

Canada
Department of Mines

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Museum Bulletin No. 45

BIOLOGICAL SERIES, No. 12

November 9, 1926

LIST OF QUATERNARY AND TERTIARY
DIATOMACEÆ FROM DEPOSITS OF
SOUTHERN CANADA

BY

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OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1926

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INTRODUCTION

V. L. Eardley-Wilmot, Mines Branch, Department of Mines, Ottawa, sent me sixty-seven samples of Canadian diatomaceous earths which he had collected in 1923 and 1924. An examination indicates that they may be divided, geologically, into two distinct groups. The eastern samples represent deposits in Nova Scotia, New Brunswick, Quebec, and Ontario and contain post-Glacial species only: these occur in the peat and mud formations of numerous lakes. The western samples are from British Columbia and are from both post-Glacial and Tertiary sediments, the latter occurring in the vicinity of Quesnel.

The eastern deposits vary considerably in the aggregate of species included, but certain species appear to be almost invariably present. Among these widely distributed forms may be mentioned *Eunotia major*, *Cymbella ventricosa*, *Stauroneis phoenicenteron* and *Pinnularia major*. *Eunotia* and *Pinnularia* predominate in the number of specimens and in the variations of the species. Of all the genera *Eunotia* varies more than any other and it may be said to characterize the deposits. The samples most prolific in diatoms are those from Earltown and Folly lakes in Nova Scotia, and Fitzgerald lake in New Brunswick. The most remarkable deposit is that of Jacquot river, Quebec, which resembles no other deposit in North America.

Many of the samples are from peat deposits, and, therefore, the following observations on preparing for study diatoms from such deposits may be useful.

Some of the samples studied required no cleaning whatever. The material from Colbert township, Quebec, was so pure and in such a friable condition that it was necessary only to place a minute quantity, about as much as would be held on the end of the blade of a penknife, in a homœopathic vial and add sufficient water. By diluting with pure water until the liquid showed a pearly appearance when held up to the light the diatoms were ready for mounting. In most cases, however, the material was boiled in a solution of carbonate of soda and if the lumps were broken down the liquid was decanted into a glass beaker with pure water, allowed to settle a few hours, then decanted again, repeating the addition of water until the soda

was eliminated. In some cases this was all that was needed. If in any case the lumps were not disintegrated, they were boiled in nitric acid and then washed. In order to remove the fine silt it was found advisable to boil in water to which a very small quantity of soap had been added and then to allow the solution to settle. The continued washing, shaking of the test tube, and in some cases repetition of the process, were successful in many instances. It is essential that all vessels and apparatus be perfectly clean and that the material be kept free from any possibility of contamination, by dust from the air or other matter. In cleaning the samples from the New Brunswick deposits, however, no process seems to remove entirely a deposit of cement from some of the valves, particularly those of *Surirella*, but as there are many valves that are not so contaminated the determination of species is possible. The samples may be cleaned by first boiling in pure water, then with the soda solution, and finally with acid as it appears necessary. The samples from Earltown, Folly, and Fitzgerald lakes, with some others, were passed through the entire process. In boiling in nitric acid place about one-third of a thimbleful of material in a 4-ounce casserole, add acid until it reaches about an inch in depth, and, when the acid boils, add a small piece of bichromate of potash, about the size of half a pea. Care should be taken, of course, to avoid the fumes by boiling in the open air or in a fume cupboard. It is necessary to wait several hours to allow the deposit to settle and the bichromate and acid must be carefully washed out by repeated decanting and adding of water until all traces are removed.

The first part of this paper is a synopsis of the diatoms noticed, with references to descriptions and figures. It is followed by a table indicating the different species identified in the samples received from each Quaternary deposit. The species recognized from the Tertiary deposits are mentioned in the section dealing with the various localities from which samples were sent. In an examination of this kind it is not possible to determine all the species in any given deposit, since the layers of earth are not uniform. In preparing the lists two mounts of each sample were made and from these the species were determined. There is, however, only a small margin left of undiscovered species, as many of the localities have similar forms and what may be omitted from one list will probably be found in another. There appear to be upwards of one hundred and sixty species or varieties of diatoms in the sixty-seven samples submitted, but this does not include several variations of *Eunotia* and *Pinnularia* and a more extended examination of other samples will probably increase the list. The classification is that which is now generally accepted, but differs considerably from that used in other lists of Canadian diatoms. Some synonyms are given, but for the most part it will be necessary to refer to modern literature on the subject, particularly to Cleve's exhaustive monograph on the Naviculoid forms, in order to understand the generic divisions.

In many respects the eastern deposits resemble those of Scotland, especially that of loch Kinnord as described by the Rev. George Davidson.¹ The peat deposits of Sweden, Finland, and other parts of northern Europe may also be mentioned as holding a strictly post-Glacial diatomaceous flora in which are found few of the species present in any of the earlier geological strata.

¹ Jour. Quek. Club, vol. 3, ser. 2, 19, p. 149.

The number of species found in Nova Scotia is much greater than the number occurring in New Brunswick, the deposits of which include many spicules of freshwater sponges whose presence may account for the difficulty in freeing the valves of an exceedingly tenacious coating which cannot always be removed by treatment with alkalis or acids. Comparisons might be made with the species found in the Maine, New Hampshire, and Massachusetts peat formations which closely resemble those of Canada and which are also, to a great extent, found living in the lakes and ponds of the New England states. The Glacial flora appears no farther south than New Jersey where it still lives to some extent in ponds at Atsion and Hammonton and also at Mays Landing.

The following contains brief notices of the various deposits, and is based on information received from Mr. Eardley-Wilmot.

QUATERNARY DEPOSITS

Nova Scotia

(1) *McQuade Lake, Halifax County*

A deposit of grey diatomite, 1 to 3 feet thick, occupies an area of 50 acres on the bottom of the lake. It is covered with a thin layer of mud.

(2) *Sabody Pond, 2 Miles North of East Chester, Lunenburg County*

Grey diatomite, 1 to 3 feet thick, lies uncovered on bottom of the pond, for the most part near the shore.

(3) *Sarty Farm, North River, 8 Miles North of New Germany, Lunenburg County*

A few inches of grey diatomite overlain by 1 foot of soil.

(4) *South End of Island in Loon Lake (North of Rossignol Lake), Liverpool River, Queens County*

A few inches to 4 feet of grey, yellow, and white diatomite containing much sand overlain by about 1 foot of peaty matter. Deposits occur on the islands and shores of the lake over a length of 2 miles. A second sample from a deposit on the east shore of the lake consists chiefly of sand, but contains *Cyclotella comta*, *Eunotia major*, *Melosira distans*, and *Tabelaria fenestrata*.

(5, 6, 7) *Little River, Digby County*

The deposit consists of 2 to 4 feet of grey diatomite, underlain by 4 to 8 feet of peat-bearing diatoms, beneath which is 6 to 8 feet of "diatomite ooze." It is overlain by 1 foot of soil. The deposit underlies several hundred acres of marsh. Sample No. 5 is of the upper part of the deposit (4 to 8 feet down), No. 6 is of the "diatomite ooze" (10 to 20 feet down), and No. 7 of the peaty part.

8) *One Mile East of Mayflower Post Office, Digby County*

One to 2 feet of impure, grey diatomite overlain by decomposing vegetable matter. Underlies about $\frac{1}{2}$ acre in swampy ground. Much sand in the deposit.

(9) *Near Segogne on Salmon River, Digby County*

Two to 4 feet of grey diatomite along east bank of the river in marshy meadows. Overlain by 6 inches of soil. Considerable organic matter and sand in the deposit.

(10) *Factory Dale, Kings County*

Two to 4 feet of grey diatomite overlain by 1 foot of peaty soil. Underlies about 2 acres of swampy ground bordering South Annapolis river.

(11) *John McGuire Farm, Morden, Kings County*

Two to 3 feet of grey diatomite at bottom of a shallow pond of about $\frac{1}{2}$ acre.

(12, 13, 14) *Bass River Lake (Silica Lake), Colchester County*

Three to 8 feet of grey diatomite lies on the bottom of the lake. In the marsh at the south end of the lake, 6 feet of diatomite underlies 6 feet of peat and vegetable matter. Sample 12 is from the deposit in the marsh, samples 13 and 14 from the deposit in the lake.

(15) *Slack Lake, 2 Miles Southwest of Folly Lake, Colchester County*

Two to 8 feet of diatomite overlies an area of 3 acres on the lake bottom; in part white, in part dark-coloured, muddy.

(16) *Folly Lake, Colchester County*

The diatomite occurs on lake bottom in separate areas close to shore and varying in depth from 2 to 8 feet.

(17) *Folly River, $\frac{1}{2}$ Mile Below Folly Lake, Colchester County*

White diatomite, 1 foot thick, occurs on the banks of the river, beneath vegetable matter.

(18) *Trout Lake, 4 Miles Northeast of Folly Lake, Colchester County*

Diatomite occupies an area of 60 acres on bottom of lake. Deposit variable in thickness and character. In places 3 feet of white diatomite underlain by 6 feet of grey diatomite. At north end of lake, over 20 feet of dark, muddy diatomite.

