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Descriptions *of* New *and* Rare Diatoms. Series XIV.

By R. K. Greville, LL.D., F.R.S.E., &c.

(Read Nov. 9th, 1864.)

(Plates I & II.)

Plagiogramma.

Plagiogramma Wallichianum, n. sp., Grev.—Valve linear, rounded at the ends; costæ two in the middle, and one each end, with a few intermediate pervious striæ. (Figs. 7, 8.)

Hab. St. Helena; rare; Dr. Wallich.

A minute, but well-marked species, of which I find a characteristic sketch of the valve in Dr. Wallich's note-book. I have also obtained views of the frustule in both aspects, in the portion of the dredging he was kind enough to place in my hands. It is not very closely allied to any described species, differing materially from *P. pygmæum*, to which it approaches in size, in the pervious striæ, and strictly linear form. Length ·0017″.

Pyxilla, n. gen., Grev.

Frustules free, oblong, transversely bivalved, box-like, minutely cellulate; each valve terminating in a short, thick apiculus.

This genus must obviously be associated with the *Pyxidiculæ*; indeed, the two species of which it is composed, might almost have been placed in *Pyxidicula* itself, so loosely

is that genus at present defined. In both sections, as it stands (including both *Pyxidicula* and *Dictyopyxis* of Ehrenberg), there are, according to my view, species bearing little, if any, generic affinity; and, as the minute fossil diatoms I am about to describe, possess a striking character of their own, I prefer to keep them apart, rather than add to the existing uncertainty and confusion, which, after all, is mainly owing, as my friend Mr. Ralfs has remarked, to various so-called species being still little known.

Pyxilla Johnsoniana, n. sp., Grev.—Frustule cylindrical-oval, simple (no contraction at the suture). (Fig. 6.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.; very rare.

This rare species has only occurred to me twice, but it is highly probable that in some other samples of the deposit, both it and the following may be more frequent. The cellulation is so minute as to be correctly defined as punctate; but the cellules, when sufficiently magnified, appear to be regularly hexagonal. The suture is situated at somewhat more than one third of the total length from one extremity. Length of frustule ·0025″.

Pyxilla Barbadensis, n. sp., Grev.—Frustule contracted at the suture, one valve cylindrical, the other globose. (Fig. 5.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.

A most beautiful diatom. The globose valve with its contracted base and terminal apiculus, resembles the bulbous dome which crowns the minaret of an eastern mosque. Although there is a great contraction between the valves, the suture itself is acute and somewhat prominent, as in some of the *Creswelliæ*. The punctation is as minute as in the preceding species, and, under a high power, comes out equally beautiful as hexagonal reticulation. Length ·0030″.

CRESSWELLIA.

Cresswellia Palmeriana, n. sp., Grev.—Very large; frustules in front view short, cylindrical, with truncate ends; connecting processes numerous, truncate; cellules punctiform at the suture, becoming larger and hexagonal towards the ends. (Fig. 9.)

Hab. Hong Kong harbour, John Linton Palmer, Esq.; Shark's Bay, Australia, in stomachs of Ascidians; Dr. Macdonald.

The largest and finest of all the known *Cresswelliæ*, discovered by my acute and very obliging correspondent, Mr. J. Linton Palmer, Surgeon, R.N., who has kindly transmitted many new things, accompanied with notes and sketches. One large diatom of singular interest I hope shortly to publish as a new genus, under the well-merited name of *Palmeria*. The subject at present under consideration is a giant in *Cresswellia*, the frustules being no less than ·0030″ to ·0035″ long, and ·0040″ broad, somewhat contracted towards the suture. The connecting processes are twenty and upwards, and truncate, as in *C. Turris* and *turgida*, and situated just within the margin of the truncate end of the valve. A very remarkable character is conspicuous in the structure, which, near the suture, is punctate, but, by degrees, becomes more and more distinctly cellulate, the cellules towards the ends being hexagonal, and about ten in ·001″. I have as yet seen only two frustules in connection. While engaged in preparing this paper, I was agreeably surprised to discover in some Shark's Bay slides, in the cabinet of my friend, Mr. George Norman, both front and side views of this species. For the finest example in my own cabinet, I am indebted to the generosity of Lawrence Hardman, Esq., the well-known diatomist and admirable microscopical manipulator, whose friendly assistance in some very critical investigation, I shall hereafter have a more favorable opportunity of acknowledging.

Cresswellia cylindracea, n. sp., Grev.— Frustules cylindrical (not contracted at the suture), truncated, unequal in length; connecting processes numerous, fine, truncated; structure obscure. (Fig. 10.)

Hab. Hong Kong harbour; May and June; John Linton Palmer, Esq.

Another very notable species, which we owe to the exertions of Mr. Palmer. It exhibits a larger number of frustules in connection than any other hitherto observed, and, at first sight, bears no inconsiderable resemblance to a *Melosira*. The connecting processes, and even the suture, are inconspicuous in specimens preserved in balsam, but come out more distinctly when burnt on the cover and mounted dry. The structure is dense and obscure, the colour pale, with a tinge of yellow.

It is by no means rare in one of the gatherings kindly sent me by its discoverer. Length of frustules ·0015″ to ·0025″, or more; breadth about ·0018″.

Cresswellia Barbadensis, n. sp., Grev.—Small; frustules elliptic, conspicuously cellulate; suture sharply prominent;

connecting processes about 8; aculeate, situated near the suture. (Fig. 11.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.

Although I have been familiar with this little species for some years, I have refrained from its publication until I could quite satisfy myself that it was constant to its characters. An extensive series of individuals having now passed under my observation, I no longer hesitate to admit its claims. Its ellipsoidal form and acute prominent suture, with the circle of aculeate processes arising at a short distance from the suture, constitute an assemblage of characters which cannot fail to identify it. The cellules are 5—6 in ·001″. Diameter nearly always about ·0020″.

Cresswellia sphærica., n. sp., Grev.—Minute; frustules spherical; cellulation very minutely punctiform; connecting processes numerous, truncate, forming a terminal coronet. (Fig. 12.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.

Distinguished by its small size (·0010″ in diameter), its globular form and very minute cellulation, the cellules being as many as about 12 in ·001″. Although very rare, I have seen, at least, a score of specimens, but only a single example of frustules in connection. The processes are very slender and numerous, and are arranged in a diverging circle.

Cresswellia minuta, n. sp., Grev.—Very minute; frustule oblong, with rounded ends; cellulation exceedingly minute. (Fig. 13.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by Mr. C. Johnson; very rare.

The length of this, the smallest species of the genus, is ·0010″, the breadth ·0005″. The connecting processes being more or less injured, I am unable to say whether they are truncate or aculeate.

LIRADISCUS, n. gen., Grev.

Frustules simple, discoid (circular or oval) with a narrow connecting zone; valves somewhat convex, sinuato-reticulate, more or less hispid.

The objects of which I now venture to constitute a new genus, have long been a source of perplexity to me. Sometimes I have even doubted whether they were diatoms at all; but have at length come to the conclusion that they have, at least, more right to be included in the family than the

Xanthiopyscidæ. The valves are remarkable for the sinuous, inosculating veins and furrow-like interstices. The veins are produced here and there, into elevated points, or short spines, not always very obvious, unless in an oblique or front view. The genus is related on the one hand to *Pyxidicula* and its allies, on the other, to the *Coscinodisceæ*.

