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THE present contribution is based on the materials of the Antarctic collections made by the members of the Japanese Antarctic Research Expedition at Showa Base during the years of 1957 and 1958. The materials used for this study were collected at the following five places:

1. The pond of East Ongul Island. The material was collected in a vial by Dr. Yukinori NAKANO in February 1958, being preserved in alcohol. The vial contains some freshwater algae, mainly blue-green algae and diatoms.

2. The Dokkene in the Lang Hovde area near Showa Base. The materials were imbedded in marine ice and collected on Nov. 28, 1957 by Dr. Tatsuo TATSUMI, one of the expedition's members. The material from which the algae were gathered by the author were some dry specimens of marine algae.

3. Jareb, north of Showa Base. The materials are dry specimens, collected by Dr. T. TATSUMI on July 5, 1957.

4. Jarebs of Skallene area, near Showa Base. The materials are dry specimens and were imbedded in the ice, being collected by Dr. T. TATSUMI on Oct. 26, 1957.

5. Soil samples of Showa Base. The samples are preserved in vial in an almost dry state. The soil samples were taken from the bare land of Showa Base.

All the specimens were supplied for the author's study by Dr. Riozo YOSII, a member of the second Japanese Antarctic Research Expedition. The author wishes to express his hearty thanks to Messrs. Y. NAKANO and T. TATSUMI for these precious collections and also to acknowledge his gratitude to Dr. R. YOSII for the rare opportunity to study them.

Information about the algae collected from the Antarctic Continent and its surrounding islands has been accumulated largely by the studies of European phycologists and these contributions suggest the rich flora of the lower cryptogams. In fact many species of freshwater algae from the northernmost area of the continent, namely Graham Land, and from the inner and southernmost area of the continent, such as Victoria Land, were reported on by L. GAIN, W. WEST, F. E. FRITSCH and others. The present materials are fragmental collections of the Antarctic flora. The author found some algae in these collections, but the species of algae included indicate the fairly favourable conditions of the Showa Base. In a pond in East Ongul Island there are some blue-green algae such as *Nostoc* and *Oscillatoria* or *Phormidium* and some

diatoms especially *Nitzschia*. The condition of the pond-water which is surrounded by snow and ice must in general be severe for growth of algae and other plants in comparison with the experience of our informations at the alpine or glacial lakes of the North Hemisphere. Nevertheless the Antarctic conditions permit the existence of lower aquatic plants. More detailed surveys at streams and ponds in bare land will multiply the number of species in the cryptogamic plants. The myxophycean species exist under very bad conditions, such as extreme cold or high temperatures, and diatoms grow under cold water so that it is not surprising that the myxophycean species and diatoms are the main algae among the Antarctic freshwater algae.

Cyanophyta

1. Microcystis fuscolutea (HANSG.) FORTI in GEITLER Krypt. Fl. 14, p. 140, 1932.

Cells densely disposed in a mucous envelope, about 4.4 μ in diameter; mucous envelope sphaerical or oval in shape, yellowish, 110 μ in length and 40 μ in width, subaerial and not so rare as in the soil samples, previously known to exist in Europe.

2. Chroococcus minutus (KÜTZ.) NÄG. in GEITLER Krypt. Fl. 14, p. 232, f. 112 a, 113 c, 1932.

Cells 5 μ in diameter, 11–12 μ in diameter with mucous envelope.

Hab. In the pond of East Ongul Island. Cosmopolitan species, previously known to exist in Victoria Land, Kaiser-Wilhelm II Land, Kerguelen Islands.

3. Synechocystis sallensis SKUJA in Act. Horti Bot. Univ. Latv. 4, p. 12, pl. 1, f. 13, 1929; Symb. Bot. Ups. 9 : 3, p. 42, pl. 3, f. 12–15, 1948.

Cells 20 μ in diameter without mucous envelope; only observed once.

Hab. In the pond of East Ongul Island. Previously known to exist in northern Europe.

4. Entophysalis granulosa KÜTZ. in KIRCHNER ENGL. Pflanzenfam. 1 : 1a, p. 54, f. 49G, 1900; GEITLER Krypt. Fl. 14, p. 298, f. 146, 1932. (Pl. II, f. 13)

The cells of trichome 6.5 μ in diameter, with sheath 8.8 μ in diameter; rather broader than the European dimension; attached on marine algae. Marine species.

Hab. Dokkene, Lang Hovde area. The species previously known to exist in South Orkney.

