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Taxonomic notes on the species

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Taxonomic Notes

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Taxonomic Notes

on the Species Figured by H. B. Brady in his
Report on the Foraminifera Dredged by H.M.S. *Challenger*
During the Years 1873-1876

Accompanied by a Reproduction of Brady's Plates

By
R. Wright Barker
Shell Development Company
Houston, Texas

Society of Economic Paleontologists and Mineralogists

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HOUSTON, TEXAS

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TAXONOMIC NOTES ON THE SPECIES FIGURED BY H. B. BRADY IN HIS
REPORT ON THE FORAMINIFERA DREDGED BY H.M.S. CHALLENGER
DURING THE YEARS 1873-1876¹

PREFACE

Henry Bowman Brady, 1835-1891, was the greatest of the English authorities on the Foraminifera. His "Challenger Report," published in 1884, is one of the most frequently cited works on this group, and his illustrations are among the most accurate ever published. It has long been the main source of our knowledge on Recent Foraminifera, and the literature abounds with references to his figures under a great diversity of names. As opposed to the Continental school (d'Orbigny, Reuss, Karrer, and others) he held a very broad view on generic and specific concepts, and included many fossil species in synonymy with his Recent forms. With the growing tendency toward minute differentiation of species in an attempt to refine geologic correlation and emphasize environmental changes in living faunas, both his genera and his species have been progressively split into new and more restricted forms. This has greatly reduced the value of his figures to those workers who do not have access to an extensive library, and even then much time is necessarily lost in checking taxonomic changes.

H. E. Thalmann attempted to remedy this in his paper "Nomenclator zu den Tafeln 1 bis 115 in H. B. Brady's Werk ueber die Foraminiferen der Challenger Expedition, London 1884" and subsequent supplements (see Bibliography). The value of these was unfortunately lessened by the absence of any indication of the authors of the changes and where the references could be found. A further difficulty in making full use of Brady's plates lies in the absence of localities for the figured specimens. Brady included specimens from widely separated regions in the same species, whereas later work indicated that in many cases Pacific Ocean material was specifically distinct from that of the Atlantic Ocean, Polar region forms different from those of more temperate and tropical oceans, etc. This difficulty was realized by W. L. F. Nuttall, who checked the figured specimens in the Brady collections in the Zoological Department in Cambridge and in the British Museum (Natural History) and published a list of all localities he could verify in 1928 and 1931 (see Bibliography). The situation was thus considerably improved, but even if a student had access to the original Challenger Report (a work of considerable rarity), he had to work with the various papers of Thalmann and Nuttall to ascertain the latest suggested name and locality of any figured specimen. In addition, each year brought further taxonomic changes, which in many cases confused the issue to a point where several names had been given to the same figure, owing to a lack of knowledge of the literature.

During the past twenty years the writer has endeavoured to trace the bibliographic references to all the changes listed by Thalmann, and to add these and many subsequent references to his copy of Brady's Atlas. The localities given by Nuttall were also added, in order to concentrate all our available data in a readily accessible form. It would appear that several of the species figured are *nomina nova* which have been named here. A number of the forms figured by Brady, and as yet undescribed, have been indicated but have not been named, for the writer has not had the opportunity to study Brady's specimens in order to prepare adequate descriptions and to designate types. In many cases it has been possible to check the taxonomic changes suggested by other authors from a study of topotypes selected from original "Challenger" material, but it should be stated that the present notes are of a bibliographic nature and in no sense a critical revision of the "Challenger Report."

It is hoped that the present notes, with a reissue of Brady's plates, will prove of value to many workers who do not have ready access to the original, nor to the papers of Thalmann and Nuttall, and may enable workers primarily interested in ecology and geographical distribution to avoid some of the many taxonomic pitfalls which await the student of the Foraminifera. The writer is deeply indebted to H. M. Stationery Office for permission to reproduce the original plates of the Challenger Atlas, to Shell Development Company for permission to publish the accompanying notes, and to Mrs. Julia G. Breeding of Shell Development Company for her assistance in editing and proof-reading the original manuscript. He also wishes to express his gratitude to Dr. Helen Tappan of the Smithsonian Institution, to Dr. Alfred Loeblich, Jr. of the United States National Museum, and to Miss Frances L. Parker of Scripps Institution of Oceanography for valuable criticism and helpful information on a number of species.

¹ Manuscript received at Society Headquarters, January 10, 1957.

NOMINA NOVA PROPOSED

- ¹*Fissurina wiesneri* nom. nov. for *Lagena marginata* (Walker and Boys) var. *carinata* Wiesner 1931, non *Fissurina carinata* Reuss 1863, non *Lagena quadrata* var. *carinata* Chapman 1909. (See pl. LIX, fig. 23).
- Frondicularia kiensis* nom. nov. for *F. bradyi* Cushman 1913, non *F. bradii* (Silvestri 1903), proposed as *Lingulonodosaria*. (See pl. LXV, figs. 16 and 18).
- Robulus atlanticus* nom. nov. for *Cristellaria lucida* Cushman 1923, non *Robulina lucida* Silvestri 1880. (See pl. LXIX, figs. 10-12).
- Spiroplectella earlandi* nom. nov. for *Spiroplectella annectens* (Brady 1884), Earland 1934, non *Textularia annectens* Parker and Jones 1863, a Cretaceous species. (See pl. XLV, figs. 22, 23).

INTRODUCTION

The "Report on the Foraminifera dredged by H.M.S. Challenger, during the years 1873-1876," by Henry Bowman Brady, needs no introduction to students of the Foraminifera. It is undoubtedly the most famous of the classic monographs in that branch of science, and has probably been quoted more frequently than any other work. The figures in the atlas, drawn on stone by A. T. Hollick from sketches by Brady and from the specimens themselves, are among the most accurate that have as yet appeared, and have been reproduced and referred to by nearly all subsequent workers. They are especially indispensable to students of Recent foraminiferal faunas, and any efforts which will enhance their utility are regarded as entirely justified.

Henry Bowman Brady was born in Gateshead-on-Tyne, Durham, England, in 1835, and after a private education became a successful manufacturing pharmacist in Newcastle-on-Tyne. He became a member of the Council and Board of Examiners of the Pharmaceutical Society of Great Britain, being one of the foremost members of his profession. He was early interested in zoology, however, and spent much time dredging marine organisms before becoming primarily interested in the Foraminifera. His fame is based on his researches on that group, on which he published a long series of memoirs, the principal ones being his "Monograph of Carboniferous and Permian Foraminifera" (Paleontographical Society, 1876) and the "Report on the Foraminifera dredged by H.M.S. Challenger" (2 vols., 1884). He also worked with W.K. Parker and T. R. Jones in papers on nomenclature of the Foraminifera. He was elected a Fellow of the Geological Society in 1864 and of the Royal Society in 1874; he was also a Fellow of the Linnaean and Zoological Societies. An extensive traveller, he visited, among other countries, Fez and the interior of Morocco in 1878. The first part of his Challenger monograph went to the printers in 1882 and the concluding part in 1884.

He belonged to the English school of students of the Foraminifera which included among others W. B. Carpenter, T. R. Jones, F. W. Millett, W. K. Parker and W. C. Williamson. These took a very broad view of foraminiferal species, including many fossil forms, now regarded as distinct species, in synonymy with Recent forms, and vice versa. Brady discusses his views on species in some detail on pages v-viii of the Challenger Report, and stresses the elastic nature of his classification and the great need for revision of generic and specific nomenclature. His view is perhaps best expressed by a quotation he gives from Professor Huxley, that we may expect "the progress of knowledge will eventually break down all sharp demarcations and substitute series for divisions."

In this the English school differed greatly from the great Continental authorities, such as Alcide d'Orbigny, Auguste E. Reuss, Olry Terquem and others, who believed in the most minute differentiation of species. In this respect Reuss may be quoted as follows:

"I am fully aware of the fact that numerous forms are very close to each other and may be regarded as derived from single fundamental types. One might designate them as variations of single morphological units (Formenkreise) or as species; this is immaterial. But they must be distinguished because they are really distinguishable and because many of them belong to widely different geological periods. Combining them amounts to denying all geological significance of palaeontology. For what is correct for Foraminifera will and must apply with equal justification to the fossil remains of other groups of animals" (A. E. Reuss, *Situngsber.k.Ak. Wiss. Wien*, Vol. 50 (1864), 1865, p. 447; translation from M. F. Glaessner, *Principles of Micro-palaeontology*, 1945, p. 4).

The return in more recent times to the principles of Reuss as cited above has resulted in the splitting of a large number of Brady's "species," their allocation to new genera, and the differentiation of most

Recent forms from their fossil congeners. Since references to Brady's figures are widely scattered through hundreds of papers in diverse languages, the use of Brady's figures is rendered increasingly difficult as these references multiply.

The purely descriptive phase of foraminiferal studies is gradually giving way to ecological investigations, and it is believed that to be of the greatest value these should have a sound taxonomic foundation. With the tremendous increase in the number of papers and monographs dealing with the Foraminifera during the past quarter of a century it is becoming increasingly difficult to achieve this foundation. The importance of Brady's figures in such taxonomic studies was realized over twenty years ago by H. E. Thalmann, who published several revisions of Brady's nomenclature in a series of papers from 1932 to 1942. These have been of great service and have been frequently cited, but suffer from two drawbacks—no references are given to the authors of the various taxonomic changes listed, and furthermore many changes have been made since Thalmann's last paper appeared nearly fifteen years ago. A number of Brady's figures seem to represent new species, and these have been indicated in the present revision.

During the past twenty years the writer has kept notes of all changes observed, which have been added to his copy of the Challenger Report. For greater convenience the localities whence the figured specimens were obtained (taken from Nuttall, 1927, 1931) have also been added, also the depth of the soundings at the various localities (from Brady's text). The great utility of such an annotated copy, the saving of time otherwise lost in searching for references, and even more, the avoidance of taxonomic errors, have led the writer to believe that the notes should be more widely circulated. This belief is supported by requests received from other workers to consult the notes, and suggestions that they should be presented in report form. There are undoubtedly many errors remaining, both of omission and commission, but it is hoped that publication will eventually remedy these.

