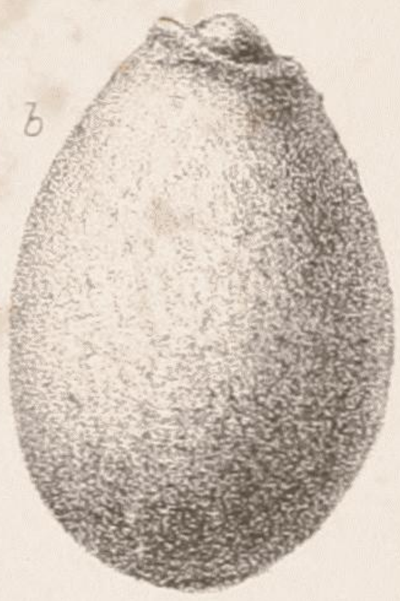

1


2 a

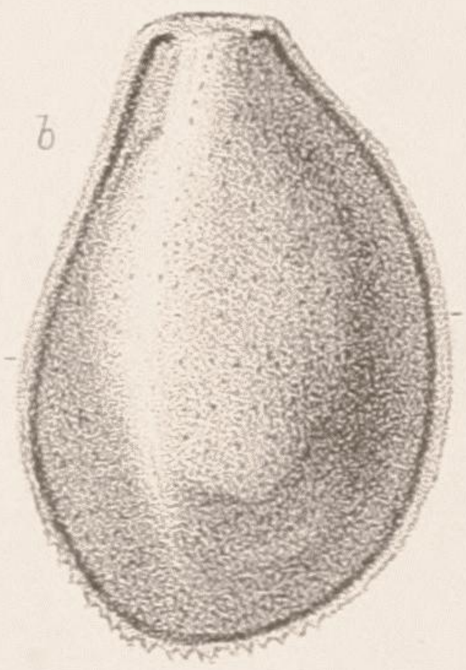

b


3 a


b


c


4 a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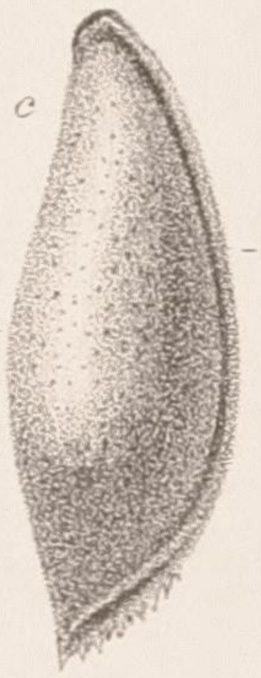
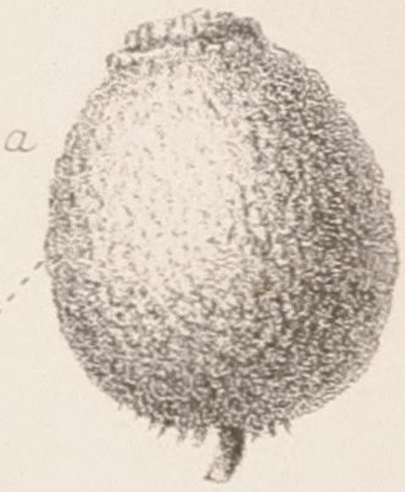

c


d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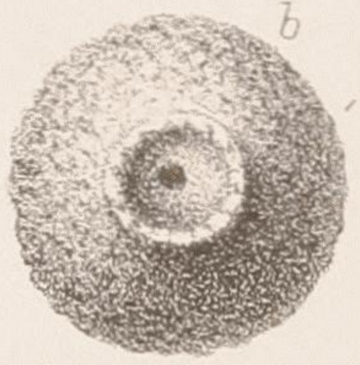
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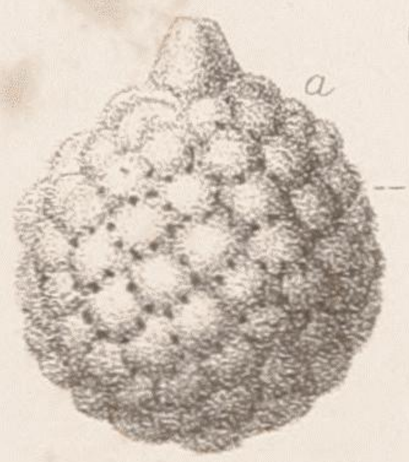
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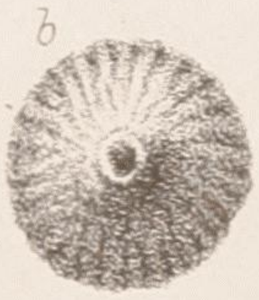
b


