KONGL. SVENSKA VETENSKAPS-AKADEMIENS HANDLINGAR. Bandet 18. N:o 5.

ON SOME NEW AND LITTLE KNOWN DIATOMS

BY

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WITH SIX PLATES.

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Several years ago I received through Professor S. Lovén from the Swedish State Museum some samples af shellsand and mud, which had been collected during the expedition of the Roy. Swedish Fregatè *Eugenie* 1851—53 on the Gallapagos Islands, Honolulu, Port Jackson etc. On examining these samples, as well as many others, received from various friends and correspondents, I found a number of diatoms, which seems to me to be entirely new to science or at least of interest. Especially am I indebted to Dr. Söderlund for some very rich materials from the Mediterranean Sea and the Balearic Islets, to Mr. Christian Febiger, the wellknown diatomist of Wilmington, Delaware, Mr. Hauck of Triest, Prof. Berggren, Dr. O. Nordstedt and others for various interesting gatherings. Mr. Grunow of Vienna has kindly helped me in preparing this paper and assisted me in many cases of uncertainity, and for which I here take the liberty of tendering him my best thanks.

Mastogloia Thwaites.

1. *M. panduriformis* Cl. N. Sp.

Valve panduriform with cuneate ends. Margin with somewhat distant loculi, except in the middle, on both sides of the central nodule, where they are wanting or indiscernible. The surface of the valve is covered with small, irregularly scattered puncta and very fine (20 in 0,01 mm.), parallel, punctate striæ. These striæ, which are not strongly marked, cover the whole valve, except a small area, round the straight median line and central nodule. Terminal nodules turned in opposite directions.

Length 0,0975 mm. Breadth 0,027 mm. at the constriction 0,0195 mm.

Gallapagos Islands (Eugenie Exp.) Very rare.

Pl. I, fig. 1, $^{500}/_{1}$.

The outline of the frustule, the few and large loculi as well as its peculiar structure destinguishes this fine form from all previously known species. Its nearest allies are the Naviculæ or Mastogloiæ, forming A. Schmidts section Pseudodiploneis, *N. marginata* Lewis, *N. strangulata* Grev., *Mastogl.? reticulata* Grun.

2. *Mastogloia submarginata* Cl. et Grun. N. Sp.

Elliptic lanceolate, ends neither produced nor capitate. Marginal loculi very indistinct, 5—8 in 0,01 mm. Striæ punctate, 18—20 in 0,01 mm., most strongly marked near the margin and on both sides of the median line, so that they seem to be interrupted by a more or less large lunate area. The striæ continue across this area, but are very faintly marked, and can only be discovered with good objectives.

Length 0,04—0,048 mm. Breadth 0,013—0,017 mm.

Gallapagos Islands (Eugenie Exp.), Campèche Bay (accord. to Grunow).

Pl. I, fig. 2, $^{1000}/_{1}$.

The specimens from Gallapagos Islands have 18 striæ and 8 canaliculi in 0,01 mm., specimens from Campèche Bay, according to Grunow, 20 striæ and 5—7 canaliculi. In its very indistinct canaliculi and the interrupted striæ this species comes nearest to *N. Jelineckii* Grun.

Amphora Ehb.

1. *A. Berggrenii* Cl. N. Sp.

Median band not complex, central nodule not transversely dilated. The frustule is elongated with broad and rounded ends and almost parallel sides; its form being like that of *A. arenaria* Donk. The valve is striate, dorsal striæ almost parallel, more distant in the middle (17 in 0,01 mm.) than near the ends (20 in 0,01 mm.); ventral striæ irregular, divergent, especially near the terminal nodules. Terminal nodules conspicuous and seem to project into the frustule.

Length of the frustule 0,065 mm. Breadth 0,025 mm.

Fossil, Arthurs Pass, New Zeeland, mixed with freshwater species, such as *Navicula serians*, *N. rhomboides*, *N. cuspidata* etc. S. Berggren.

Pl. I, fig. 3, $^{1000}/_{1}$; *a.* valve, *b.* frustle.

A freshwater species of Amphora having this appearance is very remarkable. I have issued this species in Cl. et Möll. Diat. N:o 90.

Cymbella Ag.

1. *Cymbella Brasiliana* Cl. N. Sp.

Almost symmetrical, naviculoid (a faint obliquity being percebtible only on large specimens), lanceolate with somewhat obtuse apices. Median line straight. Striæ radiant, near the apices almost parallel, covering the whole surface, except a narrow (larger near the central nodule), area round the median line. The central striæ are stronger and more marked than the others. All the striæ are punctate, the puncta forming wawy longitudinal lines. Striæ 22 in 0,01 mm. on the part between the middle and the ends.

Length 0,035 –0,06 mm. Breadth 0,012—0,015 mm.

Pl. I, fig. 4, *a.* (dry), *b.* (balsam); $^{1000}/_{1}$.

Brazil, fresh water, collected by Dr. WARMING. (CL. et MÖLL. Diat. N:o 193.)

In the strongly marked central striæ this form reminds one of *Navicula Crucicula*, but it is quite different. There is also some resemblance to the *Navicula Lundströmii* CL. (in CL. et GRUN. Arctische Diat. Pl. III, fig. 39). Another allied form is the as yet undescribed *Cymbella Frieseana* GRUN. from Tana Elf in Finmarken (CL. et MÖLL. Diat. N:o 261). This species has produced and capitate ends and 12—15 punctate striæ in the middle, 18—19 halfway between the middle and the ends, where they are 21 in 0,01 mm. Length 0,05—0,06 mm. Breadth 0,014 mm.

2. *Cymbella Stodderi* CL. N. Sp.

Elongate, lanceolate, slightly asymmetrical. Ends slightly produced and attenuated. Striæ strongly radiant in the middle, almost parallel near the apices, scarcely punctate, 10 in 0,01 mm. a little more distant in the centre, covering $^{2}/_{3}$ of the valve and leaving on both sides of the median line a tolerably broad area.

Length 0,075—0,09 mm. Breadth 0,015 mm.

Pl. I, fig. 5; $^{1000}/_{1}$ (Specimen from Brazil).

Fossil: Bemis Lake in White Mountains (Mr. STODDER). Living: Brazil, Minas Geraes on Sphagna leg. Dr. HJ. MOSÉN.

This species, which occurs in CL. et MÖLL. Diat. N:o 212 and N:o 274, is most nearly related to the *C. Americana* A. SCHM. Atl. Pl. IX, fig. 15 and 20, but the latter form has a more narrow area and, as fig. 15 shows, punctate striæ.

Pleurosigma W. SM.

1. *Pleurosigma tortuosum* CL. N. Sp.

Median line strongly and equally sigmoid. Striæ in three sets, oblique 21, transverse 22 in 0,01 mm.

Length 0,076 mm. Breadth 0,008 mm.

Pl. I, fig. 6; $^{1000}/_{1}$.

Balearic Islets (Dr. SÖDERLUND) rare.

2. *Pleurosigma lanceolatum* var. *cuspidatum* CL.

Lanceolate with produced apices, symmetrical. Median line straight, the ends turned in opposite directions. Striæ in three sets, one transverse (20 in 0,01 mm.) and two oblique (22 in 0,01 mm.).

Length 0,083 mm. Breadth 0,02 mm.

Pl. I, fig. 7; $^{1000}/_{1}$. *b.* structure; $^{2000}/_{1}$.

Marine: Port Jackson (Eugenie Exp.).

The same variety from Newcastle has according to GRUNOW 20 transverse and 19 oblique striæ in 0,01 mm. Length 0,105 mm. Breadth 0,026 mm.

3. *Pleurosigma* (*Donkinia?*) *longissimum* Cl. N. Sp.

Very long and narrow, linear; ends obtuse. Median line straight in the middle but curved in the last third part from the central nodule. Striæ in two sets crossing each other in right angles, transverse $18^1/_2$, longitudinal 21 in 0,01 mm. Colour pale straw.

Length of the frustule 0,17 mm. Breadth 0,0083 mm.

Pl. I, fig. 8. *a.* $^{600}/_1$; *b.* structure $^{2000}/_1$.

Balearic Islets rare (leg. Dr. Söderlund).

Rhoicosigma Grun.

1. *Rhoicosigma mediterraneum* Cl. (in Grun. Micr. Journ. 1877, p. 182).

Narrow lanceolate, with acute ends. Median line strongly bent in the first third part from the central nodule, afterwords straight. Striæ longitudinal and transverse. The longitudinal striæ are very fine, about 27 in 0,01 mm., the transverse $18^1/_2$ in 0,01 mm.

Length 0,18—0,21 mm. Breadth 0,0225 mm.

Pl. I, fig. 9, $^{511}/_1$. *a.* and *b.* valves, *c.* structure $^{2000}/_1$.

Balearic Islets rare (leg. Dr. Söderlund).

Navicula Bory.

1. *Navicula* (*Fluminensis* var.?) *Floridana* Cl. N. Sp.

Elongated, slightly constricted in the middle, ends rounded. Striæ not distinctly punctate, parallel, 15 in 0,01 mm., closer near the ends, 20 in 0,01 mm., absent from the middle part of the valve, not reaching the median line, which is surrounded by a narrow, linear area.

Length 0,045—0,075 mm. Breadth 0,01—0,012 mm. at the constriction 0,08—0,009 mm.

Pl. I, fig. 10, $^{1000}/_1$.

Florida coast, near Pensacola Harbour (in a gathering sent by Mr. Febiger).

2. *Navicula cruciata* Cl. N. Sp.

Oblong, slightly contracted at the centre. Striæ 12 in 0,01 mm., parallel, costate, smooth or indistinctly granulate, absent from the middle part of the valve, not reaching the median line.

Length 0,087 mm. Breadth 0,017 mm. at the middle 0,014 mm.

Pl. I, Fig. 11, $^{1000}/_1$.

I have found this species in a sample, said to be from Greenland, but as it contained many tropical forms, I am not sure that this is correct.

3. *Navicula Grœnlandica* Cl. N. Sp.

Lanceolate with obtuse apices. Striæ coarse, costate, very radiant and divergent, crowded around the centre of the valve ($7^1/_2$ in 0,01 mm.) more distant between the centre and the ends (6 in 0,01 mm.), interrupted by furrows, parallel to the margins. Around the central nodule there is a very large orbicular area.

Length 0,117 mm. Breadth 0,023 mm.

Pl. I, fig. 13, $^{1000}/_1$.

Greenland, Davis Strait (very rare in Cl. et Möll. Diat. N:o 172).

In its characters this species approches *N. Trevelyana*, but its form is entirely different. The striæ are also more distant, being in *N. Trevelyana* 10 in 0,01 mm. The terminal nodules of *N. Grœnlandia* are peculiar and resemble those of *N. Regula* Cl. et Grun. (Cl. W. Ind. Diat. p. 5, Pl. 1, fig. 3.)