Liradiscus Barbadensis, n. sp., Grev.—Valve circular, with a wide sinuous reticulation passing towards the margin into radiating lines. (Fig. 14.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.; rare.

Valve hyaline, the large flexuose reticulation occupying from one half to nearly the whole of the disc, and much less hispid than in the following species. I have never seen the front view. Diameter about ·0030″.

Liradiscus ovalis, n. sp., Grev.—Valve elliptic-oval, the sinuous reticulation reaching nearly to the margin, more or less hispid. (Figs. 15, 16.)

Hab. Barbadoes deposit, Cambridge estate, frequent; in slides communicated by C. Johnson, Esq.

The valve varies considerably in the size of the reticulation, and in the degree of hispidity. In some specimens it is difficult to perceive the spines in a side view, except where they rise up close to the margin. Long diameter about ·0025″. I am under an impression that a third species exists in the deposit, with a smaller reticulation, and the little spines crowded.

AULISCUS.

Auliscus notatus, n. sp., Grev.—Small; valve strictly circular, with two processes; whole surface covered with nearly equally distributed minute puncta. (Fig. 2.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.; very rare.

This elegant minute diatom while evidently allied to *A. punctatus*, is, I believe, truly distinct. The valve is very much smaller and strictly circular; and the punctation is uniform, not exhibiting the slightest tendency to radiation. In the specimens which I have seen, the processes are situated at some distance from the margin. Diameter ·0018″.

Auliscus Barbadensis, n. sp., Grev.—Valve elliptic-oval, with a small umbilicus, 2 processes, 4 radiating lines arranged in a cruciform manner, and 2 less conspicuous lateral ones. (Fig. 1.)

Hab. Barbadoes deposit, Cambridge estate; C. Johnson, Esq.; extremely rare.

In outline, but in no other character, resembling *A. ovalis*. The radiating lines which form the cross, are simple as they leave the centre, but afterwards, by giving off two or three very short ramuli, terminate within the margin in pencils of rays. An intermediate pencil on each side is obscure, but probably might be more decided in other examples. Long diameter ·0025″.

BIDDULPHIA.

Biddulphia fimbriata, n. sp., Grev.—Structure minutely dotted; valves with the angles produced into curved, obtuse horns, and furnished with a marginal row of long filaments. (Fig. 4.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.; rare.

A most extraordinary species, of which I have seen at least half a dozen examples in different degrees of preservation. The horns are slightly tumid towards the base, and the terminal articulating surfaces obliquely truncate. The most remarkable feature consists in the filaments which fringe the discoid margin of the valve. None of them appear to be quite perfect at the apex, and yet in the specimen figured they are as long again as the horns. Minute raised points are sparingly scattered towards the margin of the valve. Diameter ·0035″.

Biddulphia spinosa, n. sp., Grev.—Structure very minutely punctate; valve elliptical, produced at the angles into 2 minute horns, and armed with 3 marginal spines on each side, besides 1 opposite each horn. (Fig. 3.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.; rare.

Although this diatom is decidedly rare, I cannot have seen fewer than a dozen or more specimens of the valve, all retaining its well-marked characters; the only variation being some difference in the breadth, and in the acuteness of the ends. The horns are very small, obtuse, and without any inflation at the base. Diameter about ·0030″.

TRICERATIUM.

Triceratium Dobrèeanum, n. sp., Norman in lit.—Large; valve with straight sides and obtuse angles produced into

prominent pseudo-nodules (elongated processes); 3 vein-like lines projecting from each side, and the whole surface, except the angles, filled up with circular, remote, subequidistant cellules; connecting zone filled with similar cellules arranged in oblique decussating lines. (Figs. 23, 24.)

Hab. Dredged off Sydney, New South Wales, in 15 fathoms. N. F. Dobrèe, Esq.

This splendid *Triceratium* was detected by Mr. Norman in some material dredged by his friend Mr. N. F. Dobrèe, near Sydney. It is a very beautiful object, and fortunately, Mr. Norman obtained both front and side views of the frustule. The valve is very convex, and has three vein-like lines projecting from each side, the middle one of which reaches half way to the centre. Remotely scattered over the surface are circular cellules, and at the angles are very prominent pseudo-nodules,—so called, but which in the front view turn out to be elongated processes; a circumstance which shows how difficult it is to describe these objects in the absence of perfect materials. The front view is very interesting, as showing the processes referred to, terminating in a little obliquely placed disc so exquisitely dotted as to remind the observer of the compound eyes of insects. These punctate discs are the articulating surfaces; and it is scarcely possible to resist the conclusion that some communication must exist between the processes of the frustules so united by means of this structure. Are they the base or scars of minute vessels intended to hold the chain of frustules together until the period of maturity and separation? A little above, and on the inner side of the punctat spaces are terminal spines, the bases only being left in the specimens before me. In position they resemble those which I have observed in various other *Triceratia*, in some species of *Entogonia*, and in the genus *Hemiaulus*. In the connecting zone of our present species, the round cellules are arranged symmetrically in oblique decussating lines. One specimen (fig. 24) exhibits a variation of structure intermediate between the connecting zone and the valve, consisting of a broad belt of totally different cellules, much larger, of a roundish-oval slightly quadrate shape, and closely arranged. How so remarkable an organisation should occur in one example and not in the others, is sufficiently perplexing. Distance between the angles of the valve ·0060″.

Triceratium neglectum, n. sp., Grev.—Valve with straight sides and subacute angles, with transverse lines cutting them off so as to leave a nearly equal hexagonal centre; structure minutely punctate, in lines radiating from a small punctate

umbilicus; but, within the angle, passing in right lines from the transverse line. (Fig. 20.)

Hab. Barbadoes deposit, Cambridge estate; C. Johnson, Esq.

I am not aware of any species with which the present diatom can be compared. There is no appearance of a pseudo-nodule. The transverse line which cuts off the angle is not like a rib, but appears rather like a break in the continuity of the radiating lines of puncta, or like a groove, for there is a perceptible shadow. But there is not actually a break in the continuity of the lines referred to, but a sudden termination; for the space between the transverse line and the angle is filled up with a different set of lines, arranged at a right angle to the transverse line. Distance between the angles ·0025″.

Triceratium Kittonianum, n. sp., Grev.—Valve triradiate, the angles prolonged into narrow linear arms terminated by prominent pseudo-nodules; structure reticulato-cellulate, three rows of cellules being contained in the arms. (Fig. 18.)

Hab. Deposit at Nottingham, Maryland, U.S; F. Kitton, Esq.

A very interesting species allied to *T. Solenoceros* and *ligulatum*, and, indeed, so similar in form, that any one, in the absence of minute examination, might be pardoned for pronouncing all three identical. Mr. Kitton, as I find from the drawings he has kindly permitted me to see, referred our present species to *T. Solenoceros*; but the differences are in reality very decided. The last-named species has not the very slightest trace of a pseudo-nodule. In *T. Kittonianum*, on the contrary, it is conspicuous, and in the front view (according to Mr. Kitton's drawing) projects above and below the connecting zone, like a hammer. The structure, also, is much more widely cellulate. Our new species, therefore, differs from *T. Solenoceros* both in structure and in being furnished with a pseudo-nodule; and from *T. ligulatum* in structure. The front view of the pseudo-nodule in the latter has not been seen. The cellules of *T. Kittonianum* are hexagonal, and in the arms about 8 in ·001″. Distance between the angles ·0060″.

