JOURNAL

OF THE

ROYAL MICROSCOPICAL SOCIETY.

JUNE, 1918.

TRANSACTIONS OF THE SOCIETY.

IV.—*Report on the Recent Foraminifera dredged off the East Coast of Australia. H.M.S. "Dart," Station* 19 (14 *May*, 1895), *Lat.* 29° 22′ *S., Long.* 153° 51′ *E.*, 465 *fathoms. Pteropod Ooze—continued.*

By Henry Sidebottom.

[*Communicated by* E. Heron-Allen and A. Earland.]

(*Read October* 17, 1917.)

Plates III–V.

Sub-family **Bulimininæ.**

Bulimina d'Orbigny.

Bulimina pyrula d'Orbigny.

Bulimina caudigera d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 270, No. 16, Modèle No. 68.
B. pyrula d'Orbigny, 1846, For. Foss. Vien, p. 184, pl. xi, figs. 9, 10.
B. pyrula Brady, 1884, Chall. Rept., p. 399, pl. l, figs. 7–10.

Fair examples are present.

EXPLANATION OF PLATE III.

FIGS.

1–3.—*Bulimina ovata* d'Orbigny. Figs. 1–3, lateral views. × 25.
4–6.—*B. declivis* Reuss. Figs. 4–6, lateral views. × 50.
7.—*B. subcylindrica* Brady. Fig. 7, lateral view. × 50.
8–10.—*B. elegantissima* d'Orbigny, var. *fusiformis* nov. var. Figs. 8–10, lateral views. × 50.
11.—*B. elegantissima* d'Orbigny, var. *apiculata* Chapman. Fig. 11, lateral views. × 50.

[*continued.*

Bulimina ovata d'Orbigny. (Pl. III, figs. 1–3.)

Bulimina ovata d'Orbigny, 1846, For. Foss. Vien, p. 185, pl. xi, figs. 13, 14.
B. ovata Brady, 1884, Chall. Rept., p. 400, pl. l, fig. 13.

The specimens are very large and in excellent condition. I believe that both the forms I have figured belong to the same species, the one (fig. 1) being in the megalospheric, the other (figs. 2, 3) in the microspheric condition.

Bulimina subteres Brady.

Bulimina presli, var. *elegantissima*, Parker and Jones, 1865, Phil. Trans. vol. clv, p. 374, pl. xv, figs. 12–17.
B. subteres Brady, 1884, Chall. Rept., p. 403, pl. l, figs. 17, 18.

The tests agree with the "Challenger" figures of this species.

Bulimina declivis Reuss. (Pl. III, figs. 4–6.)

Bulimina declivis Reuss, 1863, Sitzungsb. d. k. Ak. Wiss. Wien, vol. xlviii, p. 55, pl. vi, fig. 70; pl. vii, fig. 71.
B. declivis Brady, 1884, Chall. Rept., p. 404, pl. l, fig. 19.

Two found, both of which I have illustrated. Fig. 4 is very nearly the same as Reuss's fig. 71.

Bulimina subcylindrica Brady. (Pl. III, fig. 7.)

Bulimina subcylindrica Brady, 1881, Quart. Journ. Micr. Sci., vol. xxi, N.S., p. 56.
B. subcylindrica Brady, 1884, Chall. Rept., p. 404, pl. l, fig. 16.
B. subcylindrica Millett, 1898, etc., Rept. Rec. Foram. Malay Archipelago, 1900, p. 377, pl. ii, fig. 6.

Typical examples occur.

Bulimina elegantissima d'Orbigny.

Bulimina elegantissima d'Orbigny, 1839, Foram. Amér. Mérid., p. 51, pl. vii, figs. 13, 14.
B. elegantissima Brady, 1884, Chall. Rept., p. 402, pl. l, figs. 20–22.

A single small specimen, which I unfortunately flicked off the slide after examination

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EXPLANATION OF PLATE III.—*continued.*

FIGS.

12–15.—*B. magdalidiforme* (Schwager). Figs. 12, 13, two views of the test. Fig. 14, half section of the test. Fig. 15, section viewed by transmitted light. × 25.
16.—*Virgulina schreibersiana* Czjzek. Fig. 16, lateral view. × 50.
17, 18.—*Bifarina mackinnonii* Millett, var. *robusta* nov. var. Fig. 17, lateral view. Fig. 18, edge view. × 50.
19.—*Bolivina textilarioides* Reuss. Fig. 19, lateral view. × 50.
20, 21.—*B. lobata* Brady. Fig. 20, lateral view. Fig. 21, oral view. × 75.
22.—*Cassidulina calabra* (Seguenza). Fig. 22, ventral view. × 25.
23–25.—*Nodosaria radicula* (Linné). × 50.

Bulimina elegantissima d'Orbigny, var. *fusiformis*, nov. var.
(Pl. III, figs. 8–10.)

The test is fusiform, opaque and polished. The sutures show feebly. Five found. The specimens may be compared with *Bulimina pupa, Terquem.*

Bulimina elegantissima d'Orbigny, var. *apiculata* Chapman.
(Pl. III, fig. 11.)

Bulimina elegantissima d'Orbigny, var. *apiculata* Chapman, 1907, Tert. Foram. Victoria, Australia, pt. i, Journ. Linn. Soc. Zool., vol. xxx, p. 31, pl. iv, fig. 77.
B. elegantissima d'Orbigny, var. *apiculata* Chapman, 1915, Zool. Res. "Endeavour," Nat. Mus. Melbourne, vol. iii, pt. i, p. 18.

Two tests, somewhat more elongated than that figured by Chapman in the above reference. The basal spine is well developed. This species occurs also off Pernambuco, "Challenger" Station 120.

Bulimina rostrata Brady.

Bulimina truncana Hanken, 1875, Mittheil, Jahrb. d. k. Ung. geol. Anstalt, vol. iv, p. 61, pl. vii, fig. 5.
B. rostrata Brady, 1884, Chall. Rept., p. 408, pl. li, figs. 14, 15.

The species is well represented.

Bulimina aculeata d'Orbigny.

Bulimina aculeata d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 269, No. 7.
B. aculeata, Brady, 1884, Chall. Rept., p. 406, pl. li, figs. 7–9.

The examples are rather small.

Bulimina marginata.

Bulimina marginata d' Orbigny 1826, Ann. Sci. Nat., vol. vii, p. 269, No. 4. pl. xii, figs. 10–12.
B. marginata Brady, 1884, Chall. Rept., p. 405, pl. li, figs. 3–5.

A single, good example.

Bulimina inflata Seguenza.

Bulimina inflata Seguenza, 1862, Atti del' Accad. Gioenia, vol. xviii, Ser. 2, p. 109, pl. i, fig. 10.
B. inflata Brady, 1884, Chall. Rept., p. 406, pl. li, figs. 10–13.

Excellent specimens occur.

Bulimina contraria (Reuss).

Rotalina contraria Reuss, 1851, Zeitschr. d. deutsch. geol. Gesell., vol. iii, p. 76, pl. v, fig. 37.
Bulimina contraria Brady, 1884, Chall. Rept., p. 409, pl. liv, fig. 18.

There are beautiful examples of this very interesting form.

Bulimina convoluta Williamson.

Bulimina pupoides, var. *convoluta* Williamson, 1858, Rec. Foram. Gt. Britain, p. 63, pl. v, figs. 132, 133.
B. convoluta Brady, 1884, Chall. Rept., p. 409, pl. cxiii, fig. 6.
B. convoluta Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc., 1900, p. 279, pl. ii, fig. 9.

The specimens are small, but typical, and rather more erect than is usual in this species. The secondary chambers are well developed. Frequent.

Bulimina Williamsoniana Brady.

Bulimina williamsoniana, 1884, Chall. Rept., p. 408, pl. li, figs. 16, 17.
B. williamsoniana Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc., 1900, p. 279, pl. ii, fig. 8.
B. williamsoniana (*Buliminoides*) Cushman, 1910, etc., Foram. N. Pacific Ocean, 1911, U.S. Nat. Mus. Bull. 71, pt. ii, Textulariidæ, p. 90, fig. 144.

Two very short tests occur.

Bulimina magdalidiforme (Schwager). (Pl. III, figs. 12–15.)

Ataxophragmium magdalidiforme Schwager, 1866, Geol., ii, p. 194, pl. iv, fig. 1.

I was quite unable to decide to which genus the specimens should be allocated, and therefore submitted examples and sections to Mr. Earland, who is of opinion that they are the same as Schwager's species. After reading a translation of Schwager's description and remarks I am in agreement with Mr. Earland.

Test rough, subcylindrical or ovate, superior end rounded off, inferior end tapering to a blunt point. Colour, a light yellowish grey.

In the following remarks the quotations are from Mr. Earland's letter to me: "The walls are built up of fine calcareous and siliceous mud on a basis of calcareous cement." The sutural lines do not show on the surface of the test owing to a "certain amount of overlapping external shell deposit masking the sutural lines." In the section the sutural lines can be seen between the later chambers. The aperture in fig. 12 differs from the type-form (which is comma-shaped and erect), and is arched and horizontal, and situated as shown. In some of the tests it is more or less indefinite and depressed. Nine occur.

This is a very curious and abnormal form differing widely in structure from any of the associated species of *Bulimina*. It does not appear to have been recorded since its discovery by Schwager in the Tertiary of the Nicobar Islands, and a further investigation of its structure may necessitate its removal to a new genus.

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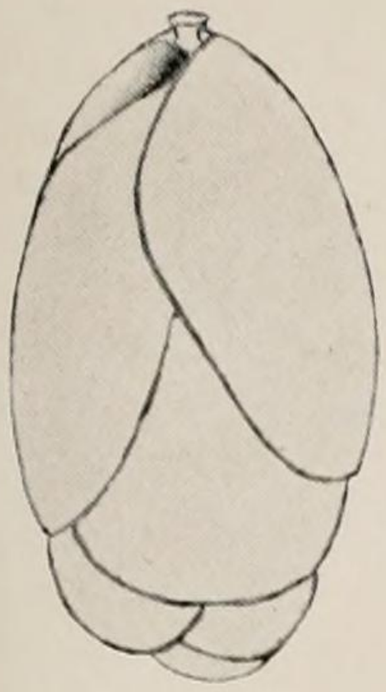

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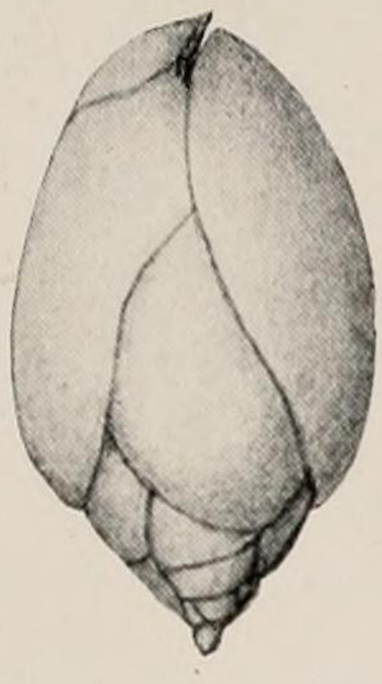

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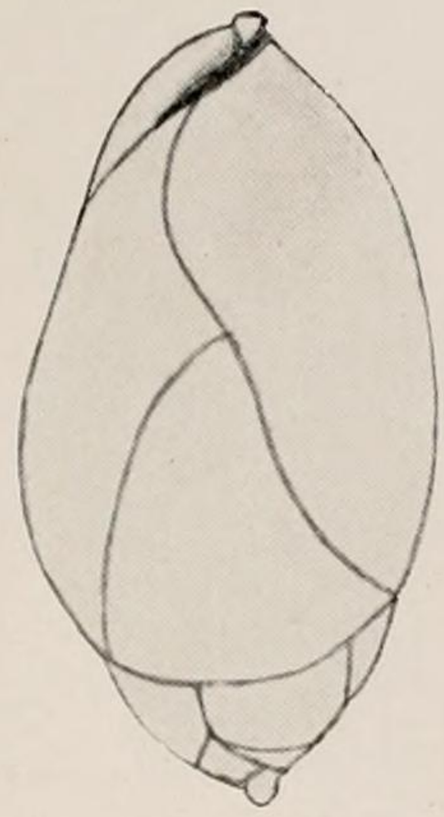

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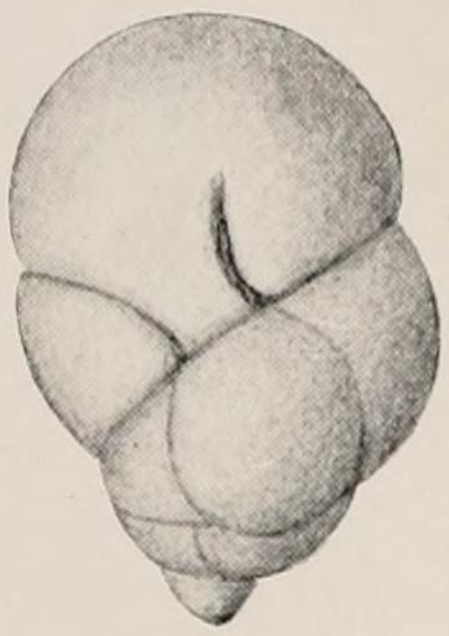