4. *Navicula Eugeniæ* Cl. N. Sp.

Valve very convex, linear, with rounded ends. Striæ coarse, costate, radiant, 9 in 0,01 mm., reaching the median line, interrupted by a line parallel to the margin. Median line undulate. Central nodule surrounded by a small area. Terminal nodules elongated. — F. V. Frustule constricted in the middle; ends truncate.

Length 0,085—0,1 mm. Breadth 0,017 mm.

Pl. II, fig. 16, $^{1000}/_1$, *a*. S. V., *b*. F. V.

Gallapagos Islands (Eugenie Exp.).

5. *Navicula Hennedyi* var. *undulata* Cl.

Oval with cunate ends and three undulations on each side. Striæ distinctly punctate, marginal and around the median line. The striæ near the median line are 16 in 0,01 mm. as are also the marginal striæ, except in the constrictions between the undulations, where they are only 12 in 0,01 mm.

Length 0,07 mm. Breadth 0,035 mm.

Pl. II, fig. 19, $^{1000}/_1$.

Gallapagos Islands (Eugenie Exp.).

This variety has finer striæ than the other forms of the most variable N. Hennedyi; the outline is also different.

N. Hennedyi var. *minuta* Cl.

Broadly oval, with the marginal punctate striæ (7—8 in 0,01 mm.) separated from each other by unusually large spaces. Central striæ 9—10 in 0,01 mm.

Length 0,05 mm. Breadth 0,027 mm.

Pl. I, fig. 15, $^{1000}/_1$.

Gallapagos Islands (Eugenie Exp.).

N. Hennedyi var. *Tahitensis* Cl.

Broadly oval with almost parallel sides. Striæ scarcely punctate, marginal 13 in 0,01 mm., central 15 in 0,01 mm.

Length 0,05 mm. Breadth 0,023 mm.

Pl. I, fig. 14, $^{1000}/_{1}$.

Tahiti (Eugenie Exp.).

This variety is remarkable for its almost smooth striæ.

6. *Navicula rudis* Cl. N. Sp.

Broadly oval, with broadly rounded ends. Striæ coarse, 6 in 0,01 mm. marginal composed of about 5—8 large, separate puncta; central striæ composed of 2—3 puncta.

Length 0,052 mm. Breadth 0,032 mm.

Pl. II, fig. 17, $^{1000}/_{1}$.

Balearic Islets rare (leg. Dr. Söderlund).

This peculiar form belongs evidently to the *Nav. Lyra* section. It approaches in some respects *N. spectabilis* Greg. and *N. prætexta* Ehb., but it differs of both.

The numerous forms, belonging to this section, are so closely allied, that it is impossible to decide what are species or what varieties. Another most beautiful and gigantic form of this section is the following:

7. *Navicula* (*excavata* Grev. var.?) *Angelorum* Cl.

Very large, broadly oval, with rounded ends. Area large bilobate. Striæ punctate, radiant, $6^{1}/_{2}$ in 0,01 mm. (8 near the ends). Central striæ $11^{1}/_{2}$ in 0,01 mm.

Length 0,22 mm. Breadth 0,12 mm.

Pl. II, fig. 20, $^{600}/_{1}$.

Fossil: California, Sancta Monica los Angelos (comm. by Dr. G. Eisen).

8. *Navicula Holmiensis* Cl.

Valve large, oblong elliptic, with rounded ends. Striæ slightly radiant, $12^{1}/_{2}$ in 0,01 mm., indistinctly punctate, covering a little more than half the valve and leaving round the median line an irregular area.

Length 0,07—01 mm. Breadth in 0,023 mm.

Pl. II, fig. 18, $^{1000}/_{1}$.

Slightly brackish water near Waxholm (entrence to Stockholm) leg. Lagerstedt and O. Nordstedt.

This form agrees in general appearance with *N. latiuscula* Kütz. (*N. patula* W. Sm.), but has more distant striæ, which in *N. latiuscula* are 18 in 0,01 mm. and parallel.

9. *Navicula Platessa* Cl. N. Sp.

Small, broadly elliptic, with mucronate apices. Striæ strong, smooth, 8 in 0,01 mm., marginal, leaving around the median line a very large area.

Length 0,028 mm. Breadth 0,018 mm.

Pl. I, fig. 12, $^{1000}/_{1}$.

Gallapagos Islands rare (Eugenie Exp.).

This little Navicula belong to the Palpebralis-group, but differs from all described forms of that section by its short, distant and coarse striæ.

10. *Navicula Hauckii* Cl. N. Sp.

Very long and slender, linear, somewhat gibbous in the middle and near the ends, convex. Striæ punctate, 15 in the middle of the valve, 16 towards the ends and 18 in 0,01 mm. in the ends, a little shortened around the central nodule and not reaching the median line, which is surrounded by a linear area. The striæ are interrupted by a very fine line parallel with the margin.

Length 0,128 mm. Breadth 0,012 mm.

Pl. II, fig. 27, $^{900}/_{1}$.

Adriatic Sea, Rovigno, stomachs of Holothurians. leg. F. Hauck (rare in Cl. et Möll. Diat. N:o 208—210).

This species seems to belong to the section *Nav. limosæ* and is allied to *N. maxima*, *N. formosa* etc.

11. *Navicula Febigerii* Cl. N. Sp.

Lanceolate, with produced, obtuse ends. Striæ 16 in 0,01 mm., composed of distinct puncta, reaching the median line. In the middle they are alternately longer and shorter around the central nodule, which is surrounded by a broad area.

Length 0,054 mm. Breadth 0,02 mm.

Pl. II, fig. 21, $^{1000}/_{1}$.

Oakland Bridge, California in a sample sent by Mr. Chr. Febiger.

This beautiful little species has some resemblance to *Achnanthes Danica* (Flögel) Grun., but seems to be a true Navicula, belonging to the section »punctatæ».

12. *Navicula Cluthensis* var.? *maculifera* Cl.

Broadly oval, with rounded ends. Striæ radiant, reaching the median line, abbreviated around the central nodule, which is surrounded by a tolerably large area. Number of striæ, (which are composed of distinct puncta), 11—12 in 0,01 mm.

Length 0,05 mm. Breadth 0,026 mm.

Pl. II, fig. 23, $^{1000}/_{1}$.

Slightly brackish water, near Waxholm, entrance to Stockholm (Mr. Lagerstedt).

This form has closer striæ than the typical species and an area around the nodule. Another smaller form is probably.

N. Cluthensis var. *minuta* Cl.

Broadly oval, with rounded ends. Striæ slightly radiant, composed of distinct puncta, abbreviate around the central nodule, 15 in 0,01 mm. in the middle, 18 in 0,01 mm. in the ends.

Length 0,03 mm. Breadth 0,014 mm.

Pl. II, fig. 22, $^{1000}/_{1}$.

Florida, Pensacola in a gathering, sent by Mr. Chr. Febiger.

The following varieties of *N. Cluthensis* are described:

a. genuina (Greg. Diat. of Clyde p. 6, Pl. I, fig. 2) with 8 striæ in 0,01 mm and no area. Length 0,035—0,04 mm.

b. erythræa (*N. erythræa* Grun. Verh. 1860 p. 539, Pl. III, fig. 17) with 10—12 striæ in 0,01 mm. and no area. Length 0,05—0,06 mm.

c. Finmarchica Grun. (in Cl. et Grun. Arct. Diat. p. 40, Pl. II, fig. 49) with 11—12 striæ in 0,01 mm. and very small area. Length 0,022—0,024 mm.

d. maculifera Cl. with 11 striæ in 0,01 mm. and tolerably large area.

e. minuta Cl. with 15—18 striæ in 0,01 mm. and tolerably large area.

13. *Navicula bicuspidata* Cl. et Grun.

Oblong, slightly constricted in the middle, apiculate. Striæ coarse, finely punctate, 6 in 0,01 mm., shortened around the middle.

Length 0,04 mm. Breadth 0,015 mm.

Pl. II, fig. 25, $^{1000}/_{1}$.

Mediterranean, Pithuisian Islands in a gathering sent by Prof. V. B. Wittrock.

The nearest allied to this species seems to be *Nav. directa* Sm. The *Nav. salva* A. Schm. and *Nav. opima* Grun. have the terminal nodules at some distance from the apices.

14. *Navicula mesoleia* Cl. N. Sp.

Very convex, linear with cuneate ends. Striæ coarse, 15 in 0,01 mm., very slightly radiant, almost reaching the median line, absent from the middle of the valve, where there is a transverse blank space.

Length 0,04—0,06 mm. Breadth 0,005—0,008 mm.

Pl. II, fig. 26 *a* and *b*, $^{1000}/_{1}$.

Fresh water, Brazil, leg Dr. Warming. (Cl. et Möll. Diat. N:o 193.)

This form has the appearance of some smaller varieties of *N. Pinnularia* Cl. (Cl. et Grun. Arct. Diat. p. 27) but is more convex and has closer striæ.

15. *Navicula Fromenteræ* Cl. N. Sp.

Small, elliptic. Striæ coarse, costate, 6 in 0,01 mm., reaching the median line, but abbreviated around the nodule.

Length 0,0375 mm. Breadth 0,0128 mm.

Pl. II, fig. 24, $^{1000}/_{1}$.

Balearic Islets (F. Söderlund).

This small species seems to be the unnamed form in A. SCHMIDTS Atlas Pl. 46, fig. 7 and is perhaps according to GRUNOW the *N. mediterranea* KÜTZ. Bac. Pl. III, fig. XVII, which however is represented on much too small a scale to admet of identification. Another allied form is the yet unpublished *N. cotiformis* GRUN. from Demerara River, which has cuneate ends and 5 striæ in 0,01 mm. Length 0,06 mm. Breadth 0,014 mm.

16. *Navicula Anderssonii* CL. N. Sp.

Linear oblong, with almost cuneate ends. Striæ parallel or slightly radiate in the middle, $6^1/_2$—7 in 0,01 mm. not reaching the median line, which in surrounded by a narrow area, dilated around the central nodule.

Length 0,075 mm. Breadth 0,019 mm.

Pl. III, fig. 28, $^{1000}/_1$.

Gallapagos Islands (Eugenie Exp.).

I have named this species in honour of the late Prof. N. J. ANDERSSON, botanist to the Eugenie Expedition.

17. *Navicula marginulata* CL. N. Sp.

Rhombic; striæ very short, marginal, enclosing a large structureless area, 17 in 0,01 mm.

Length 0,042 mm. Breadth 0,012 mm.

Pl. III, fig. 29, $^{1000}/_1$.

Florida, near the Harbour of Pensacola, in a gathering sent by Mr. FEBIGER.

18. *Navicula* (*Powelli* LEWIS var.) *Gallapagensis* CL.