(19) *Big Totten Lake, 5 Miles Northeast of Folly Lake, Colchester County*

Diatomite occupies an area of 12 acres on lake bottom. In places 2 feet of gritty, grey diatomite.

(20) *Little Gummel Lake, Near Castlereagh, Colchester County*

White diatomite occurs about the edges of the lake bottom and is covered by several feet of peaty mud; thickness, 2 to 3 feet.

(21) *Clear Lake, 3 Miles South of New Annan, Colchester County*

Diatomite occupies about 8 acres on bottom of lake. In places a few inches of white diatomite, in other places the white is underlain by 2 to 8 feet of black diatomite-bearing mud.

(22) *Earltown Lake, Colchester County*

Diatomite occurs locally on lake bottom, in places forming a deposit consisting of 2 feet of white, underlain by 12 feet of dark grey-brown, diatomite. A deposit also occurs in a swamp $\frac{1}{2}$ mile north of the lake where 1 foot of greyish diatomite is overlain by 6 inches of vegetable matter.

(23) *Cluness Marsh, Robertson Lake, 5 Miles South of Barney River Station, Pictou County*

An area of $\frac{1}{2}$ acre of light grey diatomite, 2 feet thick, overlain by 1 foot of soil.

(24) *Brora Lake, Pictou County*

Diatomite occupies part of the lake bottom, and is of varying thickness and colour. In places the deposit consists of several feet of white diatomite, in others of white underlain by yellow, and this by dark brown. Thickness varies from 3 to 13 feet. Area of deposit is 40 acres. Dark diatomite, 6 to 13 feet thick, occurs in a bordering swamp, and somewhat gritty diatomite, 2 to 3 feet thick, underlies a small area in a marsh $\frac{1}{4}$ mile northeast of the lake.

(25) *Near Sydney, Cape Breton County*

Horse island, Roseway river at Middle Ohio, Shelburne county. One to $1\frac{1}{2}$ feet of grey diatomite overlain by 1 foot soil. The material occurs in several small areas in a marshy meadow. The sample received consists almost entirely of sand and of sponge spicules, with occasional diatoms of universal distribution.

Sarty farm, North river, 8 miles north of New Germany, Lunenburg county. A few inches of grey diatomite overlain by 1 foot of soil. One sample received consists of sand, sponge spicules, and a few of the common diatoms. A second sample, No. 3 above, contains many species.

New Brunswick(26) *Near Moncton, Westmorland County*(27) *Stannard Lake, 3 Miles Southwest of Albert Mines, Albert County*

Diatomite occurs over an area of 7 acres on bottom of the lake. In places white diatomite at surface, but in most places 3 to 5 feet of brown diatomite covered by a few inches of mud. Sponge spicules are abundant.

(28) *Floods Lake, South of Waterford, Kings County*

An area of 10 acres of lake bottom occupied by 6 to 8 feet of brown and, in places, white, diatomite.

(29) *Pollet Lake, Kings County*

Diatomite in places overlain by several feet of mud occupies an area of 70 acres on bottom of the lake. In places 2 feet of white diatomite is present, in others 2 to 5 feet of grey and brown diatomite.

(30) *Fitzgerald Lake, 8 Miles East of St. John, St. John County*

The lake has been drained and is now represented by a bog. Dark grey diatomite, 4 to 9 feet thick, occupies an area of 70 acres and is overlain by 1 to 2 feet of peat, moss, etc.

(31) *Long Lake at Foot of Telegraph Hill, 8 Miles Northwest of St. John, Kings County*

The muddy bottom holds diatoms. Locally there is present 2 to 5 feet of brown diatomite and patches 2 feet thick of white diatomite. Numerous sponge spicules are present.

Quebec

(32) *Desert River, Egan Township, Ottawa County*(33) *Colbert Township, 3 Miles West of Allen Mills, Portneuf County*

A small pond with 4 to 6 feet of flocculent diatomite on the bottom.

(34) *Jacquot River, 2 Miles South of Allen Mills, Portneuf County*

A few square yards of white diatomite lying in a small depression 100 yards away from the river. The sample submitted is very pure and consists chiefly of innumerable variations of small species of *Fragilaria*, especially of *Fragilaria undata*.

(35) *Ste. Anne River, 6 Miles North of Gosford, Portneuf County*

About 2 feet of diatomite mixed with gravel and sand. Occurs along the course of a small brook in the valley of the north branch of Ste. Anne river.

(36) *Michel Lake, Chertsey Township, Montcalm County*

The deposit consists of 2 feet of light grey diatomite on the bottom of the lake and beneath soil, in a marsh bordering the outlet of the lake.

(37) *St. Justin Parish, Maskinonge County*

A few patches of diatomite lying near and 30 feet above a brook in flat country. The sample received consists chiefly of *Eunotia major* and *Navicula semen*.

Ontario

(38) *Chaffey Township, Con. X, Lot 20, Muskoka County*

Gritty, white diatomite, 6 inches to 1 foot thick, lies beneath 1 foot of peaty soil in a small swamp.

(39) *Stisted Township, Con. XII, Lot 19, Muskoka County*

Impure (mud and peat) diatomite, 1 to 6 feet thick, occurs along the shore of a small lake.

(40) *Medora Township, Con. IV, Lot 19, Muskoka County*

Grey-brown diatomite, 3 to 5 feet thick, covered by a few inches of mud, occupies 6 acres of the bottom of a small bay in the south shore of Joseph lake.

(41) *Moon River, Con. D II, Medora Township, Muskoka County*

About 1 foot of white diatomite lying in a small bay on the river.

(42) *McKay Lake, Gloucester Township, Carleton County*

A sample of fossil marl which occurs 15 feet above the level of McKay lake at Ottawa was examined for diatoms, but none was found. E. J. Whittaker,¹ has described the "Bottom Deposits" of this lake where he found a "reddish jelly or ooze" occurring at depths of about 30 feet, in the deepest part of the lake. A sample of this bottom mud, collected in midwinter, 1925, and sent to the writer for examination by E. M. Kindle, is rich in the number of species of diatoms. It is evidently of comparatively recent origin and differs from other deposits of Canada chiefly in the rareness of *Pinnularia* and *Eunotia*. A notable occurrence is that of *Mastogloia dansei* Thw., usually existing in brackish water.

British Columbia

(43) *Oldfield's Farm, North End of Prospect Lake, Lake District, Vancouver Island*

White diatomite, 2 feet thick and covered by 6 inches of soil, lies on both sides of a small stream in a wide valley.

(44) *Near Cobble Hill, Vancouver Island*

About 1 foot of white diatomite beneath 1 foot of peat, near stream in a wide valley.

(45) *Hassels Farm, Quamichan Lake, Vancouver Island*

Grey diatomite, 1 to 2 feet thick and covered by 6 inches of soil, occurs on gently rising, somewhat marshy, ground, bordering the lake.

¹Whittaker, E. J.: Trans. Roy. Soc., Can., 1922.

(46) *Williams Farm, 6 Miles South of Chilliwack*

Gritty, grey-white diatomite about 1 foot thick occurs in a small swamp.

(47) *Frazers Farm, Pukaist Creek, Kamloops District*

Grey-white diatomite 6 inches to 3 feet thick, covered by 2 feet or less of peaty matter and lying in a meadow in a wide valley.

(48) *Deadman River (North of Kamloops Lake)*

Small deposits of diatomite with calcareous shells, lying close to the shores of a chain of small lakes.

Loon lake, east of Clinton, Lillooet district. The sample consists of *Melosira granulata*.

TERTIARY DEPOSITS

(49 to 54) *Quesnel and Vicinity, British Columbia*

The following statements are based on an account given by L. Reinecke.¹ Tertiary sediments consisting of gravels, sands and clays, and beds of lignite and of diatomaceous earths occur along Fraser river from a point 8 or 9 miles above Quesnel to beyond Australia creek, 17 miles below Quesnel. The beds in places are unconformably overlain by nearly flat-lying Tertiary basalt. The diatomite is grey-white to cream coloured and occurs interbedded with the Tertiary clays and sands. Some beds are only a few feet thick. At one locality, 2 miles southwest of Quesnel "about 48 feet of infusorial earth is exposed in thick beds between which are three layers of silty or sandy beds having a total thickness of 14 inches"

These deposits consist almost entirely of variations of *Melosira granulata* and resemble those of Virginia City, Nevada, Surprise valley, Cal., and certain deposits of Oregon. *Melosira decussata* (Ehrenb.) Kütz. in H. L. Smith T. S. No. 221 and *Melosira spiralis* (Ehrenb.) Kütz. in H. L. Smith T. S. No. 231 appear to be merely variations of *M. granulata*, differing in the length and breadth of the valves.

The deposits are absolutely pure; the only form not *Melosira* is an occasional *Tetracyclus ellipticus*.

The six samples from the vicinity of Quesnel are apparently alike. They are very pure and contain an unusual variation of *Melosira granulata*. The diameter of the frustules, in proportion to their length, varies exceedingly, the smallest forms appearing as *Melosira granulata spiralis* (Ehrenb.) Grun. One sample (No. 51, lot 1132) is from a bed of pure *Melosira granulata* unconformably overlying another bed containing the same species. The overlying bed possibly is of recent age, but the material composing it may have come from the Tertiary beds.