5. Nostoc sphaericum VAUCH. in GEITLER Krypt. Fl. 14, p. 850, f. 539b, 1932. (Pl. II, f. 14)

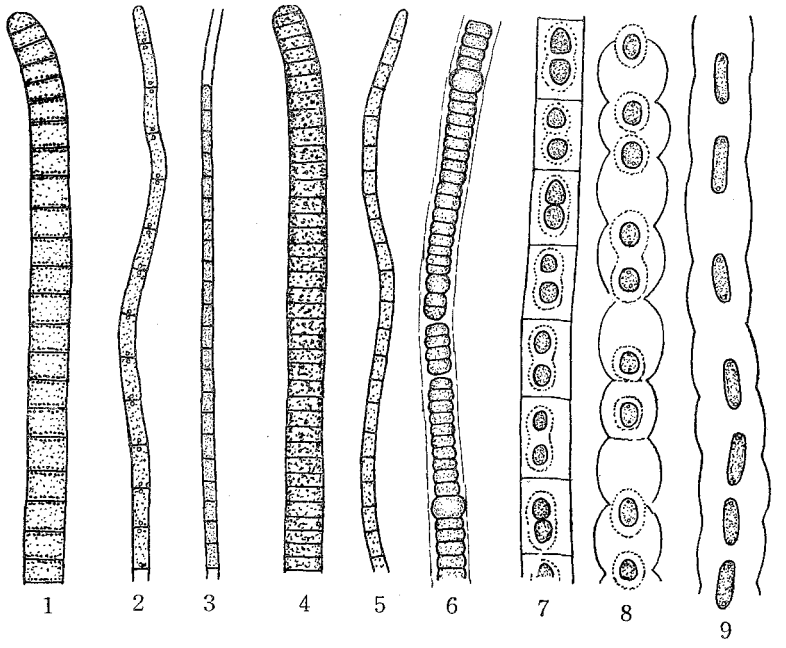
Trichome flexuose, cells 4.4 μ in diameter, heterocyst 5.3 μ in diameter, resting spore?

Hab. In the pond of East Ongul Island, previously known to exist in Victoria Land. Cosmopolitan species.

6. Oscillatoria simplicissima GOM. in GEITLER Krypt. Fl. 14, p. 962, 1932. (Text-f. 1, f. 4)

The cells of trichome about 8 μ in diameter, twice as wide as long, with distinct granules at the joint. The species resemble var. *antarctica* F. E. FRITSCH but are slightly narrower than PRITSCH's description.

Hab. In the pond of East Ongul Island. Previously known to exist in Victoria Land and Europe.



Text-figure 1.

1. *Oscillatoria irrigua* KÜTZ.
2. *Phormidium laminosum* GOM.
3. *Ph. tenue* (MENEGH.) GOM.
4. *Oscillatoria simplicissima* GOM.
5. *O. ambigua* AG.
6. *Nodularia Harveyana* THUR.
7, 8. *Binuclearia tatrana* WITTR.
9. *Asterocystis ornata* (AG.) HAMEL.

7. Oscillatoria irrigua KÜTZ. in GEITLER Krypt. Fl. 14, p. 961, f. 611a, b, 1932. (Text-f. 1, f. 1)

Trichomes straight, not constricted at the joint; cells about as long as wide or a little wider than long, about 8.8 μ in diameter, without pseudovacuole; granules at the joint not always present in every trichome.

Hab. In the pond of East Ongul Island. Previously known to exist in Victoria Land, Kaiser-Wilhelm II Land.

8. Oscillatoria amphibia AG. in GEITLER Krypt. Fl. 14, p. 966, 1932. (Text-f. 1, f. 5)

Trichome not constricted at the joint slightly curved, cells 1.5–2 times longer than wide, 3.2 μ in width and 7.7 μ in length, without granules.

Hab. In the soil sample of Ongul Island, previously known to exist in Victoria Land and Graham Land, Kaiser-Wilhelm II Land, Kerguelen Islands. Cosmopolitan species.

9. Phormidium laminosum GOM. in GEITLER Krypt. Fl. 14, p. 1005, f. 642 c, 1932. (Text-f. 1, f. 2)

Trichome not constricted at the joint, with a distinct granule on each end of the cell; cells about two to three times longer than wide; 5.7 μ in width and 11–17 μ in length.

Hab. In the pond of East Ongul Island, previously known to exist in Victoria Land.

10. Phormidium tenue (MENEGH.) GOM. in GEITLER Krypt. Fl. 14, p. 1004, f. 642 d, e, 1932. (Text-f. 1, f. 3)

Trichome straight, not constricted at the joint; cells slightly longer than wide, 0.8–1.0 μ in width and 2.5–3 μ in length, without a granule at the joint.

Hab. In the pond of East Ongul Island, previously known to exist in Victoria Land, Kaiser-Wilhelm II Land.

11. Nodularia Harveyana THUR. in GEITLER Krypt. Fl. 14, p. 864, f. 551, 1932. (Text-f. 1, f. 6)

Trichome straight, about 4.4 μ in diameter, not attenuated towards the apices; heterocyst intercalar, elliptic; slightly broader than the vegetative cell; 5.7 μ in diameter; resting spore absent.

Hab. In the pond of East Ongul Island, previously known to exist in Victoria Land under the name of *Nodularia spumigena* MERTENS var. *minor* F. E. FRITSCH.