Linear oblong with cuneate ends. Striæ coarse, almost parallel, $8^1/_2$ in 0,01 mm., on both side of the median line interrupted by linear areas. There are thus four longitudinal series of short striæ, two near the margins and two close to the median line, interrupted near the central nodule.

Length 0,05—0,09 mm. Breadth 0,013—0,021 mm.

Gallapagos Islands (Eugenie Exp.).

Pl. III. fig. 30.

Of the true *N. Powellii* LEWIS I have not seen a figure, but GRUNOW states that his *N. Vidowichii* (Verh. 1863, Pl. IV, fig. 4) is the same species. I have seen the latter form in gatherings from Adriatic sea, kindly sent me by Mr. F. HAUCK, and I find that the form is different, the striæ more distant (6 in 0,01 mm.). Length 0,1122 mm. Breadth 0,02 mm. *N. Egyptiaca* GREV. Trans. Micr. Journ. XIV, p. 127, Pl. 12, fig. 16—17 seems to be the same, but the striæ are stated to be only 4 in 0,01 mm. Another allied form is, as far on may judge from the figure, *N. Zanardiniana* GRUN. (Verh. 1860, Pl. 3, fig. 12) with indistinctly punctate striæ, 6 in 0,01 mm., in four uninterrupted rows. Another, undescribed form is *N. Wittii* GRUN. Mspt. (Pl. III, fig. 31, $^{900}/_1$) from Brazil, which is not so long and slender as the last named species and has 8 striæ in 0,01 mm: The two following forms are also allied to *N. Powellii.*

19. *Navicula amica* Cl. et Grun.

Contracted in the middle, ends cuneate; striæ $7^1/_2$ in 0,01 mm., almost parallel, smooth. The two interior rows of striæ are interrupted in the middle.

Length 0,075 mm. Breadth 0,023 mm.

Pl. III, fig. 37, $^{950}/_1$.

Tahiti (Eugenie Exp.).

20. *Navicula quadriseriata* Cl. et Grun.

Large, oblong oval with parallel sides and cuneate ends. Striæ smooth, 8 in 0,01 mm. in four longitudinal, uninterrupted rows. The interior striæ are shortened around the central nodule, which is surrounded by an orbicular area.

Length 0,09 mm. Breadth 0,035 mm.

Pl. III, fig. 32, $^{600}/_1$.

Balearic Islets very rare (F. Söderlund).

Two other species, of which Mr. Grunow has sent me figures, seem to be related to the last described forms: *N. Castracanei* Grun. (Pl. III, fig. 33, $^{900}/_1$) and *N. Petitiana* Grun. (Pl. III, fig. 34, $^{900}/_1$). Both species are elliptic lanceolate and have the interior rows of striæ parallel with the margins of the valve, not close to the median line. *N. Castracanei* is 0,1 mm. in length, 0,03 mm. in breadth, and has 9 striæ in 0,01 mm. *N. Petitiana* is 0,07 mm. in length and 0,02 mm. in breadth and has 11 striæ in 0,01 mm.

All these species together with the following seem to form a section, for which Mr. Grunow has proposed (Cl. et Grun. Art. Diat. pag. 29), the name *quadri-seriatæ:*

This group contains:

Navicula Powellii Lewis = N. Vidowichii Grun.
N. Egyptiaca Grev.
N. (*Powellii* var.) *Gallapagensis* Cl.
N. Zanardiniana Grun.
N. Wittii Grun.
N. amica Cl. et Grun.
N. quadriseriata Cl. et Grun.
N. Castracanei Grun.
N Petitiana Grun.
? N. (*Stauroneis*) *robusta* Petit (Diat. de l'île Campbell Pl. V, fig. 16).
N. biseriata Petit (l. c. Pl. IV, fig. 15).
N. Richardsoniana O'Meara (Irish Diat. Pl. 31, fig. 33).
N. Eugeniæ Cl. (this paper pag. 7).
? N. denticulata O'Meara (Quart. J. M. S. VII, p. 115, Pl. V, fig. 2, 1867).
? N. Musca Ehb.
? N. mirabilis Leuduger Fortmorel (Diat. de Ceylon Pl. II, fig. 21).
N. blanda A. Schm. (Nordsee Diat. Pl. II, fig. 27).
N. latefasciata Grun. (in Cl. et Grun. Arct. Diat. Pl. I, fig. 21).

N. subdivisa GRUN. (Nordsee Diat. fig. 20).
N. consimilis A. SCHM. (l. c. p. 46).
N. æmula GRUN. (in A. SCHM. Nordsee Diat. II, fig. 47).
N. superimposita A. SCHM. (Nordsee Diat. II, fig. 34 and Diat. Atl. Pl. 46, fig. 61).

To these species are two undescribed forms nearly allied: *N. Bruchii* GRUN. and *N. multiseriata* GRUN.

N. Bruchii GRUN. (Pl. III. fig. 35, $^{900}/_{1}$) found on Tahiti, is in length 0,04 mm. and in breadth 0,012 mm.

N. multiseriata GRUN. (Pl. III, fig. 36, $^{900}/_{1}$) from Tongatabu, is in length 0,036.

Navicula. Section: **Pseudo-amphiprora** CL.

I propose to include in this section a small number of Navicula-forms, which are in some respects akin to Amphiprora and in other to Stauroneis. The valve on both sides in the median line is divided by a keel into two portions. The central nodule is transversely dilated into a short stauros, reaching the above named keels. The type of the section is:

Navicula arctica CL.

In my paper On the arctic Diat. (Bih. till K. Sv. Vet. Ak. Handl. 1873, 1, N:o 13, p. 16, Pl. III, fig. 13).

This fine species was first described and somewhat indifferently figured by BAILAY (SMITHS. Contr. Vol. VII, p. 8. fig. 14 and 15, 1853) as *Amphora stauroptera.* GREGORY afterwards gave (in his Diat. of Clyde 1857, p. 34, Pl. IV, fig. 59 c.) a very fine figure of the species in question in S. V., but he regardes it as *Amphiprora lepidoptera.* At the same time he describes the F. V. as *Amph. obtusa* (fig. 60 l. c.). but Mr. LAGERSTEDT (Bih. till K. Sv. Vet. Ak. Handl. T. III, N:o 15, p. 46) has found that the two figures (59 and 60) belong to the same species. As the names N. stauroptera and N. obtusa have been used for other forms it will be most conveniant to name the species N. arctica. A. SCHMIDT has figured the species in his Nordsee Diat. Pl. III, fig. 1 as *Amphiprora obtusa* GREG. If the *Nav. arctica* O'MEARA (Micr. Journ. Vol. XIV, Pl. VIII, fig. 1) belongs to this species I d'ont know.

The Nav. arctica lives in the northern part of the Atlantic. It has been issued in CL. et MÖLL. Diat. N:o 57.

21. *Navicula jugata* CL.

Elegantly elliptic with parallel, indistinct, and punctate striæ, 10 in 0,01 mm., between the keels and the margins. The median portion of the valve, between the keels, seems in very oblique light and with good objectives to be exceedingly finely striate.

Length 0,093 mm. Breadth 0,024 mm.

Pl. III, fig. 38, $^{900}/_{1}$.

Gallapagos Islands rare (Eugenie Exp.).

GRUNOW has found in the Campeche Bay gathering a closely allied form, *Amphiprora Campechiana* GRUN. (Arct. Diat. pag. 66), which has $12^{1}/_{2}$ striæ in 0,01 mm. and another species with 15 striæ in 0,01 mm. and obtuse ends.

22. *Navicula Pensacolæ* CL. N. Sp.

Lanceolate, with undulate margins and prominent apices. Striæ indistinct, punctate, 15 in 0,01 mm., parallel. The portion of the valve between the keels is very indistinctly striate.

Length 0,054 mm. Breadth 0,015 mm.

Pl. III, fig. 39, $^{1000}/_{1}$.

Florida near the Harbour of Pensacola in a gathering sent by Mr. FEBIGER.

The following species is perhaps related to the species of this section:

23. *Navicula Gallapagensis* CL. N. Sp.

Panduriform, with cuneate ends. Striæ transverse, parallel, 15 in 0,01 mm., indistinctly punctate, reaching the median line and interrupted by a line or keel. The median part of the valve around the median line is striate.

Length 0,067—0,092 mm. Breadth 0,025 mm.

Pl. III, fig. 40, $^{850}/_{1}$ *a.* S. V. *b.* F. V.

Gallapagos Islands rare (Eugenie Exp.).

Stauroneis EHB.

1. *Stauroneis Balearica* CL. N. Sp.

Elongated, with acute ends. Stauros very short. Striæ transverse, 26 in 0,01 mm., and longitudinal 23 in 0,01 mm., crossing each other in right angles.

Length 0,11 mm. Breadth 0,013 mm.

Pl. III, fig. 41, *a.* $^{600}/_{1}$, *b.* structure $^{2000}/_{1}$.

Balearic Islets rare (F. SÖDERLUND).

This species is nearly akin to *St. Quarnerensis* (GRUN. in litt.) from the Adriatic Sea, which has also a short stauros and 18 longitudinal striæ in 0,01 mm.

2. *Stauroneis sulcata* CL. N. Sp.

Linear, with cuneate ends, stauros reaching the margin. Structure: strong, longitudinal lines or furrows, parallel with the median line, and transverse parallel striæ, 21 in 0,01 mm.

Length 0,088—0,109 mm. Breadth 0,008—0,009 mm.
Pl. III, fig. 46, $^{1000}/_{1}$.
Balearic Islets rare (F. SÖDERLUND).

Among the Stauroneis forms, known to me, there are two, which have a similar structure: *St. Stodderi* LEWIS and *St. Stodderi* var. *insignis* GRUN., both freshwater species. *St. sulcata* is marine and has finer striæ.

3. *Stauroneis Africana* CL. N. Sp.

Valve very convex, hyaline, elongate. Stauros reaching the margins. Striæ fine, 23 in 0,01 mm., parallel, reaching the median line.

Length 0,05 mm. Breadth 0,01 mm.
Pl. III, fig. 42, $^{1000}/_{1}$, *a*. F. V., *b*. S. V.

Fresh, or very slightly brackish water, Zwathrops River, Port Elisabeth, South Africa in a sample sent by Mr. W. JOSHUA (CL. and MÖLL. Diat. N:o 196).

This form is nearly related to *S. salina* W. SM., but has finer striæ. The striæ of *S. salina* are 17 in 0,01 mm.

4. *Stauroneis pachycephala* CL. N. Sp.

Linear, gibbous in the middle and at the ends, which are broadly rounded and capitate. Striæ oblique, very fine, about 29 in 0,01 mm., reaching the median line. Stauros reaching the margin. Median line straight. Terminal nodules turned in opposite direction.