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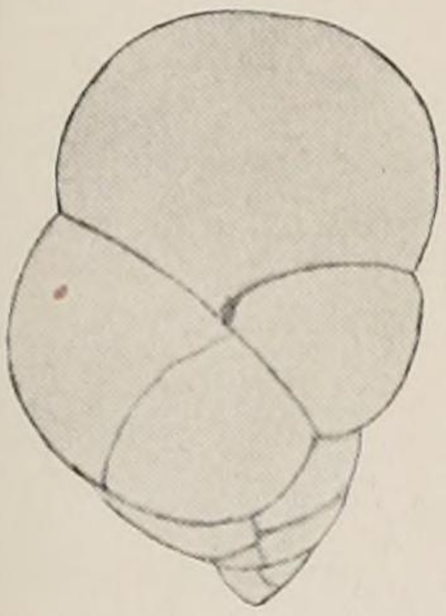

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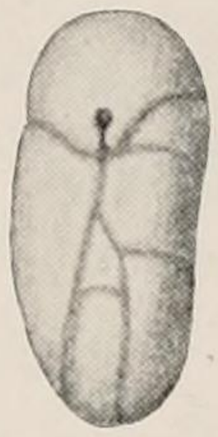

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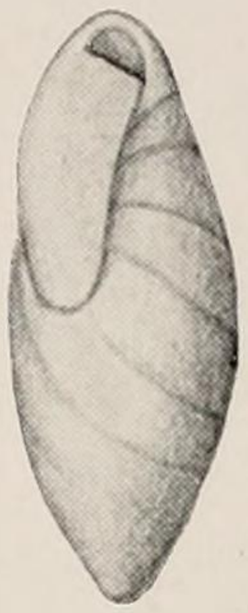

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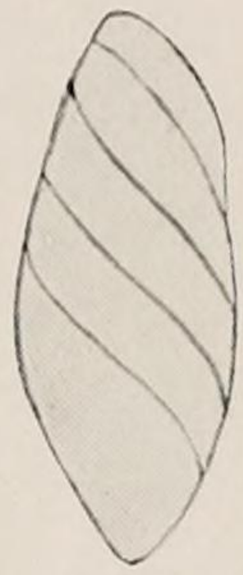

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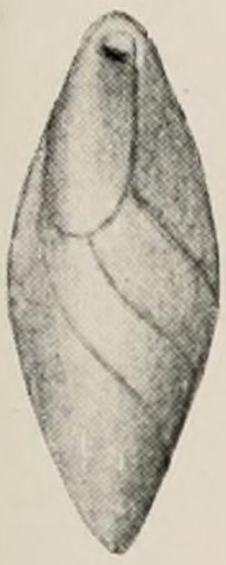

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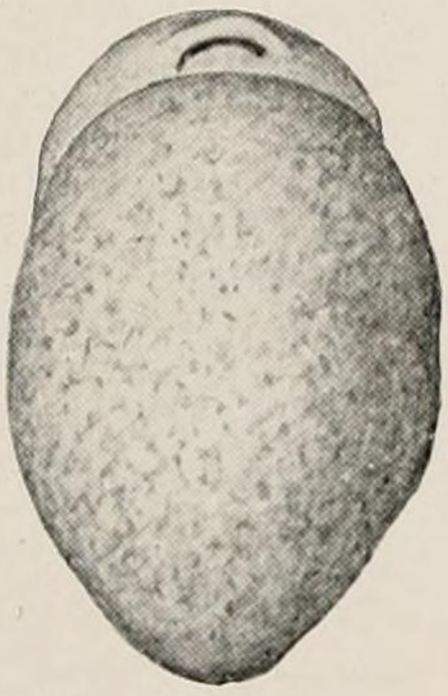

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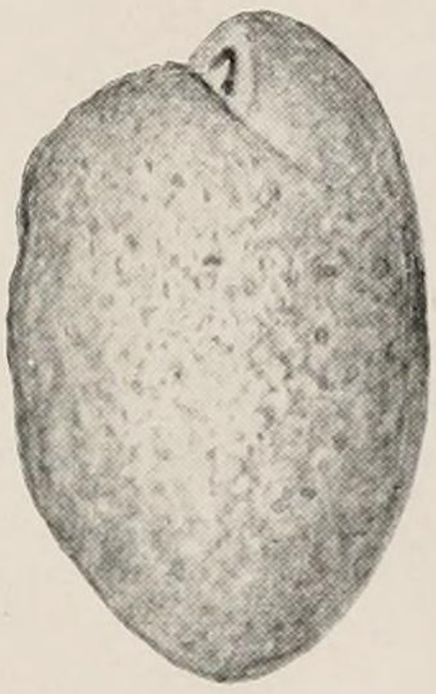

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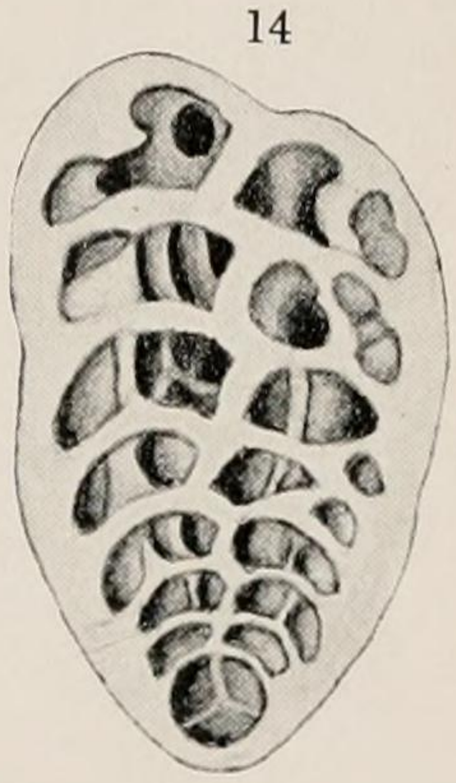

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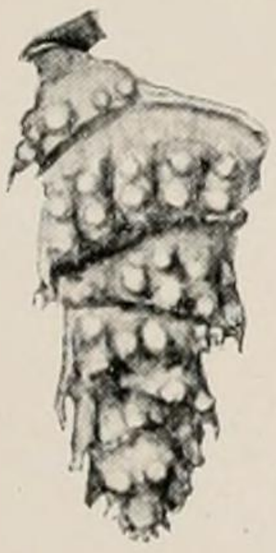

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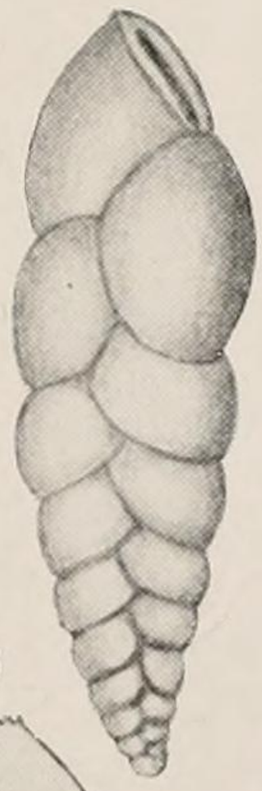

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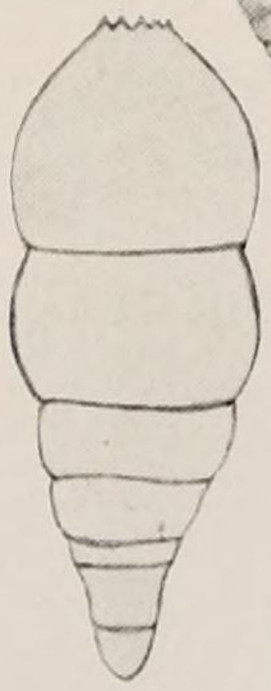

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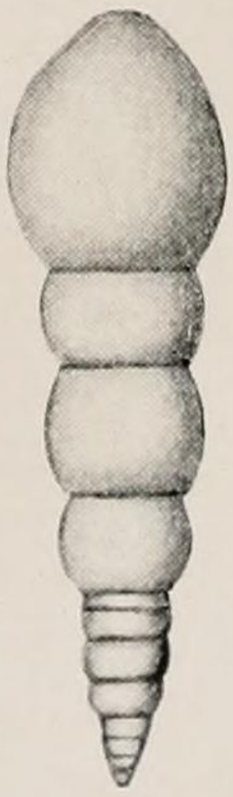

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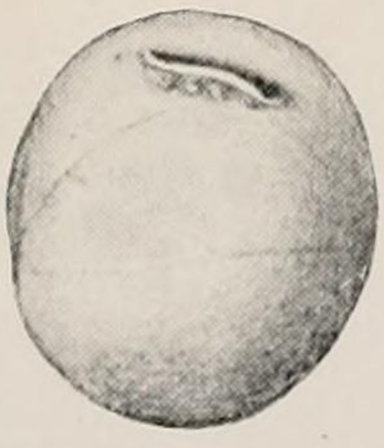

H. Sidebottom, del. ad. nat.

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Pleurostomella Reuss.

Pleurostomella alternans Schwager.

Pleurostomella alternans Schwager, 1866, Novara-Exped. geol. Theil, vol. ii, p. 238, pl. vi, figs. 79, 80.
P. alternans Brady, 1884, Chall. Rept., p. 412, pl. li, figs. 22, 23.

A solitary, immature specimen.

Virgulina d'Orbigny.

Virgulina schreibersiana Czjzek. (Pl. III, fig. 16.)

Virgulina schreibersiana Czjzek, 1848, Haidinger's Naturwiss. Abhandl., vol. ii, p. 147, pl. xiii, figs. 18–21.
V. schreibersiana Brady, 1884, Chall. Rept., p. 414, pl. lii, figs. 1–3.

This variable species is only represented by a long, slender, compressed form. The chambers are upright, slightly inflated, and textularian throughout the entire length of the test. The basal chamber is armed with a long stout spine. The orifice is compressed. Six occur.

Virgulina subsquamosa Egger.

Virgulina subsquamosa Egger, 1857, Neues Jahrb. für Min., etc., p. 295, pl. xii, figs. 19–21.
V. subsquamosa Brady, 1884, Chall. Rept., p. 415, pl. lii, figs. 7–11.

The tests are somewhat similar to the "Challenger" fig. 10.

Virgulina squamosa d'Orbigny.

Virgulina squamosa d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 267, No. 1; Modèle No. 64.
V. squamosa Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc., 1900, p. 281, pl. ii, fig. 14.

The examples agree with Millett's figure in the above reference.

Bifarina Parker and Jones.

Bifarina mackinnonii Millett, var. *robusta*, nov. var. (Pl. III, figs. 17, 18.)

This variety is much more heavily built than the type-form. The tubercles are large and the virguline cluster of chambers also are tuberculate. The test is opaque, and all the interstices of the later chambers are rough. I have a somewhat similar test from the "Challenger" Station No. 185. Two occur.

Bolivina d'Orbigny.

Bolivina textilarioides Reuss. (Pl. III, fig. 19.)

Bolivina textilarioides Reuss. 1862, Sitzungsb. d. k. Ak. Wiss. Wien., vol. xlvi, p. 81, pl. x, fig. 1.
B. textilarioides Brady, 1884, Chall. Rept., p. 419, pl. lii, figs. 23–25.
B. textilarioides Heron-Allen and Earland, 1908, etc., Rec. and Foss. Foram. Selsey Bill, Journ. Roy. Micr. Soc., 1911, p. 316, pl. 10, figs. 10–12.

Some of the tests agree fairly well with Reuss's figure, and others with the "Challenger" fig. 23. The longer specimens

appear to be in the microspheric, and the shorter in the megalospheric condition.

Another set is of the same variety as that figured by Heron-Allen and Earland in the above reference, having the roughened, granular deposit in the neighbourhood of the sutures referred to by them.

There are also two large tests which appear to be intermediate between *B. textilarioides* and *V. turturata* Brady. I have illustrated one of these (fig. 19).

Bolivina punctata d'Orbigny.

Bolivina punctata d'Orbigny, 1839, Foram. Amér. Mérid., p. 63, pl. viii, figs. 10–12.
B. punctata Brady, 1884, Chall. Rept., p. 417, pl. lii, fig. 18, 19.

Good examples are present. They are long and narrow.

Bolivina robusta Brady.

Bolivina robusta Brady, 1884, Chall. Rept., p. 421, pl. liii, figs. 7–9.
B. robusta Heron-Allen and Earland, 1915, Foram. Kerimba Archipelago, Zool. Soc., vol. xx, pt. xvii, p. 646.

The type-form is well represented. Most of the tests have the spine at the base; in the other cases it has most probably been broken off.

There are more numerous specimens of what appears to be a weak form. These are much narrower, and the edges of the test are rounded off. There is no basal spine. Probably this is one of the forms referred to by Heron-Allen and Earland in the above reference.

Bolivina beyrichi Reuss.

Bolivina beyrichi Reuss, 1851, Zeitschr. d. deutsch. geol. Gesellsch., vol. iii, p. 83, pl. vi, fig. 51.
B. beyrichi Terrigi, 1880, Atti dell' Accad., Pont. ann. xxxiii, p. 198, pl. ii, fig. 44.

Fair specimens occur.

Bolivina beyrichi, var. *alata* Seguenza.

Valvulina alata Seguenza, 1862, Atti dell' Accad., Gioenia, ser. 2, vol. xviii, p. 113, pl. ii, figs, 5, 5*a*.
Bolivina beyrichi, var. *carinata* Terrigi, 1880, Atti dell' Acad., Pont. ann. xxxiii, p. 198, pl. ii, fig. 43–45.
B. beyrichi, var. *alata* Brady, 1884, Chall. Rept., p. 422, pl. liii, figs. 2–4.

Three fair specimens and two short ones.

Bolivina nobilis Hantken.

Bolivina nobilis Hantken, 1875, Mittheil. Jahrb. d. k. ung. geol. Anstalt, vol. iv, p. 65, pl. xv, fig. 4.
B. nobilis Brady, 1884, Chall. Rept., p. 424, pl. liii, fig. 14, 15.