¹ Geol. Surv., Canada, Mem. 118, pp. 13-17 (1920).

(55) *Blackwater River, Cariboo and Coast Districts, British Columbia*

The geological relations of the deposit on Blackwater river are unknown. Tertiary sediments occur on the river,¹ possibly the diatomite deposit represented by sample No. 55 is of Tertiary age or has been derived from Tertiary beds. The following species were recognizable: *Cymbella ventricosa*, *Diploneis finnica*, *Gomphonema angustatum*, *G. puiggarianum aequatoriale*, *Hantzschia amphioxys*, *Melosira granulata*, *Navicula pseudo-bacillum*, *N. semen*, *Pinnularia major*, *P. termes*, *P. viridis*, *Stauroneis phoenicenteron*, *Tetracyclus ellipticus clypeus*.

SYSTEMATIC LIST OF SPECIES²

Centricae

MELOSIRA (Ag.) Kütz.

Melosira arenaria Moore, Ralfs in Ann. and Mag. Nat. Hist., vol. 12, p. 349, Pl. 9, fig. 4. Van Heurck, Syn. Diat. Belg., Pl. 90, figs. 1-3. Schmidt, A., Atlas, Pl. 179, figs. 15-19.

This form, rare in North America, occurs in the Earltown Lake deposit, N.S.

Melosira crenulata (Ehrenb.) Kütz., Bac., p. 55. Van Heurck, Syn. Diat. Belg., Pl. 88, figs. 3-5. Boyer, Diat. Philadelphia, Pl. 1, figs. 1, 2. Generally distributed in the eastern deposits.

Melosira distans (Ehrenb.) Kütz., Bac., p. 54. Van Heurck, Syn. Diat. Belg., Pl. 86, figs. 19, 20. Boyer, Diat. Philadelphia, Pl. 1, figs. 8, 9. Generally distributed in the eastern deposits.

Melosira distans laevissima Grun., in Van Heurck, Syn. Diat. Belg., Pl. 86, fig. 24. With finer markings than in the type species.

Occurs in the Little River and Bass River Lake deposits, N.S.

Melosira granulata (Ehrenb.) Ralfs in Prit. Inf., p. 820. Van Heurck, Syn. Diat. Belg., Pl. 86, figs. 9-11. Boyer, Diat. Philadelphia, Pl. 1, fig. 10. A. Schmidt, Atlas, Pl. 181, figs. 58, 59, 60, 62.

Occurs in the Clear Lake deposit, N.S.; also in the deposits in the vicinity of Quesnel, B.C., in which the variations are numerous. The variety known as *spiralis* (Ehrenb.) Grun., Van Heurck, Syn. Diat. Belg., Pl. 87, figs. 19-22, also is found, with many intermediate forms, in the Loon Lake deposit, B.C.

Melosira undulata (Ehrenb.) Kütz., Bac., p. 54. A Schmidt, Atlas, Pl. 176, figs. 4-6; Pl. 182, fig. 51 (as *M. Gowenii* A. Schmidt). Boyer, Diat. Philadelphia, Pl. 1, figs. 15-17.

Occurs rarely in the Little River deposit, N.S.

¹Dawson, G. M.: Geol. Surv., Canada, Rept. of Prog. 1875-76, pp. 255-256.

²NOTE. Certain species in the list of McKay Lake diatoms (See table), which was prepared after the completion of the systematic list, are not included.

The present list should, with Prof. Bailey's check-list, furnish a nearly complete list of the recorded Canadian diatoms. See Bailey, L. W.: "An Annotated Catalogue of the Diatoms of Canada Showing Their Geographic Distribution"; Contr. to Can. Biol., N.S., vol. II, pp. 31-68 (1924).

CYCLOTELLA Kütz.

Cyclotella antiqua W. Smith, Syn. Brit. Diat., vol. 1, p. 28, Pl. 5, fig. 49. A. Schmidt, Atlas, Pl. 224, figs. 45-48. Boyer, Diat. Philadelphia, Pl. 2, fig. 11. Occurs in the Little River deposit, N.S.

Cyclotella comta (Ehrenb.) Kütz., Sp. Alg., p. 21. Van Heurck, Syn. Diat. Belg., Pl. 92, fig. 16. Boyer, Diat. Philadelphia, Pl. 2, fig. 7.

✱ Occurs in the deposits of McQuade lake, Loon lake, Salmon river, Silica lake, Folly lake, Robertson lake, Brora lake, Pollet lake, Clear lake, N.S.; Floods lake, N.B.

Cyclotella meneghiniana Kütz., Bac., p. 50. A Schmidt, Atlas, Pl. 222, figs. 25, 31, 32. Boyer, Diat. Philadelphia, Pl. 2, fig. 8. Little River, N.S.; Desert river and Michel lake, Que.

STEPHANODISCUS Ehrenb.

Stephanodiscus astraea spinulosus Grun., in Van Heurck, Syn. Diat. Belg., Pl. 95, fig. 6. A. Schmidt, Atlas, Pl. 226, fig. 7. Prospect lake, Quamichan lake, B.C.

Pennatae

TABELLARIA Ehrenb.

Tabellaria binalis (Ehrenb.) Grun., Van Heurck, Syn. Diat. Belg., Pl. 44, fig. 23. Colbert township, Que.

Tabellaria fenestrata (Lyngb.) Kütz., Bac., p. 127. W. Smith, Syn. Brit. Diat., vol. 2, p. 46, Pl. 43, fig. 317. Boyer, Diat. Philadelphia, Pl. 8, figs. 11, 12. More or less common in the eastern deposits.

Tabellaria flocculosa (Roth) Kütz., Bac., p. 127. W. Smith, Syn. Brit. Diat., vol. 2, p. 45, Pl. 43, fig. 316. Boyer, Diat. Philadelphia, Pls. 8, 9, 10. More or less common in the eastern deposits.

TETRACYCLUS Ralfs

Tetracyclus ellipticus (Ehrenb.) Grun. Husted, in A. Schmidt, Atlas, Pl. 281, fig. 13. Quesnel, B.C.

Tetracyclus ellipticus clypeus (Ehrenb.) Husted, in A. Schmidt, Atlas, Pl. 281, fig. 23. *Stylobibulum clypeus* Ehrenb. Mikrogeologie, Pl. 33, 2, fig. 18. Ralfs, in Brit. Inf., Pl. 4, fig. 45. Blackwater river and vicinity of Quesnel, B.C.

MERIDION Ag.

Meridion circulare (Grev.) Ag., Consp. Crit. Diat., p. 40. W. Smith, Syn. Brit. Diat., vol. 2, p. 6, Pl. 32, fig. 277. Boyer, Diat. Philadelphia, Pl. 10, figs. 1 to 3. Not common.

Occurs in the deposits of North river, Loon lake, Mayflower P.O., Folly river, Earltown lake, N.S.

FRAGILARIA (Lyngb.) Rab.

Fragilaria construens (Ehrenb.) Grun., Zool.-Bot. Ges. Wien, vol. 12, p. 371, Pl. 7 (4), fig. 10. Van Heurck, Syn. Diat. Belg., Pl. 45, fig. 11. Boyer, Diat. Philadelphia, Pl. 10, fig. 30. Quite variable.

Abundant in the Cobble Hill deposit, B.C.; Jacquot river, Que.

Fragilaria construens venter Grun., in Van Heurck, Syn. Diat. Belg., Pl. 45, fig. 26. With the type.

McKay lake, Ont.

Fragilaria elliptica Schum., Preuss. Diat., p. 52, Pl. 1, fig. 5. Van Heurck, Syn. Diat. Belg., Pl. 45, fig. 17. Abundant in Jacquot River deposit, Que.

Fragilaria mutabilis (W. Smith) Grun., Zool.-Bot. Ges. Wien, vol. 12, p. 369. Van Heurck, Syn. Diat. Belg., Pl. 45, fig. 12.

Abundant in Jacquot River deposit, Que.

Fragilaria mutabilis intercedens Grun., in Van Heurck, Syn. Diat. Belg., Pl. 45, fig. 13.

Folly river, N.S.; Cobble Hill, B.C.

Fragilaria undata W. Smith, Syn. Brit. Diat., vol. 2, p. 24, Pl. 60, fig. 377. Van Heurck, Syn. Diat. Belg., Pl. 44, fig. 9. A. Schmidt, Atlas, Pl. 296, figs. 48 to 61. Boyer, Diat. Philadelphia, Pl. 10, figs. 24 to 29. Quite variable in outline.

Occurs in the deposits of Little River, Mayflower P.O., Bass River lake, near Sydney, N.S.; Ste. Anne river, and (abundant) at Jacquot river, Que.

Fragilaria virescens Ralfs, Ann. and Mag. Nat. Hist., vol. 12, p. 110, Pl. 2, fig. 6. Van Heurck, Syn. Diat. Belg., Pl. 44, fig. 1. Boyer, Diat. Philadelphia, Pl. 10, figs. 20, 21.

Bass River lake, Folly lake, N.S.

Fragilaria virescens exigua Grun., in Van Heurck, Syn. Diat. Belg., Pl. 44, fig. 3.

Abundant in Jacquot River deposit, Que.

