RECENT FORAMINIFERA OF VICTORIA: SOME LITTORAL GATHERINGS.

By Fredk. Chapman, A.L.S., F.R.M.S.

(*Read May 17th*, 1907.)

Plates 9 and 10.

The shells of Foraminifera are found abundantly on the shores both of Port Phillip and the Victorian coast generally; but, notwithstanding this, they appear to have been up to the present so overlooked that the chief recorded list is that given by Professors Parker and Jones as early as 1865.* That list comprised thirty-two species, and the specimens were obtained from a sample of "coast-sand, Melbourne, Australia," which consisted of "coarse quartz sand, full of shells, zoophytes, sponges, and algae."

A paper on the "Foraminifera of Victoria," by H. Watts, published in 1883,† besides furnishing some short lists of fossil forms, gives one of recent Foraminifera from tide-pools at Beaumaris, Griffith's Point, Queenscliff, etc., comprising six species, all of which are herein recorded if we read *Biloculina* "*compressa*" as *B. depressa*, and *Spiroloculina* "*canaliculata*" as *S. nitida*.

A short note on the "Foraminifera of Shoreham, Western Port," was published by myself in 1902,‡ when seventeen species were enumerated, only one being common to Parker and Jones' list. Since then I have added a few more species for this locality, herein recorded. The Foraminifera of the Port Adelaide area have been very thoroughly worked over by the Rev. W. Howchin, F.G.S.,§ and his list will help to form a basis of comparison with our own fauna.

Besides collecting material myself from various localities,

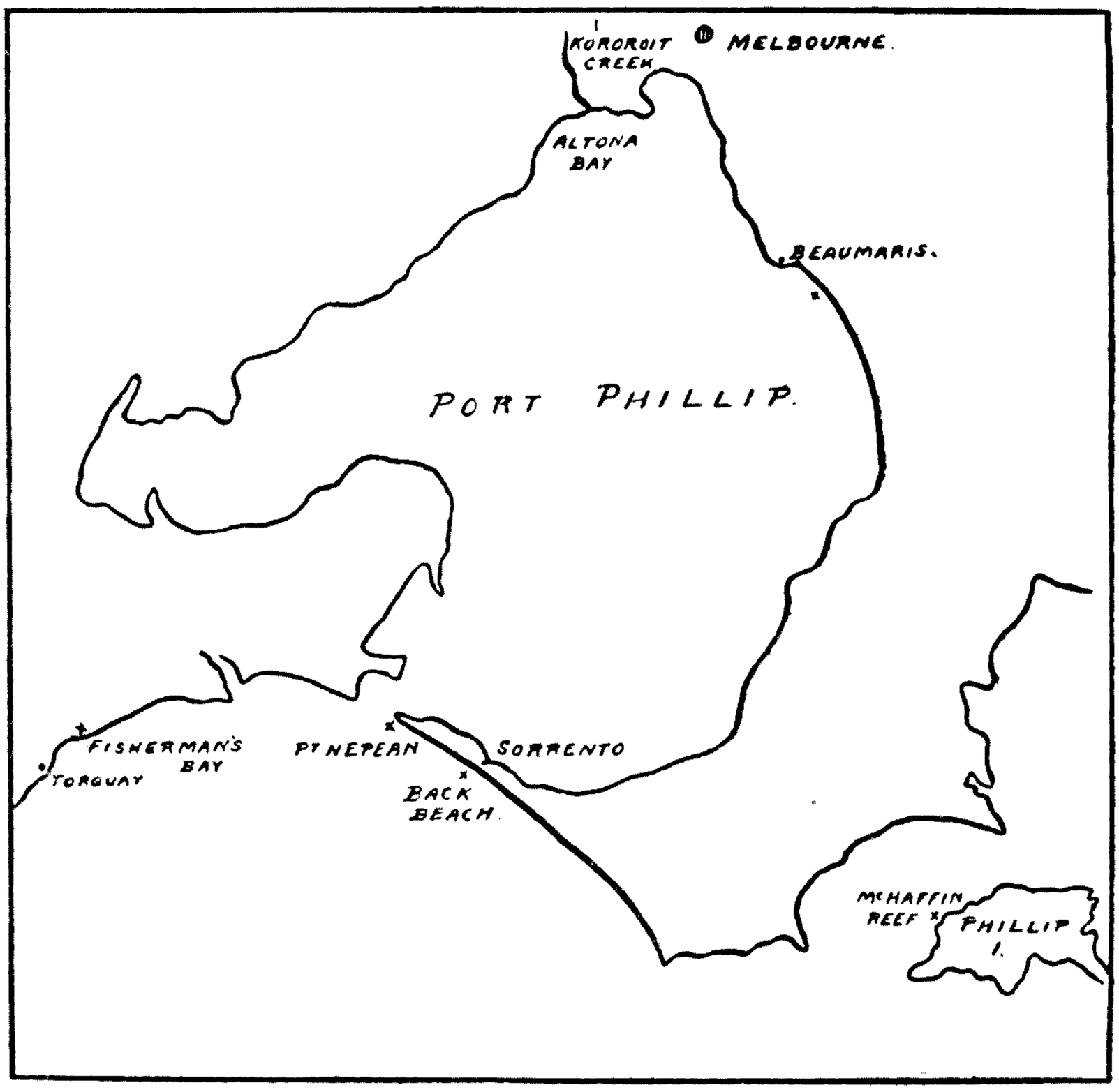
* *Phil. Trans.*, vol. 155, pt. i., p. 438.

† *Southern Science Record*, vol. iii., No. 3, p. 77.

‡ *Victorian Naturalist*, p. 112.

§ "The Estuarine Foraminifera of the Port Adelaide River." *Trans. R. Soc. S. A.*, vol. xiii., 1890, pp. 161—169.

Messrs. T. S. Hall, M.A., and E. O. Thiele have kindly gathered material for this paper. Mr. Hall's sample of shore-sand from Beaumaris was obtained under exceptionally favourable conditions, for it yielded a large number of the species only now recorded from Victoria, besides many interesting Ostracoda which will be described at the first opportunity. The shore-sand from McHaffie's Reef, also obtained by Mr. Hall, is noteworthy on account of certain rare forms which it contains, such as *Cassidulina parkeriana* and *Lagena fasciata*.



This contribution to a description of the recent Victorian Foraminifera has no pretension to be exhaustive; but since it is necessary to obtain some idea of the distribution of the commoner species, in order to form a comparison with those occurring in our Tertiary strata, it has been thought advisable to publish the following results as a preliminary inquiry into this section of the Victorian marine fauna. These notes deal with 103 species and varieties, one species and three varieties being apparently new.

The localities which have afforded us material up to the present are Altona Bay (denoted A.B. in the systematic description); Beaumaris (B.); Shoreham, Western Port (Sh.); McHaffie's Reef,

Phillip Island (M.H.); and Torquay, Jan Juc (T.). A few selected Foraminifera have been kindly given me by Mr. J. H. Gatliff, from Point Nepean (P.N.) and Sorrento (S.), which are also included here. It should be noted that the foreshore of Beaumaris is backed by Tertiary cliffs of a more or less sandy and fossiliferous nature; and in examining the tidal floatings from this locality it is well to bear in mind the possibility of finding a few fossil Foraminifera included in the shore-sand. Fossils thus derived are distinguished by their stained appearance and infilled chambers, and such have been discarded from our lists. The gatherings from Torquay were obtained from Fisherman's Bay. At this locality the foreshore is bounded by calcareous sand-dunes, so that the risk of meeting with derived fossils here is reduced to a minimum. Further to the west, in the neighbourhood of Spring Creek, I have repeatedly failed to find Foraminifera, although shells of young molluscs are abundant at times. Altona Bay has a foreshore of calcareous and quartzose sand, with a low fringing raised beach full of marine shells; but since the Pleistocene Foraminifera from the old beach would be scarcely different from the present fauna, the chances of an occasional specimen washed down need not be seriously considered. The two remaining localities, Shoreham and McHaffie's Reef, on opposite sides of Western Port, have the foreshore skirted by basaltic rocks, so that here there is no possibility of the inclusion of derived forms.

Order **FORAMINIFERA.**

Family MILIOLIDAE.

Sub-family Nubeculariinae.

Genus **Nubecularia**, Defrance.

Nubecularia bradyi, Millett.

N. inflata, Brady (non Terquem), 1884, *Rep. Chall.*, vol. ix., p. 135, pl. i., figs. 5—8.

N. bradyi, Millett, 1898, *Journ. R. Micr. Soc.*, p. 261, pl. v., figs. 6, *a*, *b*.

This species, although Nubecularian in its general characters, may probably be related to *Miliolina labiosa*, as Brady has already

pointed out, and of which relationship there is further evidence in its apertural character and close association in the littoral sands near Melbourne. It has already been recorded from several localities in the Pacific, generally in the shore-sands of coral islands, and Millet records it from the Malay Archipelago.

T., very common; M.H., rare.

Sub-family Miliolininae.

Genus **Biloculina**, d'Orbigny.

Biloculina depressa, d'Orbigny.

B. depressa, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 298, No. 7.

Sh., very rare and rather small.

Genus **Spiroloculina**, d'Orbigny.

Spiroloculina nitida, d'Orbigny.

(Pl. 9, Fig. 1.)

S. nitida, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 298, No. 4; Brady, 1884, *Rep. Chall.*, vol. ix., p. 149, pl. ix., figs. 9, 10.