Triceratium nitescens, n. sp., Grev.—Small; valve triradiate, the arms linear-oblong, rounded at the ends, with 5—6 short vein-like lines on each side, and minute puncta between the lines, the whole forming a marginal band, leaving a blank space down the middle; centre with a few scattered puncta enclosing an irregular triangular space. (Fig. 19.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.

A most brilliant and beautiful diatom allied to *T. lobatum*, but apparently distinct. The arms are much longer and narrower; and the punctation is confined to the intervals between the lines on the same side, thus leaving a well-defined, broad, blank space extending down the middle of each arm to the central area. The latter is occupied by a small cluster of puncta opposite each side-angle, with a few scattered intermediate ones, so as to enclose an obtusely triangular blank space. Distance between the arms ·0028″.

Triceratium cancellatum, n. sp., Grev.—Valve with slightly concave sides and subacute angles; surface with 6 alternate radiating elevations and depressions, filled with radiating lines of cellules which become large and somewhat quadrate towards the margin and angles, which latter contain large pseudo-nodules. (Fig. 17.)

Hab. Barbadoes deposit, Cambridge estate; C. Johnson, Esq.; extremely rare.

A very curious and unquestionably distinct species. The surface is undulated in such a way that when the angles are in focus, they appear to terminate a ridge or elevation which radiates from the centre, while the middle of the margin at each side is out of focus, and in like manner terminates a radiating depression. The cellulation gradually increases in size from the centre to the margin, and to the angles, where it ends abruptly at the pseudo-nodules which, in the front view must be considerably elongated processes. There is a sort of indication of the commencement of vein-like lines, here and there at the margin, especially near the angles, which is shown by some of the cellule-walls becoming thickened for a short distance inwards. Distance between the angles ·0032″.

Triceratium acceptum, n. sp., Grev.—Small; valve with nearly straight sides and obtuse angles containing a conspicuous roundish pseudo-nodule; structure composed of lines of minute puncta radiating from an umbilicus of a few larger puncta, the lines diverging in a fan-like manner to the sides, and converging towards the angles. (Fig. 21.)

Hab. Barbadoes deposit, Cambridge estate; in slides communicated by C. Johnson, Esq.

Although the sides of the valve are nearly straight, there is a perceptible approach towards convexity. The pseudo-nodules are transversely roundish-oval, and somewhat resemble the mastoid process of an *Auliscus*. Distance between the angles ·0025″.

Triceratium exornatum, n. sp., Grev.—Rather large; valve

with nearly straight sides and rounded angles, which contain large hemispherical pseudo-nodules, having a nucleus of very minute puncta ; surface with 6 alternately raised and depressed radiating undulations ; structure composed of lines of minute puncta radiating from a small blank umbilicus ; margin coarsely striated. (Fig. 25.)

Hab. Barbadoes deposit, Cambridge estate ; C. Johnson, Esq. ; very rare.

This fine diatom belongs to a small group in which occur the remarkable undulations of the surface of the valve, already described in *T. cancellatum*. They exist also in *T. insigne*, a fact which I overlooked in my description of that species, but which was detected by my acute friend Mr. Ralfs. It may be a question whether the present diatom be not a variety of the one last named, but after the examination of a series of specimens, I am under a very strong impression that the two, although very nearly related, are really distinct. Our present species is larger, the sides always nearly straight, and the angles less rounded. In *T. insigne* the sides are always considerably concave, and the angles hemispherical, a very striking character. Distance between the angles ·0050″.

Triceratium quadrangulare, n. sp., Grev.—Large ; valve with 4 rounded, somewhat produced angles, and sides with a concavity in the middle ; cellulation conspicuous, irregularly hexagonal, radiating from the centre ; the cellules becoming suddenly very small within the angles, which exhibit no decided pseudo-nodule. (Fig. 26.)

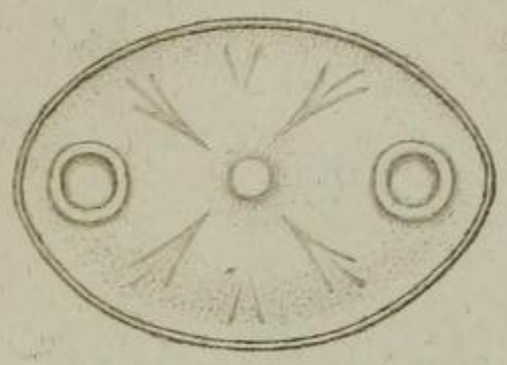
Hab. Barbadoes deposit, Cambridge estate ; C. Johnson, Esq. ; very rare.

A very fine species with a graceful outline, and pale, delicate reticulation. Margin thickened, or perhaps, rather involute, especially at the lateral concavities. The valve might be almost described as four-lobed, each lobe broadly elliptical-ovate, with the angle produced. Distance between the angles ·0038″.

Triceratium Atomus, n. sp., Grev.—Very minute ; valve with slightly concave sides and rounded angles, where there is the appearance of a small pseudo-nodule across the extreme apex ; margin with 4—5 minute puncta ; central structure obscure. (Fig. 22.)

Heb. Barbadoes deposit, Cambridge estate ; in slides communicated by C. Johnson, Esq. ; extremely rare.

I can make nothing more out of this very minute diatom than what is contained in the specific character.