Length 0,055 mm. Breadth 0,009 mm.
Pl. III, fig. 43, $^{1000}/_{1}$.

Fresh or slightly brackish water, Baakens River, Port Elizabeth, South Africa in a sample sent by Mr. JOSHUA (CL. et MÖLL. N:o 197).

This species comes nearest to *St. desiderata* CL. (in CL. et GRUN. Arctische Diat. Pl. III, fig. 58), which also has the terminal nodules turned in opposite direction, but the outline of this species is different and its striæ are almost parallel and much coarser. Both belong to a section parallel with GRUNOWS section Pseudopleurosigma of Navicula.

5. *Stauroneis* (*Pleurostauron*) *Sagitta* CL. N. Sp.

Elongated, apiculate, to the outline resembling *St. Smithii* GRUN. Ends with short interior diaphrams as in Pleurostauron. Striæ oblique 21 in 0,01 mm. one or two in the middle very strong.

Length 0,03—0,04 mm. Breadth 0,006—0,01 mm.
Pl. III, fig. 45, $^{1000}/_{1}$.

Fresh water, mouth of Tana Elf, Finmarken, collected by Prof. TH. M. FRIES (CL. et MÖLL. Diat. N:o 261 not rare).

This form has the appearance of *S. Smithii* GRUN., but is larger and has coarser striæ (being 28 in 0,01 mm. on S. Smithii) not so parallel as in *S. Smithii*.

Schizostauron GRUN.

1. *Schizostauron Crucicula* GRUN.

Striæ oblique, fine, 25 in 0,01 mm. Stauros bifid with very divergent branches, reaching the margins.

Length 0.03 mm. Breadth 0,009 mm.

Pl. III, fig. 44, $^{1000}/_{1}$.

Merrimac River U. St. on Chara, very rare in a gathering sent by Mr. O. NORDSTEDT. [1])

Nitzschia W. SM.

1. *Nitzschia ocellata* CL.

This species has already been described in CL. et GRUN. Arct. Diat. p. 80. The frustule is panduriform; the keel central with 8—10 puncta in 0,01 mm. The striæ are fine, 22 in 0,01 mm. composed of small, elongate puncta. The striæ are sharper and more distant in the centre of the valve. The whole valve is covered with large scattered puncta sometimes arranged in irregular, transverse lines.

Length 0,08—0,1 mm. Breadth of the frustule 0,027 mm. at the constriction 0,018 mm.

Pl. IV, fig. 47, $^{1000}/_{1}$, *a*. valve, *b*. frustle.

Balearic Islets (Dr. SÖDERLUND). CL. et MÖLL. Diat. N:o 154—155 rare.

This species is placed by GRUNOW in his section Pseudoamphiprora, very nearly to Perrya KITTON.

2. *Nitzschia prælonga* CL.

This species has already been described in CL. et GRUN. Arct. Diat. p. 85. The frustules are extremely long and slender, slightly arcuate, linear, with obliquely cuneate ends. Keel almost central, with about 5 puncta in 0,01 mm. The striæ are strong, 16 in 0,01 mm.

Length 0,25 mm. Breadth 0,009 mm.

Pl. IV, fig. 48, *a*. $^{600}/_{1}$. *b*. $^{1000}/_{1}$.

Balearic Islets not rare (Dr. F. SÖDERLUND).

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[1]) In printing this paper I have been informed by Mr. GRUNOW that he has found the same form abundantly in pools of the Rio Purus, Brazil, and that he has named it in Linnæan Society Journ. of May 1880 I consequently adopt his name.

Surirella Turpin.

1. *Surirella Caldensis* Cl. N. Sp.

Very long and slender, linear, with cuneate ends. Alæ high. Canaliculi short, numerous, 4—5 in 0,01 mm. Margin striate; striæ punctate 20 in 0,01 mm. F. V. linear, not cuneate.

Length 0,108 mm. Breadth 0,013 mm.

Pl. IV, fig. 50, $^{1000}/_{1}$.

Brazil, Caldas on Sphagnum (Dr. Hj. Mosén). Cl. et Möll. Diat. N:o 212, common.

This species comes near to *S. arcta* A. Schm. Atl. Pl. 23, fig. 23—24 from Demerara, but its canaliculi are shorter and denser.

2. *Surirella degenerans* Cl. N. Sp.

Oblong, with very broad ends and slightly contracted middle. Margins striate. Costæ obsolete, consisting only of the dilated portion. Area with some scattered markings and striæ.

Length 0,09—0,072 mm. Breadth 0,037—0,046 mm.

Pl. IV, fig. 51, $^{500}/_{1}$.

Gallapagos Islands (Eugenie Exp.).

This form, which belongs to the variable section of *S. lata*, is related to *S. laxa* Janisch.

3. *Surirella formosa* Cl. N. Sp.

Panduriform with large, rounded ends. Margin striate. Costæ abbreviate, with the dilated portion comparatively large. The middle of the valve is occupied by a narrow linear area, defined by short striæ.

Length 0,22 mm. Breadth 0,11 mm. at the constriction 0,07 mm.

Pl. IV, fig. 49, $^{500}/_{1}$.

Gallapagos Islands extremely rare (Eugenie Exp.).

This very large and beautiful Surirella does not agree with any of the many forms belonging to *S. lata*-section hitherto figured.

Campylodiscus Ehb.

1. *Campylodiscus* (*Ecclesianus* var.?) *peramplus* Cl.

Very large, costæ numerous 4—5 in 0,01 mm., equal in length, marginal. Area large with a circle of puncta and with some stellate markings.

Diam. 0,12—0,16 mm.

Pl. IV, fig. 53, $^{600}/_{1}$.

Gallapagos Islands (Eugenie Exp.).

The *C. Ecclesianus* GREV. (1857) is as Mr. JANISCH correctly states the same as *C. fenestratus* GREV., which is the entire frustule. Mr. JANISCH proposed (1863) the name *C. Rabenhorstianus*, but which should be changed for the older name of GREVILLE's. The type of this extremely variable species, especially abundant in the caribbean area, has alternating longer and shorter costæ and an area not surrounded by a circlet of puncta. The form from Gallapagos Islands is therefore distinct, but, considering the great variability of the species, I am inclined to regard it only as a variety.

The stellate markings on the disc are very variable, and in some specimens wanting.

2. *Campylodiscus Margaritarum* CL. N. Sp.

Costæ numerous, covering about $^2/_3$ of the disc, interrupted by a fine line and surrounding an elongate area, where some fragmentary punctate lines are visible as the continuation of the costæ.

Diam. 0,06 mm.

Pl. IV, fig. 52, $^{500}/_1$.

Pearl Islands rare (Eugenie Exp.).

In its general form this species resembles *C. angularis* GREV., but is different.

Plagiogramma GREV.

1. *Plagiogramma rutilarioides* CL. N. Sp.

Small, rhombic, more or less elongate, with two converging costæ around the centre, but not near the ends. Structure: transverse punctate lines, 15 in 0,01 mm. Margin with one or two sets of larger puncta, which probably are the bases of bristles.

Length 0,03—0,0425 mm. Breadth 0,01—0,013 mm.

Pl. IV, fig. 54, $^{1000}/_1$.

Port Jackson, Australia (Eugenie Exp.).

2. *Plagiogramma spinosum* CL. N. Sp.

Valve narrow, constricted in the middle, then dilated, and again constricted. Costæ 2 strong, around the centre. Ends slightly capitate. Structure: puncta, arranged in regular transverse rows, 10 in 0,01 mm. and in irregular longitudinal lines. The margin of the frustule is furnished with a row of short setæ or bristles. The ends of the valves have blank (not punctate), oval areas.

Length 0,08 mm. Breadth 0,01 mm.

Pl. IV, fig. 55, $^{800}/_1$.

The marginal setæ are visible when the frustule lies in an oblique position.

Gallapagos Islands rare (Eugenie Exp.).

This form has the same general outline as *P. caribbæum* CL., *P. lyratum* GREV and *P. Barbadense* GREV. It is most nearly akin to the latter, but the ends are dissimilar and the structure different.

Rutilaria Grev.

1. *Rutilaria recens* Cl. N. Sp.

Valve plane, elliptic or elongate with acute ends. It is covered with numerous scattered puncta, which sometimes are arranged in irregular lines. Besides these there are in the centre of the valve some more strongly marked puncta, and which seem to belong to another stratum of the valve. The margin has a row of puncta, which are, as may be seen in the F. V., short spines. In the F. V. the ends of the valve terminate in short processes.

Length 0,037—0,11 mm. Breadth 0,02 mm.

Pl. IV, fig. 57, *a.* $^{1000}/_{1}$ (an abnorm specimen having no puncta on a part of the valve), *b.* $^{800}/_{1}$ small specimen.

Gallapagos Islands (Eugenie Exp.).

The genus Rutilaria established by Dr. Greville, comprises only some few species, all fossil. These are *R. Epsilon* Grev., rare in Monterey stone, *R. superba* (and var.? *ventricosa*) Grev. and *R. elliptica* Grev. from Barbados. They all have the curious markings in the centre of the valve, which are elevations above the level of the frustule, as is visible on the fig. 10, Pl. XI, T. Micr. Soc. Vol. XIV. In our recent species these markings are represented only by the strongly marked puncta. From Greville's fig. of the F. V. of *R. elliptica* and *R. superba* it is evident that the valve is plane and that its apices are produced into processes, and farther that the margins of the frustule are bounded with a row af setæ, exactly as in our species.

The position of Rutilaria is somewhat uncertain. Greville has pointed out its relationship to Nitzschia and Fragilarieæ. Prof. Hamilton Smith places it among the Melosiræ. It has however no real affinity with Nitzschia or Melosiræ, but is very nearly allied to the genus *Cynatosira* Grun., of which the only known species *C. Lorenziana* Grun. has also marginal bristles. The Cymatosira is without doubt nearly related to Dimerogramma.

Mr. Kitton writes to me in a letter about a new species of Rutilaria from the Californian deposits, *Rut. obesum* Grev. Mpt. The valve has 3 inflations, the central being the largest; the apices are shortly cuneate; one third of the area is smooth, the remainder distinctly covered with irregular markings. The central nodule consists of a nebulous circular spot, upon which is placed a short spiral (?) ring. Margin distinctly punctate. Mr. Kitton has seen about half a dozen specimens of this species, all frustles, and in no case was he able to separate the valves. I crushing partially one specimen in balsam, he observed that the nebulous central nodule was the base of a siliceous isthmus, connecting the two valves.

Actinella Lewis.

1. *Actinella Guianensis* Grun. in litt.

Of the genus Actinella only one species, the *A. punctata* Lewis from White Mountain Deposits, is known. The genus, which is nearly related to Eunotia, is distinguished by the different development of the ends. The puncta, which follow the margins of A. punctata as well as of A. Guianensis, are also visible in true Eunotia, for instance *E. denticulata* Bréb.

