

F.W. Millett del. ad nat.

West, Newman lith.

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TRANSACTIONS OF THE SOCIETY.

XII.—*Report on the Recent Foraminifera of the Malay Archipelago collected by Mr. A. Durrand, F.R.M.S.—Part XV.*

By FORTESCUE WILLIAM MILLETT, F.R.M.S.

(Read October 2nd, 1903.)

PLATE VII.

Family GLOBIGERINIDÆ.

Globigerina d'Orbigny.

Globigerina bulloides d'Orbigny.

Globigerina bulloides d'Orbigny, 1826, Ann. Sci. Nat., vol. vii. p. 277, No. 1; and Modèles Nos. 17 and 76. *G. bulloides* (d'Orb.) Sherborn and Chapman, 1886, Journ. R. Micr. Soc., ser. 2, vol. vi. p. 756, pl. xvi. fig. 8. *G. bulloides* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 225, pl. xlv. fig. 15. *G. bulloides* (d'Orb.) Burrows, Sherborn, and Bailey, 1890, Journ. R. Micr. Soc., p. 561, pl. xi. fig. 17. *G. bulloides* (d'Orb.) Haeusler,

EXPLANATION OF PLATE VII.

- Fig. 1.—*Globigerina helicina* d'Orbigny. × 65.
„ 2.—*Candeina nitida* d'Orbigny. × 45.
„ 3.—*Spirillina margaritifera* Williamson var. *semiornata* var. n. × 45.
„ 4.—*Cymbalopora bulloides* d'Orbigny sp. × 90.
„ 5.—*Discorbina corrugata* sp. n. × 90.
„ 6. „ *imperatoria* d'Orbigny sp. × 135.
„ 7. „ *rimosa* Parker and Jones. × 90.
„ 8. „ *semi-marginata* d'Orbigny sp. (fide Terquem) × 90.

Note.—In all the figures the letter *a* denotes the superior aspect; *b*, the inferior aspect; and *c*, the peripheral aspect.

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1890, Abhandl. schweiz. pal. Gesell., vol. xvii. p. 118, pl. xv. fig. 46. *G. bulloides* (d'Orb.) Terrigi, 1891, Mem. R. Com. Geol. Italia, vol. iv. p. 101, pl. iii. fig. 26; and var. *triloba* (Reuss) p. 101, pl. iii. fig. 27. *G. bulloides* (d'Orb.) Silvestri, 1893, Atti e Rendic. Accad. Sci. Lett. e Arti dei Zelanti e P.P. dello Studio di Acireale, vol. v. p. 15, pl. v. figs. 59, 61, 64. *G. bulloides* (d'Orb.) Woodward and Thomas, 1893, Geol. and Nat. Hist. Survey of Minnesota, vol. iii. p. 40, pl. D, figs. 14-17. *G. bulloides* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 362, pl. xiii. figs. 1-3. *G. bulloides* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 83, pl. xiv. figs. 754-760. *G. bulloides* (d'Orb.) Egger, 1895, Naturhist. Ver. Passau, Jahresber. xvi. p. 36, pl. iv. fig. 13. *G. bulloides* (d'Orb.) Jones, 1896, Palæont. Soc., p. 280. *G. bulloides* (d'Orb.) Burrows and Holland, 1897, Proc. Geol. Assoc., vol. xv. p. 46, pl. ii. fig. 19. *G. bulloides* (d'Orb.) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 245, pl. iv. figs. 7-9. *G. bulloides* (d'Orb.) Fornasini, 1899, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. vii. p. 579, pl. i. fig. 4, pl. ii. figs. 1, 3, 5-8, pl. iv. fig. 2. *G. bulloides* (d'Orb.) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 170, pl. xxi. figs. 5-7. *G. bulloides* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 321, pl. lxxix. fig. 2. *G. bulloides* (d'Orb.) Rhumbler, 1900, in Dr. Karl Brandt's Nordisches Plankton, Heft 14, p. 21, figs. 24-26. *G. bulloides* (d'Orb.) Chapman, 1900, Geol. Mag., n. s., dec. 4, vol. vii. pl. xiv. fig. 5. *G. bulloides* (d'Orb.) Jones and Chapman, 1900, in A Monograph of Christmas Island, p. 258, pl. xxi. fig. 17. *G. bulloides* (d'Orb.) Wright, 1900, Geol. Mag., n.s., dec. 4, vol. vii. p. 100, pl. v. fig. 18.

This cosmopolitan species occurs in considerable abundance all over the region. The examples show the usual variations of size, form, and texture, and have no special characters to distinguish them from those of other localities.

Globigerina dubia Egger.

Globigerina dubia Egger, 1857, Neues Jahrb. für Min., p. 281, pl. ix. figs. 7-9. Idem, 1893, Abhandl. k. bayer. Akad. Wiss., C. II. vol. xviii. p. 366, pl. xiii. figs. 36-38, 77. Idem, 1895, Naturhist. Ver. Passau, Jahresber. xvi. p. 37, pl. iv. fig. 17. *G. dubia* (Egger) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 322, pl. lxxix. fig. 4. *G. Eggeri* Rhumbler, 1900, in Dr. Karl Brandt's Nordisches Plankton, Heft 14, p. 19, fig. 20.

As shown by Rhumbler, there is a distinct difference between the recent specimens illustrated by Brady and Flint and the fossil example from Ortenburg figured by Egger. In these recent forms, the apertures of the chambers open directly into the umbilical

vestibule, as in *G. bulloides*. In the fossil example, the aperture is a narrow slit at the end of the last chamber, towards the central depression of the under side of the test. Following Brady's "Scheme of the genus *Globigerina*," the recent form must be placed in group A with *G. bulloides*, &c.; whilst Egger's fossil *G. dubia* must find a place with *G. Dutertrei* in group B.

In the Malay Archipelago, Brady's form is but little removed from *G. bulloides*, and hardly deserves separate mention. Egger's *G. dubia* scarcely differs from *G. Dutertrei*; the plan of growth is similar, and in the young specimens the aperture is large, becoming more and more constricted in the adult stage until in the thick-shelled mature examples it is reduced to a mere slit.

It will be sufficient here to record that the four varieties are represented in the Malay Archipelago, leaving the identity of *bulloides* and *Eggeri*, and of *dubia* and *Dutertrei*, an open question.

Globigerina inflata d'Orbigny.