Two rather feeble specimens.

Bolivina hantkeniana Brady.

Bolivina hantkeniana Brady, 1881, Quart. Journ. Micr. Sci., vol. xxi, N.S., p. 58.
B. hantkeniana Brady, 1884, Chall. Rept., p. 424, pl. liii, figs. 16–18.

Three rather small tests and a large one were found.

They are of the elongate type. In the case of the large specimen the chambers on one side of the alternating series are much more inflated than on the other.

Bolivina plicata d'Orbigny.

Bolivina plicata, 1839, Foram. Amér. Mérid., p. 62, pl. viii, figs. 4–7.
B. plicata Halkyard, 1889, Trans. and Ann. Rept. Manchester Micr. Soc., p. 65, pl. i, fig. 13.

Four occur, but they are not quite characteristic. Perhaps the usual markings are concealed through age.

Bolivina tortuosa Brady.

Bolivina tortuosa Brady, 1879, etc., Quart. Journ. Micr. Sci., 1881, N.S., p. 57.
B. tortuosa Brady, 1884, Chall. Rept., p. 420, pl. lii, figs. 31–34.
B. tortuosa Heron-Allen and Earland, 1915, Foram. Kerimba Archipelago, pt. ii, Trans. Zool. Soc., London, vol. xx, pt. xvii, p. 645.

One typical specimen, and one which is probably identical with the variation mentioned by Heron-Allen and Earland in the above reference. As they remark, "the test is covered with raised and contorted lines of shell-substance." I have also four examples of this variation from South Australia, so that it appears to be a definite form.

Bolivina karreriana Brady.

Bolivina karreriana Brady, 1881, Quart. Journ. Micr. Sci., vol. xxi, N.S., p. 58.
B. karreriana Brady, Chall. Rept., p. 424, pl. liii, figs. 19–21.

Three typical specimens.

Bolivina lobata Brady. (Pl. III, figs. 20, 21.)

Bolivina lobata Brady, 1881, Quart. Journ. Micr. Sci., vol. xxi, N.S., p. 58.
B. lobata Brady, 1884, Chall. Rept., p. 425, pl. liii, figs. 22, 23.
B. lobata Heron-Allen and Earland, 1915, Foram. Kerimba Archipelago, pt. ii, Trans. Zool. Soc., vol. xx, pt. xvii, p. 647.

The examples are not so fully developed as the "Challenger" specimens, being shorter. The aperture is situated in a depression and is not "a long oval slit contracted at the middle" as stated by Brady in his description of the species.

Millett, in his Malay Rept., 1898, etc., Journ. Roy. Micr. Soc., 1900, p. 6, pl. i., fig. 2, figures an example showing a further development, under the name *Bigenerina fimbriata*. Eight occur.

Bolivina decussata Brady.

Bolivina decussata Brady, 1881, Quart. Journ. Micr. Sci., vol. xxi, N.S., p. 58.
B. decussata Brady, 1884, Chall. Rept., p. 423, pl. liii, figs. 12, 13.

There are excellent specimens of this interesting form, but they are rough, and the protuberances are not rounded off smoothly, as shown in the "Challenger" illustrations.

Mimosina Millett.

Mimosina echinata Heron-Allen and Earland.

Mimosina echinata Millett, var. *Sidebottom*, 1904, etc., Rec. Foram. Isl. Delos, Mem. Manchester Lit. Phil. Soc. 1905, p. 16, pl. iii, fig. 9.
M. echinata Heron-Allen and Earland, 1915, Foram. Kerimba Archipelago, pt. ii, Trans. Zool. Soc., London, vol. xx, pt. xvii, p. 651, pl. l, figs. 12–18.

A few found. They have all the characteristics of the Delos specimens, and vary in the same manner in size and shape.

Sub-Family **Cassidulininæ.**

Cassidulina d'Orbigny.

Cassidulina lævigata d'Orbigny.

Cassidulina lævigata d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 282, pl. xv, figs. 4, 5, Modèle No. 41.
C. lævigata Brady, 1884, Chall. Rept., p. 428, pl. liv, figs. 1–3.

The tests are rather small.

Cassidulina crassa d'Orbigny.

Cassidulina crassa d'Orbigny, 1839, Foram. Amér. Mérid., p. 56, pl. vii, figs. 18–20.
C. crassa Brady, 1884, Chall. Rept., p. 429, pl. liv, figs. 4, 5.

Good examples, varying in size.

Cassidulina bradyi Norman.

Cassidulina bradyi (Norman M. S.) Wright, 1880, Proc. Belfast Nat. Field Club, App., p. 152.
C. bradyi Brady, 1884, Chall. Rept., p. 431, pl. liv, figs. 6–10.

A solitary example.

Cassidulina subglobosa Brady.

Cassidulina subglobosa Brady, 1879, etc., Quart. Journ. Sci., 1881, vol. xxi, N.S., p. 60.
C. subglobosa Brady, 1884, Chall. Rept., p. 430, pl. liv, fig. 17.

Good examples.

Cassidulina calabra (Seguenza). (Pl. III, fig. 22.)

Burseolina calabra Seguenza, 1879, Formaz. Terz. Reggio., p. 138, pl. xiii, fig. 7.
Cassidulina calabra Brady, 1884, Chall. Rept., p. 431, pl. cxiii, fig. 8.

Fine specimens occur. The tests are highly polished, and in some of the examples the sutural lines can hardly be distinguished.

Ehrenbergina Reuss.

Ehrenbergina serrata Reuss.

Ehrenbergina serrata Reuss, 1849, Denkschr. d. k. Akad. Wiss. Wien., vol. i, p. 377, pl. xlviii, fig. 7.
E. serrata Brady, 1884, Chall. Rept., p. 434, pl. lv, figs. 2–7.

There are eight good examples of this interesting form.

Family CHILOSTOMELLIDÆ.

Chilostomella Reuss.

Chilostomella ovoidea Reuss.

Chilostomella ovoidea Reuss, 1849, Denkschr. d. k. Akad. Wiss. Wien. vol. i, p. 380, pl. xlviii, fig. 12.
C. ovoidea Brady, 1884, Chall. Rept., p. 436, pl. lv, figs. 12–23.

With one exception the tests are narrow.

Seabrookia Brady.

Seabrookia earlandi J. Wright.

Seabrookia earlandi Wright, 1891, Rept. Foram. S.W. Ireland, Proc. Roy. Irish Acad., p. 477, pl. xx, figs. 6, 7.
S. earlandi Heron-Allen and Earland, 1913, Foram. Clare Island, Ireland, Proc. Roy. Irish Acad., p. 72, pl. v, figs. 10–12.

This interesting and minute foraminifer is well represented.

Family LAGENIDÆ.

Sub-family Lageninæ.

Lagena Walker and Boys.

Note.—All the Lagenæ found in this material have been described or referred to in my paper: Rept. Lagenæ S. W. Pacific Ocean, 1913, Journ. Quekett Micr. Soc. Club, ser. 2, vol. xii, 1913, No. 73, pp. 161–210, pls. xv–xviii. This station is indicated by the No. 43 in the localities. In the following list references are also made to my 1912 work: Lagenæ S. W. Pacific, H.M.S. "Waterwitch," Journ. Quekett Micr. Club, ser. 2 vol. xi, No. 70, pp. 375–434, pls. xiv–xxi. Most of the specimens have been transferred to the collection of Lagenæ described in the above papers, and are deposited in the South Kensington Museum under Mr. Thornhill's name. A few duplicates remain in my hands.

Lagena globosa (Montagu). Varying in size and shape.—Sidebottom, 1913, p. 164.
L. globosa (Montagu). Single and bilocular form.—Sidebottom, 1913, p. 164.
L. globosa (Montagu), var. *emaciata* Reuss.—Sidebottom, 1913, p. 165.
L. apiculata (Reuss).—Sidebottom, 1913, p. 165.
L. apiculata (Reuss), var. *punctulata* Sidebottom.—Sidebottom, 1913, p. 165; and 1912, p. 382, pl. xiv, figs. 21–23.

L. ovum (Ehrenburg).—Sidebottom, 1913, p. 166.
L. botelliformis Brady.—Sidebottom, 1913, p. 166; and 1912, p. 383, pl. 14, figs. 24, 25.
L. lævis (Montagu). Various forms.—Sidebottom, 1913, p. 166.
L. lævis (Montagu), var. *distoma* Silvestri.—Sidebottom, 1913, p. 167.
L. elongata (Ehrenberg).—Sidebottom, 1913, p. 167.
L. aspera Reuss.—Sidebottom, 1913, p. 167.
L. ampulla-distoma Rymer Jones.—Sidebottom, 1913, p. 168.
L. hispida Reuss.—Sidebottom, 1913, p. 168.
L. striata (d'Orbigny). Various forms.—Sidebottom, 1913, p. 169; and 1912, p. 386, pl. xv, fig. 8.
L. striata (d'Orbigny), var. *tortilis* Egger.—Sidebottom, 1913, p. 169.
L. lineata (Williamson).—Sidebottom, 1913, p. 170. Costæ curved, 1912, p. 387, pl xv, fig. 15.
L. costata (Williamson).—Sidebottom, 1913, p. 170; and 1912, p. 388, pl. xv, figs. 16, 19.
L. acuticosta Reuss.—Sidebottom, 1913, p. 171.
L. hexagona (Williamson). Several forms present.—Sidebottom, 1913, p. 171.
L. sulcata (Walker and Jacob).—Sidebottom, 1913, p. 172. Apiculate forms likewise occur.
L. plumigera Brady.—Sidebottom, 1913, p. 173.
L. gracilis Williamson. Various forms.—Sidebottom, 1913, p. 173.
L. semistriata Williamson.—Sidebottom, 1913, p. 174.
L. crenata Parker and Jones, var.—Sidebottom, 1913, p. 174.
L. stelligera Brady, var. *eccentrica* Sidebottom. Compressed form.—Sidebottom, 1913, p. 175.
L. striato-punctata Parker and Jones. Several forms.—Sidebottom, 1913, p. 175.
L. striato-punctata Parker and Jones, var. *spiralis* Brady.—Sidebottom, 1913, p. 176.
L. foveolata Reuss. Sculpture of the test exceedingly fine.—Sidebottom, 1913, p. 177.
L. foveolata Reuss, var.—Sidebottom, 1913, p. 177; and 1912, p. 395, pl. xvi, figs. 16, 17.
L. lamellata Sidebottom.—Sidebottom, 1913, p. 177.
L. hertwigiana Brady.—Sidebottom, 1913, p. 178.
L. hertwigiana Brady, var. *undulata* Sidebottom.—Sidebottom, 1913, p. 178; and 1912, p. 397, pl. xvi, figs. 26–28.
L. spumosa Millett.—Sidebottom, 1913, p. 179.
L. spumosa Millett, var.—Sidebottom, 1913, p. 179; and 1912, p. 398, pl. xvi, fig. 30.
L. chasteri Millett (var.?).—Sidebottom, 1913, p. 180; and 1912, p. 398, pl. xvi, figs. 32–34.
L. lævigata (Reuss). Various forms, including *Fissurina oblonga* Reuss.—Sidebottom, 1913, p. 181.
L. lævigata (Reuss).—Sidebottom, 1913, p. 181, pl. xvi, fig. 5.
L. acuta (Reuss).—Sidebottom, 1913, p. 182.
L. lucida (Williamson).—Sidebottom, 1913, p. 183.
L. multicosta (Karrer).—Sidebottom, 1913, p. 183.
L. fasciata (Egger).—Sidebottom, 1913, p. 183.
L. staphyllearia (Schwager).—Sidebottom, 1913, p. 185.
L. quadrata (Williamson).—Sidebottom, 1913, p. 185.
L. marginata Walker and Boys. Several forms.—Sidebottom, 1913, p, 186.
L. marginata Walker and Boys, var. *striolata* Sidebottom.—Sidebottom, 1913, p. 188; and 1912, p. 408, pl. xviii, figs. 10, 11.
L. marginata-perforata Seguenza.—Sidebottom, 1913, p. 189.
L. wrightiana Brady.—Sidebottom, 1913, p. 189.

L. lagenoides (Williamson). Several forms.—Sidebottom, 1913, p. 190; and 1912, p. 411, pl. xviii, fig. 22.
L. formosa Schwager. Several forms.—Sidebottom, 1913, p. 191.
L. orbignyana (Seguenza). Several forms.—Sidebottom, 1913, p. 194.
L. orbignyana (Seguenza), var. *lacunata* Burrows and Holland.—Sidebottom, 1913, p. 194.
L. orbignyana (Seguenza), var. *walleriana* Wright.—Sidebottom, 1913, p. 195.
L. orbignyana (Seguenza), var. *clathrata* Brady.—Sidebottom 1913, p. 196.
L. bicarinata (Terquem), var.—Sidebottom, 1913, p. 197, pl. xvii, fig. 19.
L. auriculata Brady.—Sidebottom, 1913, p. 198; and 1912, p. 420, pl. xx, figs. 4, 7, 8, 13.
L. auriculata Brady, var. *circumcincta* Sidebottom. — Sidebottom, 1913, p. 199.
L. auriculata Brady, var. *clypeata* Sidebottom.—Sidebottom, 1913, p. 199.
L. auriculata Brady, var.—Sidebottom, 1913, p. 199, pl. xviii, fig. 6.
L. fimbriata Brady.—Sidebottom, 1913, p. 201.
L. protea Chaster.—Sidebottom, 1913, p. 203.
L. invaginata Sidebottom.—Sidebottom, 1913, p. 204, pl. xviii, fig. 13.
Eighteen occur. I omitted to record the specimens from this station in the 1913 report.