The Actinella Guianensis, which occurs rarely in Cl. et Möll. Diat. N:o 212, is larger than *A. punctata* and has 14—16 striæ in 0,01 mm., varying in different parts of the valve.

Length of frustule 0,105 mm. Breadth of one end 0,007 of the other 0,011 mm.
Pl. V, fig. 58, $^{1000}/_{1}$.

Brazil, Caldas on mosses (Dr. Hj. Mosén).

Asterolampra Ehb.

1. *Asterolampra Balearica* Cl. N. Sp.

Rays about 10, not reaching the margin of the disc. Umbilicus small, the diameter being only $^{1}/_{4}$—$^{1}/_{5}$ of that of the disc. Umbilical rays are straight and not branched. The compartments are covered by cellules arranged into lines, crossing each other in three directions, 9 in 0,01 mm.

Diameter of the valve 0,0715 mm.

Balearic Islets extremely rare (F. Söderlund).

Pl. V, fig. 59, *a.* $^{470}/_{1}$, *b.* a compartment $^{1000}/_{1}$.

This species appears to be related to *Asterolampra Grevillei* Wallich, which also occurs in the Balearic gathering, but this species has much finer cellulation (20—22 lines in 0,01 mm.). The *A. centraster* Johnst. Micr. Journ. VIII, p. 12, Pl. I, fig. 10 is more nearly related, but its umbilicus is larger.

Coscinodiscus Ehb.

1. *Coscinodiscus undulatus* Cl. N. Sp.

The surface of the disc elevated in the middle and with an elevated ring halfway between the centre and the margin. Surface covered with dense, pearllike puncta arranged in lines radiating from the centre to the margin, where they become smaller, much more crowded and form short striæ.

Diam. 0,096 mm.

Pl. V, fig. 60, *a.* $^{450}/_{1}$, *b.* $^{300}/_{1}$ outline of a valve in oblique position.

Melosira Ag.

1. *Melosira* (*Podosira?*) *tuberculosa* Cl. N. Sp.

Frustule perfectly sphærical, with very narrow connecting membrane, which forms merely an equatorial line. Valve irregularly covered with scattered tubercules. With good lenses the surface between the tubercules is seen to be covered with fine striæ, 20 in 0,01 mm., crossing each other at an angle of 60°.

Diam. 0,05 mm.

Pl. V, fig. 65, $^{600}/_{1}$.

Gallapagos Islands rare (Eugenie Exp.).

Stictodiscus Grev.

1. *Stictodiscus Novaræ* Cl. N. Sp.

Disc circular, with irregularly scattered large puncta in the centre. Radiating lines few. Between each pair of these lines there are about 6 rows of tolerably large puncta. Margin of the disc striate.

Diam. 0,15 mm.

Pl. V, fig. 66, $^{570}/_{1}$.

Fossil, Nankoori Deposit (Novara Expedition) in a sample communicated by Mr. Grunow, rare.

I first supposed this elegant form to be a variety of *Stictodiscus Crozieri* Kitton (Micr. Journ. 1873, Pl. 38, fig. 2) but on comparing my specimen with a specimen of *S. Crozieri*, I found too great a difference. The puncta are much larger and the radiate lines not so numerous as in *S. Crozieri*. Besides the margin in striate.

Stephanodiscus Ehb.

1. *Stephanodiscus* (*bellus* A. Schm. var.?) *Novæ Zeelandiæ* Cl.

This beautiful little disc has about 20 radiate costæ, bifurcate near the margin, where no spines are visible. The whole surface is covered with small puncta, arranged in lines, radiating from the irregularly punctate centre. Two such punctate lines fill the space between each pair of costæ.

Diam. 0,02—0,03 mm.

New Zeeland, fresh or very slightly brackish water, Rotorua Lake, in some samples communicated by Dr. S. Berggren.

Pl. V, fig. 62, $^{1000}/_{1}$.

The *Cyclotella bella* A. Schm. Nordsee Diat. p. 94, Pl. 3, fig. 39 is a small marine species, which seems to correspond in all essential characters with the New Zeeland specimens.

Cyclotella Kütz.

1. *Cyclotella Meneghiniana* var.? *stelligera* Cl. et Grun.

Disc with marginal striæ, about 14 in 0,01 mm., and with a central star of radiating lines, alternately shorter and larger.

Diam. 0,022 mm.

Pl. V, fig. 63, $^{1000}/_{1}$. *a.* Specim. from New Zeeland; *c.* small specimen from Lac de Gerardmer (Vosgues).

New Zeeland, Rotorua Lake, coll. by S. Berggren.

Another variety *stellulifera* Grun. is represented by the fig. *b.* and is characterized by the granulate striæ.

Liradiscus Grev.

1. *Liradiscus* (?) *Capensis* Cl. N. Sp.

Circular, with a narrow, striate margin (with 15 striæ in 0,01 mm.). Disc covered with curved and branching, but not anastomosing lines or markings, which do not form a coherent network.

Diam. 0,04 mm.

Pl. V, fig. 61, $^{700}/_{1}$.

Marine, Cape of Good Hope in a slide sent by Mr. F. Hauck.

Of the genus Liradiscus only four species are known, all fossil from Barbados deposit. Our form, if it really belongs to Liradiscus, is the first known as recent. It is doubtful if it not would be better to place it in Cyclotella, as it has some relationship to *C. striata* Kütz. or *C. Dallasiana.*

Auliscus Bail.

1. *Auliscus* (?) *insignis* Cl. N. Sp.

Disc almost orbicular with 2 rounded, not truncate processes, and divided by a large cruciform blank area in to four compartments. The compartments have a very singular structure and seem to be covered with irregular depressions. In the F. V. they are elevated and the processes rounded.

Diam. 0,12 mm.

Pl. V, fig. 64, *a.* $^{500}/_{1}$, S. V. *b.* $^{300}/_{1}$, F. V.

Gallapagos Island extremely rare (Eugenie Exp.).

I am unacquainted with any Auliscus having the rounded processes of this glorious species; it should perhaps be placed in the genus Cerataulus.

Annother remarkable species of Auliscus (*A. Ralfsianus* Grev.) hitherto known only in a fossil state from the Barbados Deposit, occurs in the extremely interesting Gallapagos material.

Biddulphia Gray.

1. *Biddulphia Moronensis* Cl. N. Sp.

Valve in S. V. oval, stout, with two strong transverse costæ and two large and stout oval processes. Structure: large, irregularly scattered puncta on the valve and fine dots arranged in irregular lines on the processes.

Length of the valve 0,12 mm. Breadth 0,07 mm.

Pl. IV, fig. 56, $^{500}/_{1}$.

Moron deposit in a slide from Mr. J. D. Möller.

2. *Biddulphia tentaculifera* Cl. N. Sp.

Valve elevate, covered with tolerably large puncta arranged irregular lines arouud the centre of the valve. No costæ are visible. Processes elongate, club shaped.

Diam. of the valve 0,05 mm.

Pl. V, fig. 67, $^{800}/_{1}$.

Keeling Island (Eugenie Exp.).

3. *Biddulphia Gallapagensis* Cl. N. Sp.

S. V. broadly oval, almost orbicular, with two short stout processes. Structure: pearly granules arranged in lines, radiating from the irregularly punctate centre to the margin, about 12—13 in 0,01 mm.

Longest diameter 0,049 mm., shortest 0,04 mm.

Pl. VI, fig. 74, $^{1000}/_{1}$.

Gallapagos Islands (Eugenie Exp.).

This form belongs to the section of *B. aurita*, which contains a large number of nearly allied forms, as *B. Roperiana*, *B. Edwardii* Febiger etc.

Triceratium Ehb.

1. *Triceratium* (*Hydrosera; Terpsinoe?*) *trifoliatum* Cl. N. Sp.

Valve plane, with concave sides and three 3-cuspidate angles, separated from the valve by transverse lines (incomplete diaphragms). Surface covered with small puncta arranged in irregular lines.

Diam. 0,045 mm. Distance between two apices 0,05—0,06 mm.

Pl. VI, fig. 71, $^{600}/_{1}$.

New Zeeland in fresh or slightly brackish water collected by Mr. S. Berggren very rare.

This curious species is remarkable for its freshwater habit and seems to be most nearly related to Hydrosera *Wallich* from the Ganges, but it is entirely different.

2. *Triceratium* (*Hydrosera; Terpsinoë*) *Javanicum* Cl. N. Sp.

Valve plane, hexagonal, with three angles separated from the disc by transverse lines (diaphragms) and alternating with three other angles, which are contigous with the disc. One of the three latter angles has near the apex a small transvere fissure corresponding to the appendages on *Hydrosera triquetra* Wallich. Structure irregular 5—7-gonal cells, 4—5 in 0,01 mm., absent from the ends of the three first named angles. F. W. Rectangular with longitudinal furrows, corresponding to the sinuses between the angles.

Diam. 0,075 mm.

Pl. VI, fig. 75, $^{600}/_{1}$.

Java, Batavia in brackish water (Eugenie Exp.).

This form is so nearly related to Hydrosera triquetra Wallich Micr. Journ. VI, p. 251, Pl. 13, fig. 1—6, that it perhaps might be more correctly regarded as a mere variety.

3. *Triceratium dubium* Btw.

Micr. Journ. VII, p. 180, Pl. 9, fig. 12 is the triangular form of *T. bicorne* Cl. (Bih. t. K. Sv. Vet.-Ak Handl. Pl. 5, fig. 30).

4. *Triceratium Tripos* Cl. N. Sp.

Outline in the S. V. almost orbicular or triangular with very broad and rounded angles. Processes three near the angles. Structure a somewhat coarse and irregular cellulation of hexagonal cells, about 5 in 0,01 mm. In the F. V. the valve is elevated, sloping regularly from the apex to the margins. The three processes are strong and and project somewhat obliquely.

Diam. of the valve 0,0525 mm.

Pl. VI, fig. 72, $^{900}/_{1}$.

Gallapagos Islands (Eugenie Exp.).

5. *Triceratium Anderssonii* Cl. N. Sp.

This very rare and exceedingly fine species, of which I have found only one incomplete specimen, is quadrangular with straight sides and rounded angles, upon which are large truncate processes. The structure consists of branching veins, radiating from the centre to the margins, and of tolerably coarse cellules, about 5 in 0,01 mm., of which two rows fill the space between each pair of lines.

Greatest diameter 0,09 mm.

Pl. VI, fig. 69, $^{500}/_{1}$.

Gallapagos Islands (Eugenie Exp.).

The structure of this remarkable species, which I have named in honour of the late Prof. N. J. Andersson, is that of a Stictodiscus.

6. *Triceratium læve* Cl. N. Sp.