A final note of warning might advantageously be added regarding the depths of water shown for some of the soundings. A study of some of the original Challenger samples and a check of Brady's lists indicate considerable mixing of faunas at some localities. Notably one might cite Challenger Station 24, off Culebra Island, north of St. Thomas, West Indies, in 390 fathoms. The material from this locality shows mixing of rolled specimens of shallow water forms such as *Archaias* with much deeper species of *Liebusella*, *Cyclammina*, *Pyrgo*, *Rhabdammina*, *Hyperammina*, etc. Challenger Sta. 33, off Bermuda, in 420 fathoms, shows similar mixing of elements from different environments. This mixing is regarded as due to 'slumping' down the steep continental slope, aided, in all probability, by turbidity currents. In some cases, especially on reefs, it is probable that fossil forms were collected in the soundings, since numerous similar cases have been noted in more recent work. Apart from these exceptions the effects of depth and temperature (latitude) on foraminiferal distribution throughout the world are very clearly brought out by Brady's work, and his monograph will long continue to be one of the fundamental reference works on the Foraminifera.

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NOTES ON SPECIES FIGURED IN TEXT OF CHALLENGER REPORT

In addition to the atlas of plates there are a number of text figures in the body of the report. The majority of the species figured in these are also illustrated on the plates, but a number are shown only in the text. Although it is not feasible to reproduce the text figures here, it is believed to be of value, for the sake of completeness, to add notes on the various species.

Text figure 1, p. 141. Labyrinthic aperture of *Biloculina sphaera* d'Orbigny.

As noted for pl. II, fig. 4, this should be *Pyrgoella sphaera* (d'Orbigny).

Text figure 2, p. 158. *Serpula seminulum* Linnaeus.

2 A, B, C, reproduced from Plancus.

2 s, reproduced from Gualtieri.

2 a, b, reproduced from Martini.

The first four figures are those cited by Linnaeus in the 12th edition of his *Systema*, 1767, and figs. 2 a, b, were cited in addition by Gmelin, 1791, in the 13th edition of the *Systema*. This form is now referred to *Quinqueloculina seminulum* (Linnaeus). (See pl. V, fig. 6).

Text figure 3, p. 159. *Miliolina seminulum* (Linnaeus).

2 a, after Williamson, Recent, British.

2 b, after Jones and Parker, Recent, Arctic.

2 c, Fossil, from the Crag (Pliocene).

Quinqueloculina seminulum (Linnaeus), see above.

Text figure 4, p. 179. *Miliolina rupertiana* Brady.

a, b, c, d, various forms of aperture, X 40.

e, transverse section of shell, X 200.

From Tamatavé, east coast of Madagascar.

Triloculina rupertiana (Brady), see pl. VII, figs. 7-12.

Text figure 5, p. 194. a, *Planispirina contraria* (d'Orbigny).

Transverse section, X 40; locality not known.

Nummoloculina contraria (d'Orbigny), see note to pl. XI, figs. 10, 11.

Text figure 5, p. 194. b, *Planispirina exigua* (Brady).

Transverse section, X 80; locality not known. c, *Planispirina sigmoidea* Brady.

Transverse section, X 40; Challenger Sta. 120, off Pernambuco, western Atlantic (675 fathoms). See *Nummoloculina contraria* (d'Orbigny), juvenile forms, pl. II, figs. 1-3.

Text figure 6, p. 211. Diagrammatic representation of the progressive development of the Simple type of *Orbitolites* into the most Complex (after Carpenter).

Text figure 7, p. 211. *Orbitolites duplex* Carpenter.

Locality not known. Probably *Amphisorus hemprichii* Ehrenberg; see note to pl. XVI, fig. 7, and footnote.

Text figure 8, p. 225. *Kerammosphaera murrayi* Brady.

Figs. a, b, locality not known; figs. c, d, Challenger Sta. 157, Antarctic (1950 fathoms).

Text figure 9, p. 242. *Syringammina fragilissima* Brady.

Faroe Channel, H.M.S. "Triton".

Text figure 10, p. 263. *Hyperammina arborescens* (Norman MS.).

Dredged off Cumbræ, Scotland. X 20. This should be referred to *Psammatodendron arborescens*, Norman MS., Brady; see pl. XXVIII, figs. 12, 13.

Text figure 11, p. 441. Various forms of aperture in *Lagena globosa* Walker and Jacob (now referred to *Oolina*).

Text figure 12, p. 470. Longitudinal and transverse sections of the shell wall of *Lagena hertwigiana* Brady; Challenger Sta. 155, Antarctic (1300 fathoms).

Text figure 13, p. 499. *Nodosaria (Dentalina) farcimen* (Soldani).

a, from Soldani; b, from Reuss (Antwerp Crag); c, a Cretaceous specimen. Now referred to *Dentalina*.

Text figure 14, p. 501. *Nodosaria (Dentalina) pauperata* d'Orbigny.

a, Miocene specimen, copied from d'Orbigny;

b, Recent specimen; c, Liassic specimen.

Fig. 14a. *Dentalina pauperata*, d'Orbigny, was placed in *Siphonodosaria* Silvestri by Jedlitschka (Verh. Nat. Ver. Brünn., Vol. 66, 1935, p. 65), who showed it to possess an apertural neck with a phialine lip and tooth. Marks (Contr. Cush. Found., Vol. 2, No. 2, 1951, p. 56), in a revision of Vienna Basin Miocene foraminifera, transferred *pauperata* to *Nodogenerina*, again stressing the apertural characters. Stainforth (Contr. Cush. Found., Vol. 3, No. 1, 1952, p. 13) listed it as *Siphonodosaria*, but as noted for pl. LXII, figs. 7, 8, Finlay (N.Z. Journ. Sci. Techn., Vol. 28, 1947, pp. 272-275) has shown *Siphonodosaria* to be a synonym of the earlier genus *Stilostomella* Guppy 1894 (P.Z.S. London, 1894, p. 649). The correct name for this form is therefore *Stilostomella pauperata* (d'Orbigny), and material from near

Baden, outside Vienna (probably near topotype) shows forms like d'Orbigny's figure, with the apertural characters shown by Jedlitschka and noted by Marks; the development of the basal spine was found to be variable, from absent to prominent.

Fig. 14b shows a typical *Dentalina*, with a radiate aperture, which is quite distinct from *Stilostomella pauperata* (d'Orbigny). Brady records this form in his distribution tables from Challenger Sta. 311, S.W. Patagonia (245 fathoms), off the coast of Norway, 65° to 71° N (20-300 fathoms), Franz Josef Land, 79° to 80° N (89-145 fathoms), and Baffin's Bay and Smith Sound, Arctic, 77°15' to 79°45' N. (13-320 fathoms). Loeblich and Tappan (Smith. Misc. Coll., Vol. 121, No. 7, 1953, p. 57, pl. 9, figs. 7-9) have figured a similar form from the Arctic, but showing a basal spine, as *Dentalina pauperata* (d'Orbigny). This, as shown above, cannot be called *pauperata*, since it is a true *Dentalina* and *pauperata* is a *Stilostomella*. They also show a form rather similar to that of Brady, without a basal spine, as *Dentalina baggi* Galloway and Wissler, which is a larger form than *pauperata* (Loeblich and Tappan, 1. c., 1953). Brady gives no dimensions for his "*Nodosaria pauperata*" but it is probable that he was dealing with *Dentalina baggi* Galloway and Wissler, as interpreted by Loeblich and Tappan. "*Dentalina pauperata*" of Loeblich and Tappan, with a basal spine, is probably a new species of *Dentalina*. Brady's text figure 14c, from the Lias, has not been identified, and could be a *Stilostomella* from the figure.

Text figure 15, p. 516. *Nodosaria intercellularis* Brady.

Transverse and longitudinal sections of the shell wall, X 400. From Challenger Sta. 33, Bermudas (435 fathoms). Jedlitschka (Verh. Nat. Ver. Brünn., Vol. 66, 1935, p. 70) placed this species in *Nodogenerina*, with a simple round aperture on an extended neck with a phialine lip. Brady, however, indicates a radiate aperture similar to that found in *Amphicoryna scalaris* and *separans*, and the species is therefore referred provisionally to *Amphicoryna intercellularis* (Brady) until the types can be studied. (See also pl. LXV, figs. 1-4).

Text figure 16, p. 524. *Fronidularia millettii* Brady.

Challenger Sta. 185, Raine Island, Torres Strait, Pacific. (155 fathoms). This species has not been referred to by subsequent workers, except for one very doubtful record by Wright (Proc. Belfast Nat. Field Club, Appendix, 1910-1911, pp. 5, 6, 13, pl. 2, fig. 11) from the

Pleistocene and Recent of N.E. Ireland. It is regarded as a *Plectofronidularia*, becoming *Plectofronidularia millettii* (Brady).

Text figure 17, p. 598. *Globigerina marginata* (Reuss).

Pelagic, off New Guinea, Pacific. This was originally described as a Cretaceous species, and though subsequently recorded from the Recent by Egger and Rhumbler as a *Globigerina*, has been placed in *Globotruncana* by Thalmann (Eclog. geol. Helv., Vol. 27, No. 2, 1934, p. 414) and this has been followed by Cushman, Glaessner, Jedlitschka and others. Brady's specimen was caught alive, and clearly cannot be referred to the Cretaceous *Globotruncana marginata* (Reuss). As far as the writer is aware the only reliable figures since that of Brady are those given by Rhumbler (Foram. Plankton-Exped., 1911, pl. 29, figs. 1a-c; pl. expl., The Micropal., N.Y., Vol. 3, No. 2, 1949, p. 39), and these are not entirely satisfactory. It seems probable that Brady's form should be referred to *Globorotalia* sp. nov.

Text figure 18, p. 616. *Pullenia sphaeroides* (d'Orbigny).

Horizontal section, X 100; locality unknown.

Now referred to *Pullenia bulloides* (d'Orbigny), following Cushman and Todd. See note to pl. LXXXIV, figs. 12, 13.

Text figure 19, p. 635. *Patellina campanaeformis* Brady.

Challenger Sta. 185, off Raine Island, Torres Strait, Pacific. (155 fathoms). This was made the genotype of *Alanwoodia* gen. nov. by Loeblich and Tappan (Smith. Misc. Coll., Vol. 128, No. 5, 1955, p. 26), becoming *Alanwoodia campanaeformis* (Brady). (See Loeblich and Tappan for additional figures).

Text figure 20, p. 639. *Cymbalopora (Tretomphalus) bulloides* (d'Orbigny).