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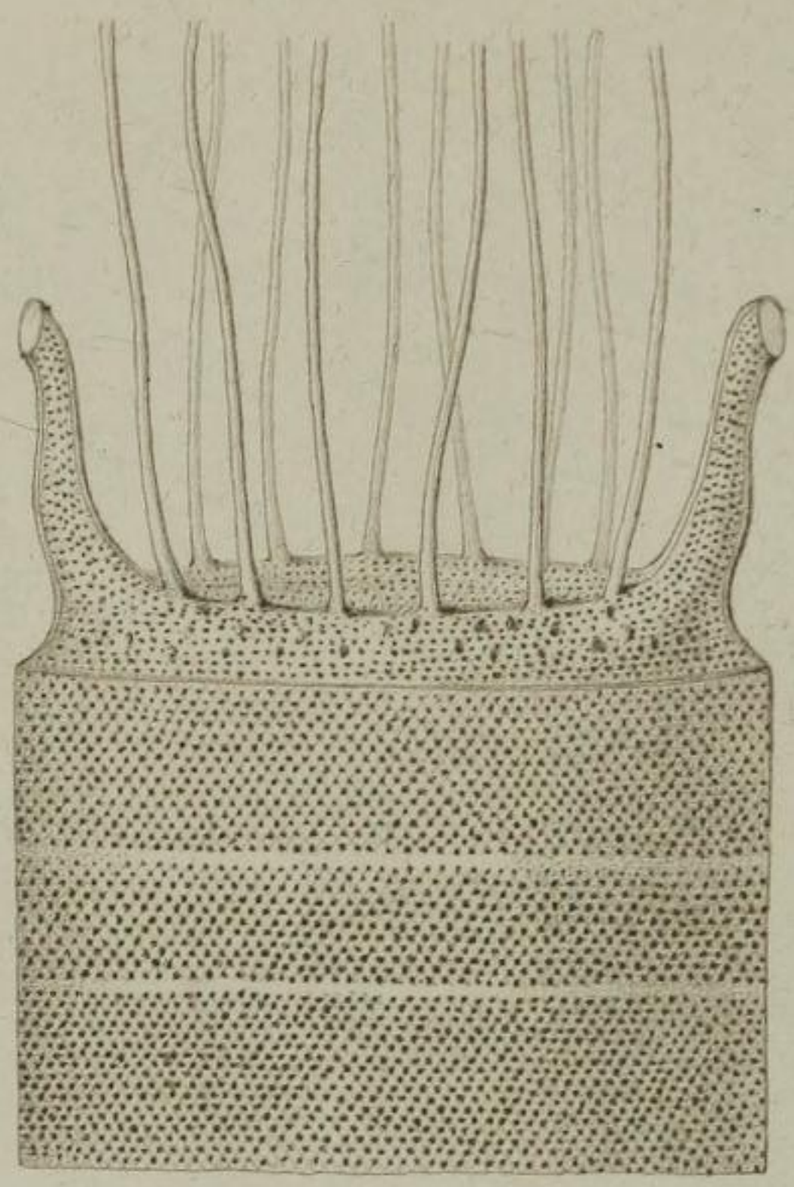

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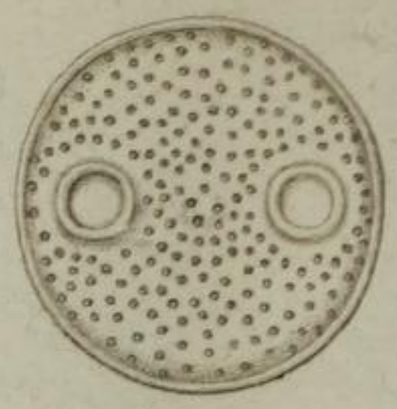

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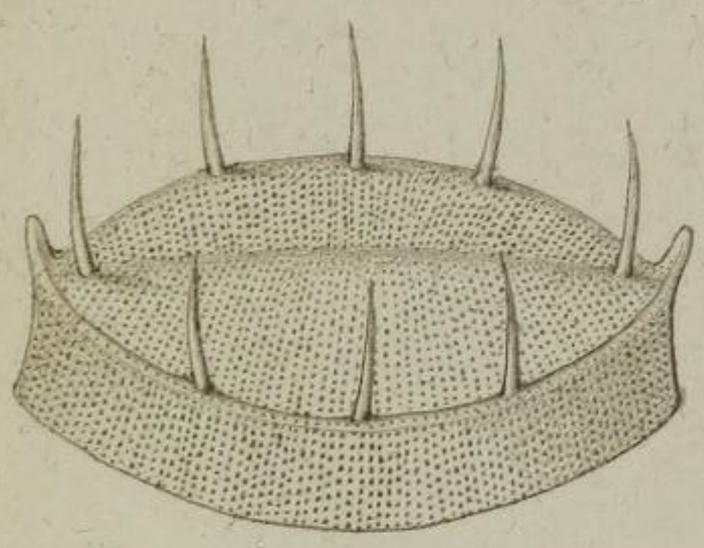

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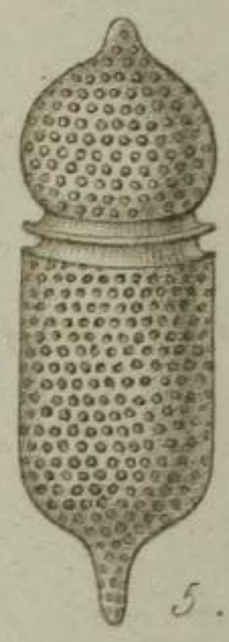

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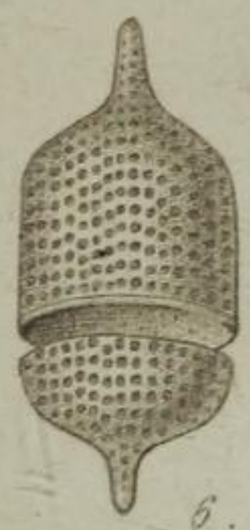

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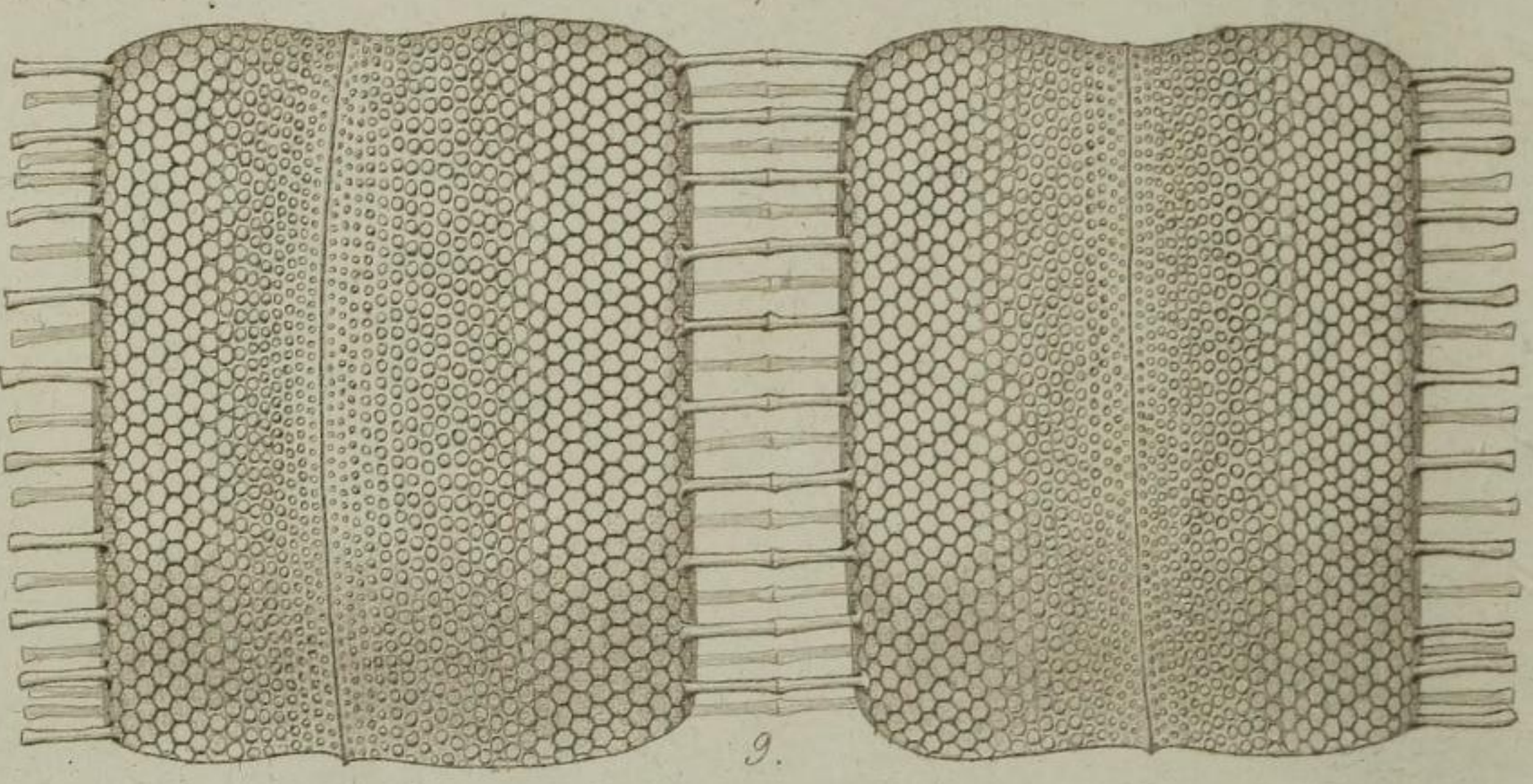