This species is common in shallow water of tropical and warm-temperate areas. The Victorian examples vary in the direction of a square periphery as in *S. planulata*, Lam. sp.; otherwise they are typical.

M.H., very rare; Sh., very rare.

Spiroloculina grata, Terquem—and varieties.

S. grata, Terquem, 1878, *Mém. Soc. géol. France*, sér. 3, vol. i., p. 55, pl. x., figs. 14, 15.

The Victorian specimens, by their rounded peripheral edge and fine, regular striations, link themselves to *S. antillarum*, d'Orb.

A.B., frequent; B., frequent, well-grown examples.

Genus **Miliolina**, Williamson.

Miliolina oblonga, Montagu sp.

Vermiculum oblongum, Montagu, 1803, *Test. Brit.*, p. 522, pl. xiv., fig. 9.

Miliolina oblonga, Mont. sp. ; Millett, 1898, *Journ. R. Micr. Soc.*, p. 267, pl. v., figs. 14, *a*, *b*.

A.B., common ; B., very common ; M.H., very rare ; T., frequent.

Miliolina bosciana, d'Orbigny sp.

Quinqueloculina bosciana, d'Orbigny, 1839, *De la Sagra, Hist. Phys. de l'Ile de Cuba, Foram.*, p. 191, pl. xi., figs. 22—24.
Miliolina bosciana, d'Orb. sp. ; Millett, 1898, *Journ. R. Micr. Soc.*, p. 267, pl. vi., fig. 1.

This species differs from the preceding in having more oblique sutures. Our Victorian specimens do not show the alveolate, striate, or agglutinate surfaces described by Millett from Malayan specimens, but generally have a smooth shell. The striate variety is occasionally met with at Altona Bay.

A.B., common ; B., very common ; M.H., very rare.

Miliolina rotunda, d'Orbigny sp.

Triloculina rotunda, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., No. 4, p. 299.
Miliolina rotunda, d'Orb. sp. ; Millett, 1898, *Journ. R. Micr. Soc.*, p. 267, pl. v., figs. 15, 16.

A.B., very rare ; Sh., very rare.

Miliolina circularis, Bornemann sp.

Triloculina circularis, Borneman, 1855, *Zeitschr. d. deutsch. geol. Gesellsch.*, vol. vii., p. 349, pl. xix., fig. 4.
Miliolina circularis, Born. sp. ; Egger, 1893, *Abhandl. bayer. Akad. Wiss.*, Cl. II., vol. xviii., abth. ii., p. 235, pl. ii., figs. 61—63.

The Victorian examples agree on the whole with the Biloculine and Triloculine varieties ascribed to the type of *M. circularis*. One or two specimens, however, show the Quinqueloculine modification which links the form to *M. subrotunda* of Montagu ; but, as Millett has already remarked, with regard to his series from the Malay Archipelago,* the variations undoubtedly belong to the species

* *Journ. R. Micr. Soc.*, 1898, p. 500.

M. circularis, distinguished by certain fundamental characters common to all three varieties. A typical example of *M. subrotunda*, however, occurs in the Shoreham gathering.

A.B., very rare; M.H., very rare; T., rare.

Miliolina circularis, Bornemann sp.; var. **sublineata,** Brady.

M. circularis, Born. sp.; var. *sublineata*, Brady, 1884, *Rep. Chall.*, vol. ix., p. 169, pl. iv., fig. 7; Millett, 1898, *Journ. R. Micr. Soc.*, p. 501, pl. xi., fig. 4.

The Victorian shell shows the simple crescentic aperture of the type form, and is distinguished by its delicately lineated surface. The examples recorded by Millett from the Malay Archipelago are of much stouter build, and possess cribrate apertures.

M.H., very rare.

Miliolina valvularis, Reuss sp.

Triloculina valvularis, Reuss, 1851, *Zeitschr. d. deutsch. geol. Gesellsch.*, vol. iii., p. 85, pl. vii., fig. 56.
Miliolina valvularis, Rss. sp.; Millett, 1898, *Journ. R. Micr. Soc.*, p. 501, pl. xi., figs. 5—7.

B., very rare; M.H., very rare; Sh., very rare; T., very rare.

Miliolina dilatata, d'Orbigny sp.

Quinqueloculina dilatata, d'Orbigny, 1839, *Foram. Cuba*, p. 192, pl. ix., figs. 28—30; Schlumberger, 1893, *Mem. Soc. Zool. France*, vol. vi., p. 217, fig. 30, and pl. iii., figs. 73, 74.

This species seems to be closely related to the preceding, and may be only a depressed discoidal variety of it. Parker and Jones record *M. dilatata* from the Melbourne shore-sands.

M.H., very rare.

Miliolina labiosa, d'Orbigny sp.

(Pl. 9, Fig. 2.)

Triloculina labiosa, d'Orbigny, 1839, *Foram. Cuba*, p. 178, pl. x., figs. 12—14.

Miliolina labiosa, d'Orb. sp.; Millett, 1898, *Journ. R. Micr. Soc.*, p. 502, pl. xi., figs. 8, 9.

The remarks by Millett with regard to the Malayan specimens apply equally to the Victorian.

M.H., very rare; T., very common.

Miliolina subrotunda, Montagu sp.

Vermiculum subrotundum, Montagu, 1803, *Test. Brit.*, pt. ii., p. 521.

Miliolina subrotunda, Mont. sp.; Jones, 1895, *Foram. Crag* (*Pal. Soc. Mon.*), p. 120, woodcut, fig. 9.

A.B., very rare; Sh., very rare.

Miliolina tricarinata, d'Orbigny sp.

Triloculina tricarinata, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 299, No 7.

Miliolina tricarinata, d'Orb. sp.; Brady, 1884, *Rep. Chall.*, vol. ix., p. 165, pl. iii., figs. 17, *a*, *b*.

B., small and very rare.

Miliolina trigonula, Lamarck sp.

Miliolites trigonula, Lamarck, 1804, *Ann. du Museum*, vol. v., p. 351, No. 3.

Miliolina trigonula Lam. sp.; Goës, 1894, *Kongl. Svenska Vet.-Akad. Handl.*, vol. xxv., p. 115, pl. xxii., fig. 870.

M.H., frequent; Sh., frequent; T., very rare.

Miliolina seminulum, Linn. sp.

Serpula seminulum, Linné, 1767, *Syst. Nat.*, 12th ed., p. 1264, No. 791.

Miliolina seminulum, Linn. sp.; Sidebottom, 1904, *Mem. and Proc. Manchester Lit. and Phil. Soc.*, vol. xlviii., pt. ii., p. 10.

Our specimens, from Beaumaris, have rounded and polished convolutions and the test is of the elongated variety, approaching *M. oblonga*.

A.B., common; B., very common; M.H., very rare.

Miliolina vulgaris, d'Orbigny sp.

Quinqueloculina vulgaris, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 302, No. 33; Schlumberger, 1893, *Bull. Soc. géol. France*, vol. vi., p. 65, figs. 13, 14; pl. ii., figs. 65, 66.

A.B., very rare; B., rare; Sh., very rare, specimens small.

Miliolina cuvieriana, d'Orbigny sp.

Quinqueloculina cuvieriana, d'Orbigny, 1839, *Foram. Cuba*, p. 190, pl. xi., figs. 19—21.
Miliolina cuvieriana, d'Orb. sp.; Millett, 1898, *Journ. R. Micr. Soc.*, p. 505, pl. xii., figs. 2, *a*, *b*.

A.B., rare; M.H., very rare.

Miliolina venusta, Karrer sp.

Quinqueloculina venusta, Karrer, 1868, *Sitzungsb. d. k. Akad. Wiss. Wien*, vol. lviii., p. 147, pl. ii., fig. 6.

A.B., rare; B., rare; M.H., very rare.

Miliolina undosa, Karrer sp.

Quinqueloculina undosa, Karrer, 1867, *Sitzungsb. d. k. Akad. Wiss. Wien*, vol. lv., p. 361, pl. iii., fig. 3.

It is of interest to note that, although this species is commonly found in the neighbourhood of coral reefs, it has also occurred off Moncœur Island, Bass Strait, at 35 fathoms, as well as in the Mediterranean and off Ascension Island.

T., frequent, small.

Miliolina ferussacii, d'Orbigny sp.

Quinqueloculina ferussacii, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 301, No. 18.
Miliolina ferussacii, d'Orb. sp.; Millett, 1898, *Journ. R. Micr. Soc.*, p. 507, pl. xii., figs. 6, *a*, *b*, 7, *a*—*c*.

Typical specimens of the elongate, strongly costate variety.
Sh., frequent; T., frequent.

Miliolina contorta, d'Orbigny sp.

Quinqueloculina contorta, d'Orbigny, 1846, *Foram. Foss. Vienne*, p. 298, pl. xx., figs. 4—6.

A.B., rare; B., rare; Sh., frequent; T., frequent.

Miliolina agglutinans, d'Orbigny sp.

Quinqueloculina agglutinans, d'Orbigny, 1839, *Foram. Cuba*, p. 195, pl. xii., figs. 11—13.

B., rare.

Miliolina bicornis, Walker & Jacob sp.

Serpula bicornis, Walker & Jacob, 1798, in Kanmacher's ed. of *Adam's Essays Microsc.*, p. 633, pl. xiv., fig. 2.

Adelosina bicornis, W. & J. sp.; Schlumberger, 1886, *Bull. Soc. Zool. France*, vol. xi., p. 546, figs. 1—5, and pl. xvi., figs. 10—15.

Specimens not typical, having few and coarse striae.
T., very rare.