These are regarded as *Tretomphalus planus* Cushman. See note to pl. CII, figs. 7, 8?, 12?. No locality found for these figures.

Text figure 21, p. 700. *Pulvinulina partschiana* (d'Orbigny).

Transverse section, X 40. Locality unknown. Brady places *partschiana* in synonymy with *P. elegans* (d'Orbigny), now known as *Höglundina elegans* (d'Orbigny), as the deep water form. See note to pl. CV, figs. 4-6.

Text figure 22, p. 749. *Nummulites cumingii* (Carpenter).

Specimen laid open to show segmentation, X 20. China Sea, dredged. This is probably *Operculina ammonoides* (Gronovius). See note to pl. CXII, figs. 3-9, 11-13.

ADDENDA

PLATE LII (52)

Fig. 22.—*Loxostomoides* (?) *porrectum* (Brady)

This species was transferred from *Bolivina* to *Loxostomum* by Cushman in 1937 as already noted, but Z. Reiss (Research Council Israel, Bull., v. 6B, 1957, pp. 241-242) has since removed most species presently placed in *Loxostomum* to a new genus, *Loxostomoides*. R. A. Reymont (Acta Universitatis Stockholmiensis, Stockholm Contr. Geol., v. III:1, 1959, pp. 14-15) has discussed *Loxostomum* Ehrenberg and redefined *Loxostomoides* and from his descriptions it does not appear that this species is either *Loxostomum* or a true *Loxostomoides*. It appears that forms such as that figured here must either remain in *Bolivina*, or require a new name. In the latter case the distinguishing features are a terminal slit aperture and a tendency to become uniserial. They differ from *Loxostomoides* in possessing a flattened rather than a rounded cross-section and the chambers do not show the overlap with retral processes of *Loxostomoides*.

Figs. 26-28.—*Loxostomoides* (?) *limbatum* (Brady)

The remarks regarding *L.* (?) *porrectum* (Brady), above, apply equally to *limbatum*. This possesses characters not diagnostic for *Bolivina*, *Loxostomum* nor *Loxostomoides*, and may also require a new name.

PLATE LIII (53)

Fig. 1.—*Loxostomoides* (?) *bradyi* (Asano).

As noted elsewhere this was placed in *Bolivina* by Asano in 1938, but was later transferred by him to *Loxostoma* (i.e. *Loxostomum*) (Illustrated Catalogue of Japanese Tertiary Smaller Foraminifera, Pt. 2, p. 11, 1950). As noted for fig. 22 on Plate LII (52) above, this species shows a flattened test, a tendency to become uniserial and a terminal aperture. It is therefore closer to *Bolivina* than to *Loxostomum* Ehrenberg or to *Loxostomoides* Reiss, and as noted above may require a new generic or subgeneric designation.

Figs. 14, 15.—*Loxostomoides* sp. nov.

This species is now regarded as a *Loxostomoides* (see notes above, fig. 1).

Figs. 19-21.—*Loxostomoides* *karrerianum* (Brady)

This species, previously referred to *Loxostomum* is also regarded as a *Loxostomoides*.

Figs. 22, 23.—*Loxostomoides* (?) *lobatum* (Brady)

Now referred to *Loxostomoides*, but with hesitation. As noted by Cushman (Cushman Lab. Foram. Research Special Pub. No. 9, 1937, p. 188) Brady's figures are so close to immature specimens of *Bifarina fimbriata* (Millett) that study of a good series of both may well prove that we are dealing with a single species, which would then receive the name *Bifarina lobatum* (Brady).

PLATE LVII (57)

Fig. 3.—*Lagena hispida* Reuss var. *crispata* (Matthes)

As noted earlier figs. 1-4 were originally referred to *L. hispida* Reuss. Matthes, however, (Palaeontographica, v. 90, abt. A, 1939, p. 61) separated fig. 3 as his variety *crispata*.

PLATE LXXX (80)

Figs. 18-21. *Hastigerina* (*Hastigerina*) *siphonifera* (d'Orbigny)

Originally referred to *Globigerina aequilateralis* Brady, Cushman (1927) made it the type species of *Globigerinella*, which was shown to be a synonym of *Hastigerina* by Bolli, Loeblich and Tappan in 1957. Since that date F. T. Banner and W. H. Blow (Micropaleontology, v. 6, no. 1, 1960, p. 22) have shown that Brady's species is the same as *Globigerina siphonifera* d'Orbigny (in de la Sagra, Hist. Phys. et Nat. de l'Île de Cuba, v. 8, 1839, p. 83, pl. 4, figs. 15-18) and referred it to *Hastigerina* (*Hastigerina*).

Figs. 6-10.—*Globorotalia* (*Beella*) *digitata* (Brady).

This species was transferred to *Globorotalia* from *Hastigerinella* and made the type of a new subgenus *Beella* by F. T. Banner and W. H. Blow in 1960 (Micropaleontology, v. 6, no. 1, 1960, p. 26).

PLATE LXXXII (82)

Figs. 6, 7.—*Hastigerinella* (*Bolliella*) *adamsi* (Banner and Blow)

Originally referred to *Globigerina digitata* Brady, Banner and Blow (Palaeontology, London, v. 2, no. 1, 1959, p. 13) regard these specimens as distinct from *Globigerina digitata* Brady, as figured on Plate LXXX (80) and have made this form the type of their new subgenus *Bolliella*, with the specific designation *adamsi*.

PLATE LXXXIII (83)

Figs. 1-4, 6.—*Hastigerina* (*Hastigerina*) *pelagica* (d'Orbigny)

This species has been restudied recently by F. T. Banner and W. H. Blow (Micropaleontology, v. 6, no. 1, 1960, pp. 20-22) and the figures cited are retained in *H. pelagica* (d'Orbigny) with *H. murrayi* Thomson 1876 as a junior synonym. They make no reference to fig. 5, which is believed by the writer to belong also in *H. pelagica*, and specifically exclude figs. 7 and 8 without, however, referring these to a definite genus and species. Figs. 7 and 8 show many points of similarity to *Hastigerinella digitata* (Rhumbler) although they do not show the streptospiral coiling nor any indication of bifurcation of the chambers as described for that species. The original specimens should be re-examined.

PLATE LXXXVII (87)

Figs. 5-7.—*Discopulvinulina australis* (Parr)

Asano (Illustrated Catalogue of Japanese Tertiary Smaller Foraminifera, pt. 14, 1951, p. 3) has transferred *australis* Parr from *Discorbis* to *Discopulvinulina* Hofker, on the presence of septal foramina. He has also transferred *Discorbis orbicularis* (Terquem) to *Discopulvinulina* (loc. cit. supra, p. 6) on the supposed presence of septal foramina on the ventral surface, but as he does not refer to Brady's figures of "*Discorbina orbicularis* (Terquem)" on Plate LXXXVIII (88) figs. 4-8, these are retained in *Neoconorbina terquemi* (Rzehak). He similarly transferred "*Discorbina concinna* Brady" on Plate XC (90), figs. 7 and 8 to *Discopulvinulina*, but noted that the septal foramina are "indistinct". That species is retained here in *Rosalina*.

PLATE XCVII (97)

Figs. 3-6.—*Discanomalina semipunctata* (Bailey)

This species was transferred to *Discanomalina* Asano 1951 by Asano (Illustrated Catalogue Japanese Tertiary Smaller Foraminifera, Part 13, 1951, p. 13), with *Anomalina coronata* Parker and Jones. Loeblich and Tappan have since made *coronata* the type species of *Paromalina* (see above) but left *semipunctata* (as "*semipuncta*") in *Discanomalina*.

PLATE CVII (107)

Figs. 6, 7.—*Gyroidinoides neosoldanii* (Brotzen)

This species which was referred to *Gyroidina* by Brotzen in 1936 should be placed in *Gyroidinoides* Brotzen 1942 since it is an umbilicate form.

PLATE CXIII (113)

Fig. 7.—*Loxostomoides* (?) *strigosum* (Brady)

See notes in these ADDENDA on plates 52 and 53 for transfer of species from *Loxostomum* Ehrenberg to *Loxostomoides* Reiss. This does not agree well with the diagnosis of *Loxostomoides* but clearly must be removed from *Loxostomum*. It may prove to be more closely allied to *Bolivina*, and require a new subgeneric designation, or may prove from a study of more material to belong in *Bifarina*.

PLATE CXV (115)

Fig. 6.—*Gyroidinoides altiformis* (R. E. and K. C. Stewart)

This species agrees almost exactly with figures and specimens of *Gyroidina altiformis* and since it is deeply umbilicate must be transferred to *Gyroidinoides* Brotzen 1942. It differs in this respect and also in its general shape and acute periphery from specimens from Rimini identified as *G. orbicularis* d'Orbigny, which is true *Gyroidina*. Fornasini (Mem. R. Accad. Sci. Ist. Bologna, ser. 5, vol. 7, 1898, p. 260, text figs.) figured d'Orbigny's unpublished drawings of *G. laevigata* and *G. laevis*, and considered these forms as variations of *G. orbicularis* d'Orbigny, occurring with the type at Rimini. All show a closed umbilicus and broad somewhat compressed whorls, though varying from a rounded periphery to subacute.

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Species figured on the plates are entered in roman type; those regarded as new are in bold-face type, and those referred to in notes or as synonyms are in italics. The Roman numerals refer to the plates.