7 a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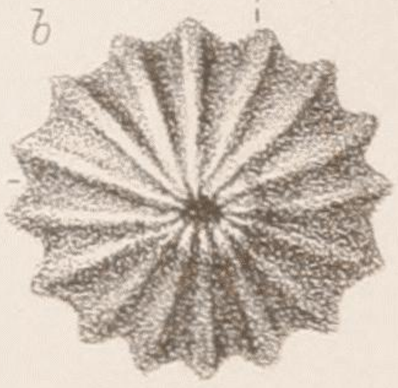
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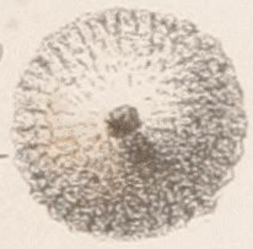
9 a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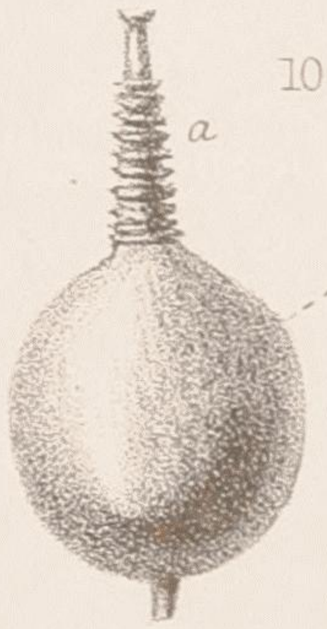
10 a


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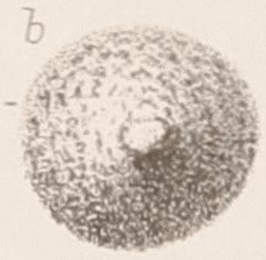
b


15 a

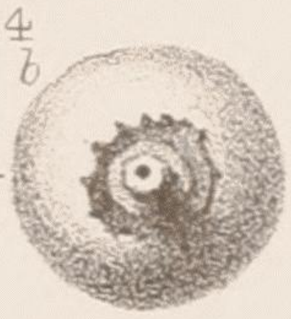
b


11 a


b


14 a


b


12 a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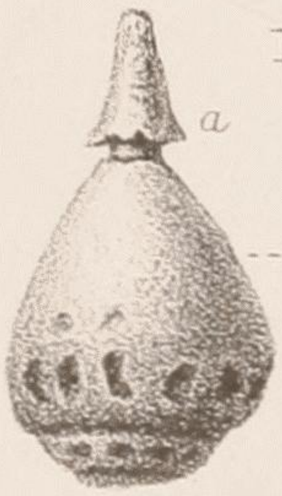
13 a


b

FWMillett del.ad nat.

West, Newman lith.

FORAMINIFERA OF MALAY ARCHIPELAGO.

JOURNAL

OF THE

ROYAL MICROSCOPICAL SOCIETY.

FEBRUARY 1901.

TRANSACTIONS OF THE SOCIETY.

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

By Fortescue William Millett, F.R.M.S.

(*Read February 20th*, 1901.)

Plate I.

Sub-family **Cassidulininæ**.

Cassidulina d'Orbigny.

Cassidulina lævigata d'Orbigny.

Cassidulina lævigata d'Orbigny, 1826, Ann. Sci. Nat., vol. vii. p. 282 (No. 1), pl. xv. figs. 4, 5;—Modèle No. 41. *C. lævigata* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 221, pl. xliii. fig. 11. *C. lævigata* (d'Orb.) Terrigi, 1889, Mem. R. Accad. Lincei, ser. 4, vol. vi. p. 111, pl. v. fig. 9. *C. lævigata* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol.

EXPLANATION OF PLATE.

Fig. 1.—*Mimosina affinis* sp. n. × 90.
In fig. 11*a*, plate IV. the inferior aperture is wrongly depicted; the present figure is intended to correct it.
„ 2, 3.—*Chilostomella ovoidea* Reuss. Fig. 2 × 60; fig. 3 × 75.
„ 4.—*Seabrookia pellucida* Brady. × 135.
„ 5.—*Lagena ampulla-distoma* Ry. Jones. × 75.
„ 6. „ *rudis* Reuss. × 75.
„ 7. „ *variata* Brady. × 75.
„ 8. „ *costata* Williamson sp. var. × 100.
„ 9. „ *spumosa* sp. n. × 100.
„ 10. „ *lævis* Montagu sp., var. *distoma* Silvestri. × 100.
„ 11. „ *Chasteri* sp. n. × 100.
„ 12, 13. „ *pannosa* sp. n. Fig. 12 × 110; fig. 13 × 90.
„ 14. „ „ var. × 100.
„ 15. „ *foveolata* Reuss. × 100.

xviii. p. 302, pl. vii. figs. 47, 48, 54–56. *C. lævigata* (D'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 43, pl. viii. figs. 418–420. *C. lævigata* (d'Orb.) A. Silvestri, 1896, Mem. Pontif. Accad. Nuovi Lincei, vol. xii. p. 103, pl. ii. fig. 10.

This is a very rare form in the Malay Archipelago, and has been observed only at Station 10, in Area 1.

Cassidulina crassa d'Orbigny.