Miliolina boueana, d'Orbigny sp.

Quinqueloculina boueana, d'Orbigny, 1846, *Foram. Foss. Vienne*, p 293, pl. xix., figs. 7—9.

A.B., very rare; T., rare.

Sub-family Hauerininae.

Genus **Vertebralina,** d'Orbigny.

Vertebralina striata, d'Orbigny.

Vertebralina striata, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 283, No. 1—*Modèle*, No. 81; Millett, 1898, *Journ. R. Micr. Soc.*, p. 607, pl. xiii., fig. 1.

This species was recorded by Parker and Jones from the sand obtained near Melbourne.

B., rare.

Sub-family Peneroplidinae.

Genus **Peneroplis**, Montfort.

Peneroplis pertusus, Forskål sp.

Nautilus pertusus, Forskål, 1775, *Descr. Anim.*, p. 125, No. 65.
Peneroplis pertusus, Fors. sp.; Brady 1884, *Rep. Chall.*, vol. ix., p. 204, pl. xiii,, figs. 16, 17.

P.N.; the type-form occurs here. It has already been recorded by Parker and Jones from near Melbourne.

Family LITUOLIDAE.

Sub-family Lituolinae.

Genus **Reophax**, Montfort.

Reophax scorpiurus, Montfort.

R. scorpiurus, Montfort, 1808, *Conch. Syst.*, vol. i., p. 331, 83e genre; Goës, 1894, *K. Svenska Vet.-Akad. Handl.*, vol. xxv., p. 24, pl. v., figs. 158—169.

Sh., very rare.

Genus **Haplophragmium**, Reuss.

Haplophragmium canariense, d'Orbigny sp.

(Pl. 9, Fig. 3.)

Nonionina canariensis, d'Orbigny, 1839, *Hist. Nat. Iles Canaries*, vol. ii., pt. 2, p. 128, pl. ii., figs. 33, 34.

B., very rare; small, compressed form.

Family TEXTULARIIDAE.

Sub-family Textulariinae.

Genus **Textularia**, Defrance.

Textularia conica, d'Orbigny.

T. conica, d'Orbigny, 1839, *Foram. Cuba*, p. 143, pl. i., figs. 19, 20.

B., very rare.

Textularia folium, Parker & Jones.

(Pl. 9, Fig. 4.)

T. folium, Parker & Jones, 1865, *Phil. Trans.*, vol. clv., pp. 370, 420, pl. xviii., fig. 19.

This delicate little species is chiefly confined to coral reefs in the Pacific and Indian Oceans. It was originally described from shore-sand near Melbourne by Parker and Jones, and one of the "Challenger" records is from Bass Straits, 38 fathoms.

M.H., rare.

Genus **Clavulina**, d'Orbigny.

Clavulina parisiensis, d'Orb. ; var. **multicamerata**, nov.

(Pl. 9, Fig. 5.)

This variety differs from the type-form in the lowness, and consequently greater width, of the chambers of the later, uniserial part of the test. Since all the specimens met with show this feature, it seems advisable to separate it as a variety or sub-variety.

Sh., moderately rare.

Sub-family Buliminae.

Genus **Bulimina**, d'Orbigny.

Bulimina elegans, d'Orbigny.

B. elegans, d'Orb., 1826, *Ann. Sci. Nat.*, vol. vii., p. 270, No. 10—*Modèle*, No. 9 ; Millett, 1900, *Journ. R. Micr. Soc.*, p. 274, pl. ii., fig. 1.

B., rare.

Bulimina buchiana, d'Orbigny.

(Pl. 9, Fig. 6.)

B. buchiana, d'Orb., 1846, *Foram. Foss. Vienne*, p. 186, pl. xi., figs. 15—18.

This species is usually found in moderately deep water.

M.H., very rare, a finely striate variety.

Genus **Bolivina**, d'Orbigny.

Bolivina textilarioides, Reuss.

B. textilarioides, Reuss, 1862 (1863), *Sitzungsb. d. k. Akad. Wiss. Wien*, vol. xlvi., p. 81, pl. x., fig. 1.

B., very rare.

Bolivina punctata, d'Orbigny.

B. punctata, d'Orbigny, 1843, *Foram. Amér. Mérid.*, p. 63, pl. viii., figs. 6—12; Flint, 1899, *Rep. U. S. Nat. Mus. for* 1897 p. 292, pl. xxxviii., fig. 1.

B., common.

Sub-family Cassidulininae.

Genus **Cassidulina**, d'Orbigny.

Cassidulina subglobosa, Brady.

C. subglobosa, Brady, 1884, *Rep. Chall.*, vol. ix., p. 430, pl. liv., fig. 17.

B., very rare.

Cassidulina parkeriana, Brady.

(Pl. 9, Fig. 7.)

C. parkeriana, Brady, 1884, *Rep. Chall.*, vol. ix., p. 432, pl. liv., figs. 11—16.

This extremely interesting form has hitherto been found only on the west coast of Patagonia.

M.H., very rare.

Family LAGENIDAE.

Sub-family Lageninae.

Genus **Lagena**, Walker & Boys.

Lagena variata, Brady.

(Pl. 9, Fig. 8.)

L. variata, Brady, 1884, *Rep. Chall.*, vol. ix., p. 461, pl. lxi., fig. 1; Millett, 1901, *Journ. R. Micr. Soc.*, p. 7, pl. i., fig. 7.

Previously recorded only off East Moncœur Island, Bass Strait, and from the Malay Archipelago.

B., very rare; M.H., very rare.

Lagena acuticosta, Reuss, var. **ramulosa,** nov.

(Pl. 9, Fig. 9.)

The test in this variety shows a departure from the typical form * in having ramifying or branching costae. The ribs are prominent and more or less thick and sub-acute; the figured specimen has eleven visible at the base. The neck is tolerably stout and but slightly produced, so that the shell is shaped like a grape-pip.

Length about ·33 mm.

M.H., very rare.

Lagena fasciata, Egger sp.

Oolina fasciata, Egger, 1857, *Neues Jahrb. für Min.*, p. 270, pl. v., figs. 12—15.

M.H., very rare.

SUB-FAMILY NODOSARINAE.

Genus **Nodosaria,** Lamarck.

Nodosaria scalaris, Batsch sp.

Nautilus (*Orthoceras*) *scalaris*, Batsch, 1791, *Conch. des Seesandes*, No. 4, pl. ii., fig. 4.

B., rare.

Nodosaria scalaris, Batsch sp., var. **separans,** Brady.

N. scalaris, Batsch. sp., var. *separans*, Brady, 1884, *Rep. Chall.*, vol. ix., p. 511, pl. lxiv., figs. 16—19.

In addition to the only "Challenger" locality, off the west coast of New Zealand, for this variety, Millett recorded it from the Malay Archipelago. It is on this account of special interest to note it from Port Phillip.

B., frequent.

Nodosaria raphanus, Linné sp.

Nautilus raphanus, Linné, 1767, *Syst. Nat.*, 12th ed., p. 1164, No. 283.

B., very rare.

* *L. acuticosta*, Reuss, 1861, *Sitzungsb. d. k. Akad. Wiss. Wien*, vol. xliv., p. 305, pl. i., fig. 4; Millett, 1901, *Journ. Roy. Micr. Soc.*, p. 8.

Nodosaria obliqua, Linné sp., var. **vertebralis,** Batsch var.

Nautilus (*Orthoceras*) *vertebralis*, Batsch, 1791, *Conch. des Seesandes*, p. 3, No. 6, pl. ii., figs. 6, *a*, *b*.

Nodosaria obliqua, Linn. sp., var. *vertebralis*, Batsch; Goës, 1894, *K. Svenska Vet.-Akad. Handl.*, vol. xxv., No. 9, p. 70, pl. xiii., figs. 698, 699; Chapman, 1906, *Trans. N. Z. Inst.*, vol. xxxviii., p. 94, pl. iii., fig. 5.

One example, from the back beach, Sorrento; found by Mr. J. H. Gatliff.

Genus **Marginulina,** d'Orbigny.

Marginulina glabra, d'Orbigny.

M. glabra, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 259, No. 6—*Modèle*, No. 55; Flint, 1899, *Rep. U. S. Nat. Mus. for* 1897 (1899), p. 313, pl. lx., fig. 1.

B., very rare.

Marginulina costata, Batsch sp.

Nautilus (*Orthoceras*) *costatus*, Batsch, 1791, *Conch. des Seesandes*, pl. i., fig. 1.

T., very rare. An elongate variety, with fine riblets.

Genus **Vaginulina,** d'Orbigny.

Vaginulina costata, Cornuel sp.

(Pl. 9, Fig. 10.)

Planularia costata, Cornuel, 1848, *Mém. Soc. géol. France*, sér. 2*a*, vol. iii., p. 253, pl. ii., figs. 5—8.

Vaginulina patens, Brady, 1884, *Rep. Chall.*, vol. ix., p. 533, pl. lxvii., figs. 15, 16.

V. costata, Corn. sp.; Silvestri, 1904, *Atti della Pont. Acc. Rom. dei Nuovi Lincei*, anno lvii., p. 142, woodcuts 3, *a*—*d*.

The only recorded localities for this rare and elegant form are Raine Island, Torres Straits, and the Philippines. One of our specimens differs from Brady's figured examples in having the primordial extremity not developed into a spine (the other example being imperfect); otherwise the test is comparable in all respects, and clearly referable to the species.

B., very rare; T., very rare.

Sub-family Polymorphininae.

Genus **Polymorphina**, d'Orbigny.