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— (<i>Tretomphalus</i>) <i>bulloides</i>	p. xii (t. fig. 20) CII
— <i>millettii</i>	CII
— <i>poeyi</i>	CII
— <i>poeyi var. bradyi</i>	CII
— <i>tabellaeformis</i>	CII
<i>Cymbaloporella tabellaeformis</i>	CII
<i>Cymbaloporetta bradyi</i>	CII
— <i>squammosa</i>	CII
<i>Cystamina galeata</i>	XL
— <i>pauciloculata</i>	XL1

D

<i>Dendritina elegans</i>	XIII
<i>Dendrophrya erecta</i>	XXVII-A
— <i>radiata</i>	XXVII-A
<i>Dentalina advena</i>	LXIII
— <i>baggi</i>	p. xii (t. fig. 14)
— <i>communis</i>	LXII
— <i>farcimen</i>	p. xi (t. fig. 13) LXII
— <i>filiformis</i>	LXIII
— <i>guttifera</i>	LXII
— <i>var. semirugosa</i>	LXIII
— <i>inornata var. bradyensis</i>	LXII
— <i>intorta</i>	LXII
— <i>pauperata</i>	p. xi (t. fig. 14)
— <i>plebeia</i>	LXIII
— <i>subemaciata</i>	LXII
— <i>subsoluta</i>	LXII, LXIV
<i>Dentostomina agglutinans</i>	VIII
<i>Discamina compressa</i>	XXXIII
<i>Discobolovina inconspicua</i>	XLII
<i>Discopulvinulina</i>	LXXXVI
— <i>advena</i>	LXXXVII
— <i>araucana</i>	LXXXVI
— <i>baconica</i>	XC
— <i>bertheloti</i>	LXXXVI
— <i>bertheloti</i>	LXXXIX
— <i>subbertheloti</i>	LXXXIX
<i>Discorbina allomorphinoides</i>	XCI
— <i>araucana</i>	LXXXVI
— <i>bertheloti</i>	LXXXIX
— <i>bertheloti var. baconica</i>	XC
— <i>biconcava</i>	XCI
— <i>bradyana</i>	XCI
— <i>circularis</i>	XC
— <i>concinna</i>	XC
— <i>eximia</i>	LXXXVIII
— <i>globularis</i>	LXXXVI
— <i>isabelleana</i>	LXXXVIII
— <i>mediterraneensis</i>	LXXXVI
— <i>mira</i>	LXXXVII
— <i>obtusa</i>	XCI
— <i>opercularis</i>	LXXXIX
— <i>orbicularis</i>	LXXXVIII
— <i>parisiensis</i>	XC
— <i>patelliformis</i>	LXXXVIII, LXXXIX
— <i>pileolus</i>	LXXXIX
— <i>polystomelloides</i>	XCI
— <i>pulvinata</i>	LXXXVIII
— <i>rarescens</i>	XC
— <i>rosacea</i>	LXXXVII
— <i>rosea</i>	XCVI
— <i>rugosa</i>	LXXXVII, XCI
— <i>var. minuta</i>	XCI
— <i>sauleyi</i>	XCI
— <i>subrotunda</i>	LXXXVIII
— <i>tabernacularis</i>	LXXXIX
— <i>terquemi</i>	LXXXVIII
— <i>turbo</i>	LXXXVII
— <i>valvulata</i>	LXXXVII
— <i>ventricosa</i>	XCI
— <i>vesicularis</i>	LXXXVII
— <i>vildeboana</i>	LXXXVI, LXXXVIII
— <i>sp.</i>	XC
<i>Discorbinella biconcava</i>	XCI
<i>Discorbis advena</i>	LXXXVII
— <i>australensis</i>	LXXXIX
— <i>australis</i>	LXXXVII
— <i>bertheloti</i>	LXXXIX
— <i>dimidiatus</i>	LXXXVII
— <i>eximius</i>	LXXXVIII
— <i>globularis var. bradyi</i>	LXXXVI

Species	Plate	Species	Plate
<i>Discorbis globularis</i> var. <i>cyprinodon</i>	LXXXVI	F	
— <i>isabelleanus</i>	LXXXVIII	<i>Favocassidulina favus</i>	CIV
— <i>lobatulus</i>	LXXXVIII	<i>Fissurina alveolata</i>	LX
— <i>mira</i>	LXXXVII	— var. <i>caudigera</i>	LX
— <i>opercularis</i>	LXXXIX	— <i>annectens</i>	LIX
— <i>patelliformis</i>	LXXXVIII, LXXXIX	— <i>auriculata</i>	LX
— <i>procera</i>	CV	— var. <i>costata</i>	LX
— <i>pulvinatus</i>	LXXXVIII	— var. <i>duplicata</i>	LX
— <i>rarescens</i>	XC	— var. <i>linearituba</i>	LX
— <i>subbertheloti</i>	LXXXIX	— var. <i>semisculpta</i>	LX
— <i>subobtusus</i>	XCI	— <i>bradyi</i>	LIX
— <i>tabernacularis</i>	LXXXIX	— <i>carinata</i>	LIX
— <i>vesicularis</i>	LXXXVI	— <i>clathrata</i>	LX
— var. <i>dimidiatus</i>	LXXXVII	— <i>contusa</i>	LX
— <i>wiesneri</i>	XC	— <i>crebra</i>	LIX
DISCORBIS SP. NOV. (1)	LXXXVII	— <i>cucullata</i>	LIX
SP. NOV. (2)	LXXXVII	— <i>exsculpta</i>	LVIII, LXI
<i>Discospirina italica</i>	XV	— <i>fimbriata</i>	LX
— <i>tenuissima</i>	XV	— <i>foliiformis</i>	LX
<i>Dorothia bradyana</i>	XLVI	— <i>formosa</i> var. <i>brevis</i>	CXIV
— <i>exilis</i>	XLVI	— var. <i>comata</i>	LX
— <i>pseudoturris</i>	XLIV	— var. <i>favosa</i>	LX
— <i>scabra</i>	XLIV, XLVI	— <i>hispida</i> var.	LIX
<i>Dyocibicides biserialis</i>	XCIH	— <i>kerquelenensis</i>	LIX
— <i>uniserialis</i>	XCIH	— <i>lacunata</i>	LX
		— <i>laevigata</i>	CXIV
		— <i>lagenoides</i>	LX
E		— var. <i>tenuistriata</i>	LX
<i>Eggerella bradyi</i>	XLVII	— <i>marginata</i>	CIX, CXIV
— <i>perplexa</i>	XLVII	— var. <i>semimarginata</i>	LIX
— <i>propinqua</i>	XLVII	— <i>orbignyana</i>	LX
— <i>scabra</i>	XLVII	— and vars.	LIX
<i>Ehrenbergina bradyi</i>	LV	— <i>pacifica</i>	LX
— <i>hystrix</i>	LV	— <i>quadrangularis</i>	CXIV
— <i>pacifica</i>	LV	— <i>quadrata</i>	LIX
— <i>pupa</i>	LV, CXIII	— var. <i>carinata</i>	LIX
— <i>serrata</i>	LV	— var. <i>rizzae</i>	LX
— var. <i>trigona</i>	LV	— var. <i>semi-alata</i>	LX
— <i>trigona</i>	LV	— <i>quinquelatera</i>	LXI
<i>Ellipsoglandulina rotundata</i>	LXII	— <i>radiata</i>	LX
<i>Ellipsolagena</i> sp. nov.	LVI	— var. <i>striatula</i>	LX
<i>Elphidiella arctica</i>	CX	— <i>radiato-marginata</i>	LXI
<i>Elphidioides imperatrix</i>	CX	— <i>romellensis</i>	LIX
— <i>verriculatus</i>	CX	— <i>schulzeana</i>	LXI
<i>Elphidiononion incertum</i>	CIX	— <i>seguenziana</i>	LIX
— <i>poeyanum</i>	CIX	— <i>semimarginata</i>	LIX
<i>Elphidium aculeatum</i>	CX	— <i>seminiformis</i>	LIX
— <i>advena</i>	CX	— <i>siliqua</i>	LIX
— <i>angulatum</i>	CIX	— <i>squamoso-alata</i>	LX
— <i>craticulatum</i>	CX	— <i>squamoso-marginata</i>	LX
— <i>crispum</i>	CX	FISSURINA SP. NOV.	
— <i>excavatum</i>	CIX	— <i>submarginata</i>	LIX
— <i>incertum</i>	CIX	— <i>sulcata</i>	LX
— cf. <i>kerquelenense</i>	CIX	— <i>trigono-marginata</i>	LXI
— <i>lessonii</i>	CX	— <i>trigono-oblonga</i>	LXI
— <i>macellum</i>	CX	— <i>trigono-ornata</i>	LXI
— <i>macellum</i> var. <i>aculeata</i>	CX	— <i>unguiculata</i>	LIX
— <i>orbiculare</i>	CIX	FISSURINA WIESNERI NOM. NOV.	
— <i>poeyanum</i>	CIX	— <i>wrightiana</i>	LXI
— <i>subgranulosum</i>	CIX	— sp. indet.	LX
<i>Entosolenia flintiana</i> var. <i>caribaea</i>	LIX	<i>Flintia robusta</i>	IX
— <i>montagui</i>	LVIII	<i>Flintina bradyana</i>	IV
— <i>quadrata</i>	LIX	— <i>crassatina</i>	VIII
— <i>submarginata</i>	LIX	— <i>grata</i>	IV
<i>Epistomaroides polystomelloides</i>	XCI	— <i>triquetra</i>	VIII
<i>Epistomina bradyi</i>	CV	<i>Frankeina variabilis</i>	XLVII
— <i>elegans</i>	CV	<i>Fronicularia advena</i>	LXVI
— <i>flintii</i>	CV	— <i>alata</i>	LXV, LXVI
<i>Epistominella exigua</i>	CIH	— <i>alata</i> var. <i>lanceolata</i>	LXV, LXVI
— <i>umbonifera</i>	XCV	— var. <i>sagittula</i>	LXV, LXVI
<i>Eponides berthelotianus</i>	CVI	— <i>archiaciana</i>	CXIV
— <i>bradyi</i>	XCV	— <i>bradii</i>	LXV
— <i>exiguus</i>	CIH	— <i>bradyi</i>	LXV
— <i>frigidus</i>	CV	— <i>compta</i>	LXV
— <i>praecinctus</i>	XCV	— var. <i>villosa</i>	CXIV
— <i>procera</i>	CV	— <i>inaequalis</i>	LXVI
— <i>punctulatus</i>	CIV	— <i>interrupta</i>	LXVI
— <i>repandus</i>	CIV	FRONICULARIA KIENSIS NOM. NOV.	
— var. <i>concamerata</i>	CIV	— <i>millettii</i>	p. xii (t. fig. 16)
— <i>schreibersi</i>	CXV	— <i>robusta</i>	LXVI
— <i>tenera</i>	XCV	— <i>sagittula</i>	LXV, LXVI
— <i>tumidulus</i>	XCV	— var. <i>lanceolata</i>	LXV, LXVI
— <i>umbonatus</i>	CV	— <i>spatulata</i>	LXV
<i>Euvigerina aculeata</i>	LXXIV		
— <i>aculeata</i>	LXXV		
— <i>mediterraneensis</i>	LXXIV		
— <i>peregrina</i>	LXXIV		
— <i>tenuistriata</i>	LXXIV		
		G	
		<i>Gaudryina apicularis</i>	XLVI
		— <i>baccata</i>	XLVI