Globigerina inflata d'Orbigny, 1839, Foram. Cuba, p. 134, pl. ii. figs. 7-9. *G. inflata* (d'Orb.) Balkwill and Millett, 1884, Journ. Micr., vol. iii. p. 84, pl. iv. fig. 11. *G. inflata* (d'Orb.) Terrigi, 1891, Mem. R. Com. Geol. Italia, vol. iv. p. 102, pl. iv. fig. 2. *G. inflata* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 369, pl. xiii. figs. 45-47. *G. inflata* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 85, pl. xiv. figs. 763-765. *G. inflata* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 322, pl. lxxix. fig. 3. *G. inflata* (d'Orb.) Fornasini, 1899, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. vii. p. 577, pl. i. fig. 3. *G. inflata* (d'Orb.) Rhumbler, 1900, in Dr. Karl Brandt's Nordisches Plankton, Heft 14, p. 19, fig. 19.

This variety is not very abundant in the Malay Archipelago, but occurs at several Stations in both Areas.

Globigerina rubra d'Orbigny.

Globigerina rubra d'Orbigny, 1839, Foram. Cuba, p. 82, pl. iv. figs. 12-14. *G. rubra* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 225, pl. xlv. fig. 12. *G. rubra* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 360, pl. xiii. figs. 42-44. *G. rubra* (d'Orb.) Silvestri, 1893, Atti e Rendic. Accad. Sci. Lett. e Arti dei Zelanti e P.P. dello Studio di Acireale, vol. v. p. 16, pl. v. figs. 62, 63, 65. *G. rubra* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 85, pl. xiv. fig. 766. *G. rubra* (d'Orb.) Rhumbler, 1897, Verhandl. Deutsch. Zool. Gesellsch., p. 172, fig. 16. *G. rubra* (d'Orb.) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 262, pl. v. fig. 4. *G. rubra* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899),

p. 322, pl. lxxix. fig. 5. *G. rubra* (d'Orb.) Fornasini, 1899, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. vii. p. 580, pl. ii. fig. 11.

There are numerous examples from most of the Stations, but the individuals are insignificant, and have little to distinguish them beyond the colour.

Globigerina conglobata Brady.

Globigerina conglobata Brady, 1879, Quart. Journ. Mier. Sci., n.s., vol. xix. p. 72; and Chall. Rept., 1884, p. 603, pl. lxxx. figs. 1-5, pl. lxxxii. fig. 5. *G. conglobata* (Brady) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 225, pl. xlv. fig. 13. *G. conglobata* (Brady) Terrigi, 1889, Mem. R. Accad. Lincei, ser. 4, vol. vi. p. 114, pl. vi. fig. 14. Idem, 1891, Mem. R. Com. Geol. Italia, vol. iv. p. 102, pl. iv. fig. 3; and *G. bulloides* var. *triloba* (Reuss), p. 101, pl. iv. fig. 1. *G. conglobata* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 368, pl. xiii. figs. 55, 56. *G. conglobata* (Brady) Goës, 1894, K. Svenska Vet.-Akad. Handl., p. 86, pl. xiv. figs. 768, 769. *G. conglobata* (Brady) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 322, pl. lxxix. fig. 6. *G. conglobata* (Brady) Fornasini, 1899, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. vii. p. 582, pl. ii. figs. 12-15, pl. iii. figs. 1-5. *G. conglobata* (Brady) Chapman, 1900, Geol. Mag., dec. 4, vol. vii. pl. xiv. fig. 6. *G. conglobata* (Brady) Jones and Chapman, 1900, in A Monograph of Christmas Island, p. 234, pl. xx. fig. 3.

This form is well represented, and occurs in more or less abundance at nearly all of the Stations.

Globigerina sacculifera Brady.

Globigerina sacculifera Brady, 1877, Geol. Mag., ser. 2, vol. iv. p. 535; and Chall. Rept., 1884, p. 604, pl. lxxx. figs. 11-17, pl. lxxxii. fig. 4. ? *G. helicina* (d'Orb.) Terrigi, 1891, Mem. R. Com. Geol. Italia, vol. iv. p. 103, pl. iv. fig. 4. *G. sacculifera* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 369, pl. xiii. figs. 50-51. *G. sacculifera* (Brady) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 263, pl. v. fig. 5. *G. sacculifera* (Brady) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 322, pl. lxx. fig. 1.

Is very rare, and has been noted only at Station 2 in Area 1.

Globigerina helicina d'Orbigny, plate VII. fig. 1.

Globigerina helicina d'Orbigny, 1826, Ann. Sci. Nat., vol. vii. p. 277, No. 5. *G. helicina* (d'Orb.) Parker, Jones, and Brady, 1871, Ann. and Mag. Nat. Hist., ser. 4, vol. viii. p. 175, pl. xi. fig. 113.

G. helicina (d'Orb.) Terrigi, 1889, Mem. R. Accad. Lincei, ser. 4, vol. vi. p. 114, pl. vi. fig. 15. *G. helicina* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 370, pl. xiii. fig. 52. *G. helicina* (d'Orb.) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 264, pl. v. fig. 6. *G. helicina* (d'Orb.) Fornasini, 1899, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. vii. p. 583, pl. iii. figs. 11, 12.

This appears to be the most unsatisfactory of all the forms assigned to the genus *Globigerina*; and, as shown by the "Planches inédites," d'Orbigny himself was not quite clear as to its characters. Brady's description of it as a "Globigerine shell of the '*rubra*' type, with the addition of an inflated chamber at two opposite points of its periphery," is perhaps the best definition of the normal form; but, judging from the published figures, and the examination of actual specimens, it is frequently nothing more than an irregular aggregation of globose chambers, two or more of which exhibit an exterior arched aperture.

In the Malay Archipelago, the form is very rare; but it occurs in both areas.

Brady writes, "*Globigerina helicina* is a comparatively rare form. Occasional specimens have been met with at nine or ten 'Challenger' Stations, scattered over the North and South Atlantic and in the South Pacific; to which may be added, on the authority of Soldani, certain points in the Mediterranean and the Adriatic." Egger reports it from nine 'Gazelle' Stations, extending from the west coast of Africa to the Fiji Islands.

Globigerina æquilateralis Brady.