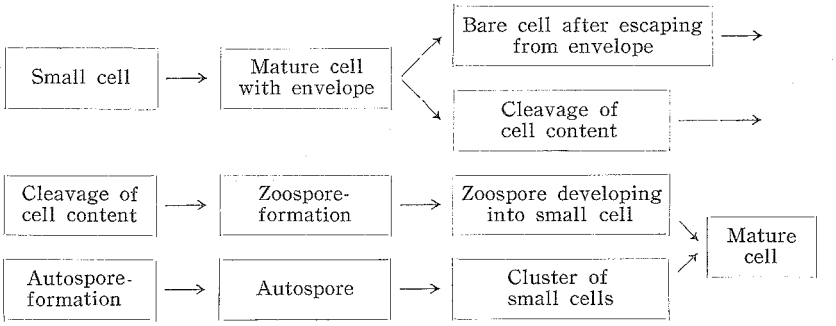
Chlorophyta

12. Chlorosphaera antarctica F. E. FRITSCH in Journ. Linn. Soc. Bot. 40, p. 302, 324, pl. 10, f. 2–6, pl. 11, photo. 1, 3, 5, 6c, 1912. (Pl. I, f. 1–6, pl. II, f. 7–12)

Cells spherical, enclosed by a distinct envelope, solitary or grouped in colonial state, attached or imbedded in fungous matrix; cells small in a young mass, grouped in a large mass and disposed like a cluster in solid state, gradually enlarged and separated from each other; mature cells large and solitary in general; all the cells enclosed by a thick envelope which consists of hyaline, mucous-like manner; young cell about 12–13 μ in diameter and mature large

cells about 70 μ in diameter; chloroplast spherical and hollow, sometimes excentrically disposed owing to the increase of reserve substances and sometimes containing distinct granules; the cells sometimes contain drops of a fatty-like substance and show a golden color. The contents of the large mature cells sometimes show a cleavage-appearance but it is not certain whether this appearance develops into zoospore-formation or autospore-formation. However in judging from the formation of a cluster of the small grouped cells as described above, the mature cells become autosporangium and produce many autospores, and each spore produces the mucous envelope and the cells may gradually separate from each other; mature cells sometimes are without an envelope, keeping a bare state and sometimes they show a slight cleavage of cell content; the bare cells may escape from the envelope; some examples show the escaping state but there is some doubt that the escaping state does show the actual change of progression, because the specimens are in a dry state and when placed in water, the algae become lively and quickly escape from the envelope. It is improbable that the escaping state is discontinued in the dry state for a long period of time. If the materials are pressed by placing a cover glass on them and then the contents pushed out by breaking, the bare contents do not show the smooth outline but show an irregular breaking manner. The envelope of the cells is composed of fungous hyphae and makes a fairly firm tissue and sometimes it seems to be stratified and sometimes to have a curious projection which does not relate immediately to the escaping of the cell contents.

The author proposes the mode of reproduction as follows:



Chlorosphaera antarctica was first reported to exist in South Orkney on yellow snow by F. E. FRITSCH. This yellow snow consists of some kind of algae as shown by microphotograph, and later E. KOL reported this alga to exist in the glaciers in Alaska. She called this alga 'glacialis-cryobiont'. The habitat of the present specimens is an ice-field and the algae were imbedded in ice. However, the present specimens show the complex of *Chlorosphaera antarctica* and some other plants.

In general, snow or ice-flora does not constitute a single plant. The present specimens seem to be a compact tissue of fungous hyphae and the author can tear off the compact tissue in a thin layers by a micropin and the thin layers constitute an entangled fungous hyphae and some layers contain *Gloeocapsa* species and *Chlorosphaera* so that the tissue-like body seems to be a pile of the cryobiont grown in the warm season. *Chlorosphaera* must be a leading part of the complex-body.

E. KOL reported this alga to exist in Alaskan glaciers and her figures and photomicrographs seem to me to be somewhat different from the species of Antarctic *Chlorosphaera*. Our specimens do not show the broad thickness of the envelope as shown in photomicrographs 7, 9 and figures 17, 21 and the envelopes are also different from those of FRITSCH's original description and photomicrograph, as well as according to my own observation. But FRITSCH does not explain the hyphae-like structure of the envelope. The photomicrographs of the natural state of this alga reported on by FRITSCH coincide very well with the author's specimens except as regards its envelope. Further studies are needed on the curious envelope of the present specimens to determine whether the nature of the envelope is really characteristic of the species of this alga.

13. Binuclearia tatrana WITTR. in SMITH Freshw. Alg. U.S. p. 385, f. 258, 1933; PRESCOTT Alg. Great Lake Area p. 102, pl. 7, f. 7–9, 1951. (Text-f. 1, f. 7, 8)

Colony uniseriate; cells elliptic or ovate after division; disposed in pairs in a common gelatinous envelope; cells about 5.3 μ in diameter and 8.8 μ with sheath in diameter.

Hab. In the pond of East Ongul Island, previously known to exist in Europe and N. America.

This alga resembles the next species, *Asterocystis ornata*, but is different from it due to the arrangement of the cells and the possession of a common gelatinous envelope, however there is an intermediate form which shows the character of the cell arrangement and nature of the gelatinous envelope in the same place.