Species	Plate
<i>Gaudryina baccata</i> var. <i>novangliae</i>	XLVI
— <i>bradyi</i>	XLVI
— <i>filiformis</i>	XLVI
— <i>pseudofiliformis</i>	XLVI
— <i>pupoides</i>	XLVI
— var. <i>chilostoma</i>	XLVI
— <i>rugosa</i>	XLVI
— <i>scabra</i>	XLVI
— <i>siphonella</i>	XLVI
— <i>subrotundata</i>	XLVI
— (<i>Pseudogaudryina</i>) <i>atlantica</i>	XLVII
— <i>atlantica</i>	XLVI
— <i>collinsi</i>	XLVI
GAUDRYINA (PSEUDOGAUDRYINA) SP. NOV. (1)	XLVI
— SP. NOV. (2)	XLVII
— (<i>Siphogaudryina</i>) <i>rugulosa</i>	XLII
— <i>siphonifera</i>	XLII
— <i>transversaria</i>	CXIII
<i>Gavelinonion barleeanum</i>	CIX
— (?) <i>pompilioides</i>	CIX
— <i>umbilicatum</i>	CIX
<i>Gavelinopsis lobatulus</i>	LXXXVIII
<i>Geminospira convoluta</i>	CXIII
GEMINOSPIRA SP. NOV.	CXIII
<i>Girvanella schaudinni</i>	XXIV
— <i>vagans</i>	XXIV
<i>Glabrattella</i>	LXXXVIII, LXXXIX
— <i>pulvinata</i>	LXXXVIII
<i>Glandulina</i> —see <i>Nodosaria</i> (<i>Glandulina</i>)	LXIII, LXI
<i>Glandulina armata</i>	LXIII
<i>Glandulonodosaria radicularia</i>	LXI
<i>Globigerina aequilateralis</i>	LXXX
— <i>angulata</i>	CIII
— <i>bradyi</i>	LXXXII
— <i>bulloides</i>	LXXXVII, LXXXIX
— var. <i>triloba</i>	LXXXIX, LXXXI
— <i>conglobata</i>	LXXX
— <i>conglomerata</i>	LXXXI
— <i>conglomerata</i>	LXXXIX
— <i>crassaformis</i>	CIII
— <i>cretacea</i>	LXXXII
— <i>digitata</i>	LXXX, LXXXII
— <i>dutertrei</i>	LXXXI
— <i>eggeri</i>	LXXXIX
— <i>inflata</i>	LXXXIX
— <i>helicina</i>	LXXXI
— <i>linneana</i>	LXXXII, CXIV
— <i>marginata</i>	p. xii (t. fig. 17)
— <i>pachyderma</i>	CXIV
— <i>rubra</i>	LXXXIX
— <i>sacculifera</i>	LXXX, LXXXII
— <i>subcretacea</i>	LXXXII
— <i>tricamerata</i>	LXXXI
— <i>triloba</i>	LXXXIX
GLOBIGERINA SP. NOV?	LXXXIX
<i>Globigerinella aequilateralis</i>	LXXX
— <i>cretacea</i>	LXXXII
— <i>subcretacea</i>	LXXXII
<i>Globigerinoides conglobata</i>	LXXX
— <i>pachyderma</i>	CXIV
— <i>rubra</i>	LXXXIX
— <i>sacculifera</i>	LXXX, LXXXII
— <i>triloba</i>	LXXXIX
<i>Globobulimina glabra</i>	L
— <i>pacifica</i>	L
<i>Globorotalia crassula</i>	CIII
— <i>hirsuta</i>	CIII
— <i>humilis</i>	XCIV
— <i>menardii</i>	CIII
— var. <i>fimbriata</i>	CIII
— (<i>Turborotalia</i>) <i>oceanica</i>	CIII
— <i>pseudocrassa</i>	CIII
— <i>punctulata</i>	CIII
— <i>scitula</i>	CIII
— <i>truncatulinoidea</i>	CIV
— <i>tumida</i>	CIII
GLOBOROTALIA SP. NOV.	p. xii (t. fig. 17)
<i>Globotextularia anceps</i>	XXXV
<i>Globotruncana linneana</i>	LXXXII, CXIV
— <i>marginata</i>	p. xii (t. fig. 17)
<i>Globulina gibba</i>	LXXI
— var. <i>myristiformis</i>	LXXXIII
— <i>inaequalis</i>	LXXI
— <i>minuta</i>	LXXI
— <i>rotundata</i>	LXXXIII
GLOBULINA SP. NOV.	LXXXIII
<i>Glomospira charoides</i>	XXXVIII
— <i>gordialis</i>	XXXVIII

Species	Plate
<i>Gordiammina charoides</i>	XXXVIII
— <i>gordialis</i>	XXXVIII
<i>Guttulina austriaca</i>	LXXIII
— <i>dawsoni</i>	LXXII
— <i>problema</i>	LXXII, LXXIII
— <i>regina</i>	LXXIII
— <i>yabei</i>	LXXIII
— (<i>Sigmoidina</i>) <i>pacifica</i>	LXXII
— <i>seguenzana</i>	LXXII
<i>Gypsina globulus</i>	CI
— <i>inhaerens</i>	CII
— <i>vesicularis</i>	CI
<i>Gyroidina broeckhiana</i>	CVII
— <i>neosoldanii</i>	CVII
— <i>orbicularis</i>	CXV
— <i>tenera</i>	XCX
— <i>umbonata</i>	CV
H	
<i>Haliphysema ramulosa</i>	XXVII-A
— <i>tumanowiczii</i>	XXVII-A
<i>Haplophragmium agglutinans</i>	XXXII
— <i>anceps</i>	XXXV
— <i>calcareum</i>	XXXIII
— <i>canariensis</i>	XXXV
— <i>cassisi</i>	XXXIII
— <i>compressum</i>	XXXIII
— <i>emaciatum</i>	XXXIII
— <i>foliaceum</i>	XXXIII
— <i>fontinense</i>	XXXIV
— <i>globigeriniformis</i>	XXXV
— <i>glomeratum</i>	XXXIV
— <i>latidorsatum</i>	XXXIV
— <i>nana</i>	XXXV
— <i>pseudospirale</i>	XXXIII
— <i>rotulatum</i>	XXXIV
— <i>scitulum</i>	XXXIV
— <i>tenuimargo</i>	XXXIII
— <i>turbinatum</i>	XXXV
<i>Haplophragmoides canariensis</i>	XXXV
— <i>coronatum</i>	XL
— <i>emaciatum</i>	XXXIII
— <i>glomeratum</i>	XXXIV
— <i>major</i>	XXXV
— <i>rotulatum</i>	XXXIV
— <i>scitulum</i>	XXXIV
— <i>subglobosum</i>	XXXIV
— <i>trullissata</i>	XL
<i>Haplostiche dubia</i>	XXXII
— <i>soldanii</i>	XXXII
<i>Hastigerina aequilateralis</i>	LXXX
— <i>murrayi</i>	LXXXIII
— <i>pelagica</i>	LXXXIII
— <i>subcretacea</i>	LXXXII
<i>Hastigerinella digitata</i>	LXXX, LXXXII
<i>Hauerina bradyi</i>	XI
— <i>circinata</i>	XI
— <i>compressa</i>	XI
— <i>fragilissima</i>	IX
— <i>involuta</i>	VII
— <i>orientalis</i>	VII
— <i>ornatissima</i>	VII
— <i>speciosa</i>	X
<i>Hauerinella inconstans</i>	XII
— <i>tumidulum</i>	XII
<i>Hemisphaerammina bradyi</i>	XL
<i>Heronallenia lingulata</i>	XC
<i>Heterostegina antillarum</i>	CXII
— <i>costata</i>	CXII
— <i>curva</i>	CXII
— cf. <i>curva</i>	CXII
— <i>depressa</i>	CXII
— <i>suborbicularis</i>	CXII
<i>Hippocrepina indivisa</i>	XXVI
<i>Hofkerinella balthica</i>	CXII
<i>Hoglundina elegans</i>	p. xii (t. fig. 21), CV
<i>Hormosina carpenteri</i>	XXXIX
— <i>globulifera</i>	XXXIX
— <i>monile</i>	XXXIX
— <i>normani</i>	XXXIX
— <i>ovicula</i>	XXXIX
<i>Hyalinea balthica</i>	CXII
<i>Hyperammina arborescens</i>	p. xi (t. fig. 10), XXVIII
— <i>cylindrica</i>	XXIII
— <i>elongata</i>	XXIII
— <i>friabilis</i>	XXIII

