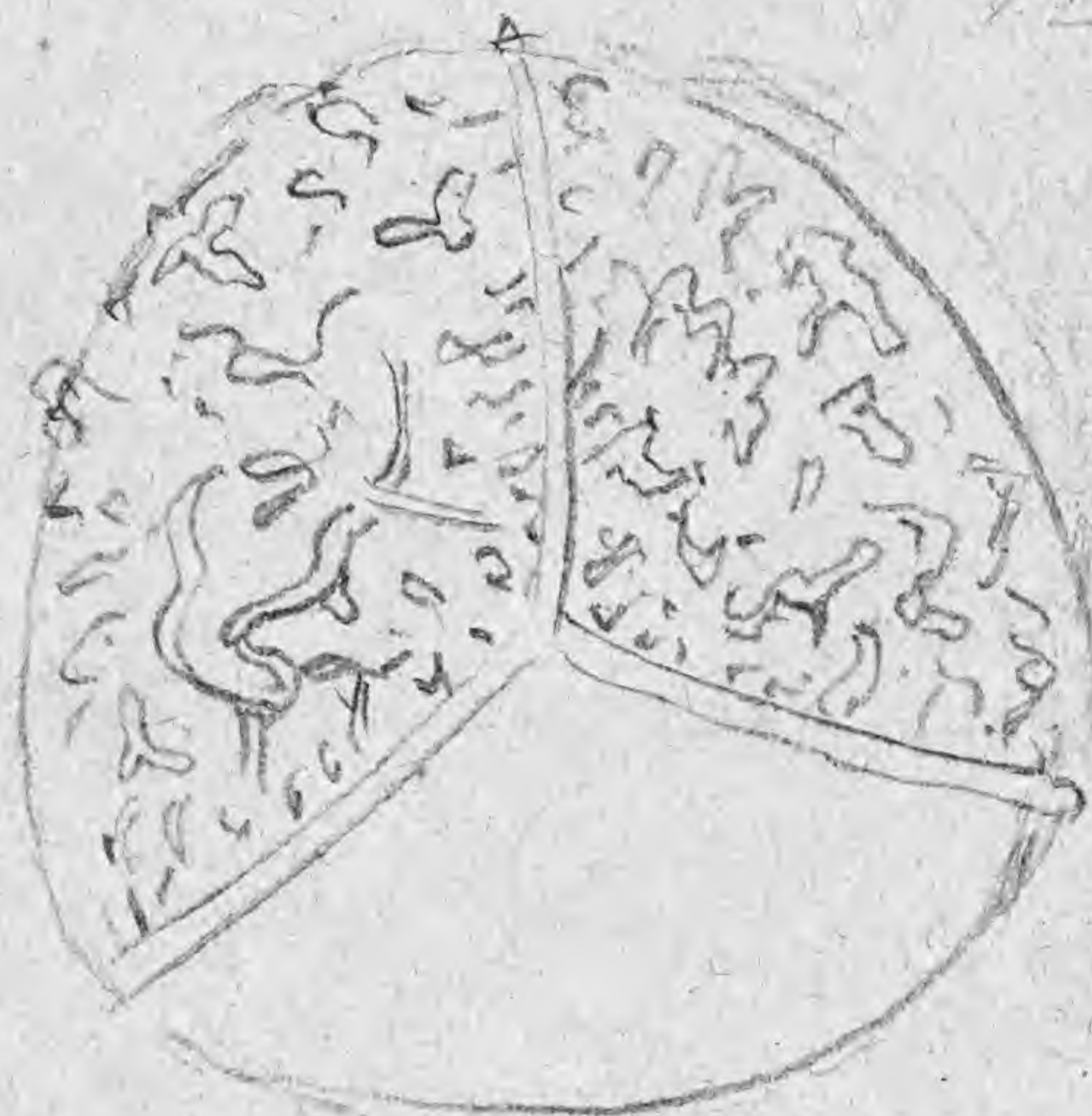


$\frac{125-13}{915} = 0.029-0.032 \text{ mm}$

x 2



macrosporangium



0 1 2 3 4 5 6 7 8 9 10

cm

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COR. 4TH & OLIVE STS. ST. LOUIS