Triangular or quadratic, with straight sides and acute not produced angles. The surface perfectly smooth, no structure being visible on balsam-specimens. In F. V. the centre of the valve is elevated, and the angles are produced into processes, forming right angles with the transverse diameter.

Distance between angles 0,02—0,0285 mm.

Pl. VI, fig. 70, $^{700}/_{1}$, *a.* S. V., *b.* F. V.

Gallapagos Islands (Eugenie Exp.).

7. *Triceratium* (*productum* Grev. var.) *Balearicum* Cl. et Grun. (in Cl. et Möll. Diat. N:o 154—155).

This form is closely allied to *Amphitetras producta* Greville and *Triceratium Antillarum* Cl. Its outline is 4—5 angular, with the angles produced into short processes. The centre of the valve is elevated and by a depression separated from the margins. The structure consists of rounded puncta arranged in lines, radiating from the centre to the angles, about 5 in 0,01 mm.

Greatest diameter 0,06—0,08 mm.

Pl. VI, fig. 73, $^{500}/_{1}$.

Balearic Islets (Dr. F. Söderlund).

There can be not doubt that *A. producta* Grev. (Micr. Journ. II, p. 94, Pl. 9, fig. 2) and *T. Antillarum* Cl. (Bih. till K. Sv. Vet.-Ak. Handl. Bd. V, N:o 8, Pl. V, fig. 29) belong to the same species, which seems to be nearly allied also to *Amphitetras elegans* Grev. from Monterey stone, in which form the depression between the centre and the margins form an inscribed quadrate.

Allied to these forms seems to be *Am. nobilis* Grev. (Trans. Micr. Soc. 1865, p. 105, Pl. IX, fig. 27) from the Red Sea. This species is however larger and seems to be only the pentagonal form of *Am. antediluviana*. It occurs in Rabenhorst, Alg. Eur. N:o 2264 from Livorno together with Am. antediluviana, and Mr. Kitton informs me that he has found it in samples from Orkney Islands and Southampton; he also remarks that the processes are much exaggerated in Grevilles figure. Another form related to A. antediluviana is *A. tessellata* Shadb. (T. M. S. 1854, p. 16, Pl. 1, fig. 11), of which a variety with very coarse cellulation and large processes occurs in Moron Deposit.

The *Triceratium productum* Grev. from Barbados Deposit is a quite different form (see T. M. S. 1863, IX, p. 69, Pl. VIII, fig. 9).

8. *Triceratium Gallapagense* Cl. N. Sp.

Triangular, with acute angles, not provided with processes. Structure: distant puncta, scattered over the disc of the valve, closer near the margins, where they form

short rows, 5 in 0,01 mm. In the angles the puncta are much smaller and form fine branching lines.

Distance between angles 0,0975 mm.

Pl. VI, fig. 72, $^{600}/_{1}$.

Gallapagos Islands rare (Eugenie Exp.).

9. *Triceratium margaritiferum* Cl. N. Sp.

Valve quadrangular with concave sides and rounded angles, without processes. Surface probably plane. Structure tolerably coarse granules arranged near the margins in short lines, smaller in the angles, rare and scattered in the middle.

Diam. 0,05 mm.

Pl. VI, fig. 76, $^{600}/_{1}$.

Gallapagos Islands rare (Eugenie Exp.).

Chætoceros Ehb.

1. *Chætoceros Dichæta* Ehb. = *C. remotus* Cl. et Grun.

This form has already been described in Cl. et Grun. Arct. Diat. p. 119 and is to be found in most slides of Cl. et Möll. Diat. N:o 125.

Pl. VI, fig. 77, $^{600}/_{1}$.

Antarctic Ocean (Challenger Exp.).

Rhizosolenia Ehb.

1. *Rhizosolenia* (*alata* var.?) *gracillima* Cl.

Extremely long and slender, measuring 0,5—0,7 mm. in length and only 0,006 mm. in breadth. The beaks are almost straight, provided with pocket-like impressions. The zig-zag markings on the connecting membrane are very indistinct. The frustule is extremely hyaline, having no colour in dry state. No structure has been seen.

Pl. VI, fig. 78, $^{1000}/_{1}$.

West coast of Sweeden, Lysekil, freely floting on the surface of the sea (July 1877 by P. T. Cleve).

Another slender species, characterized by its coarse, of puncta composed striæ, *Rh. Shrubsolii* Cl. N. Sp., occurs in the Atlantic Ocean between Iceland and Greenland. It was recently found in great abundance on the surface of the sea near the island of Sheppey by Mr. Shrubsole.

Description of plates I—VI.

Plate I.

Fig. 1. Mastogloia panduriformis Cl.
» 2. M. submarginata Cl. et Grun.
» 3. Amphora Berggrenii Cl.
» 4. Cymbella Brasiliana Cl.
» 5. C. Stodderi Cl.
» 6. Pleurosigma tortuosum Cl.
» 7. Pl. lanceolatum var. cuspidatum Cl.
» 8. Pl. (Donkinia?) longissimum Cl.
» 9. Rhoicosigma mediterraneum Cl.
» 10. Navicula (Fluminensis var.?) Floridana Cl.
» 11. N. cruciata Cl.
» 12. N. Platessa Cl.
» 13. N. Grœnlandica Cl.
» 14. N. Hennedyi var. Tahitensis Cl.
» 15. N. Hennedyi var. minuta Cl.

Plate II.

Fig. 16. Navicula Eugeniæ Cl.
» 17. N. rudis Cl.
» 18. N. Holmiensis Cl.
» 19. N. Hennedyi var. undulata Cl.
» 20. N. (excavata var.?) Angelorum Cl.
» 21. N. Febigerii Cl.
» 22. N. Cluthensis var. minuta Cl.
» 23. N. Cluthensis var.? maculifera Cl.
» 24. N. Fromenteræ Cl.
» 25. N. bicuspidata Cl. et Grun.
» 26. N. mesoleia Cl.
» 27. N. Hauckii Cl

Plate III.

Fig. 28. Navicula Anderssonii Cl.
» 29. N. marginulata Cl.
» 30. N. Powellii Lewis var. Gallapagensis Cl.
» 31. N. Wittii Grun. *
» 32. N. quadriserieta Cl. et Grun.
» 33. N. Castracanei Grun. *
» 34. N. Petitiana Grun. *
» 35. N. Bruchii Grun. *

*) Delineated by Mr. Grunow.

Fig. 36. Navicula multiseriata GRUN. *
» 37. N. amica CL. et GRUN.
» 38. N. jugata CL.
» 39. N. Pensacola CL.
» 40. N. Gallapagensis CL.
» 41. Stauroneis Balearica CL.
» 42. St. Africana CL.
» 43. St. pachycephala CL.
» 44. Schizostauron Crucicula GRUN.
» 45. Stauroneis Sagitta CL.
» 46. St. sulcata CL.

Plate IV.

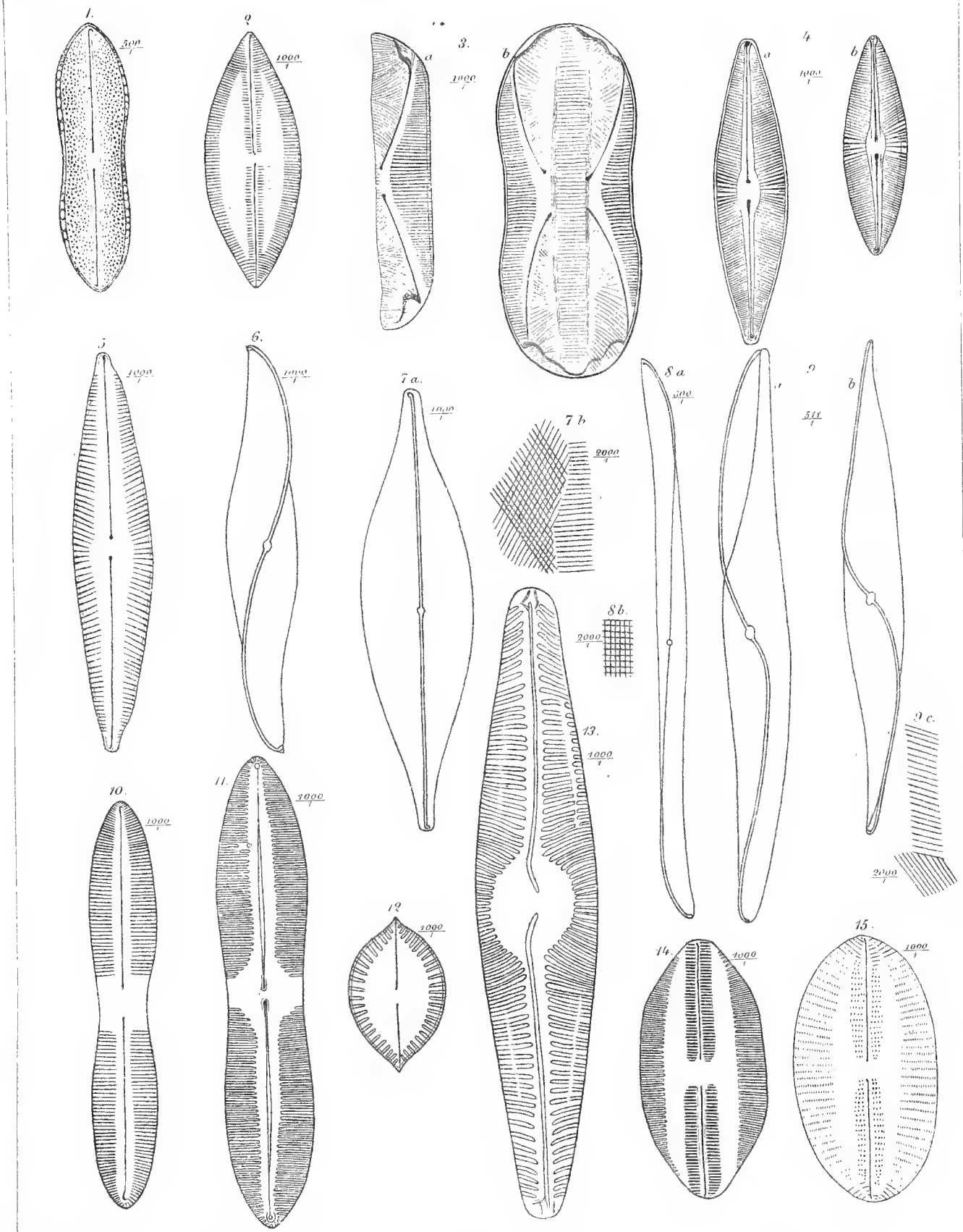
Fig. 47. Nitzschia ocellata CL.
» 48. N. prælonga CL.
» 49. Surirella formosa CL.
» 50. S. Caldensis CL.
» 51. S. degenerans CL.
» 52. Campylodiscus Margaritarum CL.
» 53. C. (Ecclesianus var.?) peramplus CL.
» 54. Plagiogramma rutilarioides CL.
» 55. P. spinosum CL.
» 56. Biddulphia Moronensis CL.
» 57. Rutilaria recens CL.