Species	Plate
<i>Hyperammina laevigata</i>	XXIII
— <i>ramosa</i>	XXIII
— <i>subnodosa</i>	XXIII
— <i>vagans</i>	XXIV
I	
<i>Involutina anguillae</i>	XXXVIII
— <i>intermedia</i>	XXXVIII
— <i>tenuis</i>	XXXVIII
J	
<i>Jaculella acuta</i>	XXII
— <i>obtusa</i>	XXII
K	
<i>Karrerella</i> (<i>Karrerulina</i>) <i>apicularis</i>	XLVI
— <i>bradyi</i>	XLVI
— <i>chilostoma</i>	XLVI
— <i>novangliae</i>	XLVI
<i>Kerammosphaera murrayi</i>	p. xi (t. fig. 8)
<i>Krumbachina tenuissima</i>	XV
L	
<i>Labrospira arctica</i>	XL
— <i>crassimargo</i>	XXXV
— <i>subglobosa</i>	XXXIV
— <i>wiesneri</i>	XL
<i>Lagena acuta</i>	LIX
— <i>acuticosta</i>	LVII, LVIII
— <i>advena</i>	LVII
— <i>alveolata</i>	LX
— <i>var. caudigera</i>	LX
— <i>var. substriata</i>	LX
— <i>ampulla-distoma</i>	LVII, LXI
— <i>ampulla-distoma</i>	LIX
— <i>annectens</i>	LIX
— <i>apiculata</i>	LVI, LVIII
— <i>apiopleura</i>	LVIII
— <i>aspera</i>	LVII
— <i>var. spinifera</i>	LIX
— <i>auriculata</i>	LX
— <i>var. costata</i>	LX
— <i>var. duplicata</i>	LX
— <i>var. linearituba</i>	LX
— <i>botelliformis</i>	LVI
— <i>castrensis</i>	LX
— <i>crebra</i>	LIX
— <i>crenata</i>	LVII
— <i>desmophora</i>	LVIII
— <i>distoma</i>	LVIII
— <i>distoma-margaritifera</i>	LVIII
— <i>elegantissima</i>	LVII, LVIII
— <i>elongata</i>	LVI
— <i>exsculpta</i>	LVIII, LXI
— <i>fasciata</i>	LIX
— <i>favoso-punctata</i>	LVIII
— <i>favoso-punctata</i>	LXI
— <i>favoso-punctata</i> var.....	LIX
— <i>felsinea</i>	LVI
— <i>fieldeniana</i>	LVIII
— <i>fimbriata</i>	LX
— <i>foliiformis</i>	LX
— <i>formosa</i>	LX
— <i>var. brevis</i>	CXIV
— <i>var. comata</i>	LX
— <i>var. favosa</i>	LX
— <i>foveolata</i>	LVIII
— <i>gibbera</i>	LVII
— <i>globosa</i>	p. xi (t. fig. 11), LVI
— <i>var. setosa</i>	LVI
— <i>gracillima</i>	LVI
— <i>gracilis</i>	LVI, LVIII
— <i>gracilis</i>	LVIII
— <i>var. meridionalis</i>	LVIII
— <i>hertwigiana</i>	p. xi (t. fig. 12), LVIII
— <i>hexagona</i>	LVIII
— <i>hispidula</i>	LVII
— <i>hispidula</i>	LVI
— <i>hispidula</i> var.....	LIX
— <i>hispidula</i>	LVI

Species	Plate
<i>Lagena intermedia</i>	LVII
— <i>lacunata</i>	LX
— <i>laevigata</i>	CXIV
— <i>laevis</i>	LVI, LVII
— <i>var. nebulosa</i>	LVI
— <i>var.</i>	LVI
— <i>lagenoides</i>	LX
— <i>var. tenuistriata</i>	LX
— <i>lateralis</i>	LVI
— <i>lineata</i>	LVII
— <i>longispina</i>	LVI
— <i>var.</i>	LIX
— <i>lyelli</i>	LVIII
— <i>marginata</i>	LIX
— <i>var. carinata</i>	LIX
— <i>var. semimarginata</i>	LIX
— <i>var. spinifera</i>	LIX
— <i>meridionalis</i>	LVIII
— <i>montagui</i>	LVIII
— <i>multicostata</i>	LXI
— <i>nebulosa</i>	LVI
— <i>orbignyana</i> and vars.....	LIX
— <i>var. caribaea</i>	LIX
— <i>ovum</i>	LVI
— <i>plumigera</i>	LVIII
— <i>quadrangularis</i>	CXIV
— <i>quadralata</i>	LXI
— <i>quadrata</i>	LIX
— <i>var. carinata</i>	LIX
— <i>var. rizzae</i>	LX
— <i>var.</i>	LX
— <i>quadrucostulata</i>	LIX
— <i>var. sexcostulata</i>	LIX
— <i>quinquelatera</i>	LXI
— <i>radiata</i>	LX
— <i>radiato-marginata</i>	LXI
— <i>reticulata</i>	LVIII
— <i>sacculus</i>	LIX
— <i>schulzeana</i>	LXI
— <i>seguenziana</i>	LIX
— <i>seminiformis</i>	LIX
— <i>semistriata</i>	LVII
— <i>sidebottomi</i>	LVII
— <i>siliqua</i>	LIX
— <i>spiralis</i>	CXIV
— <i>squamosa</i>	LVIII
— <i>squamoso-alata</i>	LX
— <i>squamoso-marginata</i>	LX
— <i>staphyllearia</i>	LIX
— <i>stelligera</i>	LVII
— <i>striata</i>	LVII
— <i>striatopunctata</i>	LVIII
— <i>var. spiralis</i>	CXIV
— <i>sublagenoides</i>	LX
— <i>var. striatula</i>	LX
— <i>substriata</i>	LX
— <i>sulcata</i>	LVII
— <i>sulcata</i>	LVII, LX
— <i>var. apiculata</i>	LVIII
— <i>var. interrupta</i>	LVII, LVIII
— <i>var. spicata</i>	LVIII
— <i>var. spirata</i>	LVII
— <i>torquata</i>	LVIII
— <i>trigono-marginata</i>	LXI
— <i>trigono-oblonga</i>	LXI
— <i>trigono-ornata</i>	LXI
— <i>unguiculata</i>	LIX
— <i>variata</i>	LXI
— <i>wrightiana</i>	LXI
LAGENA SP. NOV. (1)	LVII
SP. NOV. (2)	LVIII
SP. NOV. (?)	LVIII
<i>Lagenonodosaria</i>	LXV
— <i>proxima</i>	LXIV
— <i>separans</i>	LXIV
LAMARCKINA SP. NOV.	XCI
— <i>scabra</i>	CVI
— <i>ventricosa</i>	XCI
<i>Lamellodiscorbis dimidiatus</i>	LXXXVII
<i>Laticarinina halophora</i>	CIV
— <i>pauperata</i>	CIV
— <i>tenuimargo</i>	XCI
<i>Lenticulina</i> (<i>Lenticulina</i>).....	LXIX
— (<i>Robulus</i>).....	LXIX
— <i>albatrossi</i>	LXVI
— (<i>Vaginulinopsis</i>) <i>albatrossi</i>	LXVI
— <i>altifrons</i>	CXIV
— <i>calcar</i>	LXX

Species	Plate
<i>Lenticulina convergens</i>	LXIX
— <i>denticulifera</i>	LXX
— <i>formosa</i>	LXX
— <i>gibba</i>	LXIX
— <i>iota</i>	LXX
— <i>obtusata</i>	LXVI
— <i>papillosa</i>	LXX
— <i>papilloso-echinata</i>	LXXI
— <i>peregrina</i>	LXVIII
— <i>submamilligera</i>	LXX
<i>Liebusella bradyi</i>	XLVIII
— <i>dubia</i>	XXXII
— <i>soldanii</i>	XXXII
— var. <i>intermedia</i>	XXXII
LINGULINA SP. NOV.	LXV
— <i>carinata</i>	LXV
— var. <i>seminuda</i>	LXV
— <i>eggeri</i>	LXV
— <i>seminuda</i>	LXV
<i>Lingulonodosaria bradyi</i>	LXV
<i>Listerella bradyana</i>	XLVIII
<i>Lituolina irregularis</i> var. <i>compressa</i>	XXXIII
<i>Lituotuba lituiformis</i>	XL
<i>Loxostomum amygdalaeformis</i>	LIII
— <i>karrerianum</i>	LIII
— <i>limbatum</i>	LII
— <i>lobatum</i>	LIII
— <i>porrectum</i>	LII
— <i>strigosum</i>	CXIII
LOXOSTOMUM SP. NOV.	LIII

M

<i>Marginopora vertebralis</i>	XVI, XVII
— var. <i>plicata</i>	XVI
<i>Marginulina costata</i>	LXV
— <i>glabra</i>	LXV
— var. <i>obesa</i>	LXV
— <i>obesa</i>	LXV
— <i>scalaris</i>	LXIII
— <i>tenuis</i>	LXVI
<i>Marginulinopsis bradyi</i>	LXV
— <i>densicostata</i>	LXV
— <i>subaculeatus</i>	LXXI
MARGINULINOPSIS SP. NOV?	CXIV
<i>Marsipella cylindrica</i>	XXIV
— <i>elongata</i>	XXIV
— <i>granulosa</i>	XX
<i>Marssonella trochus</i>	XLIII, XLIV
<i>Martinottiella bradyana</i>	XLVIII
— <i>communis</i>	XLVIII
— <i>nodulosa</i>	XLVIII
<i>Massilina agglutinans</i>	VI
— <i>alveoliniformis</i>	VIII
— <i>asperula</i>	VIII
— <i>australis</i>	VI
— <i>milletti</i>	IX
— <i>pacificensis</i>	VI
— <i>secans</i>	VI
<i>Meandropsina sp. x</i>	XIV
<i>Miliolina agglutinans</i>	VIII
— <i>alveoliniformis</i>	VIII
— <i>amygdaloides</i>	VI
— <i>auberiana</i>	V
— <i>bertheliniana</i>	CXIV
— <i>bicornis</i>	VI
— <i>boeana</i>	VII
— <i>bucculenta</i>	IV, CXIV
— var. <i>placentiformis</i>	IV
— <i>circularis</i>	IV, V
— var. <i>sublineata</i>	IV
— <i>crassatina</i>	VIII
— <i>cultrata</i>	V
— <i>cuvieriana</i>	V
— <i>ferussacii</i>	CXIII
— <i>fichteliana</i>	IV
— <i>gracilis</i>	V
— <i>insignis</i>	IV
— <i>labiosa</i>	VI
— <i>lamarckiana</i>	V
— <i>linnaeana</i>	VI
— <i>macilenta</i>	VII
— <i>oblonga</i>	V
— <i>parkeri</i>	VII
— <i>pulchella</i>	VI
— <i>pygmaea</i>	CXIII
— <i>reticulata</i>	IX

Species	Plate
<i>Miliolina rupertiana</i>	p. xi (t. fig. 3), VII
— <i>scrobiculata</i>	CXIII
— <i>seminulum</i>	V
— <i>separans</i>	VII
— <i>subrotunda</i>	V
— <i>terquemiana</i>	CXIV
— <i>transversestriata</i>	IV
— <i>tricarinata</i>	III
— <i>trigonula</i>	III
— <i>triquetra</i>	VIII
— <i>undosa</i>	VI
— <i>valvularis</i>	IV
— <i>venusta</i>	V
— <i>webbiana</i>	IV
<i>Miliolinella australis</i>	V
— <i>bucculenta</i> var. <i>placentiformis</i>	IV, CXIV
— <i>labiosa</i>	VI
— <i>oblonga</i>	V
— <i>sphaera</i>	II
— <i>sublineata</i>	IV
— <i>subrotunda</i>	IV, V
— var. <i>sublineata</i>	IV
— var. <i>trigonina</i>	CXIV
<i>Millettella tessellata</i>	LXXXVI
<i>Miniacina alba</i>	CI
— <i>miniacea</i>	C, CI
<i>Mississippina concentrica</i>	CV
<i>Monalysidium politum</i>	XIII
— <i>sollasi</i>	XIII