Globigerina æquilateralis Brady, 1879, Quart. Journ. Micr. Sci., n.s., vol. xix. p. 71; and 1884, Chall. Rept., p. 605, pl. lxxx. figs. 18-21. *G. æquilateralis* (Brady) Wright, 1886, Proc. Belfast Nat. Field Club, 1884-85, App. ix., 1886, p. 332, pl. xxvii. fig. 9. *G. æquilateralis* (Brady) Chapman, 1892, Quart. Journ. Geol. Soc., vol. xlviii. p. 517, pl. xv. fig. 14. *G. æquilateralis* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 364, pl. xiii. figs. 5-8. *G. æquilateralis* (Brady) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 86, pl. xiv. fig. 767. *G. æquilateralis* (Brady) Madsen, 1895, Medd. Dansk Geol. Forening, No. 2, p. 210, pl. fig. 5. *G. æquilateralis* (Brady) Chapman, 1896, Journ. R. Micr. Soc., p. 589, pl. xiii. fig. 7. *G. æquilateralis* (Brady) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 265, pl. v. fig. 8. *G. æquilateralis* (Brady) Fornasini, 1899, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. vii. p. 580, pl. iv. figs. 3, 4. *G. æquilateralis* (Brady) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 323, pl. lxx. fig. 3. *G. æquilateralis* (Brady) Rhumbler,

1900, in Dr. Karl Brandt's Nordisches Plankton, Heft 14, p. 20, figs. 21-23.

In the Malay Archipelago this planospiral form occurs at several Stations, and is moderately abundant. The examples exhibit considerable diversity of form and texture, and often closely resemble *Hastigerina pelagica*.

Orbulina d'Orbigny.

Orbulina universa d'Orbigny.

Orbulina universa d'Orbigny, 1839, Foram. Cuba, p. 3, pl. i. fig. 1. *O. universa* (d'Orb.) Woodward and Thomas, 1885, 13th Ann. Rept. Geol. and Nat. Hist. Survey of Minnesota for 1884, p. 174, pl. iii. figs. 25-31. *O. universa* (d'Orb.) Malagoli, 1887, Boll. Soc. Geol. Italia, vol. vi. p. 522, pl. xiii. fig. 9. *Globigerina* (*Orbulina*) *universa* (d'Orb.) Idem, 1888, Atti Sci. Nat. Modena, ser. 3, vol. vii. p. 113, pl. iii. fig. 8. *O. universa* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 225, pl. xlv. figs. 7, 8, 14. *Globigerina* (*Orbulina*) *universa* (d'Orb.) Terrigi, 1889, Mem. R. Accad. Lincei, ser. 4, vol. vi. p. 114, pl. vi. figs. 16, 17. *O. universa* (d'Orb.) Mariani, 1891, Boll. Soc. Geol. Italia, vol. x. p. 729, pl. xxi. figs. 23, 24. *O. universa* (d'Orb.) Woodward and Thomas, 1893, Geol. and Nat. Hist. Survey of Minnesota, vol. iii. p. 43, pl. D, figs. 23-27. *O. universa* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 374, pl. xiv. figs. 7-9, 11, 12, 39, 40. *O. universa* (d'Orb.) Fornasini, 1893, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. iii. p. 430, pl. ii. fig. 12. *O. universa* (d'Orb.) Silvestri, 1893, Atti e Rendic. Accad. Sci. Lett. e Arti dei Zelanti di Acireale, vol. v. p. 16. pl. ii. figs. 1-3. *O. universa* (d'Orb.) Lister, 1895, Phil. Trans., vol. clxxxvi. p. 408, figs. a-e. *O. universa* (d'Orb.) Egger, 1895, Naturhist. Ver. Passau, Jahresber. xvi. p. 38, pl. iv. figs. 18, 19. *O. universa* (d'Orb.) Rhumbler, 1897, Abhandl. Deuts. Zool. Gesell., p. 174, fig. 21. *O. universa* (d'Orb.) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 266, pl. v. figs. 11-16, 19-22. *O. universa* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 322, pl. lxxix. fig. 1. *O. universa* (d'Orb.) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 173, pl. xxi. figs. 46, 47. *O. universa* (d'Orb.) Rhumbler, 1900, in Dr. Karl Brandt's Nordisches Plankton, Heft 14, p. 27, figs. 27-30.

This form is but poorly represented in the Malay Archipelago; the examples are few and insignificant. It occurs at a small number of Stations in both Areas.

Hastigerina Wyville Thomson.*Hastigerina pelagica* d'Orbigny sp.

Nonionina pelagica d'Orbigny, 1843, Foram. Amér. Mérid., p. 27, pl. iii. figs. 13, 14. *Hastigerina Murrayi* (Wy. Thomson) Murray, 1876, Proc. Roy. Soc., vol. xxiv. p. 534, pls. xxii. xxiii. *H. pelagica* (d'Orb.) Brady, 1879, Quart. Journ. Micr. Sci., n.s., vol. xix. p. 77. *H. pelagica* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 372, pl. xiii. figs. 53, 54. *H. pelagica* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 324, pl. lxx. fig. 4. *H. pelagica* (d'Orb.) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 273, pl. v. fig. 9. *H. pelagica* (d'Orb.) Rhumbler, 1900, in Dr. Karl Brandt's Nordisches Plankton, p. 29, fig. 31.

Of this essentially surface species, examples occur at numerous Stations in both Areas. Many of the individuals bear short spines, similar to those figured by d'Orbigny in the South American example.

Pullenia Parker and Jones.*Pullenia sphaeroides* d'Orbigny sp.

Nonionina sphaeroides d'Orbigny, 1826, Ann. Sci. Nat., vol. vii. p. 293, No. 1; Modèle No. 43. *Pullenia sphaeroides* (d'Orb. sp.) Parker and Jones, 1865, Phil. Trans., vol. clv. p. 368, pl. xiv. fig. 43. *P. bulloides* (d'Orb.) Andreae, 1884, Abhandl. geol. Special Karte Elsass-Loth., vol. ii. p. 206, pl. ix. fig. 23. *P. sphaeroides* (d'Orb.) Balkwill and Wright, 1885, Trans. R. Irish Acad., vol. xxviii. (Sci.) p. 348, pl. xii. fig. 28. *P. sphaeroides* (d'Orb.) Sherborn and Chapman, 1886, Journ. R. Micr. Soc., ser. 2, vol. vi. p. 756, pl. xvi. fig. 10. *P. sphaeroides* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 226, pl. xliii. figs. 21, 24. *P. sphaeroides* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 372, pl. xix. figs. 30, 31. *P. sphaeroides* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 87, pl. xiv. figs. 771, 772. *P. sphaeroides* (d'Orb.) Egger, 1895, Naturhist. Ver. Passau, Jahresber. xvi. p. 39, pl. iv. fig. 21. *P. sphaeroides* (d'Orb.) Burrows and Holland, 1897, Proc. Geol. Assoc., vol. xv. p. 47, pl. ii. fig. 20. *P. sphaeroides* (d'Orb.) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 174, pl. xxi. figs. 27, 28. *P. sphaeroides* (d'Orb.) Chapman, 1900, Proc. California Acad. of Sci., ser. 3, Geol., vol. i. p. 252, pl. xxx. fig. 6.