14. Asterocystis ornata (AG.) HAMEL in DROUET Butl. Univ. Bot. Stud. 12, p. 142, f. 302, 303, 305, 1956. (Text-f. 1, f. 9)

Colony forms a uniseriate filament, not branched in the present specimens; cells oblong-cylindrical, blue-green in color, with a granule at each end disposed some distance each other, imbedded by broad gelatinous envelope which is somewhat irregularly swollen; cells about 2.2 μ in width and 8.8–11 μ in length.

Hab. In the pond of East Ongul Island, previously known to exist in Europe.

Chrysophyta

Bacillariophyceae

15. Melosira varians AG. in HUSTEDT Krypt. Fl. 7:1, p. 240, f. 100, 1930.
Frustules 31 μ in wide.

Hab. In the soil sample of Ongul Island. Cosmopolitan species. Previously known to exist in Victoria-land and South Orkney.

16. Melosira sol (EHRENB.) KÜTZ. in KARSTEN Wiss. Ergebn. Deutsch. Tiefsee-Exped. 2:2, p. 70, pl. 1, f. 3–9, 1905; HUSTEDT Krypt. Fl. 7:1, p. 270, f. 114, 1930.

Frustules 75–92 μ in wide.

Hab. Dokkene, Lang Hovde area. Marine diatom. Previously known to exist in Victoria-land, South Orkney, Kerguelen Island and Franz Joseph-Land.

17. Triceratium arcticum BRIGHTW. in HUSTEDT Krypt. Fl. 7:1, p. 816, f. 479, 1930.

Frustules triangular in valve-view, side almost straight 136–330 μ in length, angles broadly rounded; cell wall areolate, areolae polygonal but punctate near the angles instead of areolation.

Hab. Dokkene, Lang Hovde area. Marine diatom. Previously known to exist in Victoria-land, north Atlantic ozean.

18. Biddulphia aurita (LYNGB.) BRÉB. & GODEY in HUSTEDT Krypt. Fl. 7:1, p. 846, f. 501, 1930; A. CLEVE Diat. Schw. & Finnl. 1, p. 119, f. 257, 1951. (Pl. III, f. 2, 3)

Frustules elliptic with produced poles in valve view, strongly areolate, 84 μ in length and 55 μ in wide.

Hab. Dokkene, Lang Hovde area, previously known to exist in Europe. Marine diatom.

19. Coscinodiscus planus KARSTEN in Wiss. Ergebn. Deutsch. Tiefsee-Exped. 2:2, p. 79, pl. 4, f. 1, 1905. (Pl. III, f. 1)

Valves 36.5–61.5 μ in diameter.

Hab. Jarebs, north of Showa Base. Previously known to exist in Antarctic Ocean.

20. Diatoma vulgare BORY var. linearis GRUN. in HUSTEDT Süssw. Fl. 10, p. 127, f. 108, 1930. (Pl. III, f. 22)

Frustules 55–57 μ in length and 5.3–5.5 μ in width.

Hab. Dokkene, Lang Hovde area. Freshwater diatom. Previously known to exist in Europe.

21. Synedra ulna (NITZSCH) EHRENB. in A. CLEVE Diat. Schw. & Finnl. 2, p. 60, f. 382 a, 1953. (Pl. III, f. 15)

Hab. In the soil sample of Ongul Island. Freshwater diatom and cosmopolitan species. Previously known to exist in Victoria-land and Graham-land.

22. Synedra ulna var. splendens (KÜTZ.) BRUN. in A. CLEVE Diat. Schw. & Finnl. 2, p. 61, f. 382d, e, 1953. (Pl. III, f. 16)

Frustules 106–115 μ in length and 5.3–6.6 μ in width.

Hab. Dokkene, Lang Hovde area.

23. Cocconeis costata GREGORY var. pacifica GRUN. in CARLSON Wiss. Ergebn. schwed. Südpolar Exped. 4 : 14, p. 22, pl. 3, f. 2, 1913; SCHULZ Bot. Arch. 13, p. 194, f. 49, 1926.

Valves variable in shape and size, generally elliptic, elliptic-oblong, broad elliptic or elliptic-rhomboide, 25–88 μ and 15.4–75 μ in width.

Hab. Jarebs, north of Showa Base and Dokkene, Lang Hovde area. Previously known to exist in South Georgia, South Shetland, Chile, Ceylon and Europe. Marine diatom.

24. Frustulia rhomboides (EHRENB.) DE TONI in A. CLEVE Diat. Schw. Finnl. 5, p. 7, f. 1326a, 1952.

Valves 40–53 μ in length and 8.8–13 μ in width.

Hab. Jarebs, north of Showa Base. Cosmopolitan species.

25. Navicula longa (GREGORY) RALFS in SCHMIDT Atlas Diat. pl. 47, f. 6, 1886; BOYER Diat. Philad. Vicinity p. 97, pl. 31, f. 10, 1916. (Pl. III, f. 21)

Frustules elongate-rhomboides, 123 μ in length and 15.4 μ in width.

Hab. Dokkene, Lang Hovde area. Marine diatom.