0 1 2 3 4 5 6 7 8 9 10

cm

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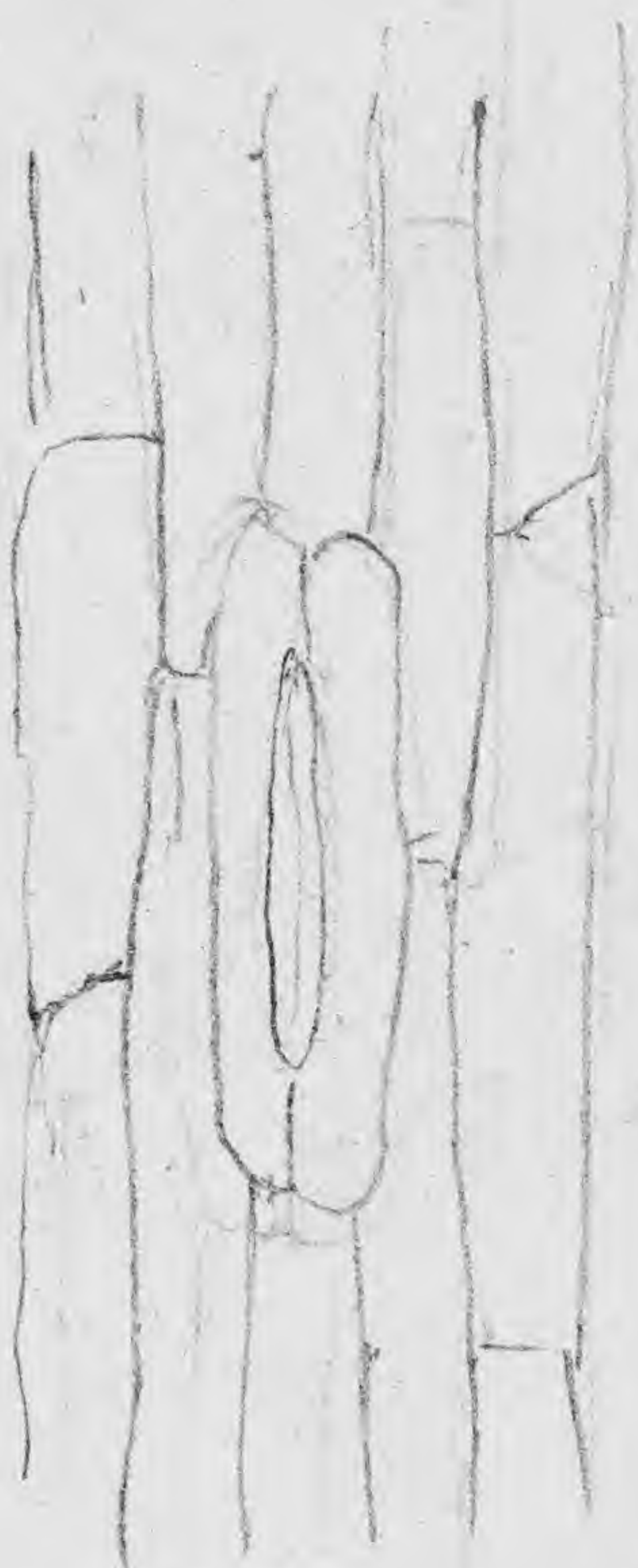
Robins N. 10.

J. riparia

Dec 30 1868



Sporang. cell,
x 280



x 280

stomata in some leaves or part
of leaves (more apparently towards
the top) abundant, in others not
seen



0 1 2 3 4 5 6 7 8 9 10

cm

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0 1 2 3 4 5 6 7 8 9 10

cm

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