Fragilaria virescens oblongella Grun., in Van Heurck, Syn. Diat. Belg., Pl. 44, fig. 6.

Occasional in the eastern deposits.

SYNEDRA Ehrenb.

Synedra capitata Ehrenb., Inf., p. 211. Van Heurck, Syn. Diat. Belg., Pl. 38, fig. 1. Boyer, Diat. Philadelphia, Pl. 11, fig. 8.

Little River, N.S.; Cobble Hill, Deadman river, B.C.; McKay lake, Ont.

Synedra danica Kütz., Bac., p. 66. Van Heurck, Syn. Diat. Belg., Pl. 38, fig. 14. Boyer, Diat. Philadelphia, Pl. 11, fig. 2.

North river, Little River, Brora lake, Slack lake, Folly river, Pollet lake, N.S.; Fitzgerald lake, N.B.; McKay lake, Ont.; Prospect lake, Pukaist creek, B.C.

Synedra delicatissima W. Smith, Syn. Brit. Diat., vol. 1, p. 72, Pl. 12, fig. 94. McKay lake, Ont.

EUNOTIA (Ehrenb.) Grun.

Eunotia arcus Ehrenb., Mikrogeologie, Pl. 16, 1, fig. 24. Van Heurck, Syn. Diat. Belg., Pl. 34, fig. 3. A. Schmidt, Pl. 274, figs. 32-47.

Generally distributed, especially in McQuade Lake deposit.

Eunotia biceps Ehrenb., in Kütz., Bac., p. 37, Pl. 29, fig. 65. Boyer, Diat. Philadelphia, Pl. 13, fig. 27.

Generally distributed.

Eunotia bidentula W. Smith, Syn. Brit. Diat., vol. 2, p. 83. Van Heurck, Syn. Diat. Belg., Pl. 34, fig. 28 (var.) Boyer, Diat. Philadelphia, Pl. 13, fig. 20. (*Eunotia camelus* Lewis (not Ehrenb.) Proc. Acad. Philadelphia, vol. 17, p. 14, Pl. 2, fig. 12b). The type form has more rounded ends.

Generally distributed in the eastern deposits.

Eunotia ehrenbergii Ralfs, in Prit. Inf., p. 764. Kütz., Bac., p. 38, Pl. 5, fig. 27. (*E. quinaria* Kütz., Bac., p. 38, Pl. 5, 27, fig. 1.) H. L. Smith, Type Slide No. 655.

Prospect lake, B.C. Rare.

Eunotia gibbosa Grun., in Van Heurck, Syn. Diat. Belg., Pl. 35, fig. 13. Rare in McQuade Lake deposit, N.S.

Eunotia gracilis (Ehrenb.) Rab., Fl. Eur. Alg., p. 72. Van Heurck, Syn. Diat. Belg., Pl. 34, figs. 1, 2. Boyer, Diat. Philadelphia, Pl. 13, fig. 3.

Generally distributed in the eastern deposits.

Eunotia hemicyclus (Ehrenb.) Ralfs, in Prit., Inf., p. 763. Van Heurck, Syn. Diat. Belg., Pl. 35, fig. 23 (as *Pseudoeunotia hemicyclus* (Ehrenb.) Grun.). Boyer, Diat. Philadelphia, Pl. 12, fig. 23.

McQuade lake, Folly lake, Trout lake, Little Gummel lake, N.S.; Stannard lake, N.B.; Colbert township, Que.; Stisted township, Ont.

Eunotia impressa Ehrenb., Mikrogeologie, Pl. 14, fig. 66. (*Eunotia impressa angusta* Grun., in Van Heurck, Syn. Diat. Belg., Pl. 35, fig. 1.

Generally distributed in the eastern deposits.

Eunotia lunaris (Ehrenb.) Grun., in Van Heurck, Syn. Diat. Belg., Pl. 35, figs. 3, 4. Boyer, Diat. Philadelphia, Pl. 12, figs. 24, 25.

Desert river, Que.; Moon river, Ont.

Eunotia major (W. Smith) Rab., Fl. Eur. Alg., p. 72 (*Himantidium majus*. W. Smith, Syn. Brit. Diat., vol. 2, p. 14, Pl. 33, fig. 286) Van Heurck, Syn. Diat. Belg., Pl. 34, fig. 14. Boyer, Diat. Philadelphia, Pl. 13, figs. 1, 2.

Abundant in the eastern deposits. A form of *E. Major* having the ventral side tumid in the middle occurs in the Floods Lake deposit, N.B. Fig. 1, Pl. 38, in Wolle, Diat. N.A., represents this variation, but the references are incorrect.

Eunotia monodon Ehrenb., Van Heurck, Syn. Diat. Belg., Pl. 33, figs. 3, 4. St. Justin, Que.; Chaffey township, Ont.

Eunotia parallela Ehrenb., Mikrogeologie, Pl. 2, fig. 24. Van Heurck, Syn. Diat. Belg., Pl. 34, fig. 16.

Rare in Folly Lake deposit, N.S.

Eunotia pectinalis (Kütz.) Rab., in Van Heurck, Syn. Diat. Belg., Pl. 33, fig. 16. Boyer, Diat. Philadelphia, Pl. 13, figs. 6, 7. (*Himantidium pectinale* Kütz., in W. Smith, Syn. Brit. Diat., vol. 2, Pl. 32, fig. 280.)

Common in the eastern deposits.

Eunotia pectinalis minor (Kütz.) Rab., in Van Heurck, Syn. Diat. Belg., Pl. 33, figs. 20, 21. With the type.

Eunotia pectinalis undulata Ralfs. Van Heurck, Syn. Diat. Belg., Pl. 33, fig. 17. Boyer, Diat. Philadelphia, Pl. 13, figs. 8, 10. With the type.

Eunotia pectinalis ventricosa Grun., in Van Heurck, Syn. Diat. Belg., Pl. 33, fig. 19B. Boyer, Diat. Philadelphia, Pl. 13, fig. 12. With the type.

Eunotia polyglyphis Grun., in Van Heurck, Syn. Diat. Belg., Pl. 34, fig. 33. With four to six elevations.

Factory Dale, Trout lake, N.S.; Ste. Anne river, Michel lake, Colbert township, Que.; Stisted township, Ont.

Eunotia praerupta Ehrenb., Mikrogeologie, Pl. 13, 1, fig. 15. Kütz., Bac., p. 36. Van Heurck, Syn. Diat. Belg., Pl. 34, figs. 17 to 19. A. Schmidt, Atlas, Pl. 274, fig. 32 et seq. Boyer, Diat. Philadelphia, Pl. 13, fig. 5.

Generally distributed in the eastern deposits.

Eunotia praerupta bidens Grun., in Van Heurck, Syn. Diat. Belg., Pl. 34, fig. 20. Boyer, Diat. Philadelphia, Pl. 13, fig. 19. With the type.

Eunotia robusta Ralfs, in Prit. Inf., p. 763. The following varieties occur:

Eunotia robusta diadema (Ehrenb.) Ralfs. With six crenæ. Van Heurck, Syn. Diat. Belg., Pl. 33, fig. 12. Boyer, Diat. Philadelphia, Pl. 13, fig. 21.

Generally distributed in Nova Scotia and New Brunswick.

Eunotia robusta decaodon (Ehrenb.) Ralfs. With ten crenæ. Boyer, Diat. Philadelphia, Pl. 13, fig. 15.

Desert river, Que.

Eunotia robusta hendecaodon (Ehrenb.) Ralfs. With eleven crenæ. Van Heurck, Syn. Diat. Belg., Pl. 33, fig. 13.

Stannard lake, N.B.

Eunotia robusta icosodon (Ehrenb.) *Eunotia icosodon* Ehrenb., Mikrogeologie, Pl. 33, 10, fig. 3. With twenty crenæ.

Stannard lake, N.B.

Eunotia robusta scalaris (Ehrenb.) Ralfs. With fifteen crenæ. Boyer, Diat. Philadelphia, Pl. 13, fig. 13.

Stannard lake, N.B.

Eunotia tetraodon (Ehrenb.) Ralfs. With four crenæ. Boyer, Diat. Philadelphia, Pl. 13, fig. 25. Van Heurck, Syn. Diat. Belg., Pl. 33, fig. 11.

Stannard lake, N.B.

Eunotia veneris (Kütz.) De-Toni, Syll. Alg., vol. 2, p. 794. *Himantidium veneris* Kütz., Bac., p. 40. *Eunotia incisa* Greg., Van Heurck, Syn. Diat. Belg., Pl. 34, fig. 35 A. Boyer, Diat. Philadelphia, Pl. 13, figs. 30, 31.

Generally distributed in the eastern deposits.

Eunotia veneris obtusiuscula (Grun.) *Eunotia incisa obtusiuscula* Grun., in Van Heurck, Syn. Diat. Belg., Pl. 34, 35 B.

Folly lake, Big Totten lake, N.S.; Fitzgerald lake, N.B.

ACTINELLA Lewis

Actinella punctata Lewis, Proc. Acad. Phila., vol. 15, p. 343, Pl. 1, fig. 5. Van Heurck, Syn. Diat. Belg., Pl. 35, fig. 18. Boyer, Diat. Philadelphia, Pl. 12, figs. 16 to 18.

Trout lake, N.S.