Sub-family **Nodosarinæ**.

Nodosaria Lamarck.

Nodosaria (*Glandulina*) *lævigata* d'Orbigny.

"*Cornu Hammonis erectum globosius*" Plancus, 1739, Conch. Min., p. 16, pl. ii, fig. 3.
N. (*Gl.*) *lævigata* d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 252, pl. x, figs. 1–3.
N. (*Gl.*) *lævigata* Brady, 1884, Chall. Rept., p. 490, pl. lxi, figs. 20–22.

One large and three small specimens.

Nodosaria calomorpha Reuss.

Nodosaria calomorpha Reuss, 1865, Denkschr. d. k. Akad. Wiss. Wien., vol. xxv, p. 129, pl. i, figs. 15–19.
N. calomorpha Brady, 1884, Chall. Rept., p. 497, pl. lxi, figs. 23–27.

Most of the tests are slightly curved, and consist of from three to five transparent chambers.

Nodosaria radicula (Linné). (Pl. III, figs. 23–25.)

"*Cornu Hammonis erectum*" Plancus, 1739, Couch. Min., p. 14, pl. i, fig. 5.
Nodosaria radicula Haensler, 1890, Abhandl. schweiz. pal. Gesell., vol. xvii, p. 92, pl. xiii, figs. 41–45, 47, 48, 50, and pl. xiv, figs. 3, 4.
N. radicula Brady, 1884, Chall. Rept., p. 495, pl. lxi, figs. 28–31.

The specimens are unsatisfactory, the chambers varying very much, as will be seen from the figures. They appear to be in the microspheric condition. Fig. 23 is not far from Haensler's illustration of *Glandulina lævigata* in the above reference, pl. xiii, fig. 62.

Nodosaria radicula (Linné), dentaline form. (Pl. IV, figs. 1–5.)

This form, which I have found at several localities, has puzzled me for a long time. I have sent specimens to various authorities and obtained different opinions regarding them. Most of the tests are transparent, the others slightly clouded. I am treating them as a dentaline form of *N. radicula*. *Dentalina obesa* Costa, 1856 (Atti. Accad. Pontaniana, vol. vii, fasc. 2, pl. xxvii, fig. 13, not described) agrees best with my specimens. Excellent examples occur at Darval Bay, lat. 4° 11′ N.; long. 118° 37′ E.; 315 fms.

Nodosaria simplex Silvestri.

Nodosaria simplex Silvestri, 1872, Nodos. Foss. e Viv. d'Ital., p. 95, pl. xi, figs. 268–272.
N. simplex Brady, 1884, Chall. Rept., p. 496, pl. lxii, fig. 4, 5, 6 (?).

A single typical example.

Nodosaria sp.? (Pl. IV, fig. 6.)

The tests are slender. The orifice is phialine in those specimens which have a perfect final chamber. There are no signs of spines, but the surface of the last two segments is roughened in several examples. It is possible this may be a nude form of *sagrina virgula* which is often without the uvigerine segments. Somewhat similar forms are: *N. egregia* Franzenaw (Math. természs értesitö, 1889. vol. vii, p. 253, pl. 4, fig. 7), and *N. annulifera* Gümbel (Abh. m-pl. Cl. k-bayer. Ak. Wiss. x. 1868 (1870), p. 614, pl. i, fig. 21).

Nodosaria pyrula d'Orbigny.

Nodosaria pyrula d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 253, No. 13.
N. pyrula Williamson, 1858, Rec. Foram. Gt. Br., p. 17, pl. ii, fig. 39.

There are fairly long fragments of well-developed specimens.

EXPLANATION OF PLATE IV.

FIGS.
1–5.—*Nodosaria radicula* (Linné), dentaline form. × 50.
6.—*Nodosaria* sp. (?). × 75.
7.—*N.* (*D*) *pauperata* d'Orbigny. × 25.
8, 9.—*N. catenulata* Brady. × 50.
10, 11.—*N.* (*D*) *obliquestriata* Reuss. Fig. 10 × 25. Fig. 11 × 50.
12, 13.—*N. raphanistrum* (Linné). × 50.
14, 15.—*Frondicularia spathulata* Brady. Fig. 14 × 50. Fig. 15 × 75.
16, 17.—*F. pacifica* sp. n. Fig. 17, oral view. × 50.
18.—*F. nitida* Terquem, var. × 75.
19.—*F. tenera* (Bornemann). × 75.
20–25.—*Rhabdogonium carinatum* sp. n. Fig. 21, oral view. × 50.
26–31.—*Marginulina glabra* d'Orbigny. × 50.

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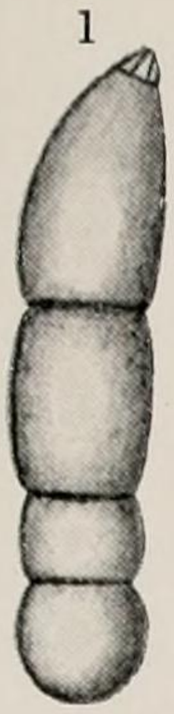

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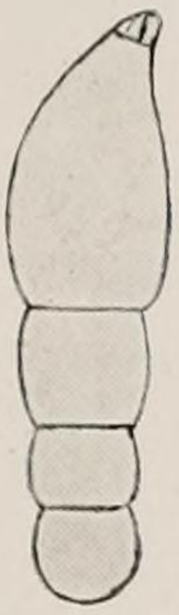

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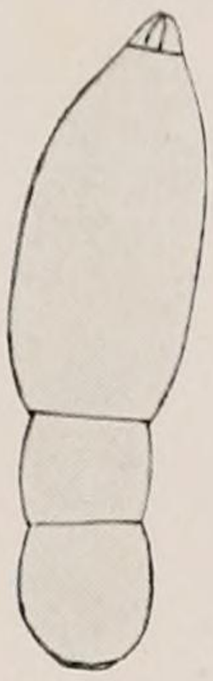

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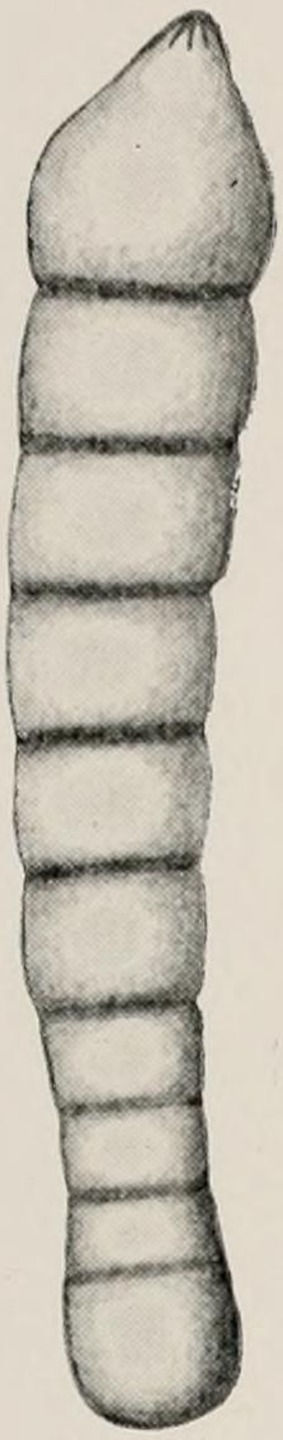

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14 *b*

14 *a*

15

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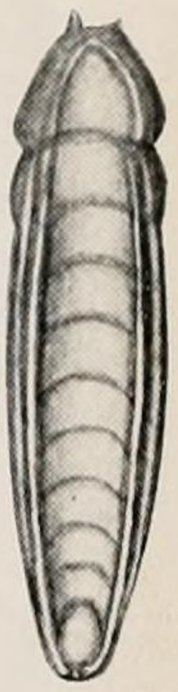

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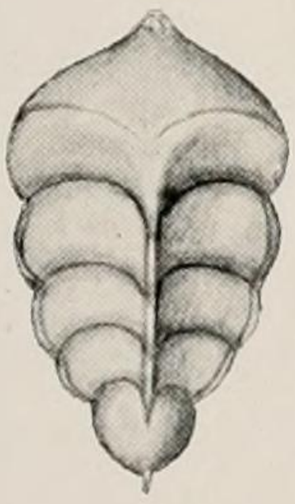

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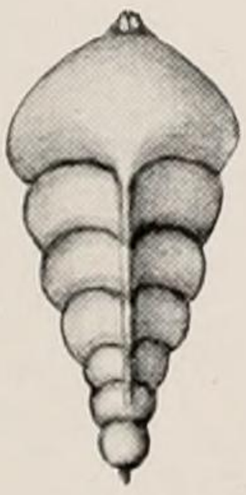

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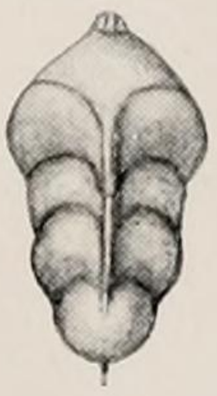

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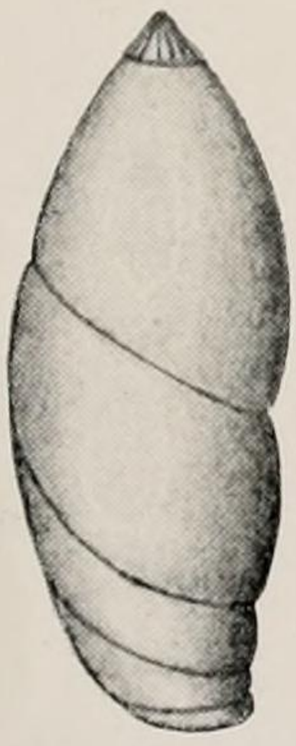

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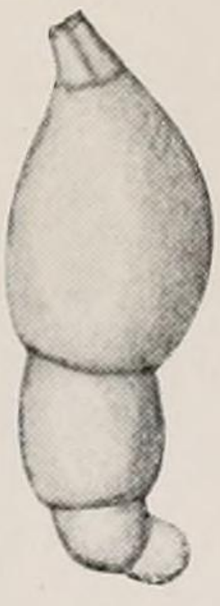

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H. Sidebottom, del. ad. nat.

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Nodosaria soluta Reuss.

Nodosaria (D) soluta Reuss, 1851, Zeitschr. d. deutsch. geol. Gesellsch., vol. iii, p. 60, pl. iii, fig. 4.
N. soluta Brady, 1884, Chall. Rept., p. 503, pl. lxii, figs. 13–16.

Two large fragments, and one of fair size.

Nodosaria inflexa Reuss.

Nodosaria inflexa Reuss, 1866, Denkschr. d. k. Akad. Wiss. Wien, vol. xxv, p. 131, pl. ii, fig. 1.
N. inflexa Reuss, 1870, Sitzungsb. d. k. Ak. Wiss. Wien, vol. lxii, p. 472, No. 16; Schlicht, 1870, Foram. Pietzpuhl, pl. xxxviii, fig. 3.
N. inflexa Brady, 1884, Chall. Rept., p. 498, pl. lxii, fig. 9.

A single test, very near to the "Challenger" figure.

Nodosaria (D) farcimen (Soldani).

"*Orthoceras Farcimen*" Soldani, 1791, Testaceographia, vol. i, pt. ii, p. 98, pl. cv, fig. *o*.
Nodosaria farcimen, Brady, 1884, Chall. Rept., p. 498, pl. lxii, figs. 17, 18.

Two capital examples, similar to the "Challenger" form, fig. 18; also a fragment, consisting of five chambers, which more nearly resembles Soldani's figure.

Nodosaria (D) communis d'Orbigny.

Nodosaria (D) communis d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 254, No. 35.
N. communis Brady, 1884, Chall. Rept., p. 504, pl. lxii, figs. 19–22.

The best examples are very near to those figured in the Chall. Rept., although one or two have a tendency towards *N. roemeri*. There are also several slender tests which may be brought under this heading.

Nodosaria (D) pauperata d'Orbigny. (Pl. IV, fig. 7.)

Dentalina pauperata d'Orbigny, 1846, For. Foss. Vien, p. 46, pl. i, figs. 57, 58.
N. pauperata Brady, 1884, Chall. Rept., p. 500, woodcuts, fig. 14, *a*, *b*, *c*.

Good examples occur. Several have a tendency towards *N. roemeri* in the later chambers. One large test (fig. 7) has the initial chamber inflated and the shell slightly compressed for a short distance. I have a similar specimen from the "Challenger" Station No. 3.

Nodosaria (D) filiformis d'Orbigny.

"*Orthoceratia filiformia aut capillaria*" Soldani, 1798, Testaceographia, vol. ii, p. 35, pl. x, fig. *e*.
Nodosaria filiformis d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 253, No. 14.
N. (D) filiformis Brady, 1884, Chall. Rept., p. 500, pl. lxiii, figs. 3–5.

A long example and two shorter ones. They tend towards *N. consobrina*, var. *emaciata* Reuss. The sutures are horizontal.

Nodosaria (D) roemeri Neugeboren.

Dentalina roemeri Neugeboren, 1856, Denkschr. d. k. Akad. Wiss. Wien, vol. xii, p. 82, pl. ii, figs. 13–17.
Nodosaria roemeri Flint, 1899, Rept. U.S. Nat. Mus. for 1897 (1899), p. 310, pl. lvi, fig. 2.
N. (D) roemeri Brady, 1884, Chall. Rept., p. 505, pl. lxiii, fig. 1.

A fine example, agreeing with the "Challenger" illustration; and two others not so long, but stouter.

Nodosaria (D) mucronata (Neugeboren).