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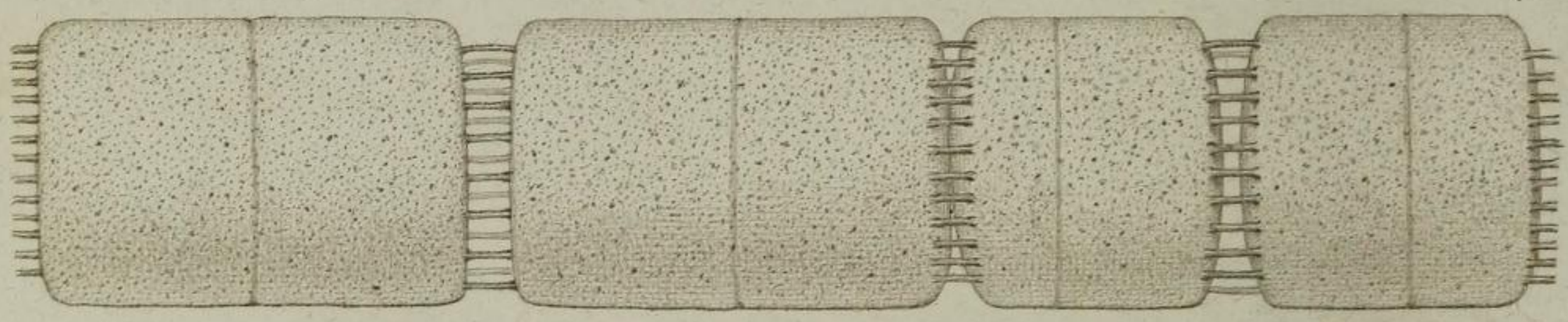

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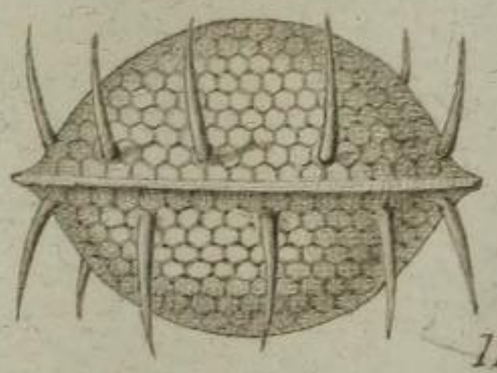

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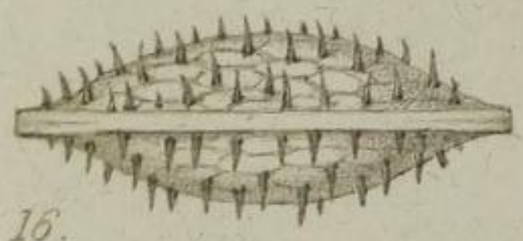

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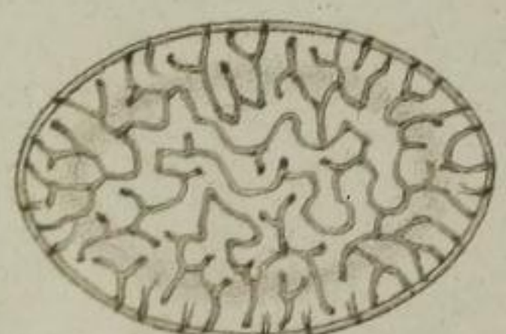

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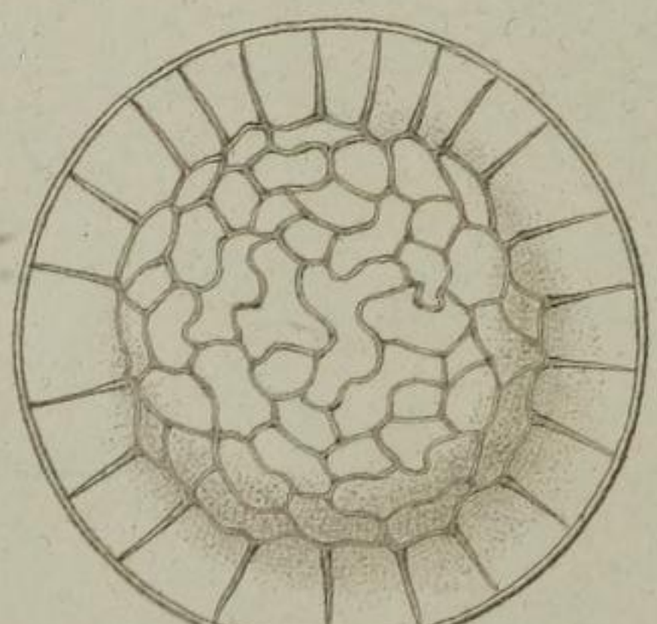

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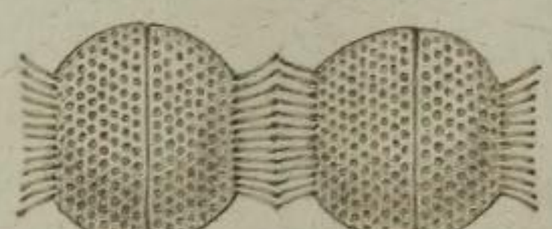