N

<i>Nautilus aduncus</i>	XIV
— <i>angulatus</i>	XIV
— <i>beccarii</i>	CVII
— <i>orbiculus</i>	XIV
— <i>spirula</i>	CVII
— <i>subarcuatulus</i>	LXVII
— <i>venosus</i>	CXI
<i>Neoalveolina bradyi</i>	XVII
— <i>melo</i>	XVII
— <i>pulchra</i>	XVII
<i>Neoconorbina</i>	LXXXVI
— <i>marginata</i>	LXXXVIII
— <i>orbicularis</i>	LXXXVI, LXXXVIII
— <i>pacifica</i>	LXXXVIII
— <i>terquemi</i>	LXXXVIII
<i>Neouvigerina ampullacea</i>	LXXV
— <i>interrupta</i>	LXXV
— <i>porrecta</i>	LXXIV
<i>Nodellum membranaceum</i>	XXXII
<i>Nodobacularia tibia</i>	I
<i>Nodobaculariella convexiuscula</i>	X
<i>Nodogenerina albatrossi</i>	LXIV
— <i>bradyi</i>	LXXXVI
— <i>challengeriana</i>	LXIV
— <i>intercellularis</i>	p. xii (t. fig. 15), LXV
NODOPHTHALMIDIUM SP. NOV.	I
<i>Nodosaria abyssorum</i>	LXIII
— <i>albatrossi</i>	LXIV
— <i>antillea</i>	LXXXVI
— <i>bradyi</i>	LXIV
— <i>calomorpha</i>	LXI
— <i>catenulata</i>	LXIII
— <i>comata</i>	LXIV
— <i>comatula</i>	LXIII
— <i>communis</i>	LXII
— <i>consobrina</i>	LXII
— var. <i>emaciata</i>	LXII
— <i>costulata</i>	LXIII
— <i>filiformis</i>	LXIII
— <i>fistula</i>	LXII
— <i>flintii</i>	LXIV
— <i>hirsuta</i>	LXIII
— <i>hispida</i>	LXIII
— var. <i>sublineata</i>	LXIII
— <i>inflexa</i>	LXII
— <i>inornata</i> var. <i>bradyensis</i>	LXII
— <i>intercellularis</i>	p. xii (t. fig. 15), LXV
— <i>intorta</i>	LXII
— <i>lamnulifera</i>	LXIV
— <i>longicauda</i>	LXV
— <i>mucronata</i>	LXII
— <i>obliqua</i>	LXIV
— <i>papillosa</i>	LXIII
— <i>perversa</i>	LXIV
— <i>plebeia</i>	LXIII

Species	Plate
<i>Planispirinoides bucculentus</i>	CXIV
— var. <i>placentiformis</i>	IV
<i>Planodiscorbis circularis</i>	XC
— <i>rarescens</i>	XC
<i>Planopulvinulina dispansa</i>	CXV
<i>Planorbulina acervalis</i>	XCII
— <i>larvata</i>	XCII
— <i>mediterraneensis</i>	XCII
<i>Planorbulinella larvata</i>	XCII
<i>Planularia australis</i> var.	LXVIII
PLANULARIA CASSIS VAR. NOV.	LXVIII
— <i>gemmata</i>	LXXI
— <i>magnifica</i>	CXIII
— var. <i>falciformis</i>	CXIV
— <i>patens</i>	LXVII
— <i>siddalliana</i>	LXVIII
— <i>sp. nov. aff. crepidula</i>	LXVII
<i>Planulina ariminensis</i>	XCIII
— <i>bradii</i>	XCIII
— <i>foveolata</i>	XCIV
— <i>wuellerstorfi</i>	XCIII
<i>Planulinoides biconcava</i>	XCI
<i>Plecanium concavum</i>	XLII
<i>Plectofrondicularia millettii</i>	p. xii (t. fig. 16)
<i>Pleurostomella acuminata</i>	LI
— <i>alternans</i>	LI
— <i>brevis</i>	LI
PLEUROSOTOMELLA SP. NOV.	LI
— <i>rapa</i>	LI
— var. <i>recens</i>	LI
— <i>subnodosa</i>	LII
PLEUROSOTOMELLINA (?) SP. NOV.	LII
<i>Polymorphina amygdaloides</i>	LXXI
— <i>angusta</i>	LXXI, LXXII
— <i>communis</i>	LXXII
— <i>compressa</i>	LXXII, LXXIII
— <i>elegantissima</i>	LXXII
— <i>extensa</i>	LXXIII
— <i>gibba</i>	LXXI, LXXIII
— <i>lactea</i>	LXXI, LXXIII
— <i>lanceolata</i>	LXXII
— <i>longicollis</i>	LXXIII
— <i>myristiformis</i>	LXXIII
— <i>oblonga</i>	LXXIII
— <i>ovata</i>	LXXII
— <i>plioacaena</i>	LXIX
— <i>problema</i>	LXXII, LXXIII
— <i>regina</i>	LXXIII
— <i>rotundata</i>	LXXIII
— <i>seguenzana</i>	LXXII
— <i>sororia</i>	LXXI, LXXIII
— <i>sororia</i> var. <i>cuspidata</i>	LXXI, LXXII
— <i>thouini</i>	LXXII
<i>Polymorphinella pacifica</i>	LXVII
<i>Polysegmentina circinata</i>	XI
<i>Polystomella aculeata</i>	CX
— <i>arctica</i>	CX
— <i>craticulata</i>	CX
— <i>crispa</i>	CX
— <i>imperatrix</i>	CX
— <i>macella</i>	CX
— var. <i>aculeata</i>	CX
— <i>striatopunctata</i>	CIX
— <i>subnodosa</i>	CX
— <i>verriculata</i>	CX
<i>Polytrema album</i>	CI
— <i>miniacea</i>	C, CI
— var. <i>alba</i>	CI
<i>Poroeponides lateralis</i>	CVI
— <i>cribrorepandus</i>	CIV
<i>Praeglobobulimina spinescens</i>	L
<i>Praemassilina arenaria</i>	VIII
— <i>asperula</i>	VIII
<i>Praesorites orbitolitoides</i>	XV
<i>Proteonina ampullacea</i>	XXX
— <i>atlantica</i>	XXX
— <i>diffflugiformis</i>	XXX
— var. <i>lagenarium</i>	XXX
— <i>fusiformis</i>	XXX
<i>Protoglobobulimina pupoides</i>	L
<i>Protoschista findens</i>	XXXII
<i>Psamatodendron arborescens</i>	p. xi (t. fig. 10), XXVIII
<i>Psammosiphonella crassatina</i>	XX
— <i>discreta</i>	XXII
<i>Psammosphaera fusca</i>	XVIII
— <i>parva</i>	XVIII
PSEUDOBULIMINA SP. NOV.	CXIII
<i>Pseudobulimina convoluta</i>	CXIII

Species	Plate
<i>Pseudoclavulina humilis</i>	XLVIII
— <i>serventyi</i>	XLVIII
<i>Pseudoeponides</i>	CV
— <i>tenera</i>	XCIV
<i>Pseudoglandulina comatula</i>	LXIV
— <i>rotundata</i>	LXI
<i>Pseudomassilina australis</i>	VI
— <i>macilenta</i>	VII
— <i>pacificensis</i>	VI
<i>Pseudoparrella</i>	XCIV
— <i>exigua</i>	CIII
<i>Pseudopolymorphina ligua</i>	LXXII
— <i>ovalis</i>	LXXII
<i>Ptychomiliola separans</i>	VII
<i>Pullenia bulloides</i>	p. xii (t. fig. 18), LXXXIV
— <i>obliquiloculata</i>	LXXXIV
— <i>quingueloba</i>	LXXXIV
— <i>sphaeroides</i>	p. xii (t. fig. 18), LXXXIV
— <i>subcarinata</i>	LXXXIV
<i>Pulleniatina obliquiloculata</i>	LXXXIV
<i>Pulvinulina auricula</i>	CVI
— <i>berthelotiana</i>	CVI
— <i>canariensis</i>	CIII
— <i>concentrica</i>	CV
— <i>crassa</i>	CIII
— <i>dispansa</i>	CXV
— <i>elegans</i>	p. xii (t. fig. 21), CV
— <i>exigua</i>	CIII
— <i>favus</i>	CIV
— <i>frigida</i>	CV
— <i>hauerii</i>	CVI
— <i>indica</i>	CVI
— <i>karsteni</i>	CV
— <i>lateralis</i>	CVI
— <i>menardii</i>	CIII
— var. <i>fimbriata</i>	CIII
— <i>miceliniana</i>	CIV
— <i>oblonga</i>	CVI
— var. <i>scabra</i>	CVI
— <i>partschiana</i>	p. xii (t. fig. 21)
— <i>patagonica</i>	CIII
— <i>pauperata</i>	CIV
— <i>philippinensis</i>	CVI
— <i>procera</i>	CV
— <i>punctulata</i>	CIV
— <i>repanda</i>	CIV
— var. <i>concamerata</i>	CIV
— <i>schreibersi</i>	CXV
— <i>tumida</i>	CIII
— <i>umbonata</i>	CV
— <i>vermiculata</i>	CXV
<i>Pulvinulinella bradyana</i>	XCIV
— <i>exigua</i>	CIII
<i>Puteolina bradyi</i>	XIII
— <i>protea</i>	XIV
<i>Pyrgo comata</i>	III
— (triloculine form)	IV
— <i>denticulata</i>	III
— var. <i>striolata</i>	III
— <i>depressa</i>	II, III
— <i>elongata</i>	II
— <i>fornasinii</i>	II
— <i>laevis</i>	II
— <i>lucernula</i>	II, III
— <i>murrhyna</i>	II
— <i>sarsi</i>	II
— <i>serrata</i>	III
— <i>vespertilio</i>	II
<i>Pyrgoella sphaera</i>	p. xi (t. fig. 1), II
<i>Pyrulina angusta</i>	LXXII
— <i>cylindroides</i>	LXXII
— <i>extensa</i>	LXXIII
— <i>fusiformis</i>	LXXI, LXXII
— <i>gutta</i>	LXXI