"*Orthoceras intortum*" Soldani, 1791, Testaceographia, vol. i, pt. ii, p. 98, pl. cv, fig. 5.
Nodosaria (D) obliqua d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 254, No. 36, Modèle No. 5.
Dentalina mucronata Neugeboren, 1856, Denkschr. d. k. Akad. Wiss. Wien, vol. xii, p. 83, pl. iii, figs. 8–11.

Two occur, one of which is apiculate.

Nodosaria catenulata Brady. (Pl. IV, figs. 8–9.)

Nodosaria catenulata Brady, 1884, Chall. Rept., p. 515, pl. lxiii, figs. 32–34.

Three fragments, two having four chambers.

They are not typical, the chambers being farther apart than is shown in the "Challenger" illustrations, but the four costæ are present, bridging the depressions between the segments. Fig. 8 is from the specimen that has the segments most widely separated. Fig. 9 is more typical.

Nodosaria vertebralis (Batsch).

Nutilus (Orthoceras) vertebralis Batsch, 1791, Conchyl. des Seesandes, p. 3, No. 6, pl. ii, fig. 6, *a*, *b*.
Nodosaria vertebralis Flint, 1899, Rept. U.S. Nat. Mus. for 1897, p. 312, pl. lvii, fig. 5.
N. vertebralis Brady, 1884, Chall. Rept., p. 514, pl. lxiii, fig. 35; pl. lxiv, figs. 11–14.

Three occur. The final chambers are more or less inflated and without decoration.

Nodosaria scalaris (Batsch).

Nautilus (Orthoceras) scalaris Batsch, 1791, Conchyl. des Seesandes, No. 4, pl. ii, fig. 4, *a*, *b*.
Nodosaria scalaris Brady, 1884, Chall. Rept., p. 510, pl. lxiii, figs. 28–31; var. pl. lxiv, figs. 16–19.

Six occur. Only one has three chambers, the rest being in the bilocular condition. Four have the embryonal chamber smaller than the one following. Millett, in his Malay Rept. Journ. R. Micr. Soc., 1902, p. 520, draws attention to the fact that the multilocular forms have the embryonal chamber sometimes smaller and sometimes larger than the next; and discusses the question as to

the probable relationship of both *N. proxima*, *O. silvestri*, and *N. simplex* Silvestri to *N. scalaris* Batsch.

Nodosaria raphanus (Linné).

"*Cornu Hammonis erectum striatum*" Plaucus, 1739, Conch. Min., p. 15, pl. i, fig. 6.
Nautilus raphanus Linné, 1767, Syst. Nat., 12th ed, p. 1164, No. 283.
Nodosaria raphanus Jones, Parker and Brady, 1866, Foram. Crag. Pal. Soc., p. 49, pl. i, figs. 4, 5, 22, 23.
N. raphanus Brady, 1884, Chall. Rept., p. 512, pl. lxiv, figs. 6–10.

A single, small specimen, similar to the "Crag" illustration, fig. 4.

Nodosaria hispida d'Orbigny.

"*Orthoceratia quasi hispida*" Soldani, 1798, Testaceographia, vol. ii, p. 15, pl. ii, fig. P.
Nodosaria hispida Brady, 1884, Chall. Rept., p. 507, pl. lxiii, figs. 10, 11, 12–16.

A single specimen, similar to the "Challenger" illustrations, pl. lxiii, figs. 10, 11.

Brady remarks that "it is difficult to say whether they are arrested individuals of the present species, or belong to one of the allied forms like *N. setosa* Schwager (Novara-Exped. geol. Theil, vol. ii, p. 218, pl. v, fig. 40), to which in some respects they bear greater resemblance."

Two examples similar to the "Challenger" fig. 12, and five fragments of tests resembling figs. 14, 15.

Nodosaria (D) obliquestriata Reuss. (Pl. IV, figs. 10, 11.)

Dentalina obliquestriata Reuss, 1851, Zeitsch. Deutsch. Geol. Gesell., vol. iii, p. 63, pl. iii, figs. 11, 12.
Dentalina obliquestriata Jones, Parker and Brady, 1866, Foram. Crag. Pal. Soc., vol. xix, p. 56, pl. i, fig. 19.

This is an interesting variety of *N. (D) obliqua*. As will be noticed in the illustration, the obliquity of the striæ is lost in the final chamber.

Two found, of which one is imperfect.

Nodosaria raphanistrum (Linné). (Pl. IV, figs. 12, 13.)

Nautilus raphanistrum Linné, 1767, Syst. Nat., 12th ed, p. 1163, No. 282.
Dentalina subarcuata, var. *jugosa* (*parte*) Williamson, 1858, Rec. For. Gt. Br., p. 20, pl. ii, fig. 44.
Nodosaria raphanistrum Jones, Parker and Brady, 1866, Foram. Crag. Pal. Soc., p. 50, pl. i, figs. 6–8.

This is a rare form in the recent condition. It is apparently fragile. Seven fragments occur, five of which have the initial chamber intact. In some there is a dark band showing just above the sutures.

Lingulina d'Orbigny.

Lingulina pellucida Sidebottom.

Lingulina pellucida Sidebottom, 1904, etc., Rept. Rec. For. Delos. Manchester Memoirs, 1907, vol. li, No. 9, p. 4, pl. i, figs. 22–25.
L. pellucida Heron-Allen and Earland, 1913, Clare Island Survey, Proc. Roy. Irish. Acad., pt. 64, Forams., p. 96, pl. viii, fig. 10.
L. pellucida Sidebottom, 1910, Rep. Rec. For. Bay of Palermo, Manchester Memoirs, vol. liv, No. 16, p. 20.
L. pellucida Heron-Allen and Earland, 1916, Foram. South Cornwall, Journ. Roy. Micr. Soc., p. 47, pl. vii, fig. 4.

Two typical tests, one of which has three chambers. This species occurs also at Marseilles, and Heron-Allen and Earland report it at Noss Head in the Moray Firth.

Frondicularia Defrance. (Pl. IV, figs. 14, *a*, 14, *b*, 15.)

Frondicularia spathulata Brady.

Frondicularia spathulata Brady, 1879, Quart. Journ. Micr. Sci., vol. xix, p. 270, pl. viii, fig. 5.
F. spathulata Brady, 1884, Chall. Rept., p. 519, pl. lxv, fig. 18.
F. spathulata Sidebottom, 1904, etc., Rept. Rec. Foram. Isl. Delos, Mem. Proc. Manchester, Lit. Phil. Soc., 1907, vol. li, No. 9, p. 5, pl. i, fig. 26.
F. spathulata, 1910, Rept. Rec. For. Bay Palermo, Mem. Proc. Manchester Lit. Phil. Soc., vol. liv, No. 16, p. 21, pl. ii, fig. 22.

Fig. 14*a* is somewhat similar to the "Challenger" illustration of *Lingulina carinata*, pl. lxv, fig. 16, but the sutures of the earlier portion of the test are arched. The initial chamber is inflated, and the four following chambers are well flattened.

Fig. 15 has a continuous depression running down the centre of the test similar to the "Palermo" example in the above reference. Bruckmann (1904, Foram. der litanisch-kurischen Jura, pl. i, figs. 18, 19) figures specimens with depressions under the name *F. spatulata* Terquem, but the curving of the sutures is not the same as in the example I figure. Besides the above there are nine other tests, varying in minor details from fig. 14. Most of these are more compressed.

Frondicularia pacifica, sp. n. (Pl. IV, figs. 16, 17.)

Test compressed, chambers arched, sutures sunk. Initial chamber circular and inflated. Immediately above the initial chamber a depression commences, which is continued throughout the length of the test. The orifice is slightly produced and stellate. The edges of the test are rounded and lobulate. The chambers, as they are added, increase rather rapidly in width. The nearest published figure to this form appears to be *F. woodwardi* Howchin, 1895, Carb. Foram. Western Australia, p. 197, pl. x, fig. 4 (Rept. Aus. Ass. Sci., Adelaide, 1893, p. 366); but my specimen chiefly

differs in having the sutures sunk, and the central depression referred to above. Howchin remarks that his form "somewhat resembles *F. complanata* Defrance," and states in what way it differs. Mine, I think, is more nearly related to *F. spathulata* Brady.

A solitary example.

Frondicularia nitida Terquem, var. (Pl. IV, fig. 18.)

Frondicularia nitida Terquem, 1858, Mém. Acad. Imp. de Metz, vol. xxxix, p. 592, pl. i, fig. 9.
F. nitida Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc., 1902, p. 525, pl. xi, fig. 19.

This little specimen (Pl. IV, fig. 18), is nearer to Millett's example than to the original. It differs chiefly from Millett's in having the final chamber neither so large nor so much pointed. Another example is not quite so regular in outline, and a third is doubtful.

Frondicularia tenera (Bornemann). (Pl. IV, fig. 19.)

Lingulina tenera Bornemann, 1854, Lias von Göttingen, p. 38, pl. iii, fig. 24, *a–c*.
L. tenera Tate and Blake, 1876, Yorkshire Lias, p. 455, pl. xviii, figs. 15, 15*a*.
Frondicularia pupa Terquem and Berthelin, 1875, Mém. Soc. Géol. France, p. 26, pl. iii (xiii) fig. 1, *a–o*.
F. pupa Terquem, 1883, Cinquième Mém. Foram. Oolithique, p. 346, pl. xxxviii, fig. 7*a*, *b*.
F. millettii Brady, 1884, Chall. Rept., p. 524, woodcut fig. 16, *a*, *b*.

There are six tests on the slide, and I have chosen the largest one for illustration. The mouth is fractured, but it has evidently been circular. There are five costæ on either edge of the test. The remaining five specimens vary in size and in minor details. One is in the microspheric condition. I find that the curving of the sutures is best seen when the light falls directly down the test.

Messrs. Heron-Allen and Earland, in the above reference, state fully their reasons for placing this varying form under the name *F. tenera* Bornemann. I have a similar test from the "Challenger" St. 185, and also from Cebu, Philippine Islands, 120 fms.

Rhabdogonium Reuss.

Rhabdogonium tricarinatum (d'Orbigny).

Vaginulina tricarinata d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 258, No. 4, Modèle No. 4.
Rhabdogonium pyramidale Karrer, 1861, Sitzungbr. d. k. Ak. Wiss. Wien, vol. xvi, p. 19, pl. i, fig. 34.
R. tricarinatum Brady, 1884, Chall. Rept., p. 525, pl. lxvii, figs. 1–3.

Good examples occur, similar to the "Challenger" figures.

Rhabdogonium carinatum, sp. n. (Pl. IV, figs. 20–25.)

The test is triangular in cross-section, and the orifice is stellate and somewhat produced. The chambers are narrow and slightly embracing, and each successive chamber increases very little in height. The sutural depressions are arched. Each chamber is carinate at its angles. Sometimes the carination is continuous. The tests are transparent, and vary a good deal in outline. Probably both the megalospheric and microspheric forms are present.

Ten occur; one is very much malformed, and two are not carinate; these latter are probably immature. The specimens appear to be closely allied to Chapman's *Rhabdagonium tricarinatum* d'Orbigny, sp., var. *acutangulum* Reuss, var. (Journ. Roy. Micr. Soc., 1894, p. 159, pl. iv. fig. 8), and may prove to be nothing more than a local form. I have two examples of this form from the "Challenger" Station No. 185, Raine Island, one of which is identical with my fig. 20, and which I submitted to the late Mr Millett for his opinion. He wrote: "The clear shelled *Rhabdogonium* is a splendid specimen, and you must figure it—Chapman gives something like it from the Gault, he calls it *acutangulum*, but I doubt if yours is that species."

I have also a specimen that I found in material received from the U.S. Nat. Museum, marked "U.S. steamer 'Albatross,' St. 2150; 382 fms., near Old Providence Island."

Fig. 25 is no doubt a young shell, and is somewhat similar to Reuss' *R. globiferum*, Sitz. d. k. Ak. Wiss. Wien., vol. xl, 1860, p. 201, pl. vii, fig. 6, and *R. pygmæum*, Denkschr. d. k. Ak. Wiss. Wien, vol. xxv, 1865, p. 138, pl. ii, fig. 32, and *R. pygmæum* (Reuss) Terquem, Ess. Anim. Plage Dunkerque, pt. i, 1875, p, 22, pl. 1, fig. 8.

Marginulina d'Orbigny.

Marginulina glabra d'Orbigny. (Pl. IV, figs. 26–31, and Pl. V, figs. 1 (?), 2, 3.)

Marginulina glabra d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 259, No. 6, Modèle, No. 55.
M. pedum d'Orbigny, 1846, For. Foss. Vien, p. 68, pl. iii, figs. 13, 14.
M. similis, d'Orbigny, 1846, For. Foss. Vien, p. 69, pl. iii, figs. 15, 16.
M. glabra, Flint, 1899, Rept. U.S. Nat. Mus. for 1897 (1899), p. 313, pl. lx, fig. 1.

One hesitates to add to the numerous figures of this species and its varieties, but the specimens I have figured are interesting as being recent examples, and I am bringing them all under the above heading. Other tests are more characteristic of the species.

Fig. 26 is not far removed from *M. subcrassa* Schwager, 1866,

Novara-Exped. Geol., p. 240, pl. vi, fig. 82, and *M. glabra* Fornasini, 1890, Mem. Acc. Sc. Bologna, ser. iv, vol. x, p. 470, fig. 29.

Fig. 28 is not far removed from *M. similis* d'Orbigny, fig. 15 in the above reference.