Cassidulina crassa d'Orbigny, 1843, Foram. Amér. Mérid., p. 56, pl. vii. figs. 18–20. *C. crassa* (d'Orb.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 303, pl. vii. figs. 35, 36. *C. crassa* (d'Orb.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 43, pl. viii. figs. 421, 422. *C. crassa* Egger, 1895, Jahresbericht xvi. Naturhist. Ver. Passau, p. 19, pl. ix. fig. 19. *C. crassa* (d'Orb.) A. Silvestri, 1896, Mem. Pontif. Accad. Nuovi Lincei, vol. xii. p. 104, pl. ii. figs. 11, 12. *C. crassa* (d'Orb.) Morton, 1897, Proc. Portland Nat. Hist. Soc., vol. ii. p. 116, pl. i. fig. 12. *C. crassa* (d'Orb.) Flint, 1899, Rept. U.S. Nat. Mus. for 1897 (1899), p. 292, pl. xxxviii. fig. 3. *C. crassa* (d'Orb.) Wright, 1900, Geol. Mag., dec. 4, vol. vii. p. 100, pl. v. fig. 11.

This is less rare than *C. lævigata*, and is found at Stations in both Areas.

Family *CHILOSTOMELLIDÆ.*

Chilostomella Reuss.

Chilostomella ovoidea Reuss, plate I. figs. 2, 3.

Chilostomella ovoidea Reuss, 1850, Denkschr. k. Akad. Wiss. Wien, vol. i. p. 380, pl. xlviii. fig. 12. *C. ovoidea* (Reuss) Sherborn and Chapman, 1889, Journ. R. Micr. Soc., p. 485, pl. xi. fig. 12. *C. ovoidea* (Reuss) Dreyer, 1891, Jenaische Zeitschr. für Naturwiss., vol. xxvi. p. 271. *C. ovoidea* (Reuss) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 305, pl. ix. figs. 1, 2. *C. ovoidea* (Reuss) Silvestri, 1893, Atti e Rendic. Accad. Sci. Lett. e Arti dei Zelanti e P.P. dello Studio di Acireale, vol. v. p. 201, pl. vi. fig. 2. *C. ovoidea* (Reuss) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 53, pl. ix. figs. 512–516.

In the robust form, fig. 2, the shell is dense and opaque, with a granular surface. The more attenuated specimens, fig. 3, are sufficiently transparent to allow of the internal chambers being seen, and the shell-wall is smooth, with a few opaque white dots scattered over its surface.

The principal variation is in the relative length of the successive chambers, and on this depends the comparative stoutness or attenuation of the contour of the test.

It is not uncommon at Station 25, in Area 2, but has not been observed at any other locality in the region.

Seabrookia Brady.

Seabrookia pellucida Brady, plate I. fig. 4.

Seabrookia pellucida Brady, 1890, Journ. R. Micr. Soc., p. 570, figs. 60, 1*a–c*, 2. *S. pellucida* (Brady) Wright, 1891, Proc. R. Irish Acad., ser. 3, vol. i. p. 476, pl. xx. fig. 5.

About twelve years ago Mr. W. H. Harris, then of Cardiff, obtained from the late Captain Seabrook some dredgings from the Java Seas. These were distributed amongst various rhizopodists, and excited much attention from the number of interesting forms contained in them. It was from these dredgings that Mr. Harris procured the specimens of the new genus *Seabrookia* which formed the subject of a paper by the late Dr. H. B. Brady, published in this Journal in the year 1890.

The differences between *Seabrookia* and *Chilostomella* are so slight that it is questionable if they are of generic value; quite as much variation exists amongst the forms assigned by common consent to the genus *Lagena*. The chief difference is in the form and position of the aperture; whilst in *Seabrookia* these are remarkably uniform, in *Chilostomella* they vary very much, as shown in the specimens figured by Sherborn and Chapman, Rzehak, Franzenau, and Silvestri. This is, however, a question which must be decided by future researches.

The Malay specimens vary so slightly that it is difficult to distinguish one individual from another.

It occurs at several Stations in both Areas, but is nowhere numerous.

The localities named by Brady and Joseph Wright are, off Cebu, 120 fathoms, Java Sea, 45 fathoms, and 'Challenger' material from Station 33, off Bermudas, 435 fathoms.

Family *LAGENIDÆ*.

Sub-family **Lageninæ**.

Lagena Walker and Boys.

Group of *Lagena globosa*.

Lagena globosa Montagu sp.

Serpula (*Lagena*) *lævis globosa* Walker and Boys, 1784, Test. Min., p. 3, pl. i. fig. 8. *Vermiculum globosum* Montagu, 1803, Test. Brit., p. 523. *Lagena globosa* (Montagu) Brown, 1844, Illustr. Rec. Conch. Gt. Brit., p. 126, pl. lvi. fig. 37. *L. globosa* var. *major* Uhlig, 1886, Jahrb. k. k. Geol. Reichs., vol. xxxvi. p. 167, fig. 1. *L. globosa*, (Montagu) Sherborn and Chapman, 1886, Journ. R. Micr. Soc., p. 744,