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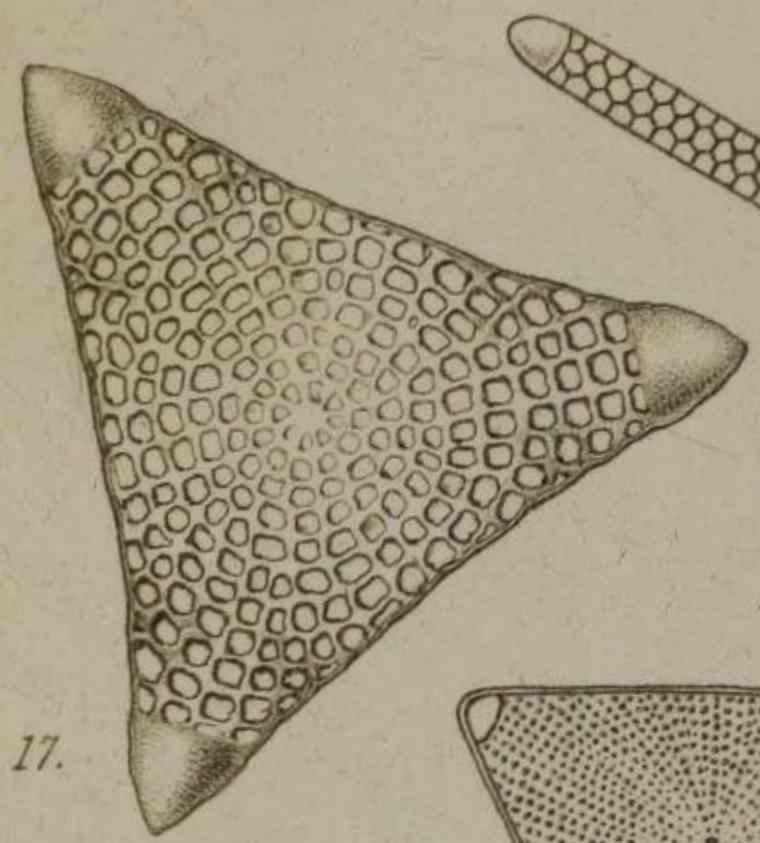
R.K. Greville, del.t - on stone by F. Huth.

W.H.M.c Farlane, Lith.r Edin.r



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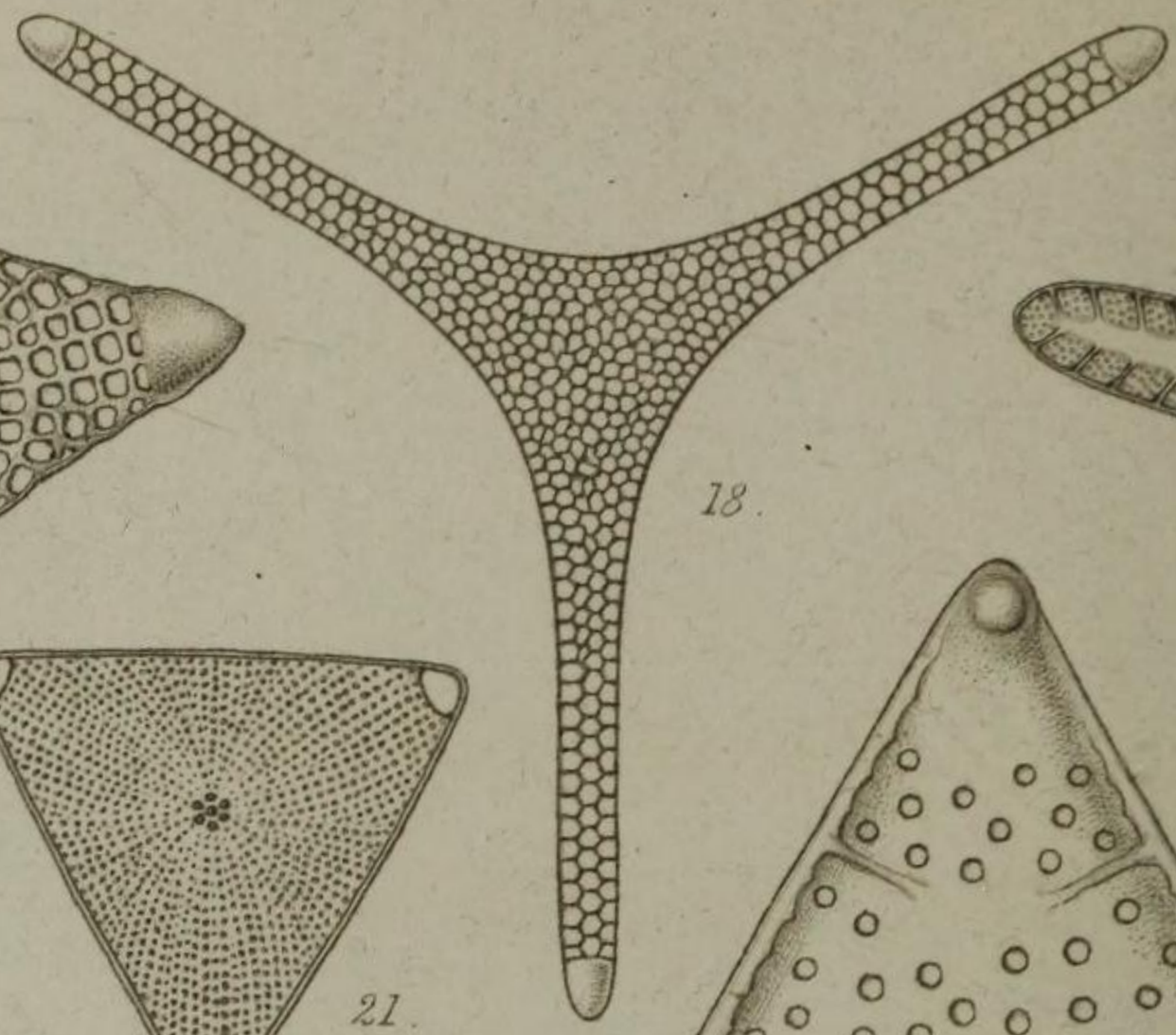

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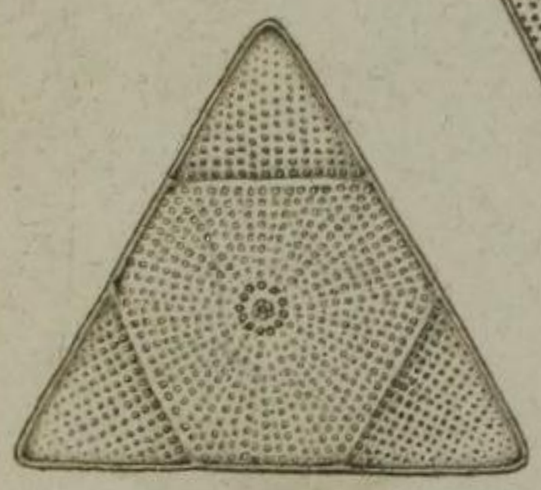

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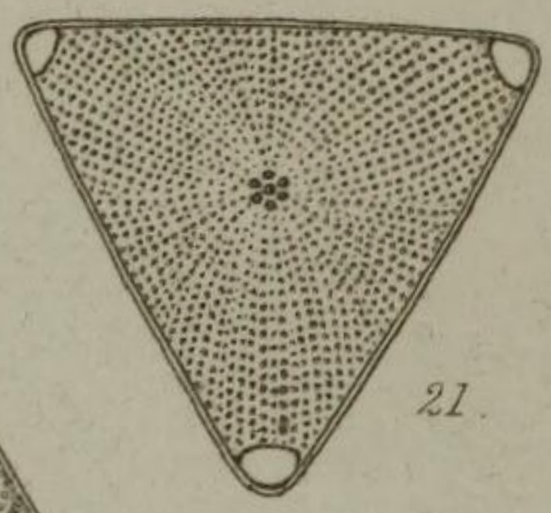