Polymorphina lactea, Walker & Jacob sp.

Serpula lactea, Walker & Jacob, 1798 (fide Kanmacher), *Adams' Essays*, 2nd ed., p. 634, pl. xiv., fig. 4.

Polymorphina lactea, W. & J. sp. ; Brady, 1884, *Rep. Chall.*, vol. ix., p. 559, pl. lxxi., figs. 11, 14.

A.B., frequent.

Polymorphina lactea, W. & J. sp., fistulose var. **diffusa**, Jones & Chapman.

(Pl. 10, Fig. 1.)

Polymorphina spp., var. *diffusa*, Jones & Chapman, 1896, *Journ. Linn. Soc. Lond.*, vol. xxv., p. 505, figs. 26—29.

T., very rare.

Polymorphina gibba, d'Orbigny.

P. (*Globulina*) *gibba*, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 266, No. 20—*Modèle*, No. 63.

B., very rare.

Polymorphina communis, d'Orbigny.

P. (*Guttulina*) *communis*, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 266, pl. xii., figs. 1—4,—*Modèle*, No. 62.

A.B., frequent ; B., common ; M.H., very rare.

Polymorphina communis, d'Orb., fistulose var. **marginalis**, Jones & Chapman.

(Pl. 9, Fig. 11.)

Polymorphina spp., var. *marginalis*, Jones & Chapman, 1896, *Journ. Linn. Soc. Lond.*, vol. xxv., p. 506, figs. 30—36.

T., rare.

Polymorphina problema, d'Orbigny.

P. (*Guttulina*) *problema*, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 266, No. 14—*Modèle*, No. 61.

B., very rare.

Polymorphina oblonga, d'Orbigny.

P. oblonga, d'Orbigny, 1846, *Foram. Foss. Vienne*, p. 232, pl. xii., figs. 29—31.

A.B., frequent; B., rare.

Polymorphina thouini, d'Orbigny.

(Pl. 10, Fig. 2.)

P. thouini, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 265, No. 8—*Modèle*, No. 23.

Parker and Jones record this species from shore-sand near Melbourne. It has also occurred in the Levant and off East Moncœur Island, Bass Strait.

B., rare.

Polymorphina elegantissima, Parker & Jones.

(Pl. 10, Fig. 3.)

P. elegantissima, Parker & Jones, 1865, *Phil. Trans.*, vol. clv., p. 438; Brady, Parker & Jones, 1870, *Trans. Linn. Soc. Lond.*, vol. xxvii., p. 231, pl. xl., figs. 15, *a—c.*

This handsome species is almost peculiarly Australian, and was originally described from shore-sand near Melbourne by Parker and Jones. It is also of frequent occurrence in the Victorian Tertiary rocks.

A.B., very rare; B., very rare.

Polymorphina regina, Brady, Parker & Jones.

(Pl. 10, Fig. 4.)

P. regina, Brady, Parker & Jones, 1870, *Trans. Linn. Soc. Lond.*, vol. xxvii., p. 241, pl. xli., figs. 32, *a*, *b*.

This species has already occurred, among other localities, at Port Jackson and in Bass Strait.

A.B., common.

Genus **Uvigerina,** d'Orbigny.

Uvigerina angulosa, Williamson.

(Pl. 10, Fig. 5.)

U. angulosa, Williamson, 1858, *Rec. Foram. Gt. Brit.*, p. 67, pl. v., fig. 140.

M.H., a small depauperated example.

Family GLOBIGERINIDAE.

Genus **Globigerina**, d'Orbigny.

Globigerina bulloides, d'Orbigny.

G. bulloides, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 277, No. 1—*Modèles*, Nos. 17, 76.

B., very rare and small; T., very rare, typical.

Globigerina triloba, Reuss.

G. triloba, Reuss, 1849, *Denkschr. Akad. Wiss. Wien*, vol. i., p. 374, pl. xlvii., fig. 11.

B., rare; T., rare, typical.

Genus **Orbulina**, d'Orbigny.

Orbulina universa, d'Orbigny.

O. universa, d'Orbigny, 1839, *Foram. Cuba*, p. 3, pl. i., fig. 1.

B., very rare, small.

Genus **Pullenia**, Parker & Jones.

Pullenia quinqueloba, Reuss sp.

Nonionina quinqueloba, Reuss, 1851, *Zeitschr. d. deutsch. geol. Gesellsch.*, vol. iii., p. 47, pl. v., figs. 31, *a*, *b*.

B., very rare.

Family ROTALIDAE.

Sub-family Spirillininae.

Genus **Spirillina**, Ehrenberg.

Spirillina vivipara, Ehrenberg.

S. vivipara, Ehrenberg, 1841, *Abhandl. k. Akad. Wiss. Berlin*, p. 422, pl. iii., fig. 41.

M.H., one typical example.

Spirillina denticulo-granulata, sp. nov.

(Pl. 10, Figs. 6, *a*—*c*.)

Superior face of test showing the entire extent of the coiled spiral, the margin of which is limbate, whilst within the border

the surface is ornamented with a series of depressions or short grooves at right angles to the border, as in *S. limbata*, var. *denticulata*, Brady.* The inferior surface is concave from the inner border of the last whorl, and the surface is almost entirely covered with small granulations. Periphery obtuse or slightly channelled, carinate on the edge of the superior face.

Diameter of test, ·43 mm.; thickness, ·08 mm.

T., very rare.

Sub-family Rotalinae.

Genus **Patellina**, Williamson.

Patellina corrugata, Williamson.

(Pl. 10, Fig. 7.)

P. corrugata, Williamson, 1858, *Rec. Foram. Gt. Brit.*, p. 46, pl. iii., figs. 86—89.

The commencement of the test in this species is generally shown as a spiral chamber, or as a Rotaliform embryo with subglobular chambers. Our specimen exhibits a very distinct Rotaline commencement, consisting of nine chambers.

T., very rare.

Genus **Discorbina**, Parker & Jones.

Discorbina turbo, d'Orbigny sp.

Rotalia (Trochulina) turbo, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 274, No. 39—*Modèle*, No. 73.

The tests of this species are generally coloured by the dried protoplasm, and are usually of a brown-pink colour. This species has been already recorded from shore-sand near Melbourne by Parker and Jones.

M.H., common, and rather small; T., rare, rather small.

Discorbina globularis, d'Orbigny sp.

Rosalina globularis, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 271, pl. xiii., figs. 1—4,—*Modèle*, No. 69.

Sh., very rare.

* *Rep. Chall.*, vol. ix., 1884, p. 632, pl. lxxxv., fig. 17.

Discorbina pileolus, d'Orbigny sp.

Valvulina pileolus, d'Orbigny, 1843, *Amér. Mérid. Foram.*, p. 47, pl. i., figs. 15—17.
Discorbina pileolus, d'Orb. sp. ; Brady, 1884, *Rep. Chall.*, vol. ix., p. 649, pl. lxxxix., figs. 2—4.

T., very rare.

Discorbina rosacea, d'Orbigny sp.

Rotalia rosacea, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 273, No. 15—*Modèle*, No. 39.
Discorbina rosacea, d'Orb. sp. ; Flint, 1899, *Rep. U. S. Nat. Mus. for* 1897 (1899), p. 327, pl. lxxii., fig. 3.

T., rare.

Discorbina opercularis, d'Orbigny sp.

Rosalina opercularis, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 271, No. 7.
Discorbina opercularis, d'Orb. sp. ; Brady, 1884, *Rep. Chall.*, vol. ix., p. 650, pl. lxxxix., figs. 8, 9.

T., very rare.

Discorbina bertheloti, d'Orbigny sp.

Rosalina bertheloti, d'Orbigny, 1839, *Foram. Canaries*, vol. ii., pt. 2, p. 135, pl. i., figs. 28—30.
Discorbina bertheloti, d'Orb. sp. ; Brady, 1864, *Trans. Linn. Soc.*, vol. xxiv., p. 469, pl. xlviii., fig. 10.

T., very rare.

Discorbina vesicularis, Lamarck sp.

Discorbites vesicularis, Lamarck, 1804, *Ann. du Mus.*, vol. v., p. 183 ; vol. viii., 1806, pl. lxii., fig. 7.
Discorbina vesicularis, Lam. sp. ; Earland, 1905, *Journ. Quekett Micr. Club*, p. 224, pl. xii., figs. 9, 10 ; pl. xiv., fig. 6.

This species has been recorded from shore-sand near Melbourne by Parker and Jones.

Sh., rare.

Discorbina dimidiata, Jones & Parker.

(Pl. 10, Figs. 8, *a*, *b*.)

D. dimidiata, Jones & Parker, 1862, in Carpenter, Parker, & Jones' *Introd. Foram.*, p. 201, fig. xxxii. B; Parker & Jones, 1865, *Phil. Trans.*, vol. clv., pp. 385, 422, pl. xix., figs. 9, *a*—*c*.

This peculiarly Australian species, regarded by Parker and Jones as a sharp-edged, inferiorly concave modification of *D. vesicularis*, is one of the most abundant of the shore-sand Foraminifera on the southern coast. The test is of a reddish brown colour, and darker in the apical region. By its more turgid form and coarsely perforated shell-wall we can easily distinguish it from *D. rosacea*, d'Orb. The original locality is shore-sand near Melbourne; and Howchin records it from the north arm of the Port Adelaide River.

A.B., very common; B., very common; M.H., very common; P.N.; Sh., common; T., common.

Discorbina rugosa, d'Orbigny sp.