Plate V.

Fig. 58. Actinella Guianensis GRUN.
» 59. Asterolampra Balearica CL.
» 60. Coscinodiscus undulatus CL.
» 61. Liradiscus Capensis CL.
» 62. Stephanodiscus (bellus var.?) Novæ Zeelandiæ CL.
» 63. Cyclotella Meneghiniana var. stelligera CL. et GRUN. *a.* from New Zeeland; *b.* from France; ; ; *c.* stellulifera GRUN.
» 64. Auliscus (?) insignis CL.
» 65. Melosira (Podosira?) tuberculosa CL.
» 66. Stictodiscus Novaræ CL.
» 67. Biddulphia tentaculifera CL.

Plate VI.

Fig. 68. Triceratium Tripos CL.
» 69. T. Anderssonii CL.
» 70. T. læve CL.
» 71. T. (Terpsinoe?) trifoliatum CL.
» 72. T. Gallapagense CL.
» 73. T. productum GREV. var. Balearicum CL. et GRUN.
» 74. Biddulphia Gallapagensis CL.
» 75. Triceratium (Terpsinoe?) Javanicum CL
» 76. T. margaritiferum CL.
» 77. Chætoceros Dichæta EHB.
» 78. Rhizosolenia (alata var.?) gracillima CL.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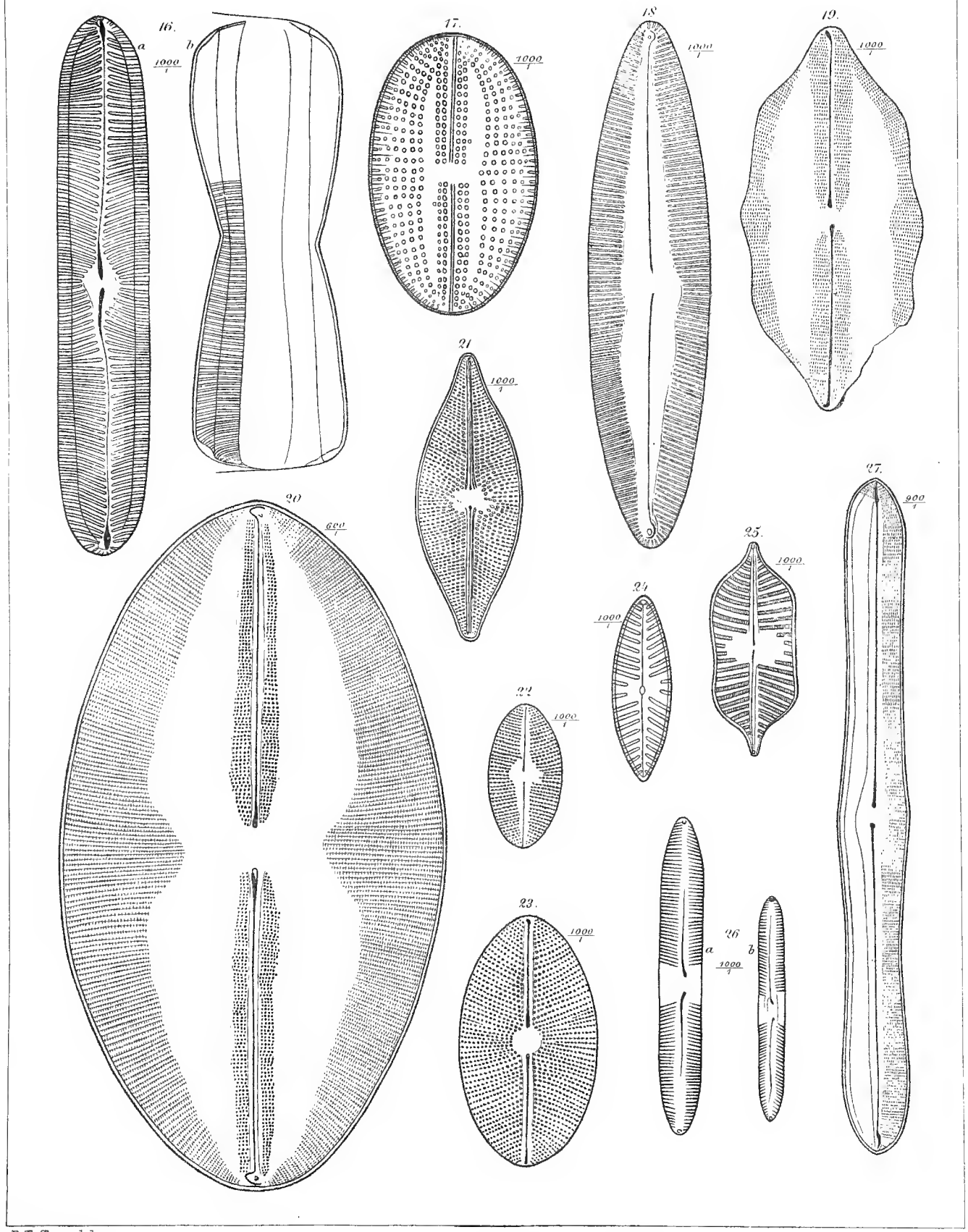
P T Cleve del.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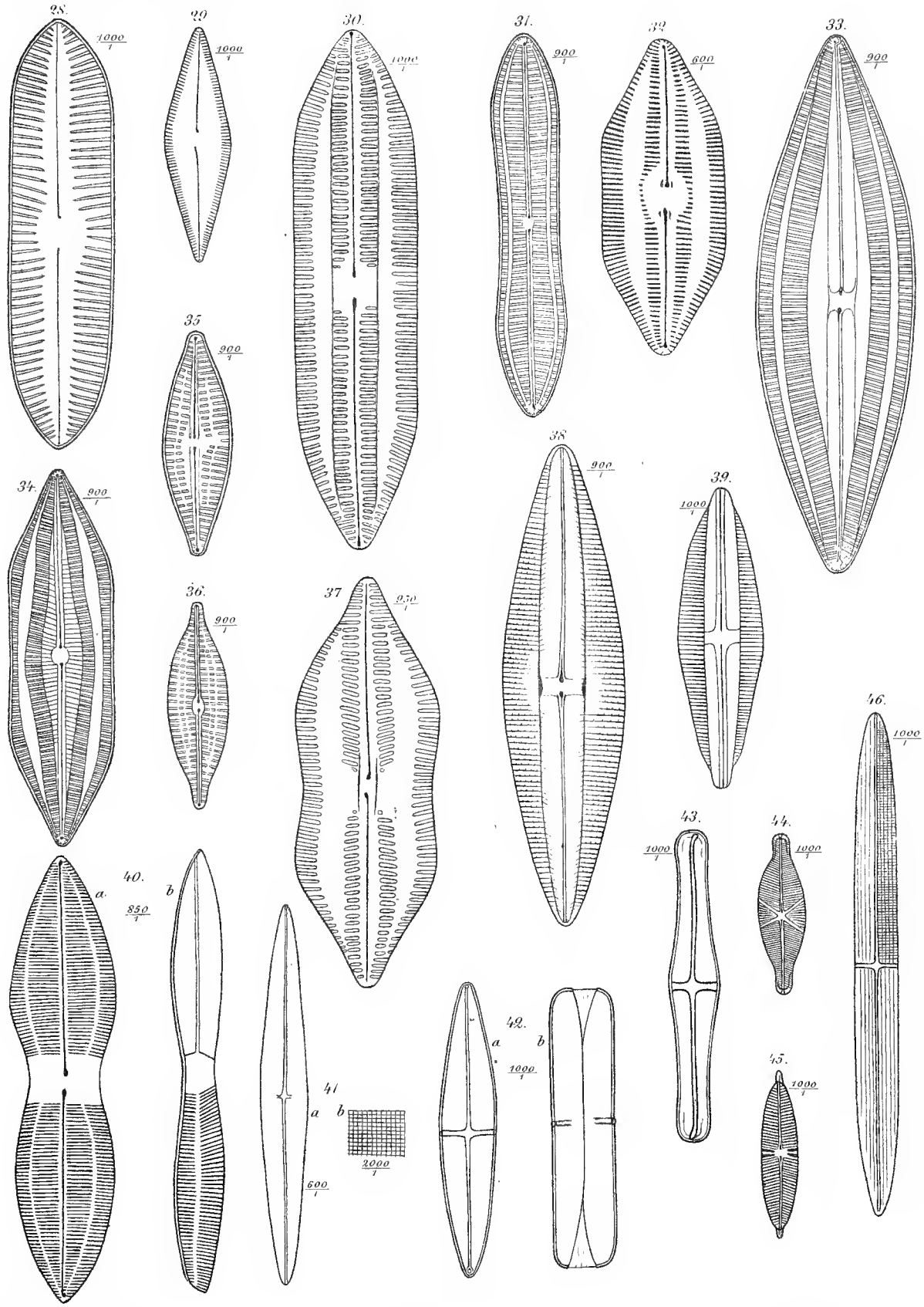
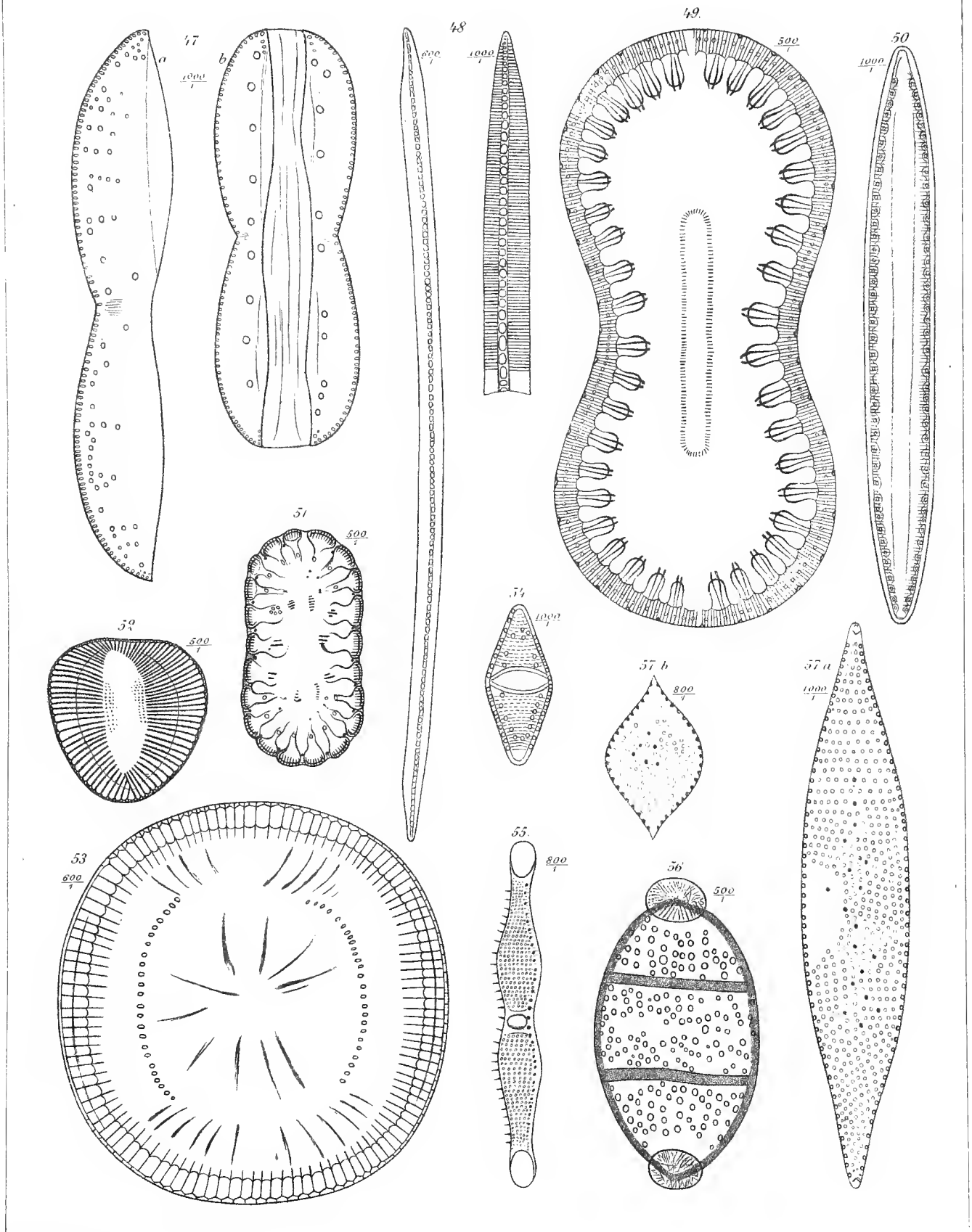
P. T. Cleve del.