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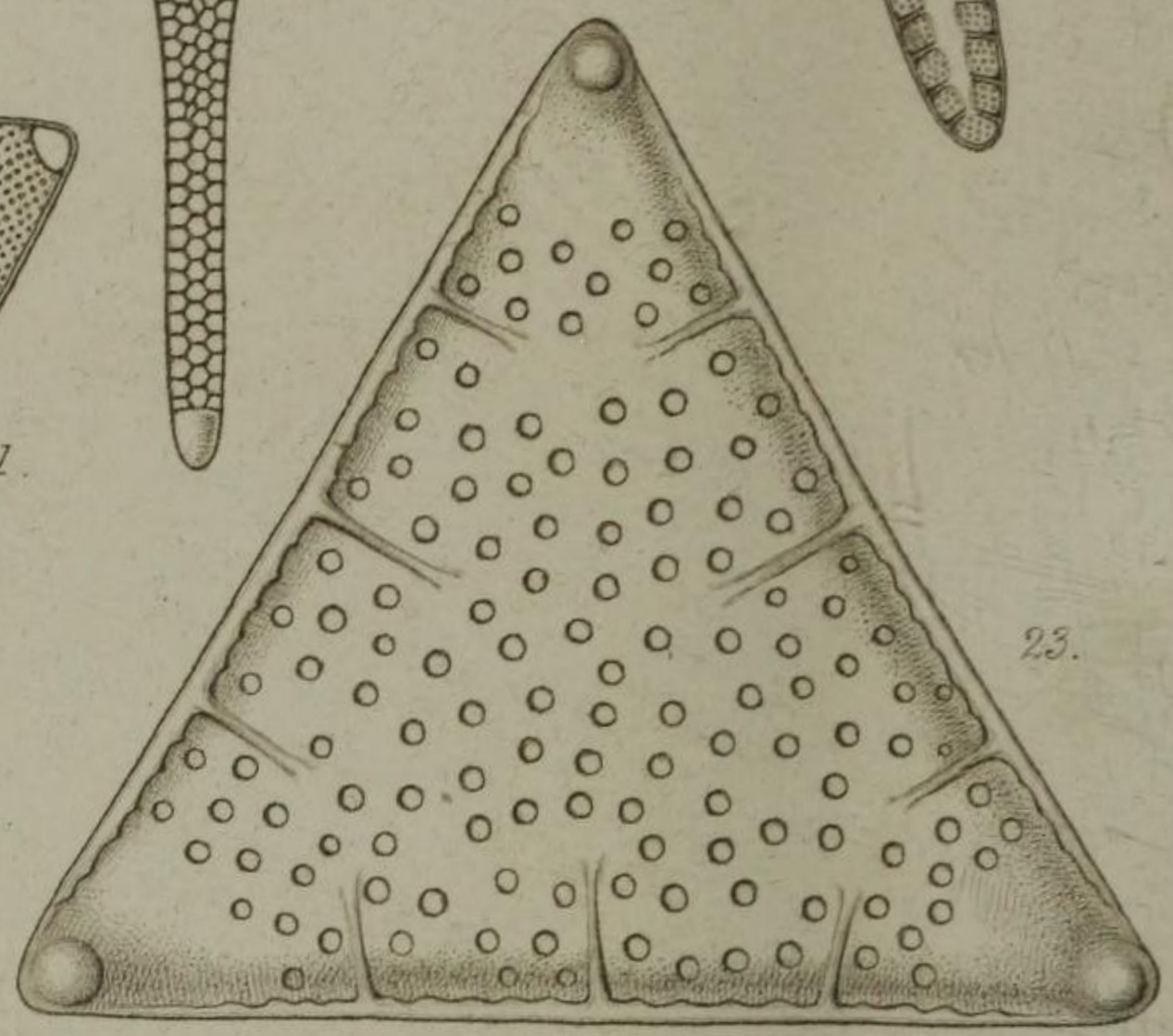

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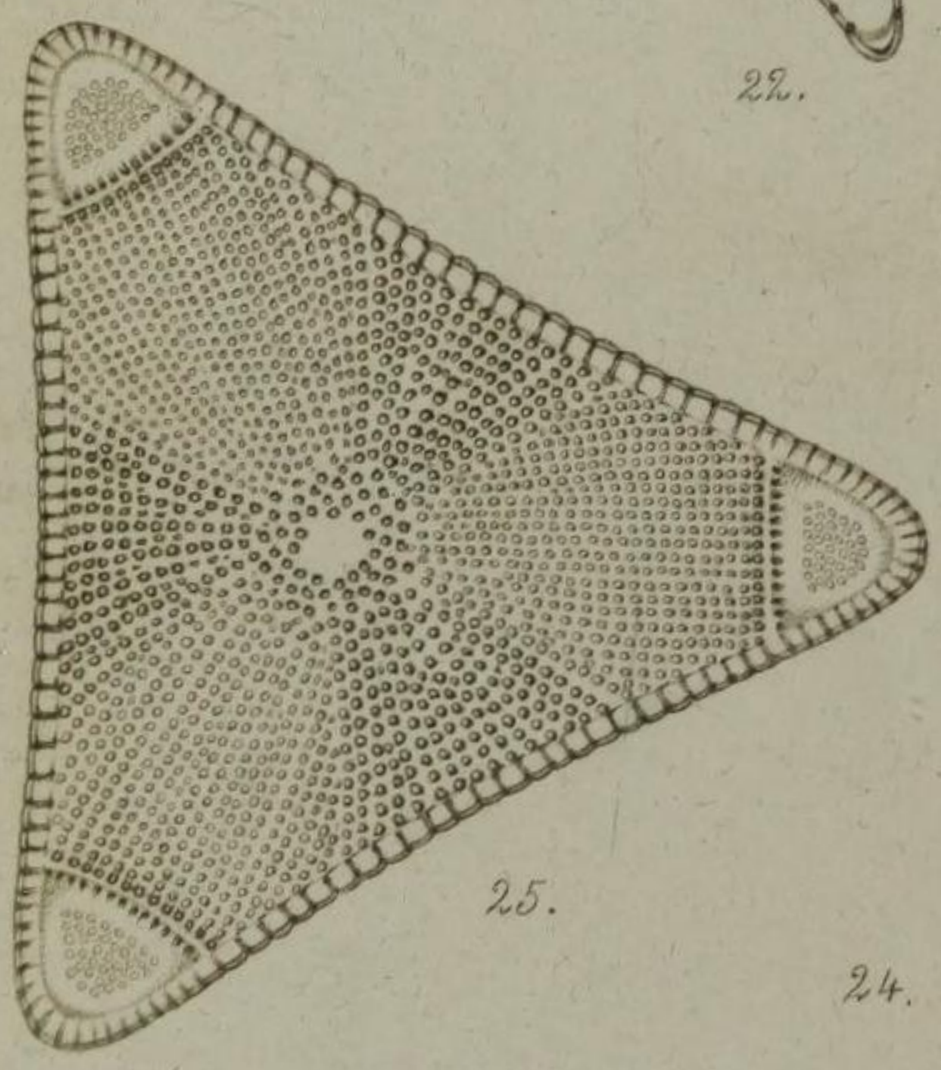