26. Navicula cancellata DONK. var. Gregorii (RALFS) GRUN. in A. CLEVE Diat. Schw. Finnl. 3, p. 132, f. 758f, 1953. (Pl. III, f. 10, 11)

Frustules linear-lanceolate with obtuse end, 39–42 μ in length and 8.8 μ in width.

Hab. Dokkene, Lang Hovde area and Jarebs, north of Showa Base. Probably marine diatom. Previously known to exist in Europe.

27. Navicula subtilissima CLEVE in A. CLEVE Diat. Schw. Finnl. 3, p. 174, f. 864, 1953. (Pl. III, f. 4)

Frustules very finely striated and scarcely visible, 30 μ in length and 4.4 μ in width.

Hab. Jarebs near Showa Base. Freshwater diatom. Previously known to exist in Europe.

28. Navicula seminulum GRUN. in A. CLEVE Diat. Schw. Finnl. 3, p. 179, f. 876, 1953. (Pl. III, f. 6–8)

Frustules in valve view slightly inflated at the middle and truncately rounded at the end, 17.5–26.5 μ in length and 4.5–4.8 μ in width.

Hab. Jarebs, north of Showa Base, previously known to exist in Europe.

29. Trachyneis aspera (EHRENB.) CL. in Synop. Naviculoid Diat. 1, p. 191, 1894; A. CLEVE Diat. Schw. Finnl. 4, p. 5, f. 976, 1955. (Pl. III, f. 17)

Frustules 150–180 μ in length and 22–31 μ in width.

Hab. Dokkene, Lang Hovde area. Marine diatom. This species differ from *Trachyneis antarctica* HEIDEN & KOLBE by the possession of more elongated valve. Widely distributed from tropic to Arctic and Antarctic Ocean.

30. Pinnularia quadratarea A. S. var. bicuneata HEIDEN & KOLBE in Deutsch. Südpolar Exped. 8, p. 596, pl. 2, f. 33–35, 1927. (Pl. III, f. 24, 25)

Frustules 79–110 μ in length and 18.5–22 μ in width.

Hab. Jarebs, north of Showa Base. Previously known to exist in Kaiser-Wilhelm II Land and Kerguelen Island.

31. Pinnularia quadratarea A. S. var. fluminensis (GRUN.) CL. in A. CLEVE Diat. Schw. Finnl. 4, p. 10, f. 982f, 1955. (Pl. III, f. 14)

Frustules gradually attenuated toward the poles which are rounded, slightly constricted at the middle, 62 μ in length and 10.4 μ in width.

Hab. Dokkene, Lang Hovde area. Previously known to exist in Kerguelen Island.

32. Pinnularia lanceolata HEIDEN & KOLBE var. interrupta (A. CL.) HIRANO, stat. nov. – *Pinnularia viridis* var. *commutata* forma *interrupta* A. CLEVE in Soc. Sci. Fenn. Comm. Biol. 4:14, p. 46, f. 63, 1934. (Pl. III, f. 23)

Frustules 62 μ in length and 9 μ in width.

Hab. Dokkene, Lang Hovde area. Previously known to exist in Finland.

33. Pinnularia biglobosa (SCHUM.) A. CLEVE in Diat. Schw. Finnl. 4, p. 28, f. 1029b, c, 1955. (Pl. III, f. 12)

Apices of valve slightly capitated; striae short and slightly radial, interrupted in the median portion, 40 μ in length and 6.5 μ in width.

Hab. Jarebs, north of Showa Base. Freshwater diatom. Previously known to exist in Europe.

34. Gomphonema exiguum KÜTZ. in A. CLEVE Diat. Schw. Finnl. 4, p. 196, f. 1300, 1955. (Pl. III, f. 5)

Frustules 33 μ in length and 5.3 μ in width.

Hab. Dokkene, Lang Hovde area.

35. Amphora ovalis KÜTZ. in A. CLEVE Diat. Schw. Finnl. 3, p. 90, f. 667a, 1953. (Pl. III, f. 20)

Frustules 44–102 μ in length and 8.8–17 μ in width.

Hab. Dokkene, Lang Hovde area. Previously known to exist in South Georgia, Kerguellen Island and Europe.

36. Amphora ovalis var. libyca (EHRENB.) CLEVE in O. MÜLLER ENGL. Bot. Jahrb. 43, Beih. 100, p. 27, pl. 1, f. 22, 1909; HUSTEDT Süssw.-fl. 10, p. 342, 1930. (Pl. III, f. 9)

Frustules 39–40 μ in length and 20 μ in width.

Hab. Jarebs, north of Showa Base. Previously known to exist in south Patagonia and Europe.

37. Cymbella cymbiformis (KÜTZ.) VAN HEURCK in HUSTEDT Süssw.-fl. 10, p. 362, f. 672, 1930.

Frustules 79 μ in length and 17.6 μ in width.

Hab. Jarebs, north of Showa Base. The species resembles *Cymb. aspera* and *Cymb. lanceolata* but differs from both species by the shorter frustules.

38. Denticula antarctica (CASTR.) CARLSON in Wiss. Ergebn. Schw. Südpol. Exped. 4 : 14, p. 31, pl. 3, f. 21, 1913. (Pl. III, f. 13)

Frustules 48 μ in length and 12 μ in width.