Rosalina rugosa, d'Orbigny, 1843, *Amér. Mérid. Foram.*, p. 42, pl. ii., figs. 12—14.

Sh., rare.

Discorbina biconcava, Jones & Parker.

D. biconcava, Jones & Parker, 1862, in Carpenter's *Introd. Foram.*, p. 201, fig. xxxii. G; Parker & Jones, 1865, *Phil. Trans.*, vol. clv., pp. 385, 422, pl. xix., figs. 10, *a*—*c*.

This species is interesting from the fact that it occurs almost exclusively around the Australian coast, having been found off East Moncœur Island, Bass Straits, Storm Bay, Tasmania, and Raine Island, Torres Straits. It has also been recorded from shore-sand near Melbourne by Parker and Jones. The only exception to the Australian localities for this species seems to be that given by J. D. Siddall, who found it in the estuary of the Dee.

M.H., rare; T., frequent.

Discorbina rarescens, Brady.

D. rarescens, Brady, 1884, *Rep. Chall.*, vol. ix., p. 651, pl. xc., figs. 2—4.

T., very rare.

Discorbina valvulata, d'Orbigny sp.

Rosalina valvulata, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 271, No. 4.

Discorbina valvulata, d'Orb. sp.; Goës, 1882, *K. Svenska Vet.-Akad. Handl.*, vol. xix., No. 4, p. 106, pl. viii., figs. 258—261.

T., rare.

Genus **Planorbulina,** d'Orbigny.

Planorbulina mediterranensis, d'Orbigny.

P. mediterranensis, d'Orb., 1826, *Ann. Sci. Nat.*, vol. vii., p. 280, pl. xiv., figs. 4—6,—*Modèle*, No. 79.

Recorded by Parker and Jones in the Melbourne list as *Planorbulina vulgaris*, d'Orb.

B., very rare, small; T., common, well-grown individuals with initial series of chambers of a brown-pink colour.

Genus **Truncatulina,** d'Orbigny.

Truncatulina lobatula, Walker & Jacob sp.

Nautilus lobatulus, Walker & Jacob, 1798, *Adams' Essays*, Kanmacher's ed., p. 642, pl. xiv., fig. 36.

This generally abundant species of the littoral zone is conspicuously rare in the Victorian gatherings, and examples are below the average size.

B., rare; T., very rare.

Truncatulina refulgens, Montfort sp.

Cibicides refulgens Montfort, 1808, *Conch. Syst.*, vol. i., p. 122, 31^e^ genre.

Truncatulina refulgens, Montf. sp.; Egger, 1899, *Abhandl. k. bayer. Akad. Wiss.*, Cl. II., vol. xxi., p. 151, pl. xx., figs. 20, 21.

T., very rare and dwarfed.

Truncatulina haidingeri, d'Orbigny sp.

Rotalina haidingeri, d'Orbigny, 1846, *Foram. Foss. Vienne*, p. 154, pl. viii., figs. 7—9.

B., very rare and small; T., rare, but typical.

Truncatulina ungeriana, d'Orbigny sp.

Rotalina ungeriana, d'Orbigny, 1846, *Foram. Foss. Vienne*, p. 157, pl. viii., figs. 16—18.

B., frequent, rather small; T., very rare.

Genus **Anomalina**, d'Orbigny.

Anomalina ammonoides, Reuss sp.

Rosalina ammonoides, Reuss, 1845, *Verstein. böhm. Kreidef.*, p. 36, pl. viii., fig. 53; pl. xiii., fig. 66.

Anomalina ammonoides, Reuss sp.; Brady, 1884, *Rep. Chall.*, vol. ix., p. 672, pl. xciv., figs. 2, 3.

This species was recorded by Parker and Jones from the shore-sand near Melbourne.

M.H., very rare, typical; T., very rare, small.

Anomalina polymorpha, Costa.

A. polymorpha, Costa, 1856, *Atti dell' Accad. Pontan.*, vol. vii., p. 252, pl. xxi., figs. 7—9.

This species has not hitherto been recorded from this part of the Australian coast. It was found, however, by the "Challenger" off Sydney, at 410 fathoms.

B., very rare, rather small.

Genus **Pulvinulina,** Parker & Jones.

Pulvinulina repanda, Fichtel & Moll sp.

Nautilus repandus, Fichtel & Moll, 1798, *Test Micr.*, p. 35, pl. iii., figs. *a—d*.

Pulvinulina repanda, F. & M. sp.; Flint, 1899, *Rep. U. S. Nat. Mus. for* 1897 (1899), p. 328, pl. lxxii., fig. 8.

M.H., rare, small; Sh., frequent, small; T., frequent, typical.

Pulvinulina brongniartii, d'Orbigny sp.

Rotalia brongniartii, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 273, No. 27.

Pulvinulina brongniartii, d'Orb. sp.; Millett, 1904, *Journ. Roy. Micr. Soc.*, p. 498, pl. x., fig. 4.

Egger found this species in the "Gazelle" dredgings off Western Australia at 90—359 metres. The examples from the Malay

Archipelago are recorded by Millett as having persistent characters and occurring abundantly.

M.H., rare and small, but otherwise typical.

Pulvinulina punctulata, d'Orbigny sp.

Rotalia punctulata, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 273, No. 25—*Modèle*, No. 12.

B., very rare and small.

Pulvinulina elegans, d'Orbigny sp.

Rotalia (Turbinulina) elegans, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 276, No. 54.

B., rare, weak examples.

Genus **Rotalia**, Lamarck.

Rotalia beccarii, Linné sp.

Nautilus beccarii, Linné, 1767, *Syst. Nat.*, 12th ed., p. 1162; 1788, *ibid.*, 13th (Gmelin's) ed., p. 3370, No. 4.

Rotalia beccarii, Linné sp.; Chapman, 1902, *The Foraminifera*, p. 37, fig. 23.

This typically estuarine species attains its best development at Altona Bay, near to where the Kororoit Creek enters the sea. Howchin records it from the Port Adelaide River.

A.B., very common, well developed in point of size; B., common, tests small, thin, and translucent, but otherwise typical; M.H., frequent, small; T., rare, of normal size.

Rotalia papillosa, var. **compressiuscula**, Brady.

R. papillosa, var. *compressiuscula*, Brady, 1884, *Rep. Chall.*, vol. ix., p. 708, pl. cvii., figs. 1, *a*—*c*; pl. cviii., figs. 1, *a*—*c*.

This variety has been found in shallow-water dredgings chiefly in the Pacific. The nearest locality to the present one is Port Jackson, Sydney. It is just possible, however, that the examples before us may have been derived from the Tertiary fossiliferous cliffs at Beaumaris, since they are somewhat iron-stained, and the species has been recorded as a Victorian fossil.

B., very rare.

Rotalia soldanii, d'Orbigny.

R. (*Gyroidina*) *soldanii*, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 278, No. 5—*Modèle*, No. 36.

This species is almost essentially a deep-water form.

M.H., very rare, specimens small.

Rotalia calcar, d'Orbigny.

Calcarina calcar, d'Orbigny, 1826, *Ann. Sci. Nat.*, vol. vii., p. 276, No. 1—*Modèle*, No. 34.

Rotalia calcar, d'Orbigny sp.; Egger, 1893, *Abhandl. k. bayer. Akad. Wiss.*, Cl. II., vol. xviii., p. 423, pl. xix., figs. 1—3.

The above species does not appear to have been recorded before from Australian waters, the nearest locality being the Malay Archipelago, where it was found by Millett associated with, and merging into, the species *R. venusta*, Brady.

A.B., very rare.

Rotalia clathrata, Brady.

R. clathrata, Brady, 1884, *Rep. Chall.*, vol. ix., p. 709, pl. cvii., figs. 8, 9.

This species has been previously obtained between Bass Strait and New Zealand, as well as off the west coast of Patagonia.

T., rare, typical.

Sub-family Tinoporinae.

Genus **Gypsina**, Carter.

Gypsina inhaerens, Schultze sp.

Acervulina inhaerens, Schultze, 1854, *Organ. der Polythal.*, p. 68, pl. vi., fig. 12.

Gypsina inhaerens, Schultze sp.; Goës, 1894, *K. Svenska Vet.-Akad. Handl.*, vol. xxv., p. 91, pl. xv., fig. 787.

This species appears to be rare in the southern hemisphere. It has been recorded by the "Challenger," among other places, off East Moncœur Island, Bass Strait.

Sh., very rare; T., very rare.

Gypsina vesicularis, Parker & Jones sp.

Orbitolina vesicularis, Parker & Jones, 1860, *Ann. and Mag. Nat. Hist.*, ser. 3, vol. vi., p. 31, No. 5.

Gypsina vesicularis, Parker & Jones sp. ; Egger, 1893, *Abhandl. k. bayer. Akad. Wiss.*, Cl. II., vol. xviii., p. 382, pl. xiv., figs. 20—23 ; Chapman, 1900, *Journ. Linn. Soc.* (*Zool.*), p. 198, pl. xix., fig. 12.

Sh., very rare ; T., very rare.

Family NUMMULINIDAE.

Sub-family Polystomellinae.

Genus **Nonionina**, d'Orbigny.

Nonionina depressula, Walker & Jacob sp.

Nautilus depressulus, Walker & Jacob, 1798, *Adams' Essays*, Kanmacher's ed., p. 641, pl. xiv., fig. 33.

Nonionina depressula, W. & J. sp. ; Wright, 1900, *Geol. Mag.*, Dec. 4, vol. vii., p. 100, pl. v., fig. 23.