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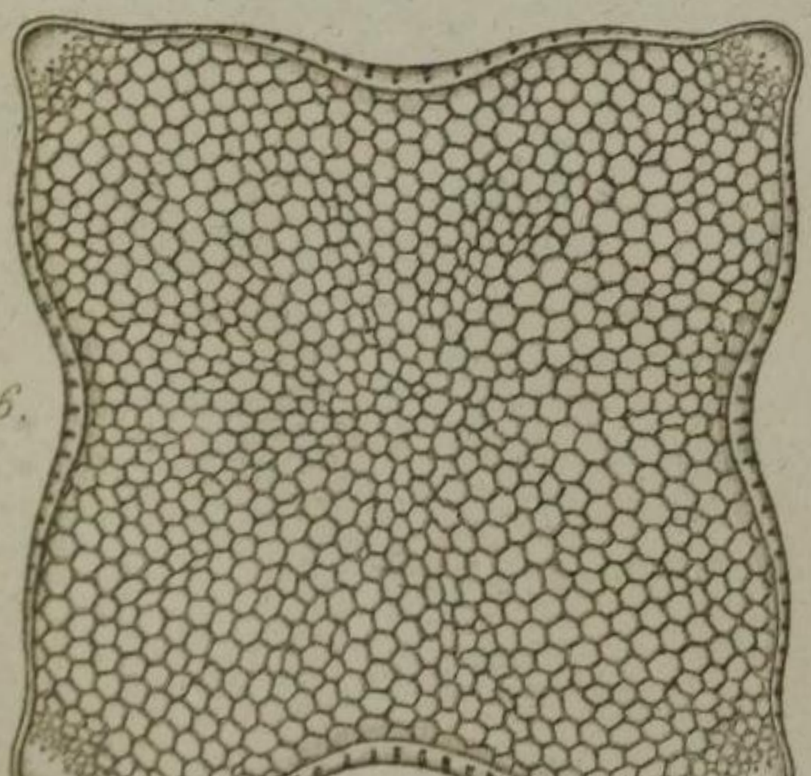
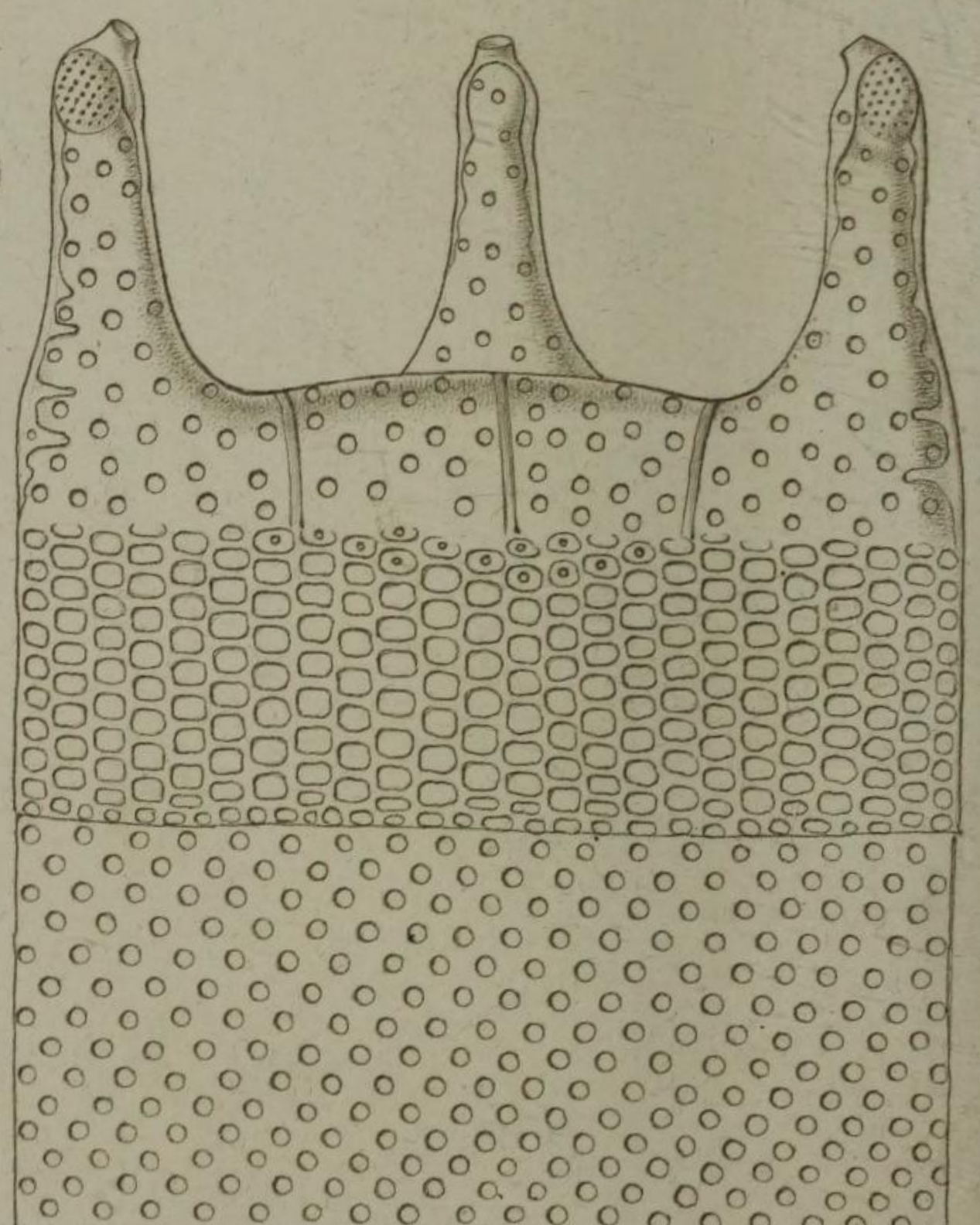


26.



24.

R.K. Greville, del.t - on stone by F. Huth.

W.H. Mc Farlane, Lith.r Edin.r

DESCRIPTION OF PLATES I & II,

Illustrating Dr. Greville's paper on New Diatoms. Series XIV.

Fig.
1.—*Auliscus Barbadensis.*
2.— „ *notatus.*
3.—*Biddulphia spinosa.*
4.— „ *fimbriata.*
5.—*Pyxilla Barbadensis.*
6.— „ *Johnsoniana.*
7.—*Plagiogramma Wallichianum*, front view.
8.— „ „ side view.
9.—*Cresswellia Palmeriana.*
10.— „ *cylindracea.*
11.— „ *Barbadensis.*
12.— „ *sphærica.*
13.— „ *minuta.*
14.—*Liradiscus Barbadensis.*
15.— „ *ovalis*, side view.
16.— „ „ front view.
17.—*Triceratium cancellatum.*
18.— „ *Kittonianum.*
19.— „ *nitescens.*
20.— „ *neglectum.*
21.— „ *acceptum.*
22.— „ *Atomus.*
23.— „ *Dobrèeanum*, side view.
24.— „ „ front view.
25.— „ *exornatum.*
26.— „ *quadrangulare.*

All the figures are × 400 diameters.