This species is represented in the Malay Archipelago by a few insignificant specimens from Area 1.

Pullenia obliquiloculata Parker and Jones.

Pullenia obliquiloculata Parker and Jones, 1865, Phil. Trans., vol. clv. p. 368, pl. xix. fig. 4. *P. obliquiloculata* (P. and J.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 372, pl. xiii. figs. 62-64. *P. obliquiloculata* (P. and J.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 324, pl. lxx. fig. 6.

This form is not uncommon at a few Stations in each of the Areas, and the examples are of the normal 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* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 226, pl. xlv. figs. 9-11. *S. bulloides* (d'Orb.) Burrows, Sherborn, and Bailey, 1890, Journ. R. Micr. Soc., p. 562, pl. xi. figs. 20, 21. *S. bulloides* (d'Orb.) Terrigi, 1891, Mem. R. Com. Geol. Italia, vol. iv. p. 104, pl. iv. fig. 6. *S. bulloides* (d'Orb.) Fornasini, 1893, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. iii. p. 430, pl. ii. fig. 14. *S. bulloides* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 375, pl. xiii. figs. 48, 49. *S. bulloides* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 87, pl. xiv. fig. 770. *S. austriaca* (d'Orb.) Egger, 1895, Naturhist. Ver. Passau, Jahresber. xvi. p. 40, pl. iv. fig. 22. *S. bulloides* (d'Orb.) Chapman, 1896, Journ. R. Micr. Soc., p. 589, pl. xiii. fig. 8. *S. bulloides* (d'Orb.) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 173, pl. xxi. figs. 29, 30. *S. bulloides* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 325, pl. lxxi. fig. 1.

S. bulloides is not uncommon in the Malay Archipelago, and has been observed at most of the Stations. There is considerable variety in the aggregation of the chambers, as well as in the number of them visible externally. Whilst the majority of the examples have the usual smooth shining surface, a few show a tendency to the roughness characteristic of *S. dehiscens*, although not to such an extent as to warrant their being assigned to that species.

Candeina d'Orbigny.*Candeina nitida* d'Orbigny, plate VII. fig. 2.

Candeina nitida d'Orbigny, 1839, Foram. Cuba, p. 108, pl. ii. figs. 27, 28. *C. nitida* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 373, pl. xiii. fig. 57. *C. nitida*

(d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 325, pl. lxxi. fig. 3. *C. nitida* (d'Orb.) Rhumbler, 1900, in Dr. Karl Brandt's Nordisches Plankton, Heft 14, p. 31, fig. 33.

This species is very rare in the Malay Archipelago, and has been found only in Area 2.

The example figured differs materially from the published illustrations of the species, the test being compressed rather than conical.

C. nitida is not so widely distributed as the other members of the Globigerinidæ to which reference has been made in this Report. Besides the localities mentioned by Brady in the 'Challenger' Report, Egger names five Stations, at all of which it is said to be rare. Flint's only Station is "near the Windward Islands."

Family ROTALIDÆ.

Sub-Family Spirillininæ.

Spirillina Ehrenberg.

Spirillina vivipara Ehrenberg.

Spirillina vivipara Ehrenberg, 1841, Abhandl. k. Akad. Wiss. Berlin, p. 422, pl. iii. VII. fig. 41. *S. vivipara* (Ehren.) Bütschli, 1886, Morph. Jahrb., vol. xi. p. 84, pl. vi. fig. 12. *S. vivipara* (Ehren.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 394, pl. xviii. figs. 56-58; and Ibid., 1899, vol. xxi. p. 18, pl. i. figs. 50, 51. *S. vivipara* (Ehren.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 326, pl. lxxi. fig. 4.

This cosmopolitan species is abundant in the Malay Archipelago, and occurs at several Stations in both Areas. The individuals are normal in character, and vary but little in size.

Spirillina inæqualis Brady.

Spirillina inæqualis Brady, 1879, Quart. Journ. Micr. Sci., n.s., vol. xix. p. 278, pl. viii. fig. 25. *S. inæqualis* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 394, pl. xviii. figs. 40-42.

This variety is very rare in the Malay Archipelago, and has been observed only at Station 2, in Area 1.

Brady states that it has been found in shallow-water dredgings from several of the island groups of the Pacific; the depths ranging from 12 to 155 fathoms. Egger reports it from two 'Gazelle' Stations: Mauritius, 225 fathoms, and West Australia, 196 fathoms.

Spirillina limbata Brady.

Spirillina limbata Brady, 1879, Quart. Journ. Micr. Sci., n.s., vol. xix. p. 278, pl. viii. fig. 26. *S. limbata* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 395, pl. xviii. figs. 43, 44. *S. limbata* (Brady) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 326, pl. lxxi. fig. 5.

S. limbata—as represented by the form having a square periphery, and the faces plane, with limbate sutures, but without tubercles—is rare and poor in the Malay Archipelago, and has been noted only at Stations No. 2 and No. 22.

Brady names thirteen localities for the species, widely apart; Egger records it from four 'Gazelle' Stations; and Siddall has found it in the Estuary of the Dee. The 'Albatross' Station from which Flint procured it has not been recorded.

Spirillina limbata var. *denticulata* Brady.

Spirillina limbata var. *denticulata* Brady, 1884, Chall. Rept., p. 632, pl. lxxxv. fig. 17. *S. limbata denticulata* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 396, pl. xviii. fig. 66.

This variety also is very rare, and has been found only in the material from Station 17.

The Stations recorded by Brady are: East Moncœur Island, Bass Strait, 38 fathoms; Raine Island, Torres Strait, 155 fathoms; and Nares Harbour, Admiralty Islands, 17 fathoms. The solitary 'Gazelle' Station is at Kerguelen, 57 fathoms.

In the Tertiary beds of St. Erth, Cornwall, a modification of this variety occurs; in which, whilst one face is in all respects similar to those of *denticulata*, the other is covered with tubercles, and the suture is not apparent.

Spirillina margaritifera Williamson var. *semiornata* var. n.,
plate VII. fig. 3.