Hab. Jarebs, north of Showa Base. Previously known to exist in South Shetland.

39. Hantzschia linearis (O. MÜLL.) A. CLEVE in Diat. Schw. Finnl. 5, p. 51, f. 1421 a–d, 1952. – *H. elongata* (HANTZ.) GRUN. var. *linearis* O. MÜLL. in ENGL. Bot. Jahrb. 43, Beih. 100, p. 35, pl. 2, f. 30, 1909. – *Nitzschia amphioxys* (EHRENB.) W. SM. in CARLSON Wiss. Ergebn. schw. Südpol. Exped. 4 : 14, p. 25, pl. 2, f. 12, 1913. (Pl. III, f. 18)

Frustules linear and side parallel, gradually attenuated and prolonged toward the poles which are rounded at the extremity; striae 12–13 in 10 μ; 110 μ in length and 6.3 μ in width.

Hab. Dokkene, Lang Hovde area. Previously known to exist in Antarktis, South Patagonia and N. Europe.

40. Nitzschia dubia W. SM. in A. CLEVE Diat. Schw. Finnl. 5, p. 63, f. 1441, 1952. (Pl. III, f. 19)

Valves distinctly constricted at the middle, abruptly narrowed and elongated toward the poles, 97 μ in length and 13 μ in width.

Hab. Dokkene, Lang Hovde area, rare in the sample. Marine? Previously known to exist in N. Europe.

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PLATES

PLATE I

Fig. 1. *Chlorosphaera* and fungous hyphae complex showing the natural state. The group of small cells are somewhat separated by being pressed under cover glass. The interspace between the spherical cells of *Chlorosphaera* are entangled fungous hyphae.

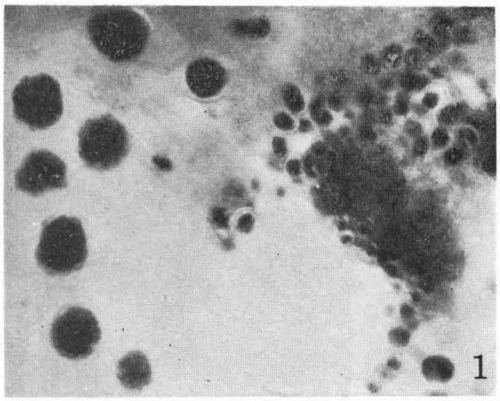
Figs. 2 and 3. *Chlorosphaera antarctica* in natural state. The cells contain bodies of reserve substance, especially a fatty-like globular body.

Fig. 4. A part of the same cells in high magnification. The cells contain a fatty-like substance globular in shape and golden in color; chloroplast is bright green in color.

Fig. 5. A cell enclosed by fungous hyphae. Fibrillar and stratified structure of the envelope is hyphae.

Fig. 6. Cell with an envelope which is partly projected.

PLATE I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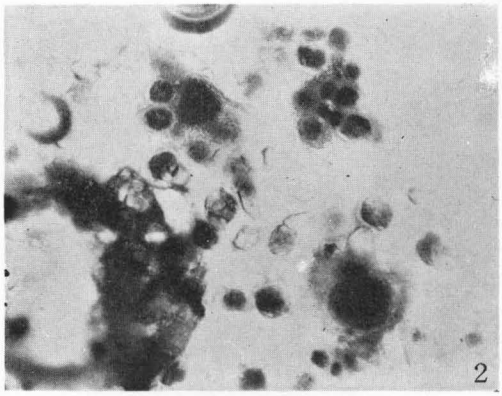
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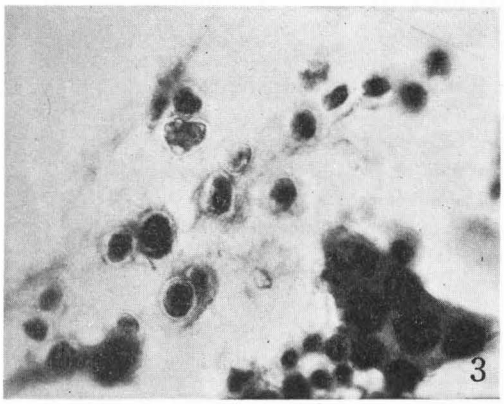
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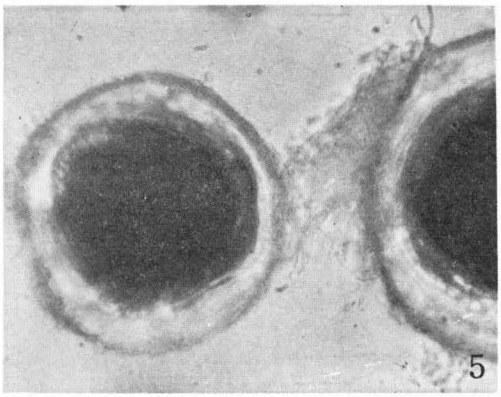
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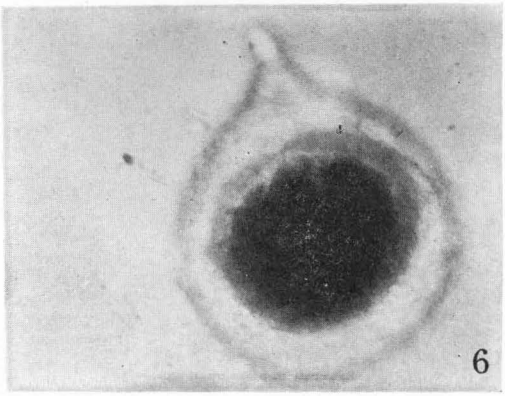
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PLATE II