COCONEIS Ehrenb. em. Grun.

Cocconeis flexella (Kütz.) Cleve, Sv. Vet.-Akad. Handl. II., vol. 27, p. 179. (*Achnanthidium flexellum* Bréb.), in Van Heurck, Syn. Diat. Belg., Pl. 26, figs. 29, 30.

Little River, Slack lake, N.S.; Fitzgerald lake, N.B.; Desert river, Que.; Moon river, McKay lake, Ont.

Cocconeis placentula Ehrenb., Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 169. Van Heurck, Syn. Diat. Belg., Pl. 30, figs. 26, 27. Boyer, Diat. Philadelphia, Pl. 16, figs. 19, 20.

North river, Little River, N.S.

Cocconeis placentula lineata (Ehrenb.) Grun., in Van Heurck, Syn. Diat. Belg., Pl. 30, fig. 31. Boyer, Diat. Philadelphia, Pl. 16, fig. 29.

Earltown lake, N.S.

CYMBELLA Ag.

Cymbella amphicephala Naegeli, in Kütz., Sp. Alg., p. 890. A. Schmidt, Atlas, Pl. 9, fig. 62. Van Heurck, Syn. Diat. Belg., Pl. 2, fig. 6. Boyer, Diat. Philadelphia, Pl. 18, fig. 16.

Little River, N.S.

Cymbella aspera (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 175. (*Cymbella gastroides* Kütz.) A. Schmidt, Atlas, Pl. 9, figs. 1, 2. Van Heurck, Syn. Diat. Belg., Pl. 2, fig. 8. Boyer, Diat. Philadelphia, Pl. 18, fig. 1.

Generally distributed, but not common in the eastern deposits.

Cymbella cesatii (Rab.) Grun., in A. Schmidt, Atlas, Pl. 71, figs. 48, 49. Van Heurck, Syn. Diat. Belg., Pl. 8, fig. 35.

Slack lake, N.S.; Desert river, Que.

Cymbella cuspidata Kütz., Bac., p. 79. A. Schmidt, Atlas, Pl. 9, fig. 50. Van Heurck, Syn. Diat. Belg., Pl. 2, fig. 3. Boyer, Diat. Philadelphia, Pl. 18, fig. 17.

Generally distributed in the eastern deposits.

Cymbella ehrenbergii Kütz., Bac., p. 79. A. Schmidt, Atlas, Pl. 9, figs. 6 to 8. Van Heurck, Syn. Diat. Belg., Pl. 2, fig. 1. Boyer, Diat. Philadelphia, Pl. 18, fig. 9.

Generally distributed in the eastern deposits.

Cymbella gracilis (Rab.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 169. (*Cymbella scotica* W. Smith.) A. Schmidt, Atlas, Pl. 10, figs. 36, 37, 40. Van Heurck, Syn. Diat. Belg., Pl. 3, figs. 20, 21. Boyer, Diat. Philadelphia, Pl. 18, fig. 20.

Generally distributed in the eastern deposits.

Cymbella heteropleura (Ehrenb.) Kütz., Bac., p. 79. A. Schmidt, Atlas, Pl. 9, figs. 4, 5. Boyer, Diat. Philadelphia, Pl. 18, fig. 10.

Trout lake, Earltown lake, Brora lake, N.S.; Prospect lake, B.C.

Cymbella lanceolata (Ehrenb.) Van Heurck, Syn. Diat. Belg., Pl. 2, fig. 7. A. Schmidt, Atlas, Pl. 10, figs. 8, 9. Boyer, Diat. Philadelphia, Pl. 18, fig. 4.

Generally distributed.

Cymbella microcephala Grun. in Van Heurck, Syn. Diat. Belg., Pl. 8, fig. 36.

McKay lake, Ont.

Cymbella parva (W. Smith) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 172. *Cocconema parvum* W. Smith, Syn. Brit. Diat. 1, Pl. 23, fig. 222. A. Schmidt, Atlas, Pl. 10, figs. 14, 15. Boyer, Diat. Philadelphia, Pl. 38, fig. 14.

Bass River lake, N.S.

Cymbella stodderi Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 163. Yermoloff, in Jour. Quekett Micr. Club, ser. 2, vol. 13, vol. 422, Pl. 26, figs. 4, 5.

Little River, Slack lake, Folly river, Little Gummel lake, Clear lake, Brora lake, near Sydney, N.S.; Fitzgerald lake, N.B.; Desert river, Que. This form and its variations allied to *Navicula monmouthiana* Grun. are exhaustively treated in Yermoloff's article.

Cymbella ventricosa Kütz., Bac., p. 80. (*Encyonema caespitosum* Kütz. A. Schmidt, Atlas, Pl. 10, figs. 56, 57) (*Encyonema lunula* A. Schmidt, Atlas, Pl. 10, figs. 42, 43). Van Heurck, Syn. Diat. Belg., Pl. 3, fig. 15. Boyer, Diat. Philadelphia, Pl. 18, figs. 14, 22. Variable in outline. Occurs in nearly all of the deposits.

AMPHORA Ehrenb.

Amphora ovalis (Bréb.) Kütz., Bac., p. 107. Van Heurck, Syn. Diat. Belg., Pl. 1, fig. 1. Boyer, Diat. Philadelphia, Pl. 15, fig. 7.

Occasional in the Nova Scotia, New Brunswick, and Vancouver Island deposits, B.C.

AMPHIPRORA Ehrenb.

Amphiprora ornata Bail. Smith. Contr., vol. 2, p. 38, Pl. 2, figs. 15, 23. Van Heurck, Syn. Diat. Belg., Pl. 22 bis, fig. 5. Boyer, Diat. Philadelphia, Pl. 14, figs. 6, 7.

McKay lake, Ont.

GOMPHONEMA Ag.

Gomphonema acuminatum coronatum (Ehrenb.) Van Heurck, Syn. Diat. Belg., Pl. 23, fig. 15. A. Schmidt, Atlas, Pl. 239, fig. 26. Boyer, Diat. Philadelphia, Pl. 19, fig. 7.

Generally distributed.

Gomphonema acuminatum elongatum (W. Smith) Van Heurck, Syn. Diat. Belg., Pl. 23, fig. 22. A. Schmidt, Atlas, Pl. 239, fig. 26.

Earlton lake, N.S.

Gomphonema angustatum (Kütz.) Grun., in Van Heurck, Syn. Diat. Belg., Pl. 24, figs. 49, 50. A. Schmidt, Atlas, Pl. 234, figs. 24, 25. Boyer, Diat. Philadelphia, Pl. 19, fig. 18.

Earlton lake, N.S.; Blackwater river, B.C.

Gomphonema augur Ehrenb. Van Heurck, Syn. Diat. Belg., Pl. 28, figs. 28, 29. Boyer, Diat. Philadelphia, Pl. 19, fig. 21.

McKay lake, Ont.

Gomphonema constrictum capitatum (Ehrenb.) Van Heurck, Syn. Diat. Belg., Pl. 23, fig. 7. Boyer, Diat. Philadelphia, Pl. 19, fig. 22.

Generally distributed.

Gomphonema gracile Ehrenb., in Van Heurck, Syn. Diat. Belg., Pl. 24, fig. 12. A. Schmidt, Atlas, Pl. 230, fig. 32.

Generally distributed.

Gomphonema intricatum Kütz., Bac., p. 87. Van Heurck, Syn. Diat. Belg., Pl. 24, fig. 30. A. Schmidt, Atlas, Pl. 236, fig. 5. Boyer, Diat. Philadelphia, Pl. 19, fig. 14.

McKay lake, Ont.; Pukaist creek, B.C.

Gomphonema lanceolatum Ehrenb. (*Gomphonema affine* Kütz.) Van Heurck, Syn. Diat. Belg., Pl. 24, fig. 8.

Little river, N.S.; Pollet lake, N.B.; McKay lake, Ont.; Cobble Hill, Chilliwack (south of), B.C.

Gomphonema martini Fricke, in A. Schmidt, Atlas, Pl. 238, figs. 23-25. Bass River lake, Folly lake, N.S.

Gomphonema puiggarianum aequatoriale Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 189. A. Schmidt, Atlas, Pl. 233, fig. 32. Chilliwack (south of), Blackwater river, B.C.

Gomphonema sarcophagus Greg., Quart. Jour. Micr. Sc., vol. 4, p. 13, Pl. 1, fig. 42. Van Heurck, Syn. Diat. Belg., Pl. 25, fig. 2. Boyer, Diat. Philadelphia, Pl. 19, fig. 16.

Earlton lake, N.S.

Gomphonema sphaerophorum Ehrenb. Van Heurck, Syn. Diat. Belg., Pl. 23, fig. 30. Boyer, Diat. Philadelphia, Pl. 19, fig. 9.

McKay lake, Ont.

Gomphonema subclavatum Grun., Van Heurck, Syn. Diat. Belg., Pl. 24, fig. 1.

Desert river, Que. This form is quite variable.

Gomphonema subtile Ehrenb. Greg., Quart. Jour. Micr. Sc., vol. 4, Pl. 1, fig. 12. Van Heurck, Syn. Diat. Belg., Pl. 23, figs. 13, 14. A. Schmidt, Atlas, Pl. 236, fig. 10.