Figs. 29, 30, 31, 32(?) are somewhat similar in character to *M. bullata* Reuss, 1845–6, p. 29, pl. xiii, figs. 34–38; and to *M. subbullata* Hanken, 1875 (1876), A magy. Kir. földt. int. évkönyve, p. 39, pl. iv, figs. 9, 10, and pl. v, fig. 9; and *M. glabra* Terrigi, 1891, Mem. Reg. Com. Geol. d'Ital. vol. iv, p. 93, pl. iii, fig. 5.

Fig. 1, Pl. V may be a malformed test or a "cluster" of *Lagena globosa*.

Figs. 2, 3, Pl. V. The nearest figures to these that I can find are *Glandulina aduncа* Costa, 1856, Atti Accad. Pontaniana, vol. vii, p. 128, pl. xi, fig. 24; *Psecadium ovatum* Seguenza, 1880, Atti. R. Acc. Lincei, vol. vi, p. 139, pl. xiii, fig. 8.

A few very small tests occur, which I am also placing under *M. glabra*.

Vaginulina d'Orbigny.

Vaginulina legumen (Linné).

Nautilus legumen Linné, 1788, Syst. Nat., p. 3373, No. 22, ed. xiii.
Vaginulina legumen Brady, 1884, Chall. Rept., p. 530, pl. lxvi, figs. 13–15.

A single, long, narrow specimen.

Vaginulina costata (Cornuel). (Pl. V, figs. 4, 5.)

Planularia costata Cornuel, 1848, Mém. Soc. Géol. France, Sér. 2*a*, vol. iii, p. 253, pl. ii, figs. 5–8.
Vaginulina patens Brady, 1884, Chall. Rept., p. 533, pl. lxvii, figs. 15, 16.
V. costata Silvestri, 1904, Atti della Pont. Acc. Rom. dei Nuovi lincei Lincei, anno lvii, p. 142, woodcuts 3, *a–d*.
V. costata Chapman, 1907, Rec. For. Victoria, p. 130, pl. 9, fig. 10.

The three specimens found agree best, as regards outline, with Chapman's figure in the above reference. They are in good condition. The sutures appear to be limbate. The initial chamber is inflated, but when viewed with the light falling directly down the test it has the appearance of being grooved (see fig. 4).

Chapman and Silvestri bring *V. patens* Brady under *V. costata* Cornuel, and my examples appear to me to be nearer to theirs than to Brady's *V. patens*. In my cabinet I have two specimens from Raine Island, which have the sides of the test more nearly parallel than those of the "Challenger" examples.

Vagulina rheophagica sp. n. (Pl. V, figs. 6, 7.)

Test elongate, slightly compressed and curved. Each segment bears four costæ, two on either side. The segments appear to be bottle-

shaped, with rounded base and produced neck. The neck of each segment is longer than that of the one preceding it. Each segment is fitted on to the back of the preceding one in such a manner as to conceal the produced neck of the latter when viewed from the back of the test. On the lateral sides of the initial chamber there is a short costa. Sutures oblique and deeply sunk, orifice marginal.

Only one occurs. In some respects the specimen bears a resemblance to Chapman's *Vaginulina neocomiana*, Quart. Journ. Geo. Soc., 1894, p. 711. pl. xxxiv., figs. 10, 11, but the description of his species shows that there are marked differences between the two forms.

Cristellaria Lamarck.

Cristellaria crepidula (Fichtel and Moll).

Nautilus crepidula Fichtel and Moll, 1803, Test. Micr., p. 107, pl. xix, figs. *g–i*.
Cristellaria crepidula d'Orbigny, 1839, Foram. Cuba, p. 64, pl. viii, figs. 17, 18.
C. crepidula Flint, 1899, Rept. U.S. Nat. Mus. for 1897 (1899), p. 316, pl. lxiii, fig. 2.

There are twenty-two tests, which I have brought together under the above heading. They are small, with the exception of two or three. Several are typical. One clearly resembles *C. crepidula* d'Orbigny in the above reference, but has fewer chambers. Intermediate forms are present, linking this species to *C. schloenbachi* Reuss, 1862, Sitzungsb. d. k. Ak. Wiss. Wien., vol. xlvi, p. 65, pl. vi, figs. 14, 15.

Cristellaria tenuis (Bornemann).

Marginulina tenuis Bornemann, 1855, Zeitschr. d. deutsch. geol. Gesellsch., vol. vii, p. 326, pl. xiii, fig. 14.
C. tenuis Brady, 1884, Chall. Rept., p. 535, pl. lxvi, figs. 21–23.
C. tenuis Flint, 1899, Rept. U.S. Nat. Mus. for 1897 (1899), p. 315, pl. lxi, fig. 2.

A single, excellent example.

Cristellaria latifrons Brady.

Cristellaria latifrons Brady, 1884, Chall. Rept., p. 544, pl. lxviii, fig. 19; and pl. cxiii, fig. 11.

The two tests found are not typical; they are more compressed than the type-form. One has the orifice at the end of a produced neck, and the other has probably been in the same condition, but it is fractured. They represent, I think, a weak form of the above species.

I have typical examples of this rare species from Cebu, Philippine Islands, 120 fms.

Cristellaria variabilis Reuss. (Pl. V, fig. 8.)

Cristellaria variabilis Reuss, 1850, Denkschr. d. k. Akad. Wiss. Wien., vol. i, p. 369, pl. xlvi, figs. 15, 16.
C. variabilis Brady, 1884, Chall. Rept., p. 541, pl. lxviii, figs. 11–16.
C. variabilis Heron-Allen and Earland, 1916, Foram. West of Scotland, Trans. Linn. Soc. London, vol. xi, pt. 13, p. 263.

Beautiful specimens occur, both in the young and adult stage. The carinate variety is similar to the "Challenger" examples. The non-carinate is elongate and much narrower than the other variety, also the initial portion is smaller. This may possibly be the microspheric form. Twelve of the carinate and nine of the non-carinate variety were found.

Cristellaria articulata Reuss.

Robulina articulata Reuss, 1863, Sitzungsb. d. k. Akad. Wiss. Wien., vol. xlviii, p. 53, pl. v, fig. 62.
Cristellaria articulata Reuss, 1870, Sitzungsb. d. k. Akad. Wiss. Wien., vol. xlviii, p. 483; Schlicht, Foram. Pietzpuhl., 1870, pl. xvii, figs. 5–12.
C. articulata Brady, 1884, Chall. Rept., p. 547, pl. lxix, figs. 1–4, 10–12.

One only found, and it is of the wild, growing variety, having two angular chambers in the linear series. The specimen is small and carries a small keel as far as the commencement of the upright chambers.

Cristellaria acutauricularis (Fichtel and Moll).

"*Hammoniæ subrotundæ*," etc., Soldani, 1879, Testaceographia, vol. i, pt. i, p. 61, pl. xlix, fig. x.
Nautilus acutauricularis Fichtel and Moll, 1803, Test. Micr., p. 102, pl. xviii, figs. *g–i*.
Cristellaria acutauricularis Flint, 1899, Rept. U.S. Nat. Mus., for 1897, p. 316, pl. lxiii. fig. 5.

Three occur. The smallest is near to the "Challenger" figure, the other two are broader and more heavily built.

Cristellaria dentata Karrer(?). (Pl. V, fig. 9.)

Cristellaria dentata Karrer, 1867, Sitzungsb. d. k. Ak. Wiss. Wien., vol. lv, p. 348, pl. i, fig. 1.
C. dentata Brady, 1884, Chall. Rept., p. 540, pl. cxiii, fig. 12.

Although my drawing bears a strong likeness to Chapman's *C. tricarinella*, 1909, Rept. Foram. Sub-antarctic Islands, New Zealand, p. 343, pl. xvi, fig. 3, it seems to me to be better placed under *C. dentata*, with a query against it. The test, however, is keelless, and may be an immature specimen. Except in the matter of the keel, it agrees almost perfectly with Brady's "Challenger" figure of *C. dentata*. The test is not flattened as in *C. tricarinella*, and when placed alongside of the many fine specimens I possess of the "Challenger" form of *C. tricarinella*, it can be seen at once that it differs from them in many respects.

Cristellaria echinata (d'Orbigny).

"*Nautili echinati sive Papillosi, & circumradiati*" Soldani, 1780, Saggio Oritt., p. 98, pl. i, fig. 6.; 1789, Testaceographia, vol. i, pt. i, p. 65, pl. lix, figs. *qq*, *rr*.
Cristellaria echinata Brady, 1884, Chall. Rept., p. 554, pl. lxxi, figs. 1–3.

One small example in poor condition.

Cristellaria convergens Bornemann.

Cristellaria convergens Bornemann, 1855, Zeitschr. d. deutsch. geol. Gesellsch., vol. vii, p. 327, pl. xiii, figs. 16, 17.
C. convergens Brady, 1884, Chall. Rept., p. 546, pl. lxix, figs. 6, 7.

One specimen is typical, and the other has a tendency towards *C. gibba* d'Orbigny.

Cristellaria rotulata (Lamarck).

Lenticulites rotulata Lamarck, 1804, Ann. Mus., vol. v, p. 188, No. 3; and 1806, vol. viii, pl. lxii, fig. 11.
Cristellaria rotulata Brady, 1884, Chall. Rept., p. 547, pl. lxix, fig. 13.

A few occur. They are rather stoutly built.

Cristellaria cultrata (Montfort).

Robulus cultratus Montfort, 1808, Conchyl. Systém, vol. i, p. 214, 54e genre.
Cristellaria cultrata Brady, 1884, Chall. Rept., p. 550, pl. lxx, figs. 4–8.

Excellent examples occur. A few have a tendency towards *C. orbicularis* (d'Orbigny).

There is one magnificent specimen, measuring about three-sixteenths of an inch in diameter.

Cristellaria orbicularis (d'Orbigny).

Robulina orbicularis d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 288, pl. xv, figs. 8, 9.
R. imperatoria d'Orbigny, 1846, For. Foss. Vien., p. 104, pl. 5, figs. 5, 6.
Cristellaria orbicularis Brady, 1884, Chall. Rept., p. 549, pl. lxix, fig. 17.

A single example.

Cristellaria crassa d'Orbigny.

Cristellaria crassa d'Orbigny, 1846, For. Foss. Vien., p. 90, pl. iv, figs. 1–3.
C. crassa Brady, 1884, Chall. Rept., p. 549, pl. lxx, fig. 1.

This solitary specimen is not typical, but, judging by the number of chambers and the thickness of the test, it appears to be nearer to *C. crassa* than to *C. gibba*.

Amphicoryne Schlumberger.

Amphicoryne bradyi (Silvestri).

"Intermediate specimen with Vaguline commencement and final Nodosarian chamber," Brady, 1884, Chall. Rept., explanation of plate, pl. lxvi, fig. 20.

Nodosariopsis bradii A. Silvestri, 1902, Atti Accad. Pontif. Nuovi Lincei, anno lv, p. 53.
Amphicoryne bradyi Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc., 1903, p. 260, pl. v, fig. 3.

Three typical tests occur. The spines on the final chamber are conspicuous.

Sub-family **Polymorphininæ.**

Polymorphina d'Orbigny.

Polymorphina amygdaloides (Reuss).

Globulina amygdaloides Reuss, 1851, Zeitschr. deutsch. geol. Gesell, vol. iii, p. 82, pl. vi, fig. 47.
Polymorphina amygdaloides Reuss, 1855, Sitzungsb. k. Akad. Wiss. Wien, vol. xviii, p. 250, pl. viii, fig. 84.

One found.

Polymorphina lactea, var. *oblonga* Williamson.

Polymorphina lactea (W. and J.), var. *oblonga* Williamson, 1858, Rec. Foram. Gt. Britain, p. 71, pl. vi, fig. 149.

Four occur, three of which are small.

Polymorphina regina Brady, Parker and Jones.

Polymorphina regina Brady, Parker and Jones, 1870, Trans. Linn. Soc., vol. xxvii, p. 241, pl. xli, fig. 32.
P. regina Brady, 1884, Chall. Rept., p. 571, pl. lxxiii, figs. 11–13.

A single, small specimen.

Polymorphina acuminata (d'Orbigny). (Pl. V, figs. 10–11.)

Pyrulina acuminata d'Orbigny, 1840, Mém. Soc. Géol. Fr., vol. iv, p. 43, pl. iv, figs. 18, 19.
Atractolina, sp. von Schlicht, 1869, Foram. Septar. Pietzpuhl, p. 70, No. 397, pl. xxv, figs. 9, 10.
Pyrulina, sp. id. ibid., No. 422, pl. xxv, fig. 53.
Polymorphina acuminata Brady, Parker and Jones, 1870, Trans. Linn. Soc., vol. xxvii, p. 219, pl. xxxix, fig. 4.

There are eight tests on the slide, and, although not quite typical, I think they may be brought under the above heading. All are pointed at the base, except one, which happens to be fractured, and four taper to a point at the upper portion of the shell. They are, however, not so symmetrically built up as in the type-form. With two exceptions, the way in which the final chamber is set on causes the test to be slightly lobsided.

It is possible that this variety may be related to some of the forms which are more or less pointed at both ends, and figured in von Schlicht's work. Brady, Parker, and Jones state in the above

reference that "although it is probable that *P. acuminata* might be found wherever *P. gutta* occurs, it is, so far as our present knowledge goes, a rare species, and, like its close ally, unknown in a recent condition." It may be that the former is the microspheric and the latter the megalospheric form.

Polymorphina gutta d'Orbigny. (Pl. V, fig. 12.)