pl. xiv. fig. 11. *L. globosa* (Montagu) Haeusler, 1887, Neues Jahrb. für Min., vol. i. p. 181, pl. iv. figs. 1–18. *L. globosa* (Montagu) Brady, 1888, Geol. Mag., dec. 3, vol. v. p. 481, pl. xiii. figs. 1–3. *L. globosa* (Montagu) Mariani, 1889, Boll. Soc. Geol. Italia, vol. vii. p. 285, pl. x. figs. 3, 4. *L. globosa* (Montagu) Terrigi, 1889, Mem. R. Accad. Lincei, ser. 4, vol. vi. p. 111, pl. v. fig. 10; pl. vi. figs. 4–6. *L. globosa* (Montagu) Burrows, Sherborn, and Bailey, 1890, Journ. R. Micr. Soc., p. 555, pl. ix. figs. 1, 4. *L. globosa* (Walker and Boys) Haeusler, 1890, Mém. Soc. Pal. Suisse, vol. xvii. p. 84, pl. xiii. figs. 5–9. *L. globosa* (Montagu) Terrigi, 1891, Mem. R. Com. Geol. Italia, vol. iv. p. 77, pl. ii. fig. 1. *L. globosa* (Montagu) Mariani, 1891, Boll. Soc. Geol. Italia, vol. x. p. 725, pl. xxi. fig. 7. *L. globosa* (Montagu) Chapman, 1893, Journ. R. Micr. Soc., p. 579, pl. viii. fig. 1. *L. globosa* (Montagu) Mariani, 1893, Ann. Istit. tecn. Udine, ser. 2, vol. xi. (p. 22) pl. i. fig. 7. *L. globosa* (Montagu) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 323, pl. x. fig. 69. *L. globosa* (Montagu) Haeusler, 1893, Abhandl. schweiz. pal. Gesell., vol. xx. p. 11, pl. i. figs. 1–13. *L. globosa* (Reuss) Grzybowski, 1894, Rozprawy Wydz. Mat.-Przyr. Akad. Umiej-Krakowie, vol. xxix. p. 189, pl. i. fig. 15. *L. globosa* (W. and J.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 77, pl. xiii. fig. 741. *L. globosa* (Montagu) Jones, 1895, Paleont. Soc., p. 177, pl. i. fig. 32 (1866). *L. globosa* (Montagu) Perner, 1897, Česka Akad. Césare Františka Josefa (Paleont. Bohemica, No. 4) p. 19, pl. vii. figs. 4, 6, and fig. 17 in text. *L. globosa* (Montagu) Morton, 1897, Proc. Portland Sci. Nat. Hist., vol. ii. p. 116, pl. i. fig. 1. *L. globosa* (Montagu) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 102, pl. v. fig. 3. *L. globosa* (Montagu) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 306, pl. liii. fig. 4. *L. globosa* (W. and B.) Kiær, 1900, Rep. on Norwegian Fishery and Marine Investigation, vol. i. No. 7, p. 39, pl. fig. 17. *L. globosa* (Montagu) Silvestri, 1900, Mem. Pontif. Accad. Nuovi Lincei, vol. xvii. p. 244, pl. vi. figs. 30, 40.

Williamson, in his 'Recent Foraminifera of Great Britain,' having regard to the resemblance in contour of the tests, associates *L. lineata* with *L. globosa*; Brady, in his 'Challenger' Report on the Foraminifera, attaching greater importance to surface ornamentation, places it with *L. striata*. There are advantages and disadvantages connected with each method, but on the whole the *Lagenæ* seem to fall into more natural groups when arranged in accordance with the general shape of the test, than when the character of the surface is taken as the basis of classification.

There are usually assigned to *L. globosa* two distinct forms; in one of these the test is thin and inflated, inclined to be opaque, and possessing a well developed internal tube. In the other the test is very thick and transparent. the shape pyriform, and the aperture surrounded with radiating striæ. Amongst these latter are doubtless

included many specimens which are nothing more nor less than arrested growths of *Nodosaria* and *Polymorphina*.

Both forms are to be found in the Malay Archipelago, and they are evenly distributed over the whole of the region, although nowhere abundantly.

Lagena apiculata Reuss.

Oolina apiculata Reuss, 1851, Haidinger's Naturw. Abhandl., vol. iv. Abth. 1, p. 22, pl. i. fig. 1. *Lagena apiculata* Reuss, 1862, Sitzber. k. Akad. Wiss. Wien, vol. xlvi. (1863) p. 318, pl. i. figs. 1, 4–8, 10, 11. *L. apiculata* (Reuss) Sherborn and Chapman, 1886, Journ. R. Micr. Soc., p. 744, pl. xiv. fig. 14. *L. apiculata* (Reuss) Haeusler, 1887, Neues Jahrb. für Min., vol. i. p. 182, pl. iv. figs. 19–30. *L. apiculata* (Reuss) Mariani, 1889, Boll. Soc. Geol. Ital., vol. vii. p. 285, pl. x. fig. 5. *L. globosa* (Montagu) Burrows, Sherborn, and Bailey, 1890, Journ. R. Micr. Soc., p. 554, pl. ix. fig. 2; and *L. apiculata* (Reuss), p. 555, pl. ix. figs. 6, 7, 9–11. *L. globosa* (Montagu) Haeusler, 1890, Mém. Soc. Pal. Suisse, vol. xvii. p. 84, pl. xiii. figs. 3–10; and *L. apiculata* (Reuss) p. 85, pl. xiii. figs. 11, 12, 14, and pl. xv. fig. 43. *L. apiculata* var. *odontostoma* de Amicis, 1893, Boll. Soc. Geol. Italia, vol. xii. p. 352, pl. iii. fig. 9. *L. apiculata* (Reuss) Haeusler, 1893, Abhandl. schweiz. pal. Gesell., vol. xx. p. 14, pl. i. figs. 25–27, 34, 35. *L. apiculata* (Reuss) Chapman, 1893, Journ. R. Micr. Soc., p. 581, pl. viii. figs. 2, 3. *L. apiculata* (Reuss) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 80, pl. xiii. fig. 747. *L. apiculata* (Reuss) Jones, 1895, Paleont. Soc., p. 179, pl. i. fig. 27 (1866). *L. apiculata* (Reuss) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 103, pl. v. fig. 32. *L. apiculata* (Reuss) Chapman, 1900, Quart. Journ. Geol. Soc., vol. lvi. p. 258, pl. xv. fig. 3.