Test, inequilateral; convolutions, numerous; peripheral edge, square. One of the lateral faces flat and smooth, with the spiral suture excavated; the opposite face concave, and ornamented with a single row of tubercles arranged closely together in a spiral line. Diameter 0.60 mm.

Williamson's knowledge of *Spirillina margaritifera* was derived from a single specimen from an unknown locality, and, as he justly states, "any species founded on a single specimen can

only be accepted as a provisional one awaiting further elucidation."*

It cannot be said that subsequent researches have altogether settled the characters of the species. The *S. tuberculata* of Brady † is very doubtfully distinct; on this point Wright observes, ‡ “The specimens recorded as *Spirillina tuberculata*, both by Siddall, in ‘Memoir on the Foraminifera of the Estuary of the Dee,’ and by Balkwill and myself, in ‘Foraminifera of Dublin Bay and Irish Sea,’ should I feel satisfied be referred to *S. margaritifera*; and *S. tuberculata* should be no longer included among the British species.” And Brady himself writes, § “I am by no means confident that this form, or at any rate the British specimens that have been assigned to it, can be separated from *Sp. margaritifera*.” Concerning these inequilateral forms of *Spirillina*, Chapman observes, || “The inequilateral modifications of *Spirillinæ* are not unfrequent at Funafuti, and are of much interest since they point to the rotaline affinities which the genus has towards shells of the trochoid type.”

Of published figures resembling or identical with *S. margaritifera*, may be mentioned:—*S. margaritifera* Terquem (not Williamson) ¶; this has a square periphery, and concave faces with two rows of tubercles. *S. nodosa* Terquem,** in which there is a single row of nodosities; he remarks that this species is sometimes inequilateral, and shows one of the faces nearly plane with the nodosities less pronounced. *S. nodifera* Terquem, †† which is slightly concave in the centre, angular at the periphery, and ornamented with one series of granulations. *S. tuberculata-limbata* Chapman, ‡‡ has the larger and flat surface limbate, and the peripheral edge of the coil sharp on that side; the smaller face is slightly rounded and strongly tuberculate.

The variety *semiornata* is very rare in the Malay Archipelago, and has been noted only at Station 22 in Area 2.

Spirillina decorata Brady.

Spirillina decorata Brady, 1884, Chall. Rept., p. 633, pl. lxxxv. figs. 22–25. *S. decorata* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 394, pl. xviii. figs. 64, 65.

This also is very rare in the Malay Archipelago, and has been found only at Station 2 in Area 1.

* Rec. Foram. Gt. Britain, 1858, p. 93.

† Quart. Journ. Micr. Sci., n.s., vol. xix. 1879, p. 279, pl. viii. fig. 28.

‡ Proc. Belfast Nat. Field Club, App. 1885, 1886, p. 321.

§ Journ. R. Micr. Soc., 1887, p. 918.

|| Journ. Linn. Soc., vol. xxviii. 1901, p. 411.

¶ Anim. Plage de Dunkerque, part 3, 1881, p. 110, pl. xiii. fig. 2.

** Op. cit., fig. 1.

†† Mém. Soc. géol. Fr., sér. 3, vol. ii. 1882, p. 34, pl. ix. fig. 32.

‡‡ Journ. Linn. Soc., vol. xxviii. 1900, p. 11, pl. i. fig. 8.

Brady names three points at which it has been obtained in the North Atlantic, one point in the South Atlantic, and three points in the South Pacific; the depths varying from 6 to 1125 fathoms. There are three 'Gazelle' Stations, West Africa, Mauritius and West Australia, at depths from 196 to 371 fathoms.

Sub-Family **Rotalinæ**.

Patellina Williamson.

Patellina corrugata Williamson.

Patellina corrugata Williamson, 1858, Rec. Foram. Gt. Britain, p. 46, pl. iii. figs. 86–89. *P. corrugata* (Will.) Terquem, 1875, Anim. Plage de Dunkerque, pt. 1, p. 31, pl. iv. fig. 3; and *P. punctata* Ibid., 1881, pt. 3, p. 128, pl. xvi. fig. 9. *P. corrugata* (Will.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 393, pl. xv. figs. 70–72. *P. corrugata* (Will.) Schaudinn, 1895, Sitzungsber. Gesell. Naturforsch. Freunde zu Berlin, No. 10, p. 181, fig. *P. corrugata* (Will.) Schlumberger, 1896, Feuille Jeunes Nat., sér. 3, Ann. xxvi. p. 129, fig. *P. corrugata* (Will.) Wright, 1900, Geol. Mag., n.s., dec. 4, vol. vii. p. 100, pl. v. fig. 20.

P. corrugata in the Malay Archipelago is rather scarce, but there are examples from Stations in each Area.

In the living condition its distribution is world-wide, but as a fossil it is rare; and it may be worthy of mention that it is abundant in the Tertiary beds of St. Erth, Cornwall.

Cymbalopora Hagenow.

Cymbalopora Poeyi d'Orbigny sp.

Rotalia squamosa d'Orbigny, 1826, Ann. Sci. Nat., vol. vii. p. 272, No. 8. *Rosalina Poeyi* d'Orbigny, 1839, Foram. Cuba, p. 92, pl. iii. figs. 18–20. *Cymbalopora (Rosalina) Poeyi* (d'Orb.) Carpenter, 1862, Introd. Foram., p. 215, pl. xiii. figs. 10–12. *C. Poeyi* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 226, pl. xlvi. fig. 12. *C. Poeyi* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 381, pl. xviii. figs. 51, 52; and Ibid., 1899, p. 167, pl. xix. figs. 28–30. *C. Poeyi* (d'Orb.) Silvestri, 1899, Mem. Pontif. Accad. Nuovi Lincei, vol. xv. p. 280, pl. vi. fig. 3. *C. Poeyi* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 326, pl. lxxii. fig. 1.

This species occurs in great abundance all over the region, and the examples exhibit great variety of form, but the trivial characters are retained throughout, and they show no tendency to coalesce with any allied forms.

Cymbalopora tabellæformis Brady.

Cymbalopora tabellæformis Brady, 1884, Chall. Rept., p. 637, pl. cii. figs. 15-18. *C. tabellæformis* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 382, pl. xviii. figs. 54, 55.

Although this is a very distinct form, and easily recognised, it seems to have escaped the notice of authors generally, and has been figured only by Brady and Egger.

In the Malay Archipelago it is rare, but it has been noted at two Stations in each Area.