Nova Scotia deposits.

Gomphonema subtile sagitta (Schum.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 182. Van Heurck, Syn. Diat. Belg., Pl. 23, fig. 27. A. Schmidt, Atlas, Pl. 236, figs. 12-14.

Earlton lake, Slack lake, Folly lake, N.S.

GYROSIGMA Hassall

Gyrosigma attenuatum (Kütz.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 115. (*Pleurosigma attenuatum* W. Smith, Syn. Brit. Diat., vol. 1, Pl. 22, fig. 216) Van Heurck, Syn. Diat. Belg., Pl. 21, fig. 11.

Brora lake, N.S.; Moncton, Pollet lake, N.B.; McKay lake, Ont.

Gyrosigma kutzingii (Grun.) Cleve. *Pleurosigma kutzingii* Grun. in Van Heurck, Syn. Diat. Belg., Pl. 21, fig. 14. Boyer, Diat. Philadelphia, Pl. 38, fig. 12.

McKay lake, Ont.

FRUSTULIA Ag.

Frustulia rhomboides (Ehrenb.) De-Toni, Syll. Alg., vol. 2, p. 277.
Navicula rhomboides Ehrenb., in W. Smith, Syn. Brit. Diat., vol. 1, p. 46,
 Pl. 16, fig. 129. *Vanheurckia rhomboides* Bréb., in Van Heurck, Syn. Diat.
 Belg., Pl. 17, fig. 1. Boyer, Diat. Philadelphia, Pl. 17, fig. 2.

Generally distributed.

ANOMOEONEIS Pfitzer

Anomoeoneis follis (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol.
 27, p. 7. *Navicula trochus* Kütz., Bac., p. 99, Pl. 3, fig. 59?. Boyer,
 Diat. Philadelphia, Pl. 17, fig. 14.

McQuade lake, Bass River lake, Slack lake, Folly river, Little Gummel
 lake, N.S.; Desert river, Que.

Anomoeoneis seriens (Bréb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27,
 p. 7. *Navicula seriens* Bréb., in Kütz., Bac., p. 92. Van Heurck, Syn.
 Diat. Belg., Pl. 12, fig. 7. Boyer, Diat. Philadelphia, Pl. 17, fig. 12.

Generally distributed in Nova Scotia and New Brunswick.

Anomoeoneis seriens forma minor (Grun.) *Navicula seriens minor*
 Grun., Van Heurck, Syn. Diat. Belg., Pl. 12, fig. 8. Boyer, Diat. Phila-
 delphia, Pl. 17, fig. 13. Occasional with the type.

CALONEIS Cleve

Caloneis obtusa (W. Smith) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26,
 p. 54. *Navicula obtusa* W. Smith, Syn. Brit. Diat., vol. 1, p. 50, Pl. 16,
 fig. 140. *Navicula hebes* Ralfs in Donkin, Brit. Diat., p. 23, Pl. 3, fig. 12
 (the only correct figure).

Folly river, N.S. Rare.

Caloneis silicula (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26,
 p. 51. *Navicula limosa* Kütz., in Van Heurck, Pl. 12, fig. 18. Boyer,
 Diat. Philadelphia, Pl. 21, fig. 3.

Generally distributed.

Caloneis silicula ventricosa (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II,
 vol. 26, p. 52. *Navicula ventricosa* (Ehrenb.?) Donkin in Van Heurck,
 Syn. Diat. Belg., Pl. 12, fig. 24.

Earltown lake, N.S.

NEIDIUM Pfitzer

Neidium affine (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 68.
Navicula amphirhynchus W. Smith. A. Schmidt, Atlas, Pl. 49, figs. 27-29.
 Generally distributed.

Neidium amphigomphus (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II,
 vol. 26, p. 69. *Navicula dilatata* Ehrenb. A. Schmidt, Atlas, Pl. 49, fig. 9.
 Generally distributed.

Neidium bisulcatum (Lagerst.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 68. *Navicula bisulcata* Lagerstedt, Bihang, Sv. Vet.-Akad. Handl., vol. 1, p. 31, Pl. 1, fig. 8. A. Schmidt, Atlas, Pl. 49, fig. 17.

Mayflower P.O., Slack lake, N.S. Rare.

Neidium hitchcockii (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 69. *Navicula Hitchcockii* Ehrenb. A. Schmidt, Atlas, Pl. 49, fig. 35. Boyer, Diat. Philadelphia, Pl. 21, fig. 15.

Salmon river, Earltown lake, Brora lake, N.S.

Neidium iridis (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 69. *Navicula firma* Kütz. A. Schmidt, Atlas, Pl. 49, figs. 2, 3. Boyer, Diat. Philadelphia, Pl. 21, fig. 17.

Generally distributed.

Neidium tumescens (Grun.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 70. *Navicula firma tumescens* Grun. A. Schmidt, Atlas, Pl. 49, fig. 10.

Bass River lake, N.S.

DIPLONEIS Ehrenb. em. Cleve

Diploneis elliptica (Kütz.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 92. *Navicula elliptica* Kütz. A. Schmidt, Atlas, Pl. 7, fig. 20. Boyer, Diat. Philadelphia, Pl. 20, fig. 14.

Quamichan lake, Chilliwack, B.C.

Diploneis finnica (Ehrenb.) Cleve, Acta Soc. Fauna et Flora Fennica, vol. 8, p. 43, Pl. 2, fig. 11.

Generally distributed.

Diploneis ovalis (Hilse) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 92. *Navicula ovalis* Hilse. A. Schmidt, Atlas, Pl. 7, fig. 33.

Little River, Earltown lake, N.S.; Moncton, Pollet lake, N.B.

MASTOGLOIA Thw.

Mastogloia dansei Thw. W. Smith, Syn. Brit. Diat., vol. 2, p. 64. Suppl. Pl. 62, fig. 388. Van Heurck, Syn. Diat. Belg., Pl. 4, fig. 18.

McKay lake, Ont.

STAURONEIS Ehrenb.

Stauroneis acuta W. Smith, Syn. Brit. Diat., vol. 1, p. 59, Pl. 19, fig. 187. Van Heurck, Syn. Diat. Belg., Pl. 4, fig. 3. Boyer, Diat. Philadelphia, Pl. 27, fig. 2.

Little River, Folly lake, Little Gummel lake, Earltown lake, N.S.; Fitzgerald lake, Moncton, N.B.; McKay lake, Ont.

Stauroneis anceps Ehrenb. W. Smith, Syn. Brit. Diat., vol. 1, p. 60, Pl. 19, fig. 190. Van Heurck, Syn. Diat. Belg., Pl. 4, fig. 4.

Generally distributed in the eastern deposits.

Stauroneis anceps amphicephala (Kütz.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 148. Van Heurck, Syn. Diat. Belg., Pl. 4, fig. 6. Boyer, Diat. Philadelphia, Pl. 27, fig. 7. With the type.

Stauroneis anceps gracilis (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 147. Boyer, Diat. Philadelphia, Pl. 27, fig. 5. Occasional with the type.

Stauroneis baileyi Ehrenb., Mikrogeologie, Pl. 6, 1, fig. 17. Wolle, Diat. N.A., Pl. 24, fig. 27.

Generally distributed.

Stauroneis phoenicenteron Ehrenb., W. Smith, Syn. Brit. Diat., vol. 1, p. 59, Pl. 19, fig. 185. Van Heurck, Syn. Diat. Belg., Pl. 4, fig. 2. Boyer, Diat. Philadelphia, Pl. 27, fig. 1.

Generally distributed.

Stauroneis phoenicenteron amphilepta (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 149. *Stauroneis amphilepta* Ehrenb., Heribaud, Diat. d'Auvergne, Pl. 3, fig. 18.

Digby neck.

Stauroneis salina W. Smith, Syn. Brit. Diat., vol. 1, p. 60, Pl. 19, fig. 188. Boyer, Diat. Philadelphia, Pl. 27, fig. 6.

McKay lake, Ont.

NAVICULA Bory em. Cleve

Navicula anglica Ralfs in Prit. Inf., p. 900. Van Heurck, Syn. Diat. Belg., Pl. 8, fig. 29. Boyer, Diat. Philadelphia, Pl. 26, fig. 29.

Little River, Brora lake, N.S.; Pollet lake, Moncton, N.B.; McKay lake, Ont.; Prospect lake, Chilliwack (south of), B.C.

Navicula bacilliformis Grun., Sv. Vet.-Akad. Handl., vol. 17, p. 44, Pl. 2, fig. 51.

Jacquot river, Que.

Navicula bacillum Ehrenb. Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 137. Van Heurck, Syn. Diat. Belg., Pl. 13, fig. 8. Boyer, Diat. Philadelphia, Pl. 26, fig. 10.

North river, Little River, Folly river, Earltown lake, N.S.; Prospect lake, B.C.

Navicula cuspidata Kütz., Bac., p. 94. Van Heurck, Syn. Diat. Belg., Pl. 12, fig. 4. Boyer, Diat. Philadelphia, Pl. 26, fig. 1. The craticular inner plates usually occur with the type.

Generally distributed.

Navicula cuspidata gracilis M. Perag., Diat. de Monde entier, p. 300. A form narrower than the type.