Fig. 7. Cells with an envelope which is partly projected and stratified.
Fig. 8. A bare cell without an envelope.
Fig. 9. The cell content showing cleavage.
Fig. 10. A cell with fatty substance in one side of the cell; the enclosed and stratified envelope is hyphae. The envelope has a projection.
Fig. 11. A cell showing the state of escaping of content from the envelope.
Fig. 12. A cells with reserve substance especially fatty oil.
Fig. 13. *Entophysalis granulosa.*
Fig. 14. *Nostoc sphaericum.*


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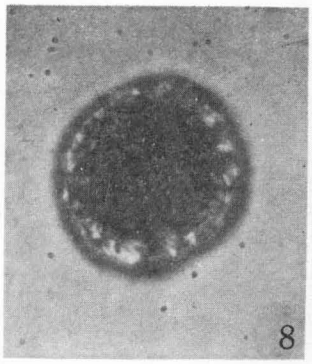
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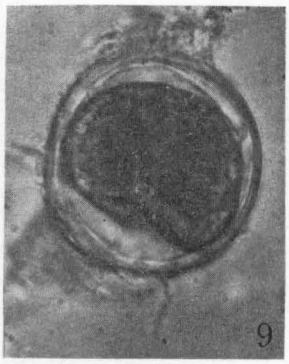
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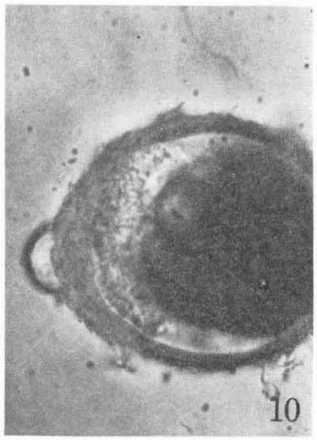
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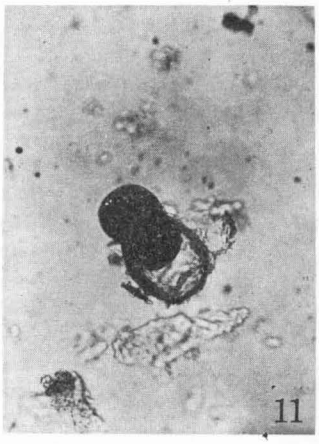
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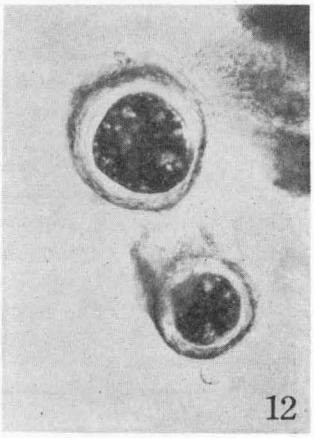
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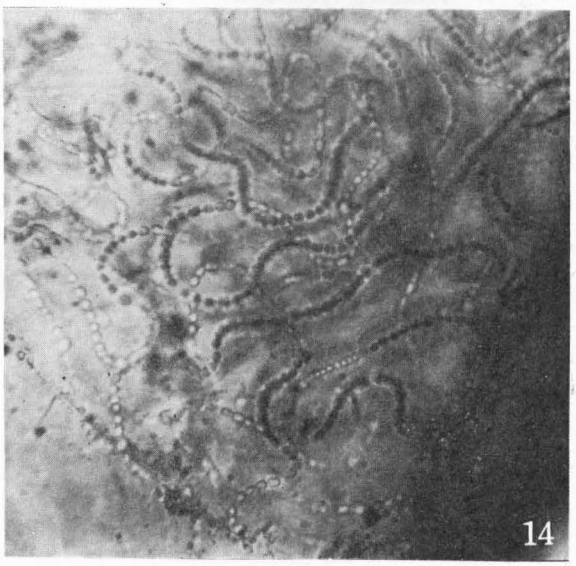
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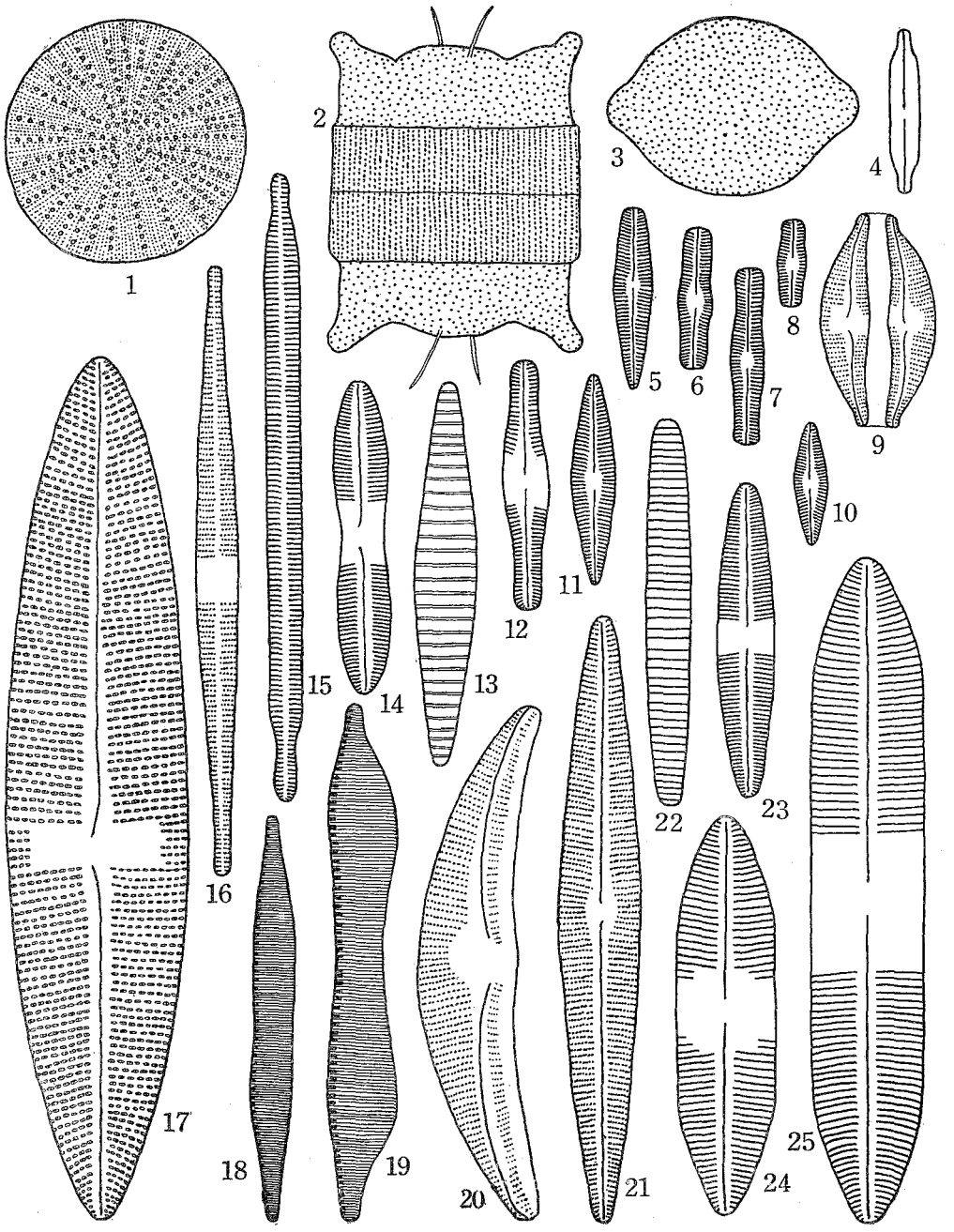
PLATE III