Brady says that it is a coral-reef species, and all the Stations at which it occurs, recorded by him, are in the Pacific and Indian Oceans. The solitary 'Gazelle' Station is Mauritius.

Cymbalopora bulloides d'Orbigny sp., plate VII. fig. 4.

Rosalina bulloides d'Orbigny, 1839, Foram. Cuba, p. 104, pl. iii. figs. 2-5. *Cymbalopora bulloides* (d'Orb.) Carpenter, 1862, Introd. Foram., p. 216. *Discorbina bulloides* (d'Orb.) Goës, 1882, K. Svenska Vet.-Akad. Handl., vol. xix. p. 106, pl. viii. figs. 262, 263. *C. bulloides* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 381, pl. xviii. fig. 53. *C. bulloides* (d'Orb.) Earland, 1902, Journ. Quekett Micro. Club, ser. 2, vol. viii. p. 309, pl. xvi. figs. 6-9.

The structure of the balloon-chamber, characteristic of this species, with its internal float, has been recently so thoroughly worked out by Earland, that it will suffice here to call attention to his paper on the subject in the Journal of the Quekett Club referred to above.

The species is well represented in the Malay Archipelago and occurs at many Stations, but is most abundant in Area 1. The examples vary considerably in form, some being as flat as a watch-case whilst others equal in height any of those figured by Möbius or Goës.

Still more numerous is an interesting variety in which the balloon-chamber is always much wrinkled, and is apparently devoid of pores or internal tube. This variety is never depressed, and seldom varies from the contour shown in the figure. Like the normal form it is most abundant at the Stations in Area 1.

Discorbina Parker and Jones.*Discorbina turbo* d'Orbigny sp.

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

Carpenter, 1862, Introd. Foram., p. 200. *D. turbo* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 389, pl. xv. figs. 42-44. *D. turbo* (d'Orb.) Jones, 1895, Palæont. Soc., p. 291, pl. vii. fig. 29. *D. turbo* (d'Orb.) Chapman, 1896, Journ. R. Micr. Soc., p. 591, pl. xiii. fig. 13.

Typical examples of this species are very rare in the Malay Archipelago, but a passage-form approaching *D. rosacea* is very common in Area 2.

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. *Discorbina turbo* var. *globularis* Carpenter, 1862, Introd. Foram., p. 204, pl. iii. fig. 1. *D. globularis* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 226, pl. xlvi. fig. 6. *D. globularis* Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. pl. xv. figs. 7-9; and *Globigerina (Rosalina) globularis* (d'Orb.), p. 365, pl. xiii. figs. 65-68. *D. globularis* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 94, pl. xv. fig. 793. *D. globularis* (d'Orb.) Jones, 1895, Palæont. Soc., p. 292, pl. vii. fig. 28. *D. globularis* (d'Orb.) Chapman, 1896, Journ. R. Micr. Soc., p. 590, pl. xiii. fig. 11. *D. globularis* (d'Orb.) Morton, 1897, Proc. Portland Soc. Nat. Hist., vol. ii. p. 120, pl. i. fig. 22. *D. globularis* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 327, pl. lxxii. fig. 2. *D. globularis* (d'Orb.) Wright, 1900, Geol. Mag., dec. 4, vol. vii. p. 100, pl. v. fig. 21. *D. globularis* (d'Orb.) Chapman, 1900, Geol. Mag., dec. 4, vol. vii. pl. xiv. fig. 8.

Occurs in abundance at nearly all the Stations in both Areas. The examples, although small, have all the characters of the species.

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.) Brady, 1864, Trans. Linn. Soc., vol. xxiv. p. 473, No. 69. *D. rosacea* (d'Orb.) Sherborn and Chapman, 1886, Journ. R. Micr. Soc., ser. 2, vol. vi. p. 756, pl. xvi. fig. 11. *D. rosacea* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 385, pl. xv. figs. 39-41. *D. rosacea* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 94, pl. xv. fig. 792. *D. rosacea* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 327, pl. lxxii. fig. 3.

This species also is abundant and widely distributed in the Malay Archipelago. The examples are small, and exhibit little variety of form and texture.

Discorbina Vilardeboana d'Orbigny sp.

Rosalina Vilardeboana d'Orbigny, 1843, Foram. Amér. Mérid., p. 44, pl. vi. figs. 13-15. *Discorbina Vilardeboana* (d'Orb.) Parker and Jones, 1872, Quart. Journ. Geol. Soc., vol. xxviii. p. 115. *D. Vilardeboana* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 387, pl. xv. figs. 13-15. *D. Vilardeboana* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 95, pl. xvi. fig. 796. *D. Vilardeboana* (d'Orb.) Chapman, 1898, Journ. R. Micr. Soc., p. 15, pl. ii. fig. 16.

This variety is still more abundant, but it is doubtful if any of the examples are sufficiently distinct from *D. rosacea* to warrant their separation from that form.

Discorbina concinna Brady.

Discorbina concinna Brady, 1884, Chall. Rept., p. 646, pl. xc. figs. 7, 8. *D. concinna* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 388, pl. xv. figs. 22-24.

This form, rare elsewhere, is very common in the Malay Archipelago, and occurs all over the region. Amongst a multitude of individuals there must of necessity be much variation, and this is here in the direction of *D. orbicularis*.

Brady enumerates seven 'Challenger' Stations where it has been found, at depths varying from 16 to 620 fathoms; to these I can add Station 185, from which there are examples in my collection.

There are three 'Gazelle' Stations at depths of from 33 to 196 fathoms. These appear to be the only records of its occurrence.

Discorbina orbicularis Terquem sp.

Rosalina orbicularis Terquem, 1876, Anim. Plage de Dunkerque, p. 75, pl. ix. fig. 4. *Discorbina orbicularis* (Terq.) Balkwill and Millett, 1884, Journ. Micr., vol. iii. p. 23, pl. iv. fig. 13. *D. orbicularis* (Terq.) Balkwill and Wright, 1885, Trans. R. Irish Acad., vol. xxviii. (Sci.) p. 349, pl. xiii. figs. 31-33. *D. orbicularis* (Terq.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 227, pl. xlvi. fig. 1. *D. orbicularis* (Terq.) Terrigi, 1889, Mem. R. Accad. Lincei, ser. 4, vol. vi. p. 115, pl. xvii. figs. 2, 3. *D. orbicularis* (Terq.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 389, pl. xv. figs. 16-18, 76-78. *D. orbicularis* (d'Orb.) Jones, 1895, Palæont. Soc., p. 295, pl. vii. fig. 31. *D. subrotunda* (d'Orb. sp.) Fornasini, 1898, Rendic. Accad. Sci. Ist. Bologna, n.s., vol. ii. (figures in the text, after d'Orbigny).