Earltown lake, Robertson lake, N.S.

Navicula dicephala W. Smith, Syn. Brit. Diat., vol. 1, p. 53, Pl. 17, fig. 157. Van Heurck, Syn. Diat. Belg., Pl. 8, fig. 34. Boyer, Diat. Philadelphia, Pl. 27, fig. 16.

McKay lake, Ont.

Navicula monmouthiana Grun., Sv. vet.-Akad. Handl., vol. 17, p. 4. Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 134, Pl. 5, fig. 20. Yermoloff, Jour. Quek. Club, ser. 2, vol. 13, p. 419, Pl. 27, figs. 1, 2. Other forms of the "Monmouthiana Integral" also occur.

Fitzgerald lake, N.B.

Navicula oblonga Kütz., Bac., p. 97. A. Schmidt, Atlas, Pl. 47, fig. 67. Van Heurck, Syn. Diat. Belg., Pl. 7, fig. 1. Boyer, Diat. Philadelphia, Pl. 27, fig. 21.

McKay lake, Ont.; Pukaist creek, Deadman river, B.C.

Navicula peregrina (Ehrenb.) Kütz., Bac., p. 97. A. Schmidt, Atlas, Pl. 47, fig. 57. Boyer, Diat. Philadelphia, Pl. 26, fig. 20.

Earlton lake, Brora lake, N.S.; McKay lake, Ont.

Navicula pseudobacillum Grun., Sv. Vet.-Akad. Handl., vol. 17, p. 45, Pl. 2, fig. 52. Van Heurck, Syn. Diat. Belg., Pl. 13, fig. 9.

Bass River lake, Slack lake, Earlton lake, Brora lake, N.S.; Fitzgerald lake, N.B.; Prospect lake, Chilliwack (south of), Pukaist creek, B.C.

Navicula pupula Kütz., Bac., p. 93. Cleve and Grun., Sv. Vet.-Akad. Handl., vol. 17, p. 45, Pl. 2, fig. 53. Van Heurck, Syn. Diat. Belg., Pl. 13, fig. 15.

Little River, N.S.; McKay lake, Ont.

Navicula radiosa Kütz., Bac., p. 91. A. Schmidt, Atlas, Pl. 47, fig. 52. Van Heurck, Syn. Diat. Belg., Pl. 7, fig. 20. Boyer, Diat. Philadelphia, Pl. 26, fig. 17.

Generally distributed.

Navicula rhyncocephala Kütz. W. Smith, Syn. Brit. Diat., vol. 1, p. 47, Pl. 16, fig. 132. Van Heurck, Syn. Diat. Belg., Pl. 7, fig. 31. Boyer, Diat. Philadelphia, Pl. 31, fig. 8.

McKay lake, Ont.

Navicula semen Ehrenb., Cleve, Sv. Vet.-Akad. Handl. II, vol. 26, p. 138. Boyer, Diat. Philadelphia, Pl. 26, fig. 11.

Morden, Bass River lake, N.S.; Chaffey township, Ont.; Prospect lake, Blackwater river, B.C.

Navicula tuscula (Ehrenb.) Grun., in Van Heurck, Syn. Diat. Belg., Pl. 10, fig. 14.

McKay lake, Ont.

Navicula vulpina Kütz., Bac., p. 92. Van Heurck, Syn. Diat. Belg., Pl. 7, fig. 18. (*Navicula viridis major*, acc. to Cleve.) A. Schmidt, Atlas, Pl. 47, figs. 53, 54.

Little River, Earlton lake, N.S.

PINNULARIA Ehrenb.

Pinnularia acrosphaeria (Bréb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 86. *Navicula acrosphaeria* (Bréb.) Kütz., Bac., p. 97. W. Smith, Syn. Brit. Diat. 1, Pl. 19, fig. 183. Boyer, Diat. Philadelphia, Pl. 30, fig. 7.

Little River, Folly lake, Earltown lake, N.S.

Pinnularia acrosphaeria turgidula Grun., Sv. Vet.-Akad. Handl. II, vol. 27, p. 86. Boyer, Diat. Philadelphia, Pl. 30, fig. 8. A. Schmidt, Atlas, Pl. 311, fig. 9.

Brora lake, N.S.

Pinnularia borealis Ehrenb. *Navicula borealis* (Ehrenb.) Kütz. Van Heurck, Syn. Diat. Belg., Pl. 6, fig. 3. A. Schmidt, Atlas, Pl. 45, fig. 17. Boyer, Diat. Philadelphia, Pl. 30, fig. 22.

North River, Little River, Factory Dale, Morden, Bass River, Folly lake, Earltown lake, N.S.; Desert river, Que.

Pinnularia brebissonii (Kütz.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 78. *Navicula brebissonii* Kütz. A. Schmidt, Atlas, Pl. 44, figs. 17, 18. Van Heurck, Syn. Diat. Belg., Pl. 5, fig. 7. Boyer, Diat. Philadelphia, Pl. 29, fig. 12.

Generally distributed.

Pinnularia cardinaliculus Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 79. Pl. 1, fig. 12. Boyer, Diat. Philadelphia, Pl. 30, fig. 1.

Slack lake, Folly river, Clear lake, Brora lake, N.S.

Pinnularia dactylus (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 90. *Pinnularia gigas* Ehrenb. *Navicula gigas*. *Navicula dactylus*. A. Schmidt, Atlas, Pl. 42, figs. 1, 6. Boyer, Diat. Philadelphia, Pl. 28, fig. 3.

Generally distributed.

Pinnularia flexuosa Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 93, Pl. 1, fig. 23. A. Schmidt, Atlas, Pl. 311, figs. 1, 2.

North River, Morden, Folly lake, Earltown lake, Robertson lake, Brora lake, N.S.; Desert river, Que.; Chaffey township, Ont.

Pinnularia gibba (Ehrenb.) W. Smith, Syn. Brit. Diat., vol. 1, p. 58, Pl. 19, fig. 180.

Generally distributed.

Pinnularia interrupta W. Smith, Syn. Brit. Diat., vol. 2, p. 96. *Pinnularia biceps* Greg. A. Schmidt, Atlas, Pl. 45, figs. 69, 70.

Pukaist creek, B.C.

Pinnularia lata (Bréb.) W. Smith, Syn. Brit. Diat., vol. 1, p. 55, Pl. 18, fig. 167. *Navicula pachyptera* (Ehrenb.) A. Schmidt, Atlas, Pl. 45, fig. 8. Boyer, Diat. Philadelphia, Pl. 30, fig. 23.

North River, Salmon river, N.S.; Chaffey township, Ont.; Chilliwack (south of), B.C.

Pinnularia major (Kütz.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 89. *Navicula major* Kütz. Van Heurck, Syn. Diat. Belg., Pl. 5, fig. 4. A. Schmidt, Atlas, Pl. 42, fig. 8. Boyer, Diat. Philadelphia, Pl. 28, fig. 4. Many variations occur.

Generally distributed.

Pinnularia major asymmetrica Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 89, Pl. 1, fig. 22.

North river, Slack lake, Earltown lake, Sydney, N.S.

Pinnularia major transversa (A. Schmidt) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 90. *Navicula transversa* A. Schmidt, Atlas, Pl. 43, fig. 5.

Little River, Factory Dale, Slack lake, Folly lake, Trout lake, Clear lake, Earltown lake, N.S.

Pinnularia mesolepta (Ehrenb.) W. Smith, Syn. Brit. Diat., vol. 1, p. 58, Pl. 19, fig. 182.

Generally distributed.

Pinnularia microstauron (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 77. *Navicula divergens minor* A. Schmidt, Atlas, Pl. 44, fig. 35. *Navicula bicapitata hybrida* Grun., in Van Heurck, Syn. Diat. Belg., Pl. 6, fig. 9.

Little River, Slack lake, Folly lake, Brora lake, N.S.; Fitzgerald lake, N.B.

Pinnularia nodosa (Ehrenb.) Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 87. *Navicula nodosa* Ehrenb. A. Schmidt, Atlas, Pl. 45, fig. 56. Boyer, Diat. Philadelphia, Pl. 30, fig. 19. Variations in this and the two preceding forms occur.

North river, Slack lake, N.S.; McKay lake, Ont.

Pinnularia stauroptera (Grun.) Cleve, Sv. Vet.-Akad. Handl., vol. 27, p. 82. Boyer, Diat. Philadelphia, Pl. 30, fig. 13.

McKay lake, Ont.

Pinnularia streptoraphe Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 93. *Navicula* sp. A. Schmidt, Atlas, Pl. 42, fig. 7; Pl. 311, figs. 3, 4. In *P. streptoraphe* the margins of the valve are parallel and the striæ are almost so, whereas in *P. flexuosa* the outline is somewhat elliptical and the striæ are slightly radiate in the middle.

North river, Folly lake, Earltown lake, Robertson lake, N.S.

Pinnularia tabellaria Ehrenb. Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 84. *Navicula tabellaria* A. Schmidt, Atlas, Pl. 43, fig. 4.

Little River, N.S.; Moncton, N.B.; Prospect lake, B.C.

Pinnularia trigonocephala Cleve, Sv. Vet.-Akad. Handl. II, vol. 27, p. 88, Pl. 1, fig. 21. Boyer, Diat. Philadelphia, Pl. 29, fig. 8.