Polymorphina (*Pyrulina*) *gutta* d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 267, No. 28, pl. xii, figs. 5, 6, Modèle No. 30.
P. gutta Jones, Parker and Brady, 1866, Monogr. Crag. Foram. Pal. Soc., vol. xix, p. 256, pl. i, figs. 46, 47.
Rostrolina, sp. von Schlicht, 1869, Foram. Septar. Pietzpuhl., p. 72, Nos. 408, 409, 411, pl. xxvi, figs. 1–6, 10–12.
Pyrulina, sp. id. ibid, Nos. 423, 424, pl. xxv, figs. 55, 56; pl. xxvii, figs. 13–15.
Polymorphina gutta Brady, Parker and Jones, 1870, Trans. Linn. Soc., vol. xxvii, p. 218, pl. xxxix, fig. 3.

If I am right as regards *P. acuminata*, most likely I am also right in putting these forms under *P. gutta*, as Brady, Parker and Jones speak of their probable association. There are four tests, two of which are rather stouter in build than the others.

Polymorphina, sp. *Fistula* form.

There is a single specimen of fair size. The inflated, fistulose chamber is roughly globular and spinous, with a few straight tubular processes also covered with minute spines. The body of the test, which is only half revealed, is nearly round in section; the chambers are only very slightly inflated, and they also bear numerous short, fine spines.

EXPLANATION OF PLATE V.

FIGS.

1 (?), 2, 3.—*Marginulina glabra* d'Orbigny. × 50.
4, 5.—*Vaginulina costata* (Cornuel). × 75.
6, 7.—*V. rheophagica* sp. n. Fig. 6, lateral view. Fig. 7, back view.
8.—*Cristellaria variabilis* Reuss. × 50. Non-carinate form.
9.—*C. dentata* Karrer (?). × 75.
10, 11.—*Polymorphina acuminata* d'Orbigny. × 50.
12.—*P. gutta* d'Orbigny. × 50.
13, 14.—*Polymorphina* (?) *complexa* Sidebottom. Fig. 14, oral view. × 50.
15, 16.—*Dimorphina millettii*. Fig. 16 is drawn from a Seychelles Island specimen. × 50.
17.—*D. lingulinoides* Millett. × 75.
18–22.—*D. nodosaria* d'Orbigny. × 50.
23.—*Uvigerina porrecta* Brady, var. *fimbriata* var. nov. × 75.
24.—*Sagrina columellaris* Brady. × 50.
25–27.—*Globigerina dutertrei* d'Orbigny (?) Fig. 25, superior view. Fig. 26, inferior view. Fig. 27, edge view. × 75.
28, 29.—*Spirillina denticulo-granulata* Chapman, var. Fig. 28, superior view. Fig. 29, inferior view. × 75.


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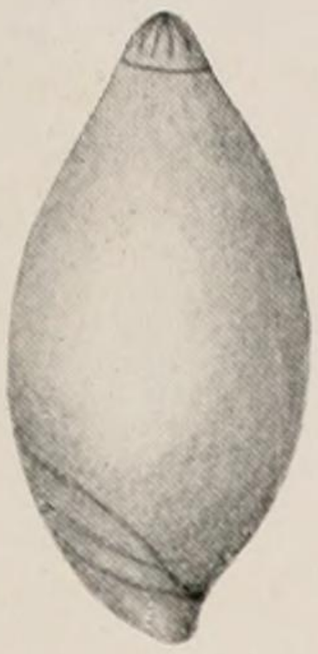
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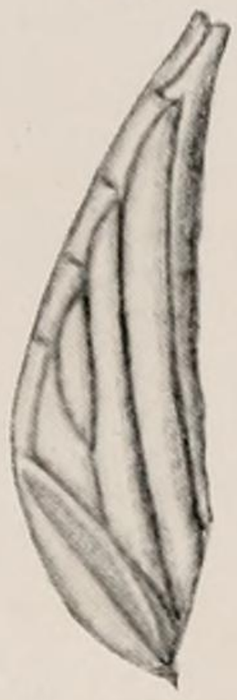
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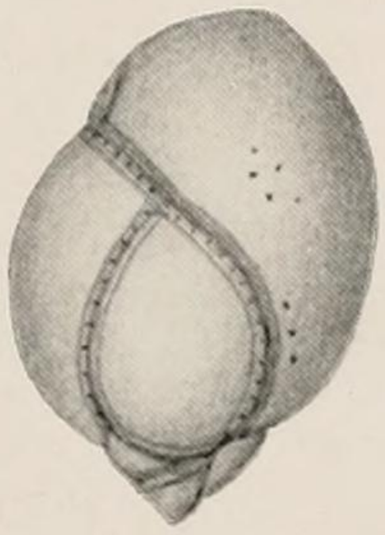
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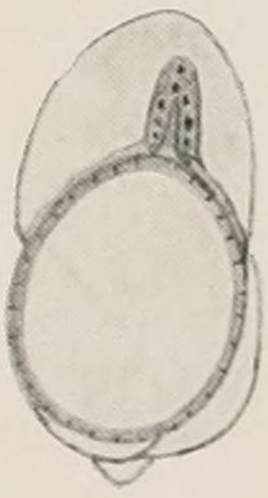
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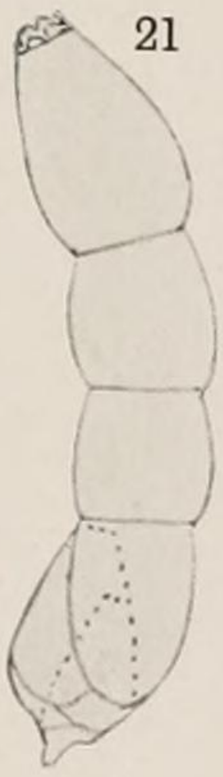
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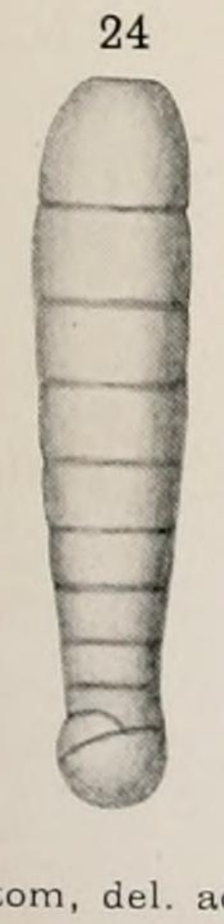
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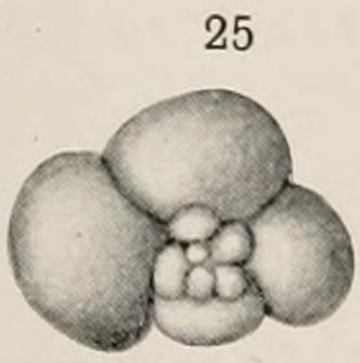
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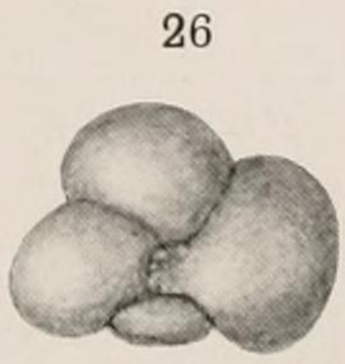
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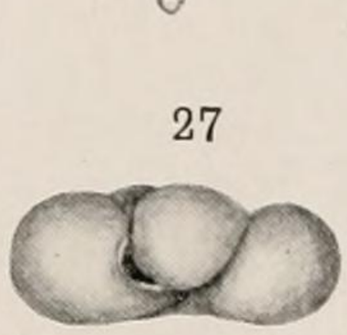
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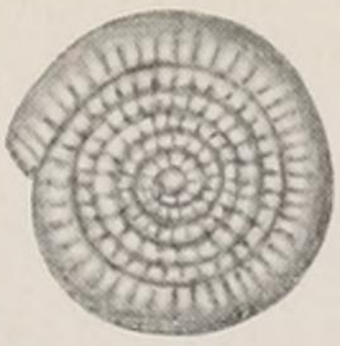
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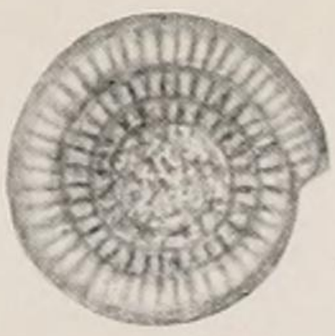
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H. Sidebottom, del. ad. nat.

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Polymorphina (?) *complexa* Sidebottom. (Pl. V, figs. 13, 14.)

Polymorphina (?) *complexa* Sidebottom, 1904–1909, Rept. Rec. Foram. Isl. Delos. Mem. Proc. Manchester Lit. Phil. Soc., 1907, vol. li, No. 9, p. 16, pl. iv, figs. 1–9, and p. 16, figs. in text, 3–7.
P. complexa Sidebottom, 1910, Rept. Rec. Foram. Bay of Palermo, Sicily, Mem. Proc. Lit. Phil. Soc. Manchester, vol. liv, No. 16, p. 22.
P. complexa Heron-Allen and Earland, 1915, Foram. Kerimba Archipelago, Trans. Zool. Soc. London, vol. xx, pt. xvii, p. 673, pl. li, figs. 1–3.
P. complexa Heron-Allen and Earland, 1916, Foram. South Coast, Cornwall, Journ. Roy. Micr. Soc., p. 48, pl. viii, figs. 5–7.

A solitary specimen, well-developed and typical. It is curious that single specimens of this species have been found at various localities, Heron-Allen and Earland reporting odd examples from four stations in the Kerimba Archipelago, and from the coast of Cornwall.

Dimorphina d'Orbigny.

Dimorphina millettii, sp. n. (Pl. V, figs. 15, 16.)

Polymorphina lactea, var. *oblonga* (Williamson), Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc., 1903, p. 262, pl. v, fig. 5.

With regard to this form, Millett writes in the above reference as follows:—"The example figured well represents the normal form with the exception that it possesses a supplementary chamber of a Nodosarian character. This is evidently a monstrosity, otherwise the specimen would have to be assigned to the genus *Dimorphina*. This chamber appears to have nothing in common with the fistulose extraneous growths so frequently found in the *Polymorphina* generally, but rare or unknown in the examples from the Malay Archipelago."

This solitary specimen has the added chamber bent to one side, as seen in fig. 15. I have broken the test, but luckily the drawing was made before the accident occurred. Fig. 16 is from a Seychelles Island specimen.

As I have also found four excellent examples from Mahé Harbour, Seychelles Islands, 14 fms., it is evident that this form is not a monstrosity, and must be assigned, as Millett said, to the genus *Dimorphina*, so I name it after my old friend.

Dimorphina lingulinoides Millett. (Pl. V, fig. 17.)

Dimorphina lingulinoides Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc., 1903, p. 266, pl. v, fig. 6.
D. (?) *lingulinoides* Chapman, 1910, Foram. Funifuti, Journ. Linn. Soc., vol. xxx, p. 414.

Except that the orifice is not quite typical, the specimen agrees well with Millett's description and figure. I think the aperture is a short slit, with the central opening slightly oval.

Dimorphina nodosaria d'Orbigny. (Pl. V, figs. 18–22.)

Dimorphina nodosaria d'Orbigny, 1846, Foram. Foss. Vienne, p. 221, pl. xii, figs. 21, 22.

The tests are in excellent condition, some of them quite transparent; but even in these latter ones I am not able to indicate in the drawings all the chambers of the polymorphine commencement. The specimens are curved and round in section, and all are in the microspheric condition. I am of opinion that they are closely related to, if not identical with, those I have described (and figured) under *Nodosaria radicula*, dentaline form. I have excellent examples of both forms from Darvel Bay, lat. 4°. 11″ N., long. 118° 37″ E., 315 fms. Some of the specimens of the two forms are practically identical apart from the polymorphine commencement.

Uvigerina d'Orbigny.

Uvigerina pygmæa d'Orbigny.

Uvigerina pygmæa d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 269, pl. xii, figs. 8, 9, Modèle No. 67.
U. pygmæa Brady, 1884, Chall. Rept., p. 575, pl. lxxiv, type, figs. 11, 12; Elongate variety, figs. 13, 14.

Two or three are typical, the rest lying between *U. pygmæa* and *U. aculeata*.

Uvigerina aculeata d'Orbigny.

Uvigerina aculeata d'Orbigny, 1846, For. Foss. Vien, p. 191, pl. xi, figs. 27, 28.
U. aculeata Brady, 1884, Chall. Rept., p. 578, pl. lxxv, figs. 1, 2.

I have brought four specimens under this heading, three of which, however, have a tendency towards *U. pygmæa*.

Uvigerina asperula Czjzek.

Uvigerina asperula Czjzek, 1848, Haidinger's Naturwiss. Abhandl., vol. ii, p. 146, pl. xiii, figs. 14, 15.
U. asperula Brady, 1884, Chall. Rept., p. 578, pl. lxxv, figs. 6–8.

Two small examples. The spines are not well developed.

Uvigerina asperula, var. *ampullacea* Brady.

Uvigerina asperula, var. *ampullacea* Brady, 1884, Chall. Rept., p. 579, pl. lxxv, figs. 10, 11.
U. asperula, var. *ampullacea* Flint, 1899, Rept. U.S. Nat. Mus. for 1897 (1899), p. 320, pl. lxviii, fig. 5.

Capital examples occur. Some of them are more drawn out than the "Challenger" specimens, and all have the earlier chambers more compact.

Uvigerina interrupta Brady.

Uvigerina interrupta Brady, 1879, Quart. Journ. Micr. Sci., N.S., vol. xix, p. 274, pl. viii, figs. 17, 18.
U. interrupta Brady, 1884, Chall. Rept., p. 580, pl. lxxv, figs. 12–14.

Seven typical tests occur.

Uvigerina angulosa Williamson.