P. T. Cleve et A. Grunow del.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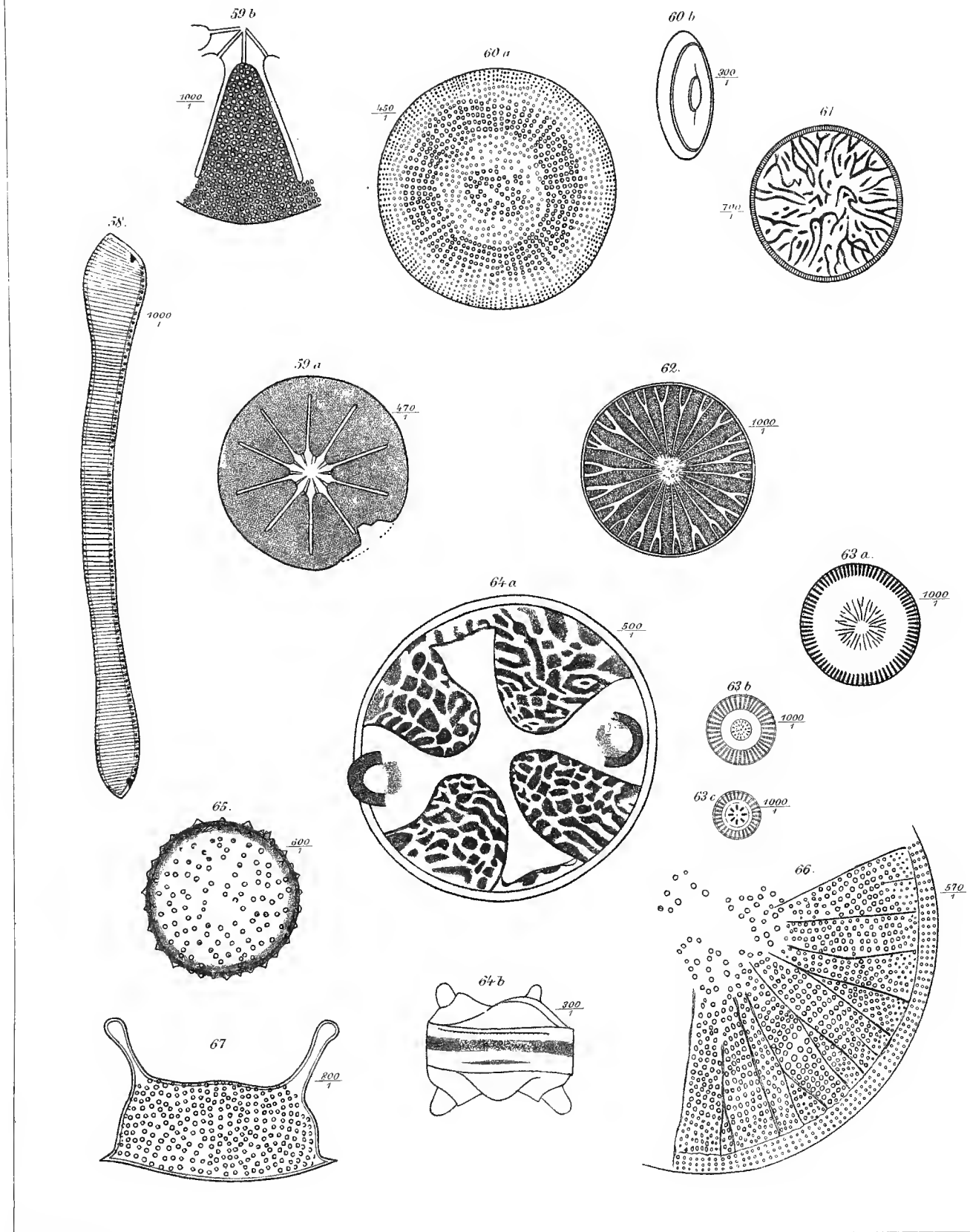
P. T. Cleve del.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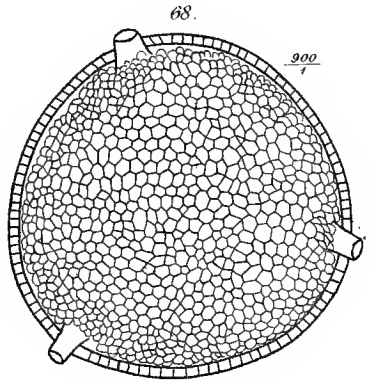
P. T. Cleve del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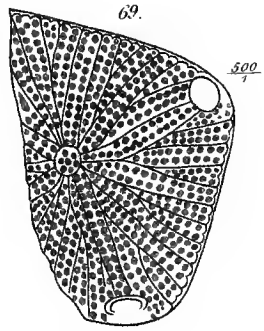
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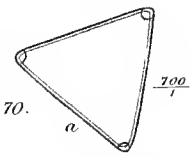
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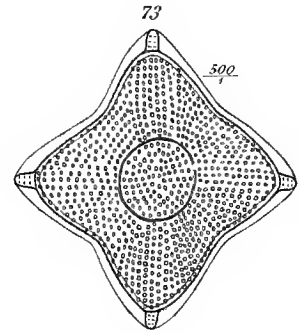
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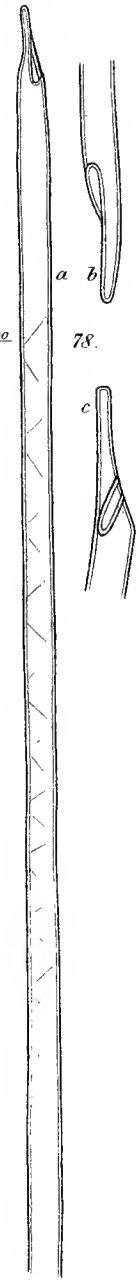
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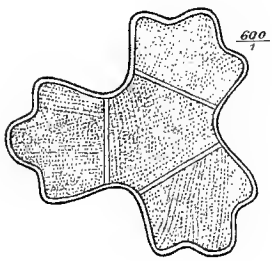
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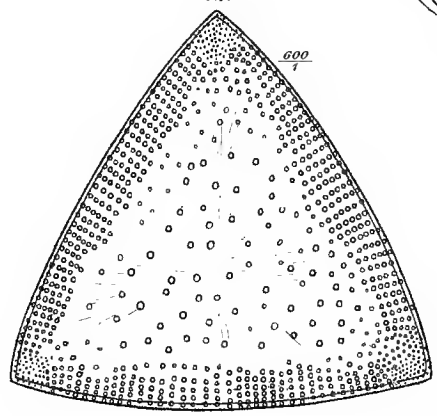
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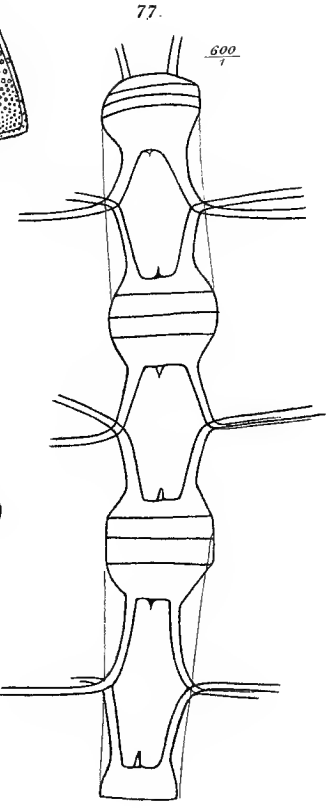
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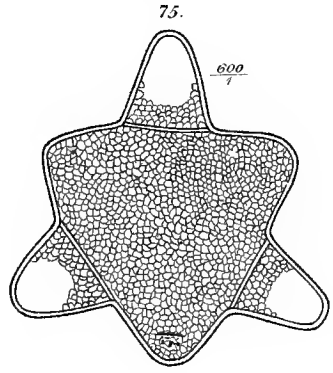
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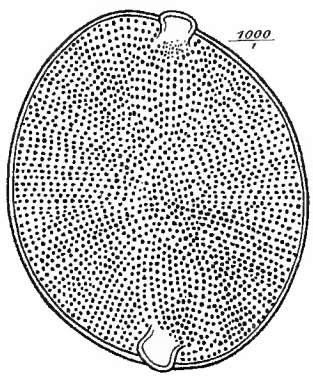
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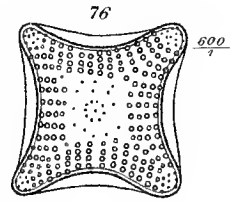
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