This form is plentiful at Stations 2 and 22; and occurs also at Station 14, but in very small numbers.

Discorbina patelliformis Brady.

Discorbina patelliformis Brady, 1884, Chall. Rept., p. 647, pls. lxxxviii. fig. 3, lxxxix. fig. 1. *D. patelliformis* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 390, pl. xv. figs. 48–50.

Is not uncommon at Station 2, and occurs at Station 6, both in Area 1, but has not been observed at any other Station.

Brady states, "Is not uncommon amongst the islands of the Pacific, at depths of 6 to 150 fathoms. It has been observed also in shallow-water dredgings from the shores of Ceylon, Madagascar, the Mauritius and Malta."

The 'Gazelle' localities are Cape Verde, Mauritius, and Western Australia.

Discorbina tabernacularis Brady.

Discorbina tabernacularis Brady, 1881, Quart. Journ. Micr. Sci., n.s., vol. xxi. p. 65; and Chall. Rept., 1884, p. 648, pl. lxxxix. figs. 5–7. *D. tabernacularis* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 390, pl. xv. figs. 58–60, 79.

In the Malay Archipelago this is a very rare form, and the examples are small and thin-shelled. It occurs at Stations 2, 6 and 14, in Area 1; and at Station 17 in Area 2.

Brady says that it is a minute coral-reef species, and names several localities where it has occurred at depths of from 2 to 255 fathoms.

Egger reports it from Mauritius, 75 and 225 fathoms; and from Western Australia, 44 fathoms.

Discorbina corrugata sp. n., plate VII. fig. 5.

Test, conical; base, flat or concave; peripheral margin acute. A series of sharp ridges extends from the apex to the base of the test, the spaces between the ridges being excavated. The umbilical region either hollow, or filled up with granular matter beyond which are minute radiating striæ which extend to the peripheral margin. Shell-substance dense, obscuring the sutures on the superior face of the test. Diameter, 0.28 mm.

The above is an incomplete description of an interesting form, of which there are only two (more or less damaged) specimens available for examination. The polygonal shape of the superior face is, however, sufficient to distinguish it from any other species of *Discorbina*. The number of convolutions, and the form of the chambers, cannot be determined; but there are indications that the ridges mark the centre of the chambers, and that the junction of

the sutures is in the hollow between the ridges. The species partakes of the characters of both *D. patelliformis* and *D. tabernacularis*, but is distinct from either.

The examples are from Station 31, in Area 2.

Discorbina opercularis d'Orbigny sp.

Rosalina opercularis d'Orbigny, 1839, Foram. Cuba, p. 93, pl. iii. figs. 24, 25, pl. iv. fig. 1. *Discorbina opercularis* (d'Orb.) Parker and Jones, 1872, Quart. Journ. Geol. Soc., vol. xxviii. p. 114. *D. opercularis* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 389, pl. xv. figs. 73-75.

This form is badly represented in the Malay Archipelago, the examples being few and insignificant. It has been noticed only at Stations 2 and 6, both in Area 1.

It is recorded by d'Orbigny from the Islands of Cuba and Martinique; by Brady from four points on the coast of Australia, at depths of from 2 fathoms to 155 fathoms; and by Egger from West Africa, Mauritius and Western Australia from 37 to 225 fathoms.

Discorbina pulvinata Brady.

Discorbina pulvinata Brady, 1884, Chall. Rept., p. 650, pl. lxxxviii. fig. 10. *D. pulvinata* (Brady) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 391, pl. xv. figs. 33-35.

Of this rare form there are some rather feeble specimens from a few Stations in both Areas.

The 'Challenger' localities given by Brady are: Nares Harbour, Admiralty Islands, 17 fathoms; and off Booby Island, south of Papua, 6 to 8 fathoms. To which I can add Raine Island, 155 fathoms, from specimens in my own collection.

The sole 'Gazelle' Station is Kerguelen, 57 fathoms.

Discorbina imperatoria d'Orbigny sp., var. *globosa* var. n.,
plate VII. fig. 6.

Rosalina imperatoria d'Orbigny, 1846, For. Foss. Vienne, p. 176, pl. x. figs. 16-18.

This variety differs from the type in several respects: the superior face is flatter, and the inferior more convex; the chambers are more inflated, and the peripheral edge less acute; the aperture is indistinct, and the radiating lines on the umbilical region are not apparent.

This is one of the characteristic forms of the Malay Archipelago,

and occurs in vast abundance at almost every Station in both Areas.

D'Orbigny's specimens were from the Tertiary of Tarnapol, in Galicia.

Discorbina Bertheloti d'Orbigny sp.

Rosalina Bertheloti d'Orbigny, 1839, Foram. Canaries, p. 135, pl. i. figs. 28–30. *Discorbina Bertheloti* (d'Orb.) Brady, 1864, Trans. Linn. Soc., vol. xxiv. p. 469, pl. xlvi. fig. 10. *D. Bertheloti* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 227, pl. xlvi. figs. 7, 8. *D. Bertheloti* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 387, pl. xv. figs. 10–12. *D. Berthelotiana* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 93, pl. xv. fig. 790. *D. Bertheloti* (d'Orb.) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 327, pl. lxxii. fig. 4.

This widely-distributed form is very abundant in the Malay Archipelago, and occurs in profusion all over the region.

Discorbina vesicularis Lamarek s.p.

Discorbites vesicularis Lamarek, 1804, Ann. du Muséum, vol. v. p. 183; vol. viii. 1806, pl. lxii. fig. 7. *Discorbina vesicularis* (Lam.) Carpenter, 1862, Introd. Foram., p. 204, pl. xiii. figs. 2, 3. *D. vesicularis* (Lam.) Halkyard, 1889, Trans. and Ann. Rept. Manchester Micr. Soc., p. 69, pl. ii. fig. 8.

Is common in Area 1, and occurs at one or two Stations in Area 2.

Discorbina rimosa Parker and Jones, plate VII. fig. 7.

Discorbina rimosa (Parker and Jones) Carpenter, 1862, Introd. Foram., p. 205, *D. rimosa* Parker and Jones, 1865, Phil. Trans., vol. clv. pp. 385, 421, pl. xix. fig. 6.