Uvigerina angulosa Williamson, 1858, Rec. Foram. Gt. Britain, p. 67, pl. v, fig. 40.
U. angulosa Brady, 1884, Chall. Rept., p. 576, pl. lxxiv, figs. 15–18.

The examples are rather short, and the triangular contour of the tests is not pronounced.

Uvigerina angulosa, var. *spinipes* Brady.

Uvigerina spinipes Brady, 1881, Quart. Journ. Micr. Sci., vol. xxi, N.S., p. 64.
U. angulosa, var. *spinipes* Brady, 1884, Chall. Rept., p. 577, pl. lxxiv, figs. 19, 20.

The tests are more elongate and less angular than in the species previously mentioned, and they occur more frequently.

Uvigerina porrecta Brady.

Uvigerina porrecta Brady, 1879, Quart. Journ. Micr. Sci., vol. xix, N.S., p. 274, pl. viii, figs. 15, 16.
U. porrecta Brady, 1884, Chall. Rept., p. 577, pl. lxxiv, figs. 21–23.

A single example.

Uvigerina porrecta Brady, var. *fimbriata*, var. nov.
(Pl. V, fig. 23.)

Test elongate; earlier chambers biserial and compact; later chambers subspiral, more or less distinct, interrupted, and alternating irregularly. Peripheral edges of the chambers angular and minutely serrate; surface free from markings; aperture situated in a produced tubular neck with everted lip.

This is an interesting variation. The test is transparent, and smaller than the type-form. The chambers are free from surface decoration.

Rather rare. The species occurs in the Dimor Sea, Java, 50 fms., also rare.

Uvigerina auberiana d'Orbigny, var. *glabra* Millett.

Uvigerina auberiana d'Orbigny, var. *glabra* Millett, 1898, etc., Foram. Malay Archipelago, Journ. Roy. Micr. Soc. 1903, p. 268, pl. v, figs. 8, 9.

U. auberiana (d'Orbigny), var. *glabra* Sidebottom, 1904, etc., Rec. Foram. Isl. Delos, Mem. Proc. Manchester Lit. and Phil. Soc. 1908, p. 2, pl. i, figs. 5, 6.
U. auberiana (d'Orbigny), var. *glabra* Sidebottom, 1910, Foram. Bay of Palermo, id. ibid., p. 23.
U. auberiana, var. *glabra* Heron-Allen and Earland, 1915, Foram. Kerimba Archipelago, pt. ii, Trans. Zool. Soc. London, vol. xx, pt. xvii, p. 674.

Short and long forms are present, the former being more stoutly built than the latter. Some of the specimens are slightly twisted, all are smooth.

Sagrina (d'Orbigny) Parker and Jones.

Sagrina columellaris Brady. (Pl. V, fig. 24.)

Sagrina columellaris Brady, 1881, Quart. Journ. Micr. Sci., N.S., vol. xxi, p. 64.
S. columellaris Brady, 1884, Chall. Rept., p. 581, pl. lxxv, figs. 15–17.
Siphogenerina glabra Schlumberger, 1883, Feuille Jeunes Nat., p. 118, pl. iii, fig. 1.

Fine specimens; both of the megalospheric and microspheric forms are present. Those in the microspheric condition are more frequent, and have the commencement of the test flattened and turned to one side. The initial chamber of the megalospheric form is large, as shown in the figure. The specimens are semi-transparent and show the syphon.

Sagrina dimorpha Parker and Jones.

Uvigerina (*Sagrina*) *dimorpha* Parker and Jones, 1865, Phil. Trans., vol. clv, p. 420, pl. xviii, fig. 18.
Sagrina dimorpha Brady, 1884, Chall. Rept., p. 582, pl. lxxvi, figs. 1–3.

Typical and in good condition.

Sagrina raphanus Parker and Jones.

Uvigerina (*Sagrina*) *raphanus* Parker and Jones, 1865, Phil. Trans., vol. clv, p. 364, pl. xviii, figs. 16, 17.
Sagrina raphanus Brady, 1884, Chall. Rept., p. 585, pl. lxxv, figs. 21–24.

A single small example occurs.

Sagrina virgula Brady.

Sagrina virgula Brady, 1879, Quart. Journ. Micr. Sci., N.S., vol. xix, p. 275, pl. viii, figs. 19–21.
S. virgula Brady, 1884, Chall. Rept., p. 583, pl. lxxvi, figs. 4–10.
S. virgula Heron-Allen and Earland, 1915, Foram. Kerimba Archipelago, pt. ii, Trans. Zool. Soc. London, vol. xx, pt. xvii, p. 676, pl. li, figs. 4, 5.

Some of the specimens are well developed, but the uvigerine initial chambers are wanting.

Sub-family **Ramulininæ.**

Ramulina Rupert Jones.

Ramulina globulifera Brady.

Ramulina globulifera Brady, 1879, Quart. Journ. Micr. Sci., vol. xix., N.S., p. 272, pl. viii, figs. 32, 33.
R. globulifera Brady, 1884, Chall. Rept., p. 587, pl. lxxvi, fig. 22–28.

Three large fragments and a small one.

Family GLOBIGERINIDÆ.

Globigerina d'Orbigny.

Globigerina bulloides d'Orbigny.

Globigerina bulloides d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 277, No. 1. Modèles Nos. 17 and 76.
G. bulloides Brady, 1884, Chall. Rept., p. 593, pl. lxxvii, pl. lxxix, figs. 3–7.

The forms figured in the Chall. Rept. (pl. lxxix, figs. 5–7) are present. Besides these there are small tests similar to fig. 5, of a rosy tint. Two other tests have some coarse spines on the earlier chambers.

Globigerina rubra d'Orbigny.

Globigerina rubra d'Orbigny, 1839, Foram. Cuba, p. 82, pl. iv, figs. 12–14.
G. rubra Brady, 1884, Chall. Rept., p. 602, pl. lxxix, figs. 11–16.

None of the specimens show signs of the colour from which they take their name.

Globigerina helicina d'Orbigny.

Globigerina helicina d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 277, No. 5.
G. helicina Brady, Chall. Rept., p. 605, pl. lxxxi, figs. 4, 5.
G. helicina Sidebottom, 1904, etc., Rept. Rec. Foram. Isl. Delos, Mem. Proc. Manchester Lit. Phil. Soc., 1908, p. 4, pl. i, fig. 9.

Three capital examples of this unsatisfactory species.

Globigerina dubia Egger.

Globigerina dubia Egger, 1857, Neues Jahrb. für Min., p. 281, pl. ix, figs. 7–9.
G. dubia Brady, 1884, Chall. Rept., p. 595, pl. lxxix, fig. 17.

The tests are rather more flattened than the "Challenger" specimens.

Globigerina sacculifera Brady.

Globigerina sacculifera Brady, 1884, Chall. Rept., p. 604, pl. lxxx, figs. 11–17; pl. lxxxii, fig. 4.

The examples are good.

Globigerina digitata Brady.

Globigerina digitata Brady, 1879, Quart. Journ. Micr. Sci., vol. xix, N.S., p. 286.
G. digitata Brady, 1884, Chall. Rept., p. 599, pl. lxxx, figs. 6–10 ; pl. lxxxii, figs. 6, 7.

There are a few good examples of this beautiful form.

Globigerina conglobata Brady.

Globigerina conglobata Brady, 1879, Quart. Journ. Micr. Sci., N.S., vol. xix, p. 286.
G. conglobata Brady, 1884, Chall. Rept., p. 603, pl. lxxx, figs. 1–5; pl. lxxxii, fig. 5.

There are fine specimens of this thick-walled and coarsely perforated variety.

Globigerina acquilateralis Brady.

Globigerina acquilateralis Brady, 1879, Quart. Journ. Micr. Sci., N.S., vol. xix, p. 285.
G. acquilateralis Brady, 1884, Chall. Rept., p. 605, pl. lxxx, figs. 18–21.

Only a few specimens of this planospiral form.

Globigerina triloba Reuss.

Globigerina triloba Reuss, 1849–1850, Denkschr. d. k. Akad. Wiss. Wien, vol. i, p. 374, pl. xlvii, fig. 11.
G. bulloides, var. *triloba* Brady, 1884, Chall. Rept., p. 595, pl. lxxix, figs. 1, 2 ; pl. lxxxi, figs. 2, 3.

Occurs occasionally.

Globigerina inflata d'Orbigny.

Globigerina inflata d'Orbigny, 1839, Foram. Cuba, p. 134, pl. ii, figs. 7, 9.
G. inflata Brady, 1884, Chall. Rept., p. 601, pl. lxxix, figs. 8–10.

The examples are normal.

Globigerina dutertrei d'Orbigny.

Globigerina dutertrei d'Orbigny, 1839, Foram. Cuba, p. 84, pl. iv, figs. 19–21.
G. dutertrei Brady, 1884, Chall. Rept., p. 601, pl. lxxxi, fig. 1.

The tests are not quite typical, the final whorl consisting of only three or four chambers and the arched orifice (with one exception) being sealed up.

Globigerina dutertrei d'Orbigny (?). (Pl. V, figs. 25–27.)

Test much compressed, transparent, outline lobulated. Five chambers in final whorl.

I was, and am still, doubtful as to the identification of this variety. I submitted specimens to A. Earland, who thinks,

judging from the aperture, that they are young examples of *G. dutertrei*. They differ so much, however, from the specimens which I have placed under that name that I think it best to put a query after it. Twelve are on the slide.

Orbulina d'Orbigny.

Orbulina universa d'Orbigny.

Orbulina universa d'Orbigny, 1839, Foram. Cuba, p. 3, pl. i, fig. 1.
O. universa Brady, 1884, Chall. Rept., p. 608, pl. lxxviii; pl. lxxxi, figs. 8–26; pl. lxxxii, figs. 1–3.

The examples are in good condition and well developed.

Hastigerina Wyville Thomson.

Hastigerina pelagica (d'Orbigny).

Nonionina pelagica d'Orbigny, 1843, Foram. Amér. Mérid., p. 27, pl. iii, figs. 13, 14.
Hastigerina pelagica Brady, 1884, Chall. Rept., p. 613, pl. lxxxiii, figs. 1–8.

Two occur, both bearing short spines.

Pullenia Parker and Jones.

Pullenia sphæroides (d'Orbigny).

Nonionina sphæroides d'Orbigny, 1826, Ann. Sci, Nat., vol. vii, p. 293, No. 1, Modèle No. 43.
Pullenia sphæroides Brady, 1884, Chall. Rept., p. 615, pl. lxxxiv, figs. 12, 13.

Excellent examples, some of which have five chambers in the final whorl.

Pullenia quinqueloba Reuss.

Nonionina quinqueloba Reuss, 1851, Zeitschr. d. deutsch. geol. Gesellsch., vol. iii, p. 71, pl. v, fig. 31.
Pullenia quinqueloba Brady, 1884, Chall. Rept., p. 617, pl. lxxxiv, figs. 14, 15.

The number of chambers in the final whorl varies in the different specimens from four to seven.

Pullenia obliquiloculata Parker and Jones.

Pullenia obliquiloculata Parker and Jones, 1865, Phil. Trans., vol. clv, p. 368, pl. xix, fig. 4.
P. obliquiloculata Brady, 1884, Chall. Rept., p. 618, pl. lxxxiv, figs. 16–20.

The tests are typical and normal in size.

Sphæroidina d'Orbigny.

Sphæroidina bulloides d'Orbigny.

Sphæroidina bulloides d'Orbigny, 1826, Ann. Sci. Nat., vol. vii, p. 267, No. 1, Modèle No. 65.
S. bulloides Brady, 1884, Chall. Rept., p. 620, pl. lxxxiv, figs. 1–7.

Rare, but normal.

Sphæroidina dehiscens Parker and Jones.

Sphæroidina dehiscens Parker and Jones, 1865, Phil. Trans., vol. clv p. 369, pl. xix, fig. 5.
S. dehiscens Brady, 1884, Chall. Rept., p. 621, pl. lxxxiv, figs. 8–11.

Rare, but typical.

Candeina d'Orbigny.

Candeina nitida d'Orbigny.

Candeina nitida d'Orbigny, 1839, Foram. Cuba, p. 108, pl. ii, figs. 27, 28.
C. nitida Brady, 1884, Chall. Rept., p. 622, pl. lxxxii, figs. 13–20.

Fair examples occur.

(To be continued.)

Journal of the
Royal Microscopical Society

CONTAINING ITS TRANSACTIONS AND PROCEEDINGS

AND

A SUMMARY OF CURRENT RESEARCHES RELATING TO

ZOOLOGY AND BOTANY

(principally Invertebrata and Cryptogamia)

MICROSCOPY, &c.

EDITED BY THE LATE

R. G. HEBB, M.A. M.D. F.R.C.P.

AND

CHARLES SINGER, M.A. M.D. F.R.C.P.

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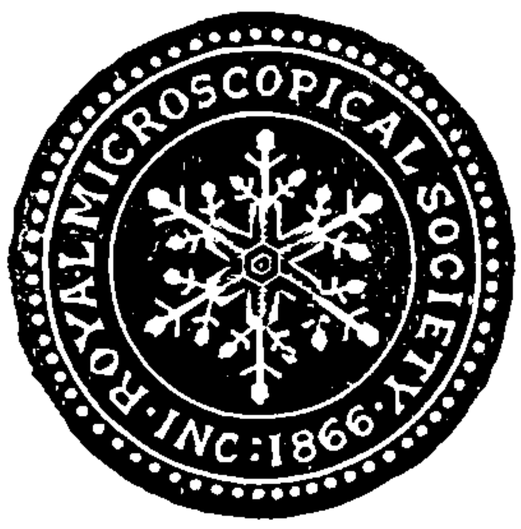
FOR THE YEAR

1918



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