B., very rare.

Genus **Polystomella**, Lamarck.

Polystomella striatopunctata, Fichtel & Moll sp.

Nautilus striatopunctatus, Fichtel & Moll, 1798, *Test. Micr.*, p. 61, pl. ix., figs. *a—c*.

Polystomella striatopunctata, F. & M. sp. ; Wright, 1900, *Geol. Mag.*, Dec. 4, vol. vii., p. 100, pl. v., fig. 24.

The Victorian examples are generally distinct from the allied form *P. macella*, but transitional individuals are occasionally met with, having laterally compressed shells with a sharp periphery.

A.B., frequent ; B., very rare ; M.H., rare ; T., very rare.

Polystomella macella, Fichtel & Moll sp.

Nautilus macellus, var. *a*, Fichtel & Moll, 1798, *Test. Micr.*, p. 66, pl. x., figs. *e—g*.

Polystomella macella, F. & M. sp. ; Brady, 1884, *Rep. Chall.*, vol. ix., p. 737, pl. cx., figs. 8, 9.

Previously recorded from shore-sand near Melbourne. The Victorian examples are usually irregular on the peripheral margin, thus resembling to some extent Brady's *P. imperatrix*, but without the occasional, strong spines.

A.B., frequent ; B., frequent ; M.H., very rare ; Sh., rare ; T., very common.

Polystomella macella, F. & M. sp., var. **limbata**, nov.

(Pl. 10, Figs. 9, *a*, *b*.)

This variety is like the specific form in having a depressed umbilicus and subacute periphery ; the sutures, however, instead of being excavated, are prominent, and the shell surface near the sutural areas and over the umbilical region is covered with an exogenous shell-growth in the form of small papillae or granulations.

A.B., frequent ; B., very common.

Polystomella crispa, Linné sp.

Nautilus crispus, Linné, 1767, *Syst. Nat.*, 12th ed., pp. 1162, 275.
Polystomella crispa, Linn. sp. ; Flint, 1899, *Rep. U. S. Nat. Mus. for* 1897 (1899), p. 338, pl. lxxx., fig. 3.

Some of the examples from Altona Bay and Beaumaris exhibit spinose outgrowths on the periphery at the sutural angle.

A.B., common ; B., frequent ; M.H., frequent ; P.N., one specimen ; Sh., frequent ; T., frequent.

Polystomella subnodosa, Münster sp.

Robulina subnodosa, Münster (fide Römer), 1838, *Neues Jahrb. für Min.*, p. 39, pl. iii., fig. 61.
Polystomella subnodosa, Münster sp. ; Goës, 1894, *K. Svenska Vet.-Akad. Handl.*, vol. xxv., p. 102, pl. xvii., figs. 817—819.

A.B., rare ; B., frequent ; M.H., rare ; Sh., very rare; T., rare.

Polystomella verriculata, Brady.

(Pl. 10, Fig. 10.)

P. verriculata, Brady, 1881, *Quart. Journ. Micr. Sci.*, vol. xxi., N.S., p. 66 ; id., 1884, *Rep. Chall.*, vol. ix., p. 738, pl. cx., figs. 12, *a*, *b*.

This is almost essentially an Australian species. It has been recorded off East Moncœur Island, Bass Strait, and in Curtis Strait, Queensland, by Dr. H. B. Brady ; these localities, by the way, are off the south and east coasts, and not the west coast of Australia, as stated by that author. Millett records this species from the Malay Archipelago and from Sagami Bay, Japan.

B., very rare.

Distribution List of Victorian Foraminifera.

—	Altona Bay.	Beaumaris.	McHaffie's Reef.	Point Nepean.	Shoreham.	Sorrento.	Torquay.
1. *Nubecularia bradyi*, Millett . .	...	...	*r.*	...	...	...	*v.c.*
2. *Biloculina depressa*, d'Orbigny .	...	...	...	...	*v.r.*	...	...
3. *Spiroloculina nitida*, „ . .	...	...	*v.r.*	...	*v.r.*	...	...
4. „ *grata*, Terq. . .	*f.*	*f.*	...	...	...	...	...
5. *Miliolina oblonga*, Mont. sp. . .	*c.*	*v.c.*	*v.r.*	...	...	...	*f.*
6. „ *bosciana*, d'Orb. sp. . .	*c.*	*v.c.*	*v.r.*	...	...	...	...
7. „ *rotunda*, „ . .	*v.r.*	...	...	...	*v.r.*	...	...
8. „ *circularis*, Born. sp. .	*v.r.*	...	*v.r.*	...	...	...	*r.*
9. „ „ var. *sublineata*, Brady . .	...	...	*v.r.*	...	...	...	...
10. „ *valvularis*, Reuss sp. .	...	*v.r.*	*v.r.*	...	*v.r.*	...	*v.r.*
11. „ *dilatata*, d'Orb. sp. . .	...	...	*v.r.*	...	...	...	...
12. „ *labiosa*, „ . .	...	...	*v.r.*	...	...	...	*v.c.*
13. „ *subrotunda*, Mont. sp. .	*v.r.*	...	...	...	*v.r.*	...	...
14. „ *tricarinata*, d'Orb. sp. .	...	*v.r.*	...	...	...	...	...
15. „ *trigonula*, Lam. sp. . .	...	...	*f.*	...	*f.*	...	*v.r.*
16. „ *seminulum*, Linn. sp. .	*c.*	*v.c.*	*v.r.*	...	...	...	...
17. „ *vulgaris*, d'Orb. sp. . .	*v.r.*	*r.*	...	...	*v.r.*	...	...
18. „ *cuvieriana*, „ . .	*r.*	...	*v.r.*	...	...	...	...
19. „ *venusta*, Karrer sp. . .	*r.*	*r.*	*v.r.*	...	...	...	...
20. „ *undosa*, „ . .	...	...	...	...	...	...	*f.*
21. „ *ferussacii*, d'Orb. sp. .	...	...	...	...	*f.*	...	*f.*
22. „ *contorta*, „ . .	*r.*	*r.*	...	...	*f.*	...	*f.*
23. „ *agglutinans*, „ . .	...	*r.*	...	...	...	...	...
24. „ *bicornis*, W. & J. sp. .	...	...	...	...	...	...	*v.r.*
25. „ *boueana*, d'Orb. sp. . .	*v.r.*	...	...	...	...	...	*r.*
26. *Vertebralina striata*, d'Orbigny .	...	*r.*	...	...	...	...	...
27. *Peneroplis pertusus*, Fors. sp. .	...	...	...	×	...	...	...
28. *Reophax scorpiurus*, Mont. . .	...	...	...	...	*v.r.*	...	...
29. *Haplophragmium canariense*, d'Orb. sp.	...	*v.r.*	...	...	...	...	...
30. *Textularia conica*, d'Orb. . .	...	*v.r.*	...	...	...	...	...
31. „ *folium*, P. & J. . .	...	...	*r.*	...	...	...	...
32. *Clavulina parisiensis*, d'Orb., var. *multicamerata* nov. . . .	...	...	...	...	*r.*	...	...
33. *Bulimina elegans*, d'Orb. . .	...	*r.*	...	...	...	...	...
34. „ *buchiana*, „ . . .	...	...	*v.r.*	...	...	...	...
35. *Bolivina textilarioides*, Reuss. .	...	*v.r.*	...	...	...	...	...
36. „ *punctata*, d'Orb. . .	...	*c.*	...	...	...	...	...
37. *Cassidulina subglobosa*, Brady .	...	*v.r.*	...	...	...	...	...
38. „ *parkeriana*, „ . .	...	...	*v.r.*	...	...	...	...
39. *Lagena variata*, „ . .	...	*v.r.*	...	...	...	...	...
40. „ *acuticosta* Rss., var. *ramulosa*, nov.	...	...	*v.r.*	...	...	...	...
41. „ *fasciata*, Egger sp. . .	...	...	*v.r.*	...	...	...	...
42. *Nodosaria scalaris*, Batsch sp. .	...	*r.*	...	...	...	...	...
43. „ „ var. *separans* Brady	...	*f.*	...	...	...	...	...
44. „ *raphanus*, Linn. sp. .	...	*v.r.*	...	...	...	...	...