Fig. 1. *Coscinodiscus planus* KARSTEN.
Fig. 2, 3. *Biddulphia aurita* (LYNGB.) BRÉB. & GODEY.
Fig. 4. *Navicula subtilissima* CLEVE.
Fig. 5. *Gomphonema exiguum* KÜTZ.
Fig. 6–8. *Navicula seminulum* GRUN.
Fig. 9. *Amphora ovalis* KÜTZ. var. *libyca* EHRENB.
Fig. 10, 11. *Navicula cancellata* DONK. var. *Gregorii* (RALFS) GRUN.
Fig. 12. *Pinnularia biglobosa* (SCHUM.) A. CL.
Fig. 13. *Denticula antarctica* (CASTR.) CARLSON.
Fig. 14. *Pinnularia quadratarea* (A. S.) CL. var. *fluminensis* (GRUN.) CL.
Fig. 15. *Synedra ulna* (NITZSCH) EHRENB.
Fig. 16. *Synedra ulna* var. *splendens* (KÜTZ.) BRUN.
Fig. 17. *Trachyneis aspera* (EHRENB.) CL.
Fig. 18. *Hantzschia linearis* (O. MÜLL.) A. CL.
Fig. 19. *Nitzschia dubia* W. SM.
Fig. 20. *Amphora ovalis* KÜTZ.
Fig. 21. *Navicula longa* (GREG.) RALFS.
Fig. 22. *Diatoma vulgare* BORY var. *linearis* GRUN.
Fig. 23. *Pinnularia* HEIDEN & KOLBE var. *interrupta* (A. CL.) HIRANO.
Fig. 24, 25. *Pinnularia quadratarea* A. S. var. *bicuneata* HEIDEN & KOLBE.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