Bearing in mind that most, if not all, of the *Lagenæ* have their apiculate condition, it seems unnecessary to endow each with a separate name; but pending an entire reform of the classification, it may cause less inconvenience for the present if these names be retained.

The form is rare in the Malay Archipelago, but is widely distributed.

Lagena ampulla-distoma Ry. Jones, plate I. fig. 5.

L. vulgaris var. *ampulla-distoma* Ry. Jones, 1872, Trans. Linn. Soc., vol. xxx. p. 63, pl. xix. fig. 52. *L. ampulla-distoma* (Ry. Jones) Brady, 1884, Chall. Rept., p. 458, pl. lvii. fig. 5.

This is a form of *L. globosa* which is not only apiculate, but roughened on the surface.

The process at the base of the acuminate *Lagenæ* may be either solid, or, as in the present instance, tubular. Whether or not the difference is worthy of varietal distinction is very doubtful.

It is by no means a rare form in the Malay Archipelago, and the

specimens are well developed. It occurs in considerable abundance all over the Region.

Rymer Jones procured it from ten miles south of Sandalwood Island, in the Java Seas, 1080 fathoms. The 'Challenger' Station is Raine Island, Torres Strait, 155 fathoms. There seems to be no other record of its occurrence.

Lagena hispida Reuss.

"Sphærulæ *hispidæ*" Soldani, 1798, Testaceographia, vol. ii. p. 53, pl. xvii. V, X. *Lagena hispida* Reuss, 1858, Zeitschr. deutsch. geol. Gesell., vol. x. p. 434. *L. hispida* (Reuss) Haeusler, 1887, Neues Jahrb. für Min., vol. i. p. 185, pl. v. fig. 7–11. *L. hispida* (Reuss) Haeusler, 1890, Mém. Soc. Pal. Suisse, vol. xvii. p. 88, pl. xiii. figs. 21–24. *L. hispida* (Reuss) Chapman, 1893, Journ. R. Micr. Soc., p. 582, pl. viii. figs. 9, 10. *L. hispida* (Reuss) Haeusler, 1893, Abhandl. schweiz. pal. Gesell., vol. xx. p. 16, pl. i. figs. 36–47. *L. hispida* (Reuss) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899), p. 307, pl. liii. fig. 8.

This variety occurs in considerable abundance, and is widely distributed in the Malay Archipelago. The specimens have all the usual variations of form and structure, and comprise hispid conditions of *L. globosa*, *L. acuminata*, and *L. lævis*.

Lagena aspera Reuss.

Lagena aspera Reuss, 1861, Sitzungsber. k. Akad. Wiss. Wien, vol. xliv. p. 305, pl. i. fig. 5. *L. aspera* (Reuss) Balkwill and Millett, 1884, Journ. Micr., vol. iii. p. 78, pl. ii. fig. 1. *L. aspera* (Reuss) Balkwill and Wright, 1885, Trans. R. Irish Acad., vol. xxviii. (Sci.) p. 337, pl. xiv. figs. 10–12. *L. aspera* (Reuss) Haeusler, 1887, Neues Jahrb. für Min., vol. i. p. 185, pl. v. figs. 14–18. *L. aspera* (Reuss) Haeusler, 1890, Mém. Soc. Pal. Suisse, p. 89, pl. xiii. figs. 25, 26. *L. aspera* (Reuss) Terrigi, 1891, Mem. R. Com. Geol. Italia, vol. iv. p. 77, pl. ii. fig. 3. *L. aspera* (Reuss) Haeusler, 1893, Abhandl. schweiz. pal. Gesell., vol. xx. p. 15, pl. i. figs. 52–59. *L. aspera* (Reuss) Woodward and Thomas, 1893, Final Rept. Geol. and Nat. Hist. Survey of Minnesota, vol. iii. p. 35, pl. D, fig. 1. *L. aspera* (Reuss) Chapman, 1893, Journ. R. Micr. Soc., p. 582, pl. viii. fig. 8. *L. aspera* (Reuss) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 106, pl. v. fig. 10.

This form is widely distributed in the Malay Archipelago, although more rare than *L. hispida*. The examples have the like variation of form, the most common being that of *L. lineata*.

Lagena rudis Reuss, pl. I. fig. 6.

Lagena rudis Reuss, 1863, Bull. Acad. Roy. Belgique, sér. 2, vol. xv. p. 145, pl. i. fig. 17. *L. rudis* Reuss, 1862, Sitzungsber. k.