—	Altona Bay.	Beaumaris.	McHaffie's Reef.	Point Nepean.	Shoreham.	Sorrento.	Torquay.
45. *Nodosaria obliqua*, Linn. sp. var. *vertebralis*, Batsch var.	...	...	...	...	...	×	...
46. *Marginulina glabra*, d'Orb. . .	...	*v.r.*	...	...	...	...	...
47. „ *costata*, Batsch sp. .	...	...	...	...	...	...	*v.r.*
48. *Vaginulina* „ Cornuel sp. .	...	*v.r.*	...	...	...	...	*v.r.*
49. *Polymorphina lactea*, W. & J. sp. .	*f.*	...	...	...	...	...	...
50. „ „ var. *diffusa*, J. & C. .	...	...	...	...	...	...	*v.r.*
51. „ *gibba*, d'Orb. . .	...	*v.r.*	...	...	...	...	...
52. „ *communis*, d'Orb. .	*f.*	*c.*	*v.r.*	...	...	...	...
53. „ „ var. *marginalis* J. & C.	...	...	...	...	...	...	*r.*
54. „ *problema*, d'Orb. .	...	*v.r.*	...	...	...	...	...
55. „ *oblonga*, „ .	*f.*	*r.*	...	...	...	...	...
56. „ *thouini*, „ .	...	*r.*	...	...	...	...	...
57. „ *elegantissima*, P. & J.	*v.r.*	*v.r.*	...	...	...	...	...
58. „ *regina*, B., P., & J. .	*c.*	...	...	...	...	...	...
59. *Uvigerina angulosa*, Will. . .	...	...	*v.r.*	...	...	...	...
60. *Globigerina bulloides*, d'Orb. . .	...	*v.r.*	...	...	...	...	*v.r.*
61. „ *triloba*, Reuss . .	...	*r.*	...	...	...	...	*r.*
62. *Orbulina universa*, d'Orb. . .	...	*v.r.*	...	...	...	...	...
63. *Pullenia quinqueloba*, Rss. sp. . .	...	*v.r.*	...	...	...	...	...
64. *Spirillina vivipara*, Ehren. . .	...	...	*v.r.*	...	...	...	...
65. „ *denticulo-granulata*, sp. nov.	...	...	...	...	...	...	*v.r.*
66. *Patellina corrugata*, Will. . .	...	...	...	...	...	...	*v.r.*
67. *Discorbina turbo*, d'Orb. sp. . .	...	...	*c.*	...	...	...	*r.*
68. „ *globularis*, „ . .	...	...	...	...	*v.r.*	...	...
69. „ *pileolus*, „ . .	...	...	...	...	...	...	*v.r.*
70. „ *rosacea*, „ . .	...	...	...	...	...	...	*r.*
71. „ *opercularis*, „ . .	...	...	..	...	...	...	*v.r.*
72. „ *bertheloti*, „ . .	...	...	...	...	...	...	*v.r.*
73. „ *vesicularis*, Lam. sp. .	...	...	...	...	*r.*	...	...
74. „ *dimidiata*, J. & P. . .	*v.c.*	*v.c.*	*v.c.*	×	*c.*	...	*c.*
75. „ *rugosa*, d'Orb. sp. . .	...	...	...	...	*r.*	...	...
76. „ *biconcava*, J. & P. . .	...	..	*r.*	...	...	...	*f.*
77. „ *rarescens*, Brady . .	...	...	...	...	...	...	*v.r.*
78. „ *valvulata*, d'Orb. sp. .	...	...	...	...	...	...	*r.*
79. *Planorbulina mediterranensis*, d'Orb.	...	*v.r.*	...	...	...	...	*c.*
80. *Truncatulina lobatula*, W. & J. sp .	...	*r.*	...	...	...	...	*v.r.*
81. „ *refulgens*, Mont. sp. .	...	...	...	...	...	...	*v.r.*
82. „ *haidingeri*, d'Orb. sp.	...	*v.r.*	...	...	...	...	*r.*
83. „ *ungeriana*, „ .	...	*f.*	...	...	...	...	*v.r.*
84. *Anomalina ammonoides*, Rss. sp. .	...	...	*v.r.*	...	...	...	*v.r.*
85. „ *polymorpha*, Costa . .	...	*v.r.*	...	...	...	...	...
86. *Pulvinulina repanda*, F. & M. sp. .	...	...	*r.*	...	*f.*	...	*f.*
87. „ *brongniartii*, d'Orb. sp.	...	...	*r.*	...	...	...	...
88. „ *punctulata*, „ .	...	*v.r.*	...	...	...	...	...
89. „ *elegans*, „ .	...	*r.*	...	...	...	...	...
90. *Rotalia beccarii*, L. sp. . . .	*v.c.*	*c.*	*f.*	...	...	...	*r.*
91. „ *papillosa*. var. *compressiuscula*, Brady . . .	...	*v.r.*	...	...	...	...	...

—	Altona Bay.	Beaumaris.	McHaffie's Reef.	Point Nepean.	Shoreham.	Sorrento.	Torquay.
92. *Rotalia soldanii*, d'Orb. . .	...	...	*v.r.*	...	...	...	...
93. ,, *calcar*, d'Orb. sp. . .	*v.r.*	...	...	...	...	...	...
94. ,, *clathrata*, Brady . .	...	...	...	...	...	...	*r.*
95. *Gypsina inhaerens*, Schultze sp. .	...	...	...	...	*v.r.*	...	*v.r.*
96. ,, *vesicularis*, P. & J. sp. .	...	...	...	...	*v.r.*	...	*v.r.*
97. *Nonionina depressula*, W. & J. sp.	...	*v.r.*	...	...	...	...	...
98. *Polystomella striatopunctata*, F. & M. sp. . . .	*f.*	*v.r.*	*r.*	...	...	...	*v.r.*
99. ,, *macella*, F. & M. sp.	*f.*	*f.*	*v.r.*	...	*r.*	...	*v.c.*
100. ,, ,, var. *limbata*, nov.	*f.*	*v.c.*	...	...	...	...	...
101. ,, *crispa*, Linn. sp. .	*c.*	*f.*	*f.*	×	...	...	...
102. ,, *subnodosa*, Münster sp. . . .	*r.*	*f.*	*r.*	...	*v.r.*	...	*r.*
103. ,, *verriculata*, Brady.	...	*v.r.*	...	...	...	...	...

Explanation of Plates 9 and 10.

Plate 9.

Fig. 1. *Spiroloculina nitida*, d'Orbigny, McHaffie's Reef, Phillip Island.

,, 2. *Miliolina labiosa*, d'Orbigny sp., Torquay.

,, 3. *Haplophragmium canariense*, d'Orbigny sp., Beaumaris.

,, 4. *Textularia folium*, Parker & Jones, McHaffie's Reef.

,, 5. *Clavulina parisiensis*, d'Orbigny, var. *multicamerata*, nov., Shoreham, Western Port.

,, 6. *Bulimina buchiana*, d'Orbigny, McHaffie's Reef.

,, 7. *Cassidulina parkeriana*, Brady, ,, ,,

,, 8. *Lagena variata*, Brady, Beaumaris.

,, 9. ,, *acuticosta*, Reuss, var. *ramulosa*, nov., McHaffie's Reef.

,, 10. *Vaginulina costata*, Cornuel sp., Beaumaris.

,, 11. *Polymorphina communis*, d'Orbigny, var. *marginalis*, Jones & Chapman, Torquay.

All figures magnified 44 diameters.

Plate 10.

Fig. 1. *Polymorphina lactea*, W. & J. sp., var. *diffusa*, Jones & Chapman, Torquay, × 44.

„ 2. „ *thouini*, d'Orbigny, Beaumaris, × 44.

„ 3. „ *elegantissima*, Parker & Jones, Beaumaris, × 44.

„ 4. „ *regina*, Brady, Parker, & Jones, Altona Bay, × 44.

„ 5. *Uvigerina angulosa*, Williamson, McHaffie's Reef, × 44.

„ 6, *a*—*c*. *Spirillina denticulo-granulata*, sp. nov., Torquay, × 44.

„ 7. *Patellina corrugata*, Williamson, apical part of test, Torquay, × 88.

„ 8, *a*, *b*. *Discorbina dimidiata*, Parker & Jones, McHaffie's Reef, × 44.

„ 9, *a*, *b*. *Polystomella macella*, F. & M. sp., var. *limbata*, nov., Altona Bay, × 44.

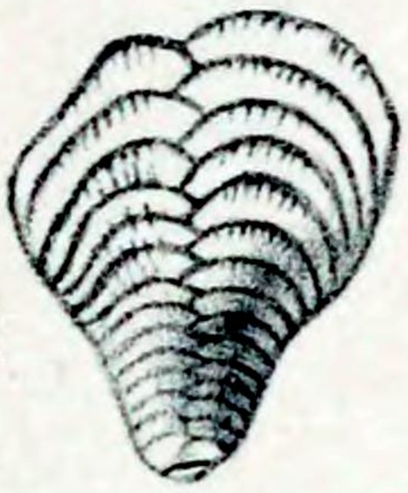
„ 10. „ *verriculata*, Brady, Beaumaris, × 33.

1.

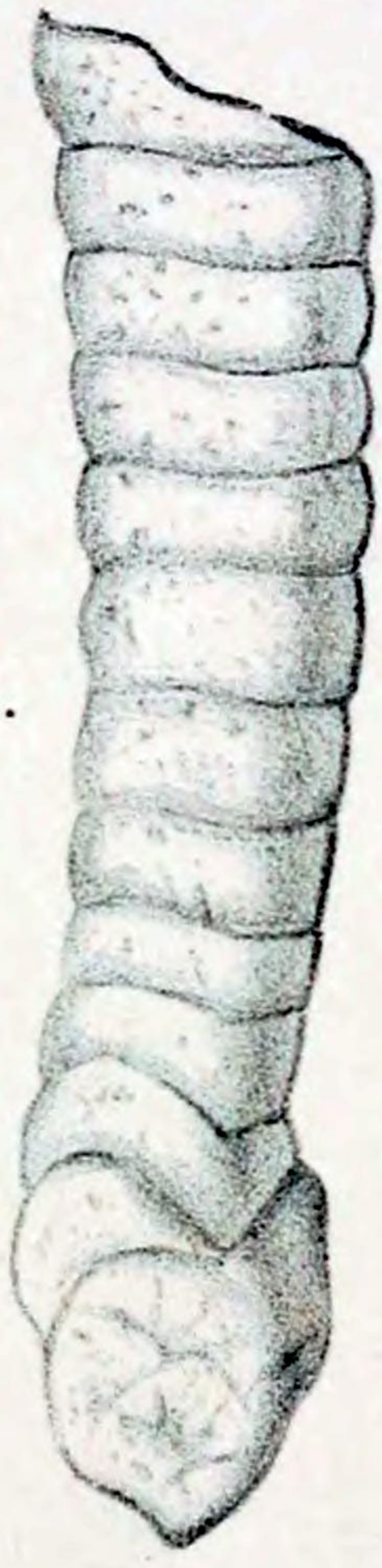
2.