The examples of this species are few, and rather small. It occurs at Stations 2 and 14, in Area 1; and at Station 31, in Area 2.

Parker and Jones report it as occurring from India to Australia, including Fiji, in the recent condition; and, as fossil, from the Tertiary of Grignon, &c.

Discorbina semi-marginata d'Orbigny sp. (fide Terquem),
plate VII. fig. 8.

Rotalia (Turbinulina) semi-marginata d'Orbigny, 1826, Ann. Sci. Nat., vol. vii. p. 276, No. 53. (Figures without name or

description). Deshayes, 1824-1837, Description des Coquilles fossiles des environs de Paris, pl. cvi. figs. 16-19. *Rotalina semi-marginata* (d'Orb.) Terquem, 1882, Mém. Soc. Geól. Fr., sér. 3, vol. ii. p. 56, pl. xi. figs. 12-14.

As represented in the Malay Archipelago, this is a Rotaline form, with a thin smooth hyaline test, and provided with a well-developed series of Asterigerine umbilical chambers. It bears a strong resemblance to the *D. rimosa* of Parker and Jones, but is devoid of the chinks between the chambers characteristic of that species. It may be noted that both forms are found in the same localities, whether recent or fossil.

The only description of *D. semi-marginata* published by d'Orbigny is in the Prodrôme de Paléontologie, vol. ii. 1850, p. 407, No. 1317, "Espèce rugueuse, ovale, bordée intérieurement," which is insufficient to identify it; whilst the figure in the "Planches inédites," referred to by Terquem, has never been published. Deshayes neither names nor describes the form figured by him, consequently the first author to give a sufficient description of the species was Terquem.

In the Malay Archipelago the form occurs in great profusion at Station 12, and in smaller quantities at Station 11; both Stations being in Area 1.

Discorbina rugosa d'Orbigny sp.

Rosalina rugosa d'Orbigny, 1843, Foram. Amér. Mérid., p. 42, pl. ii. figs. 12-14. *Discorbina rugosa* (d'Orb.) Brady, 1884, Chall. Rept., p. 652, pl. lxxxvii. figs. 3, 4. *D. rugosa* (d'Orb.) Sherborn and Chapman, 1889, Journ. R. Micr. Soc., p. 487, pl. xi. fig. 33. *D. rugosa* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 383, pl. xv. figs. 1-3. *D. rugosa* (d'Orb.) Chapman, 1896, Journ. R. Micr. Soc., p. 590, pl. xiii. fig. 10; and 1900, Geol. Mag., dec. 4, vol. vii. pl. xiv. fig. 9.

Examples of the form are numerous, and occur all over the region; but they are small, and the shells thin and more or less hyaline.

D'Orbigny obtained it from Patagonia. There are but two 'Challenger' Stations, both on the southern shores of Papua, 155 and 580 fathoms respectively. Egger gives numerous 'Gazelle' Stations, extending from West Africa to Fiji, at depths of from 37 to 3020 fathoms.

Discorbina allomorphinoides Reuss sp.

Valvulina allomorphinoides Reuss, 1860, Sitzungsber. k. Akad. Wiss. Wien, vol. xl. p. 223, pl. xi. fig. 6. *Discorbina allomor-*

phinoides (Reuss) Brady, 1884, Chall. Rept., p. 654, pl. xci. figs. 5, 8. *Valvulina allomorphinoides* (Reuss) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 43, pl. ii. figs. 4, 5. *Pulvinulina allomorphinoides* (Reuss) Fornasini, 1900, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. viii. p. 394, fig. 44. *D. allomorphinoides* (Reuss) Chapman, 1900, Proc. California Acad. of Sci., ser. 3, Geol., vol. i. p. 253, pl. xxx. fig. 8.

This species is confined to Area 1; and the examples, although not numerous, are sufficiently characteristic.

Elsewhere it is rare in the living condition. Under the name of *Rotalina utriculata*, Terquem reported it from Dunkerque, very rare. The 'Challenger' Stations are: off the Philippine Islands, 95 fathoms; off Raine Island, 155 fathoms; and Port Jackson, 2-10 fathoms. Fornasini records a solitary specimen from the Adriatic. In my cabinet are some examples from Korea, 20-30 fathoms.

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.

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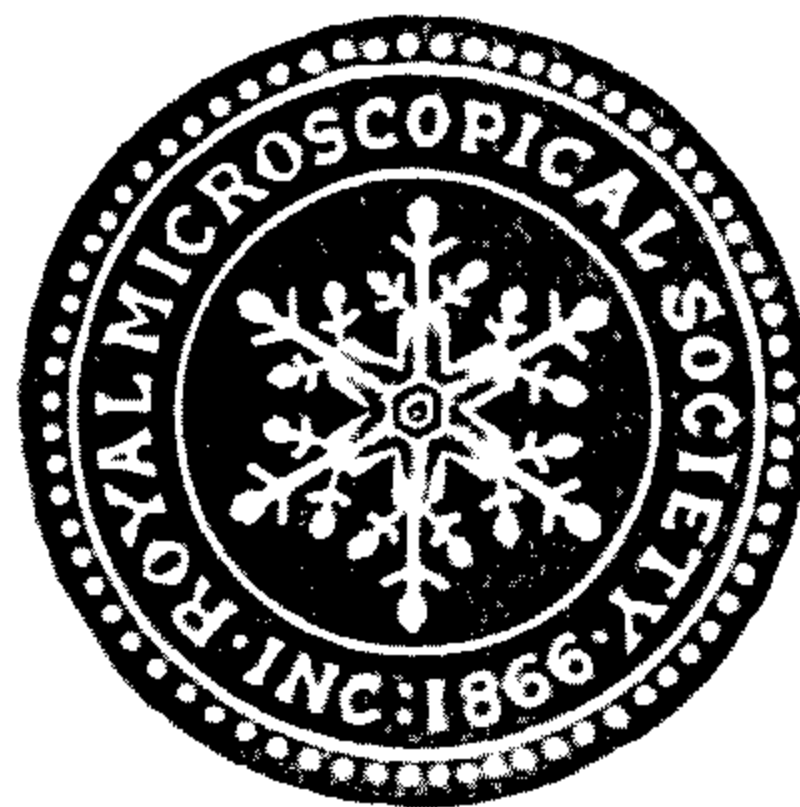
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Minimis partibus, per totum Naturæ campum, certitudo omnis innitur
quas qui fugit pariter Naturam fugit.—*Linnaeus.*

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