Akad. Wiss. Wien, vol. xlvi. (1863) p. 336, pl. vi. fig. 82. *Entosolenia rudis* (Reuss) Möbius, 1880, Meersfauna Insel Mauritius, p. 90, pl. viii. fig. 10.

Viewed by reflected light the surface appears, as described by Reuss, to be bedecked with knobs, between which lie weak and irregular dimples. By transmitted light these dimples are resolved into a reticulate system, which is continued over the entire test beneath the protuberances.

It is a very rare form, and has been noticed only in Area 2.

Lagena variata Brady, plate I. fig. 7.

Lagena variata Brady, 1881, Quart. Journ. Micr. Sci., vol. xxi. n.s. p. 61. *L. variata* Brady, 1884, Chall. Rept., p. 461, pl. lxi. fig. 1.

This variety is not uncommon at Station 22, and occurs also at Station 10. The examples are rather feeble.

The only 'Challenger' Station is off East Moncœur Island, Bass Strait, 38 fathoms.

Lagena lineata Williamson sp.

Entosolenia lineata Williamson, 1848, Ann. and Mag. Nat. Hist., ser. 2, vol. i. p. 18, pl. ii. fig. 18. *Lagena lineata* (Will.) Reuss, 1862, Sitzungsber. k. Akad. Wiss. Wien, vol. xlvi. p. 328, pl. iv. fig. 48. *L. caudata* (d'Orb.) Balkwill and Millett, 1884, Journ. Micr. vol. iii. p. 78, pl. i. fig. 9. *L. lineata* (Will.) Balkwill and Wright, 1885, Trans. R. Irish Acad., vol. xxviii. (Sci.) p. 336, pl. xiv. figs. 13–16. *L. lineata* (Will.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 222, pl. xliv. fig. 33. *L. lineata* (Will.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 326, pl. x. figs. 29, 30.

The examples of this variety are typical, and are widely distributed in the Malay Archipelago, but are nowhere abundant.

Besides various localities on the west coast of Europe, it has been recorded from the Abrolhos Bank, Tristan d'Acunha, Kerguelen Island, and West Australia.

Lagena costata Williamson sp., plate I. fig. 8.

Entosolenia costata Williamson, 1858, Rec. Foram. Gt. Britain, p. 9, pl. i. fig. 18. *E. costata* (Will.) Dawson, 1859, Canad. Nat., vol. iv. p. 29, figs. 6, 7. *Lagena costata* (Will.) Reuss, 1862, Sitzungsber. k. Akad. Wiss. Wien, vol. xlvi. (1863) p. 329, pl. iv. fig. 54. *L. costata* (Will.) Wright, 1877, Proc. Belfast Field Club (App.), p. 103, pl. iv. figs. 11–13. *L. costata* (Will.) Terquem, 1882, Mém. Soc. Géol. Fr., sér. 3, vol. ii. p. 27, pl. ix. fig. 11. *L. costata* (Will.) Balkwill and Wright, 1885, Trans. R. Irish Acad. vol. xxviii. (Sci.) p. 338, pl. xiv. figs. 3–5. *L. costata* (Will.) Haeusler, 1887, Neues Jahrb. für Min., vol. i. p. 184, pl. v. fig. 5 ; and *L. striata* (d'Orb.)

p. 184, pl. v. fig. 6. *L. costata* (Will.) Haeusler, 1890, Mém. Soc. Pal. Suisse, vol. xvii. p. 88, pl. xv. fig. 42. *L. gracilis* (Will.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 328, pl. x. fig. 33.

This form varies very much in the character of the sculpture of its surface. The figured specimen resembles the *L. mucronulata* of Reuss.*

It is not very numerous in the Malay Archipelago, but occurs at several Stations in both Areas.

Lagena acuticosta Reuss.

L. acuticosta Reuss, 1861, Sitzungsber. k. Akad. Wiss. Wien, vol. xliv. p. 305, pl. i. fig. 4. *L. sulcata* var. *acuticosta* (Reuss) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., vol. xii. p. 222, pl. xiiv. figs. 26, 31. *L. acuticosta* (Reuss) Chapman, 1893, Journ. R. Micr. Soc., p. 583, pl. viii. fig. 11. *L. acuticosta* (Reuss) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II., vol. xviii. p. 329, pl. x. figs. 47, 48, 82, 83. *L. acuticosta* (Reuss) Jones, 1895, Paleont. Soc., p. 188, pl. i. figs. 42, 43 (1866). *L. acuticosta* (Reuss) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 106, pl. vi. fig. 62.

This variety, which can hardly be separated from *L. costata*, has in the Malay Archipelago the same distribution, and occurs in about equal quantities.

Lagena melo d'Orbigny sp.

Oolina melo d'Orbigny, 1843, Foram. Amér. Mérid., p. 20, pl. v. fig. 9. *Lagena melo* (d'Orb.) Jones, Parker, and Brady, 1866, Paleont. Soc., p. 38, pl. i. fig. 35. *L. melo* (d'Orb.) Brady, Parker, and Jones, 1888, Trans. Zool. Soc., p. 222, pl. xliv. figs. 21, 24. *L. melo* (d Orb.) Jones, 1895, Paleont. Soc., p. 192, fig. 20.

This variety is but poorly represented, the examples being few and insignificant.

Lagena hexagona Williamson.