Mayflower P.O., Bass River lake, N.S.

Pinnularia viridis (Nitzsch) Ehrenb., *Navicula viridis* (Nitzsch) Kütz., Bac., p. 97. A. Schmidt, Atlas, Pl. 42, figs. 11, 12. Boyer, Diat. Philadelphia, Pl. 29, fig. 2.

Generally distributed.

EPITHEMIA Bréb.

Epithemia argus (Ehrenb.) Kütz., Bac., p. 35. Van Heurck, Syn. Diat. Belg., Pl. 31, fig. 15. A. Schmidt, Atlas, Pl. 251, figs. 1-8. Boyer, Diat. Philadelphia, Pl. 31, figs. 15, 21.
Pollet lake, N.B.

Epithemia sorex Kütz., Bac., p. 33. Van Heurck, Syn. Diat. Belg., Pl. 32, figs. 7, 8. A. Schmidt, Atlas, Pl. 252, fig. 25.
Little River, N.S.

Epithemia turgida (Ehrenb.) Kütz., Bac., p. 34. Van Heurck, Syn. Diat. Belg., Pl. 31, figs. 1, 2. A. Schmidt, Atlas, Pl. 250, figs. 1-5. Boyer, Diat. Philadelphia, Pl. 31, fig. 14.

Little River, Slack lake, Earltown lake, N.S.; Pollet lake, Fitzgerald lake, N.B.; Prospect lake, Quamichan lake, Pukaist creek, Deadman river, B.C.

Epithemia zebra (Ehrenb.) Kütz., Bac., p. 34. Van Heurck, Syn. Diat. Belg., Pl. 31, fig. 9. A. Schmidt, Atlas, Pl. 252, figs. 1, 3.

Little River, Bass River lake, Slack lake, Clear lake, N.S.; Cobble Hill, Quamichan lake, Pukaist creek, B.C.

Epithemia zebra minor Van Heurck, Syn. Diat. Belg., Pl. 33, figs. 11-13.
Fitzgerald lake, N.B.

RHOPALODIA O. Muell.

Rhopalodia gibba (Kütz.) O. Muell. *Epithemia gibba* (Ehrenb.) Kütz., Bac., p. 35. Van Heurck, Syn. Diat. Belg., Pl. 32, figs. 1, 2. Boyer, Diat. Philadelphia, Pl. 31, fig. 23.

Nova Scotia and New Brunswick deposits; McKay lake, Ont.

Rhopalodia ventricosa (Kütz.) O. Muell. *Epithemia ventricosa* Kütz., Bac., p. 35. W. Smith, Syn. Brit. Diat., vol. 1, Pl. 1, fig. 14. Boyer, Diat. Philadelphia, Pl. 31, fig. 24.

Earltown lake, N.S.; Moneton, N.B.; McKay lake, Ont.; Deadman river, B.C.

HANTZSCHIA Grun.

Hantzschia amphioxys (Ehrenb.) Grun., Sv. Vet.-Akad. Handl., vol. 17, p. 103. Van Heurck, Syn. Diat. Belg., Pl. 56, figs. 1, 2, 4. W. Smith, Syn. Brit. Diat., vol. 1, Pl. 13, fig. 105. Boyer, Diat. Philadelphia, Pl. 39, fig. 6.
North River, Factory Dale, Slack lake, N.S.; Desert river, Que.

Hantzschia elongata (Hantzsch) Grun., Sv. Vet.-Akad., vol. 17, p. 104. *Nitzschia amphioxys elongata* (Grun.) Van Heurck, Syn. Diat. Belg., Pl. 56, fig. 8.

Generally distributed in Nova Scotia and New Brunswick.

NITZSCHIA Hassall em. Grun.

Nitzschia denticula Grun. in Cleve and Grun., Sv. Vet.-Akad. Handl., vol. 17, p. 82. Van Heurck, Syn. Diat. Belg., Pl. 60, fig. 10.

McKay lake, Ont.

Nitzschia palea (Kütz.) W. Smith, Syn. Brit. Diat., vol. 2, p. 89. *Synedra fusidium* Kütz. (acc. to W. Smith), *Nitzschia fusidium* H. L. Smith. Type slide No. 343. Boyer, Diat. Philadelphia, Pl. 32, fig. 15. H. L. Smith's specimens from Upsala, Sweden, correspond exactly to this form which is variously figured and described by different authors.

Bass River lake, N.S.

Nitzschia scalaris (Ehrenb.) W. Smith, Syn. Brit. Diat., vol. 1, p. 39, Pl. 14, fig. 115. Van Heurck, Syn. Diat. Belg., Pl. 60, figs. 14, 15. Boyer, Diat. Philadelphia, Pl. 33, fig. 6. This form occurs usually in brackish water.

Little River, Mayflower P.O., N.S.

SURIRELLA Turpin

Surirella anceps (Bréb.) Lewis, Proc. Acad. Phila., vol. 15, p. 341, Pl. 1, fig. 3. Boyer, Diat. Philadelphia, Pl. 34, fig. 2.

Generally distributed in Nova Scotia and New Brunswick.

Surirella arctissima A. Schmidt, Atlas, Pl. 56, figs. 13, 14. Boyer, Diat. Philadelphia, Pl. 34, fig. 4.

McQuade lake, Little River, Slack lake, Folly lake, Trout lake, Sydney, N.S.

Surirella biseriata (Ehrenb.) Bréb. W. Smith, Syn. Brit. Diat., vol. 1, p. 30, Pl. 8, fig. 57. Van Heurck, Syn. Diat. Belg., Pl. 72, figs. 1, 2. Boyer, Diat. Philadelphia, Pl. 39, fig. 12.

McKay lake, Ont.

Surirella constricta Ehrenb. (not W. Smith). Mikrogeologie, Pl. 14, fig. 37. Fitzgerald lake, N.B.

Surirella elegans Ehrenb., Kütz., Bac., p. 60. Van Heurck, Syn. Diat. Belg., Pl. 71, fig. 3. A. Schmidt, Atlas, Pl. 21, fig. 19. Boyer, Diat. Philadelphia, Pl. 36, fig. 1.

Earlton lake, N.S.

Surirella guatamalensis Ehrenb. *Surirella cardinalis* Kitton. A. Schmidt, Atlas, Pl. 31, fig. 11. Boyer, Diat. Philadelphia, Pl. 36, fig. 5. Earlton lake, N.S.; McKay lake, Ont.

Surirella intermedia Lewis, Proc. Acad. Phila., vol. 15, p. 338. A. Schmidt, Atlas, Pl. 284, fig. 6 (*forma acuta* Fricke). Boyer, Diat. Philadelphia, Pl. 34, fig. 3.

McQuade lake, Bass River lake, Folly lake, Trout lake, Sydney, N.S.; Stannard lake, Fitzgerald lake, N.B.

Surirella linearis W. Smith, Syn. Brit. Diat., vol. 1, p. 31, Pl. 8, fig. 58. Boyer, Diat. Philadelphia, Pl. 35, fig. 8. A. Schmidt, Atlas, Pl. 23, fig. 27.

Generally distributed in Nova Scotia and New Brunswick; McKay lake, Ont.

Surirella oblonga Ehrenb., Boyer, Diat. Philadelphia, Pl. 35, fig. 9. Big Totten lake, Sydney, N.S.; Moncton, Stannard lake, N.B.

Surirella robusta Ehrenb., Van Heurck, Syn. Diat. Belg., Pl. 71, fig. 1. Boyer, Diat. Philadelphia, Pl. 36, fig. 2.

Slack lake, Trout lake, Big Totten lake, Little Gummel lake, Earl-town lake, N.S.

Surirella splendida (Ehrenb.) Kütz., Bac., p. 62. A. Schmidt, Atlas, Pl. 22, figs. 15, 16. Boyer, Diat. Philadelphia, Pl. 35, fig. 3.

Generally distributed and variable.

Surirella tenera Greg. Quart. Jour. Mic. Sci., vol. 4, p. 11, Pl. 1, fig. 38. Boyer, Diat. Philadelphia, Pl. 35, fig. 6 (var.).

McKay lake, Ont.

Surirella tenera splendidula A. Schmidt, Atlas, Pl. 23, figs. 4, 5, 6.

McKay lake, Ont.

CYMATOPLEURA W. Smith

Cymatopleura elliptica (Bréb.) W. Smith, Syn. Brit. Diat., vol. 1, p. 37, Pl. 10, fig. 80. Van Heurck, Syn. Diat. Belg., Pl. 55, fig. 1. Boyer, Diat. Philadelphia, Pl. 37, fig. 1.

McKay lake, Ont.

Cymatopleura solea W. Smith, Syn. Brit. Diat., vol. 1, p. 36, Pl. 10, fig. 78. Van Heurck, Syn. Diat. Belg., Pl. 55, figs. 5-7. Boyer, Diat. Philadelphia, Pl. 34, figs. 8, 9.

McKay lake, Ont.; Pukaist creek, B.C.

Date	Description	Debit	Credit	Balance	Date	Description	Debit	Credit	Balance	Date	Description	Debit	Credit	Balance
1891	Jan 1													
1892	Feb 1													