3.

4.

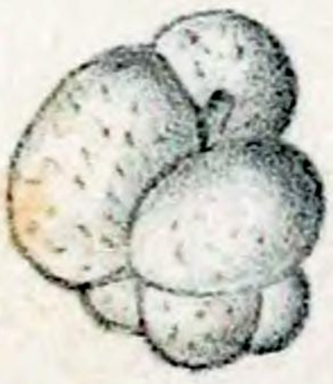


5.



6.

7.

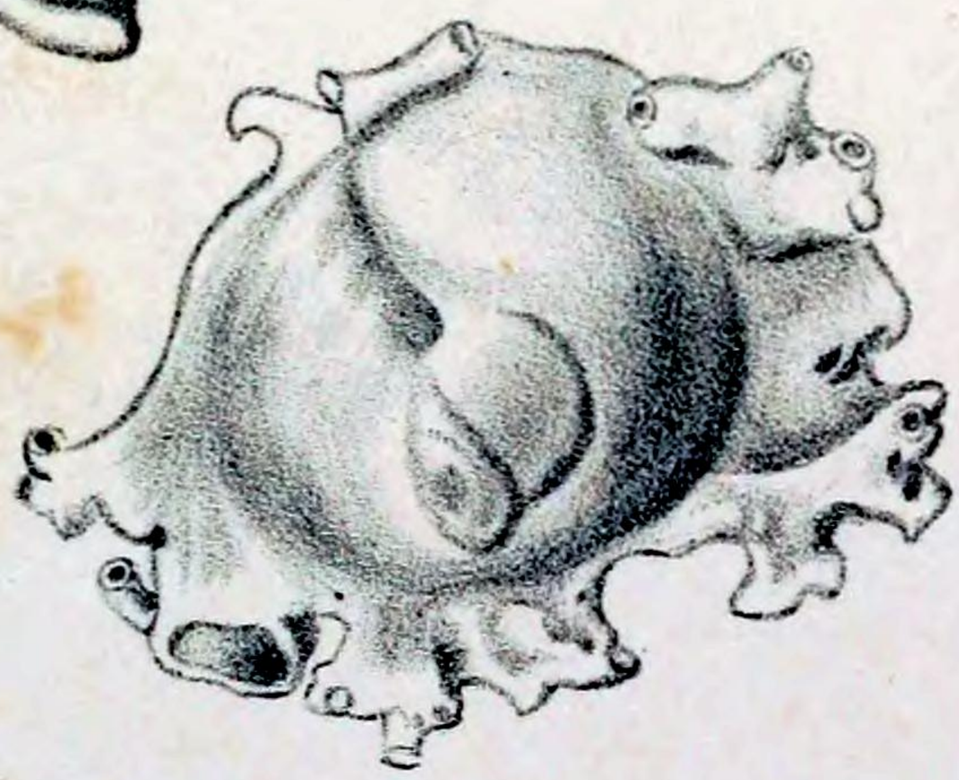


8.

9.

10.

11.

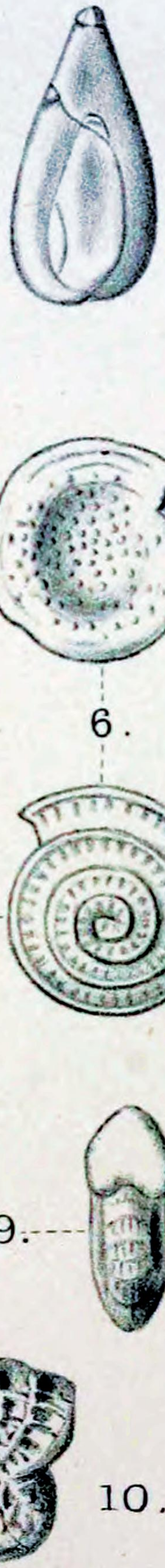


F.C. ad nat. del. × 44. A.H. Searle, lith.

Recent Foraminifera: Victoria, Australia.

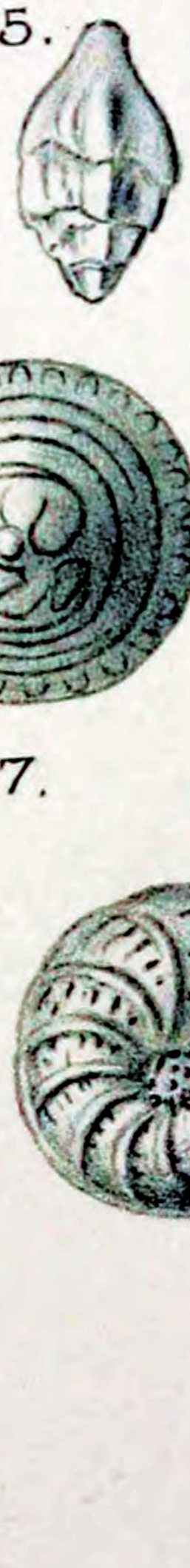
1.

2.



3.

4.

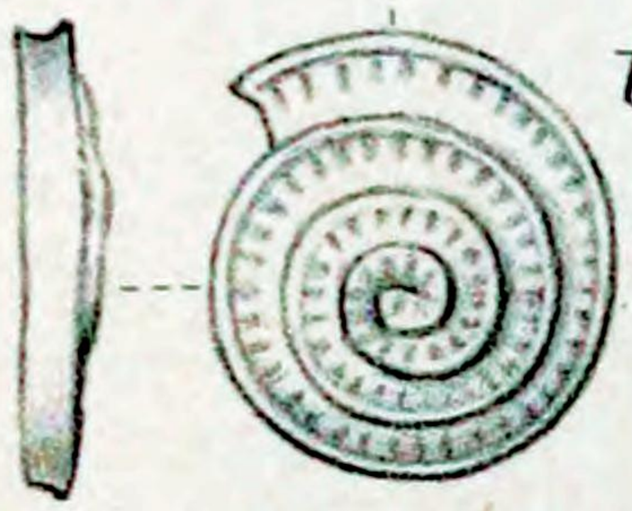


5.

a.

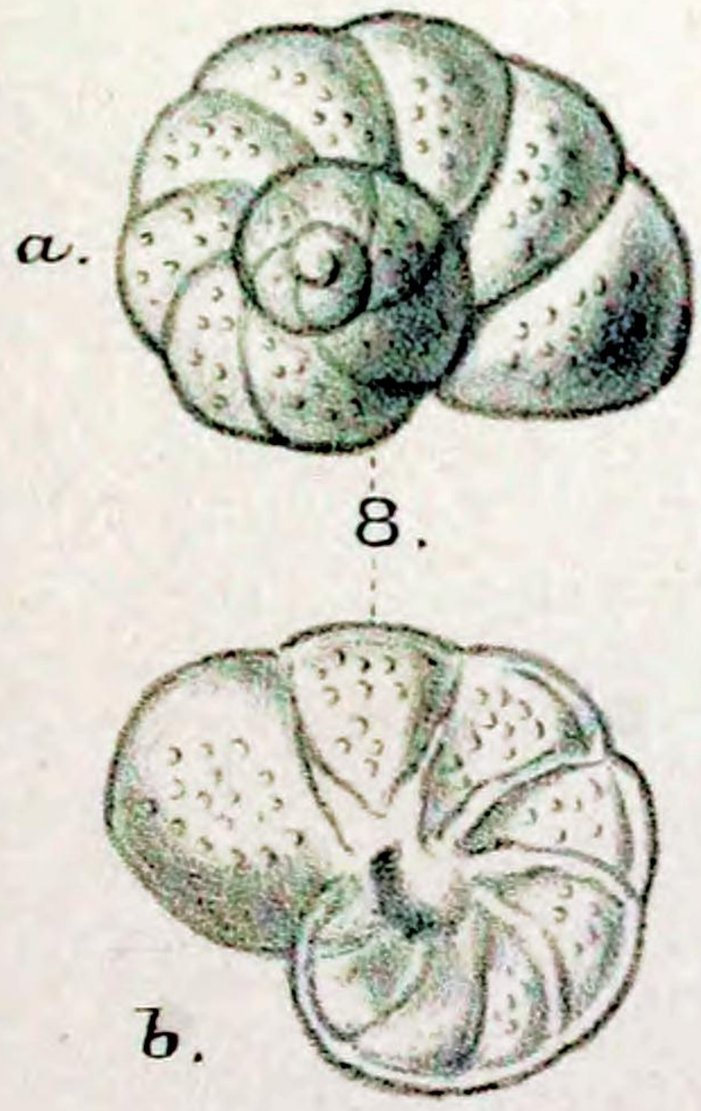
6.

7.



c.

b.



a.

8.

b.

a.

9.

b.

10.

F.C. ad nat. del. A.H. Searle, lith.

Recent Foraminifera: Victoria, Australia.

THE JOURNAL

OF THE

Quekett

MICROSCOPICAL CLUB

EDITED BY

FRANK P. SMITH.

SECOND SERIES.

VOLUME X.

1907-1909.

London :

[PUBLISHED FOR THE CLUB]

WILLIAMS AND NORGATE,

14, HENRIETTA STREET, COVENT GARDEN, LONDON,
AND 7, BROAD STREET, OXFORD.