Entosolenia squamosa var. *hexagona* Williamson, 1848, Ann. and Mag. Nat. Hist., ser. 2, vol. i. p. 20, pl. ii. fig. 23. *Lagena hexagona* (Will.) Jones, 1895, Paleont. Soc., p. 193, pl. vi. fig. 7, and w.c. fig. 21. *L. hexagona* (Will.) Wright, 1900, Geol. Mag., dec. 4, vol. vii. p. 100, pl. v. fig. 15.

In the Malay Archipelago this is the best represented of the reticulated forms. The specimens are well grown, abundant, and are distributed all over the Region.

Lagena reticulata Macgillivray sp.

Lagenula reticulata Macgillivray, 1843, Hist. Moll. Animal. Aberdeen, &c., p. 38. *Lagena reticulata* (Macgill.) Reuss, 1862,

* Sitzungsber. k. Akad. Wiss. Wien, vol. xlvi. 1862 (1863) p. 329, pl. iv. fig. 52.

Sitzungsber. k. Akad. Wiss. Wien, vol. xliv. p. 335, pl. v. figs. 67, 68. *L. hexagona?* (Will.) var. Balkwill and Millett, 1884, Journ. Micr., vol. iii. p. 79, pl. i. fig. 10. *Entosolenia squamosa* (Montagn) Dawson, 1886, Handb. Zool., p. 44, fig. 33. *L. hexagona* (Will.) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 326, pl. x. fig. 60. *L. hexagona* (Will.) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol., xxv. p. 80, pl. xiii. fig. 746. *L. reticulata* (Macgill.) Jones, 1895, Paleont. Soc., p. 195, pl. iv. fig. 7 (1866). *L. hexagona* (Will.) Silvestri, 1896, Mem. Pontif. Acad. Nuovi Lincei, vol. xii. p. 117, pl. ii. fig. 19.

This variety, distinguished by the irregularity of its meshes, is very rare in the Malay Archipelago, and the examples are by no means well developed.

Lagena squamosa Montagu sp.

Vermiculum squamosum Montagu, 1803, Test. Brit., p. 526, pl. xiv. fig. 2. *Lagena squamosa* (Montagu) Brown, 1827, Illustr. Rec. Conch. Gt. Brit., pl. i. fig. 32. *L. squamosa* (Montagu) Balkwill and Wright, 1885, Trans. R. Irish Acad., vol. xxviii. (Sci.) p. 340, pl. xiv. fig. 9. *L. squamosa* (Montagu) Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xviii. p. 326, pl. x. figs. 58, 59. *L. squamosa* (Montagu) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 79, pl. xiii. fig. 745. *L. squamosa* (Montagu) Jones, 1895, Paleont. Soc., p. 196, w.c. fig. 19.

Although not abundant, the examples are pretty evenly distributed over the whole of the Region, and have all the characters of the species, with little or no variation.

Lagena spumosa sp. n. plate I. fig. 9.

Test pyriform; shell substance a thick covering of vesicular matter overlying a dense internal layer. Aperture a conical transparent tube situated at the apex of the test. Length 0·25 mm.

This is a very interesting form, having the shell substance in two distinct layers, and differing from all the other species of the genus in its spongy outer coating.

It is very rare, and has been found only at Station 25 in Area 2.

Group of *Lagena lævis*.

Lagena lævis Montagu sp.

"Serpula (*Lagena*) lævis ovalis" Walker and Boys, 1784, Test. Min., p. 3, pl. i. fig. 9. *Vermiculum læve* (W. & B.) Montagu, 1803, Test. Brit., p. 524. *Lagena lævis* (W. & J.) Williamson, 1848, Ann. and Mag. Nat. Hist., ser. ii. vol. i. p. 12, pl. i. figs. 1, 2. *L lævis* (W. & J.) Jones, 1884, Quart. Journ. Geol. Soc., vol. xi. p. 769, pl.

xxxiv. fig. 3. *L. vulgaris* Gümbel, 1885, Geol. Bayern, Th. 1, Lief. 2, p. 422, fig. 266[6]. *L. lævis* (Montagu) Haeusler, 1887, Neues Jahrb. für Min., p. 181, pl. iv. figs. 31–38. *L. lævis* (Montagu) Malagoli, 1887, Atti Soc. Nat. Modena (Rend.), ser. 3, vol. iii. p. 109, pl. i. fig. 7. *L. lævis* (Montagu) Brady, 1888, Geol. Mag., dec. 3, vol. v. p. 482, pl. xiii. figs. 6–10. *L. lævis* (Montagu) Fornasini, 1889, Minute forme Rizopod. Retic., pl. fig. 8. *L. lævis* (Montagu) Haeusler, 1890, Mém. Soc. Pal. Suisse, vol. xvii. p. 86, pl. xiii. fig. 20. *L. lævis* (Montagu) Fornasini, 1890, Mem. R. Accad. Sci. Ist. Bologna, ser. 4, vol. x. p. 466, pl. fig. 1. *L. lævis* (Montagu) Mariani, 1891, Boll. Soc. Geol. Italia, vol. x. p. 725, pl. xxi. fig. 9. *L. lævis* (Montagu) Fornasini, 1893, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. iii. p. 431, pl. ii. fig. 1. *L. tubulifera* Egger, 1893, Abhandl. k. bayer. Akad. Wiss., Cl. II., vol. xviii. p. 324, pl. x. figs. 6, 7. *L. lævis* (Montagu) Mariani, 1893, Ann. R. Ist. Udine, ser. 2, vol. xi. p. 22, pl. i. fig. 8. *L. lævis* (Montagu) Chapman, 1893, Journ. R. Micr. Soc., p. 581, pl. viii. fig. 5. *L. lævis* (Montagu) Haeusler, 1893, Mém. Soc. Pal. Suisse, vol. xx. p. 13, pl. i. figs. 14–16. *L. lævis* (Montagu) Goës, 1894, K. Svenska Vet.-Akad. Handl., vol. xxv. p. 74, pl. xiii. figs. 719–722. *L. lævis* (Montagu) Egger, 1895, Jahresbericht xvi. Naturhist. Ver. Passau, p. 24, pl. ii. fig. 11. *L. lævis* (Montagu) Jones, 1895, Paleont. Soc., p. 181, pl. i. fig. 28 (1866). *L. lævis* (Montagu) Fornasini, 1898, Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. vii. p. 210, pl. fig. 19. *L. lævis* (Montagu) Egger, 1899, Abhandl. k. bayer. Akad. Wiss., Cl. II. vol. xxi. p. 102, pl. v. fig. 2; and *L. clavata* (d'Orb.) p. 103, pl. v. fig. 16. *L. lævis* (Montagu) Flint, 1899, Rep. U.S. Nat. Mus. for 1897 (1899) p. 306, pl. liii. fig. 6. *L. lævis* (Montagu) Chapman, 1900, Quart. Journ. Geol. Soc., vol. lvi. p. 258, pl. xv. fig. 2. *L. lævis* (Montagu) Wright, 1900, Geol. Mag., dec. 4, vol. vii. p. 100, pl. v. fig. 12. *L. lævis* (Montagu) Silvestri, 1900, Mem. Pontif. Accad. Nuovi Lincei, vol. xvii. p. 244, pl. vi. fig. 56.

This ubiquitous form occurs in great profusion at nearly all the Stations, and exhibits the usual variations of form between *L. globosa* and *L. apiculata*.

Lagena lævis var. *distoma* Silvestri, plate I. fig. 10.

Lagena lævis (Montagu) Silvestri, 1900, Mem. Pontif. Accad. Nuovi Lincei, vol. xvii. p. 244, pl. vi. figs. 74, 75.

This apiculate variety is by no means uncommon at Station 25, and has been observed at other Stations. Some of the examples are very finely striated, indicating an affinity with *L.* (*Amphorina*) *Lyellii* Seguenza.*

Prof. Silvestri's examples are from a neogene deposit, supposed to be miocene, in the Alta Valle Tiberina.

* Foram. Monotal. Mioc. Messina, 1862, p. 52, pl. i. fig. 40.

Lagena Chasteri sp. n., plate I. fig. 11.

Test flask-shaped ; rounded at the base. Shell substance consisting of a mass of vesicular matter enclosed between two layers of dense clear substance. Surface smooth and polished. Length 0·28 mm.

That this is closely allied to *L. spumosa* is shown by the tendency of the two forms to coalesce.

The vesicular matter sparkling through the transparent outer layer causes the test to resemble the mineral avanturine.

It has been observed only at Station 25, where it is not uncommon.

Lagena pannosa sp. n., plate I. figs. 12–14.

Test flask- or decanter-shaped, with usually a constriction at the place where the neck joins the body. Shell substance composed of an inner layer of hard matter, on which rests a thick coating of opaque granular substance, which exhibits a strong tendency to disintegrate. Between the middle and base of the body are two zones of irregular indentations. Length 0·30 mm.

This interesting member of the compound-wall series is well marked by the tendency of the granular portion to disintegrate and expose portions of the internal layer ; to a less extent this feature is apparent also in *L. spumosa*.

In the variety fig. 14 the disintegration is more irregular, and the zones are not produced.

The *L. tubifero-squamosa* Parker and Jones,* fossil from Grignon, with its "decaying outer layers," appears to be a member of this group.

It occurs at many Stations in both Areas, but is most abundant at Station 25, which appears to be the headquarters of the compound-wall series.

Lagena foveolata Reuss, plate I. fig. 15.

Lagena foveolata Reuss, 1862 (1863) Sitzungsber. k. Akad. Wiss. Wien, vol. xlvi. p. 332, pl. v. fig. 65. *Lagena* No. 25, Von Schlicht, 1870, Foram. Septarienthones von Pietzpuhl, p. 10, pl. iii. fig. 25.

This is a very beautiful form, the minuteness and regularity of the sculpture causing the test to shine with great lustre.

The cells are smaller, and have less space between them than in the example figured by Reuss.

It occurs, very sparingly, at Station 25, and has not been observed elsewhere.

* Phil. Trans., 1862, p. 354, pl. xviii. fig. 7.

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AND

A SUMMARY OF CURRENT RESEARCHES RELATING TO

ZOOLOGY AND BOTANY

(principally Invertebrata and Cryptogamia)

MICROSCOPY, &c.

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