Q

<i>Quingueloculina agglutinans</i>	VIII
— <i>akneriana</i>	V
— <i>alveoliniformis</i>	VIII
— <i>amygdaloides</i>	VI
— <i>auberiana</i>	V
— <i>australis</i>	V
— <i>bicornis</i>	VI
— <i>boueana</i>	VII
— <i>bradyana</i>	VI
— <i>cultrata</i>	V

Species	Plate
Sorosphaera confusa	XVIII
Sphaerogypsina globulus	CI
Sphaeroidina bulloides	LXXXIV
<i>dehiscens</i>	LXXXIV
Sphaeroidinella dehiscens	LXXXIV
Spirillina decorata	LXXXV
<i>denticulata</i>	LXXXV
<i>inaequalis</i>	LXXXV
<i>limbata</i>	LXXXV
<i>var. denticulata</i>	LXXXV
<i>obconica</i>	LXXXV
<i>tuberculata</i>	LXXXV
<i>vivipara</i>	LXXXV
<i>var. revertens</i>	LXXXV
Spirolina acicularis	XIII
<i>arietina</i>	XIII
Spiroloculina acutimargo	X
<i>affixa</i>	X
<i>angulata</i>	X
<i>antillarum</i>	X
<i>arenaria</i>	VIII
<i>asperula</i>	VIII
SPIROLOCULINA SP. NOV.	X
<i>communis</i>	IX, X
<i>convexiuscula</i>	X
<i>depressa</i>	IX
<i>depressa</i>	X
<i>disparilis</i>	X
<i>elevata</i>	X
<i>excavata</i>	IX
<i>fragilissima</i>	IX
<i>grata</i>	X
<i>var. angulata</i>	X
<i>grateloupi</i>	IX
<i>henbesti</i>	IX
<i>impressa</i>	X
<i>limbata</i>	IX
<i>var.</i>	X
<i>milleti</i>	IX
<i>nitida</i>	IX
<i>planulata</i>	IX
<i>pusilla</i>	X
<i>robusta</i>	IX
<i>rotunda</i>	IX
<i>soldanii</i>	IX
<i>speciosa</i>	X
<i>tenuirostra</i> <i>var.</i>	X
<i>tenuis</i>	X
<i>tenuiseptata</i>	X
<i>venusta</i>	X
Spirophthalmidium acutimargo	X
<i>pusillum</i>	X
Spiroplecta americana	XLV
<i>annectens</i>	XLV
<i>biformis</i>	XLV
<i>corrugata</i>	XLV
Spiroplectammina biformis	XLV
SPIROPLECTAMMINA SP. NOV.	XLV
Spiroplectella annectens	XLV
SPIROPLECTELLA EARLANDI NOM. NOV.	XLV
Spiroplectinata annectens	XLV
Squamulina scopula	XXVII-A
Stilostomella abyssorum	LXIII
<i>antillea</i>	LXXXVI
<i>bradyi</i>	LXXXVI
<i>consobrina</i>	LXII
<i>fistuca</i>	LXII
<i>hispidia</i>	LXIII
<i>pauperata</i>	p. xii (t. fig. 14)
Stomatorbina concentrica	CV
Storthosphaera albida	XXV
Streblus batavus	CVII
<i>becarii</i> <i>var. koeboeensis</i>	CVII
<i>catesbyanus</i>	CVII
<i>gaimardii</i>	CVI
<i>var. compressiuscula</i>	CVIII
<i>schroeterianus</i>	CXV
Syringammina fragilissima	p. xi (t. fig. 9)

T

Taberina sp. x	XIV
Technitella bradyi	XXV
<i>legumen</i>	XXV
<i>melo</i>	XXV
Testulosiphon indivisa	XXIX

Species	Plate
Textularia agglutinans	XLIII
<i>var. porrecta</i>	XLIII
<i>aspera</i>	XLIV
<i>carinata</i>	XLII
<i>concava</i>	XLII
<i>conica</i>	XLIII
<i>short var.</i>	CXIII
<i>crispata</i>	CXIII
<i>folium</i>	XLII
<i>goesii</i>	XLIV
<i>goesii</i>	XLIII
<i>gramen</i>	XLIII
<i>inconspicua</i>	XLII
<i>indenta</i>	XLII
<i>jugosa</i>	XLII
<i>luculenta</i>	XLIII
<i>orbica</i>	XLIII
<i>philippinensis</i>	XLVI
<i>porrecta</i>	XLIII
<i>pseudocarinata</i>	XLII
<i>pseudogramen</i>	XLIII
<i>pseudotrochus</i>	XLIII
<i>pseudoturris</i>	XLIV
<i>quadrilatera</i>	XLII
<i>rugosa</i>	XLII
<i>sagittula</i>	XLII
<i>var. fistulosa</i>	XLII
<i>siphonifera</i>	XLII
<i>transversaria</i>	CXIII
<i>trochus</i>	XLIII, XLIV
<i>tuberosa</i>	XLIV
<i>turris</i>	XLIV
<i>variabilis</i> <i>var. spathulata</i>	LII
Textulariella barrettii	XLIII, XLIV
Themoon decipiens	CIX
<i>granulosus</i>	CIX
Tholosina bulla	XXXV
<i>vesicularis</i>	XXXV
<i>var. erecta</i>	XXXV
Thurammina albicans	XXXVII
<i>castanea</i>	XXXVI
<i>compressa</i>	XXXVII
<i>haeusleri</i>	XXXVI
<i>papillata</i>	XXXVI
<i>var. albicans</i>	XXXVII
<i>var. castanea</i>	XXXVI
<i>var. compressa</i>	XXXVII
<i>var. haeusleri</i>	XXXVI
<i>var. parallela</i>	XXXVI
Tinoporus baculatus	CI, CVIII
<i>hispidus</i>	CVIII
<i>spengleri</i>	CVIII
Tolypammina schaudinni	XXIV
<i>vagans</i>	XXIV
Tretomphalus atlanticus	CII
<i>bulloides</i> <i>var. plana</i>	CII
<i>concinna</i>	XC
<i>millettii</i>	CII
<i>planus</i>	p. xii (t. fig. 20), CII
Trifarina bradyi	LXVII
<i>reussi</i>	LXVII
Triloculina bertheliniana	CXIV
<i>circularis</i>	IV
<i>cuneata</i>	I
<i>insignis</i>	IV
<i>rupertiana</i>	p. xi (t. fig. 3), VII
<i>striatotrigonula</i>	IV
<i>sublineata</i>	IV
<i>subrotunda</i>	IV
<i>subvalvularis</i>	IV
<i>terquemiana</i>	CXIV
<i>transversestriata</i>	IV
<i>tricarinata</i>	III
<i>trigonula</i>	III
<i>webbiana</i>	IV
Trimosina simplex	XLVII
Triplasia reussi	LXVII
<i>variabilis</i>	XLVII
Tritaxia caperata	XLIX
<i>indiscreta</i>	XLIX
<i>lepida</i>	XLIX
<i>tricarinata</i>	XLIX
Tritaxillina atlantica	XLIX
<i>caperata</i>	XLIX
<i>var. atlantica</i>	XLIX
Tritaxis conica	XLIX
<i>fusca</i>	XLIX
Trochammina conglobata	XL

Species	Plate
<i>Trochammina coronata</i>	XL
— <i>galeata</i>	XL
— <i>inflata</i>	XLI
— <i>lituiformis</i>	XL
— <i>miocenica</i>	XXXVII
— <i>nana</i>	XXXV
— <i>nitida</i>	XLI
— <i>pauciloculata</i>	XL, XLI
— <i>proteus</i>	XL
— <i>ringens</i>	XL
— <i>squamata</i>	XLI
— <i>trullissata</i>	XL
<i>Trochamminella</i>	XLIX
<i>Trochamminoides proteus</i>	XL
<i>Trochulina</i>	LXXVII
<i>Truncatulina akneriana</i>	XCIV
— <i>bradyi</i>	XCV
— <i>culter</i>	XCVI
— <i>dutemplei</i>	XCV
— <i>echinata</i>	XCVI
— <i>haidingerii</i>	XCV
— <i>near haidingerii</i>	XCV
— <i>humilis</i>	XCIV
— <i>lobatulus</i>	XCII, XCIII, CXV
— <i>margaritifera</i>	XCVI
— <i>praecinctus</i>	XCV
— <i>pseudoungeriana</i>	XCIV
— <i>pygmaea</i>	XCV
— <i>refulgens</i>	XCII
— <i>reticulata</i>	XCVI
— <i>robertsonianus</i>	XCV
— <i>rosea</i>	XCVI
— <i>rostrata</i>	XCIV
— <i>soluta</i>	XCVI
— <i>tenera</i>	XCV
— <i>tenuimargo</i>	XCIII
— <i>var. altocamerata</i>	XCIII
— <i>tumidulus</i>	XCV
— <i>ungeriana</i>	XCIV
— <i>variabilis</i>	XCIII
— <i>wuellerstorfi</i>	XCIII
<i>Tubinella funalis</i>	XIII
— <i>inornata</i>	XIII
<i>Tubinellina</i>	XIII
<i>Turritellella shoneana</i>	XXXVIII
— <i>spectabilis</i>	XXXVIII

U

<i>Uvigerina aculeata</i>	LXXIV, LXXXV
— <i>angulosa</i>	LXXIV
— <i>var. spinipes</i>	LXXIV
— <i>asperula</i>	LXXXV
— <i>var. ampullacea</i>	LXXXV
— <i>var. auberiana</i>	LXXXV
— <i>var. proboscidea</i>	LXXXV
— <i>bifurcata</i>	LXXIV
— <i>bradyana</i>	LXXIV
— <i>brunnensis</i>	LXXXV
— <i>canariensis</i>	LXXIV
— <i>cushmani</i>	LXXIV
— <i>hollicki</i>	LXXIV
— <i>interrupta</i>	LXXXV
— <i>mediterranea</i>	LXXIV
— <i>peregrina</i>	LXXIV

Species	Plate
<i>Uvigerina var. bradyana</i>	LXXIV
— <i>peregrina var. dirupta</i>	LXXIV
— <i>porrecta</i>	LXXIV
— <i>proboscidea</i>	LXXXV
— <i>schwageri</i>	LXXIV
— <i>tenuistriata</i>	LXXIV
— <i>pygmaea</i>	LXXIV

V

<i>Vaginulina advena</i>	LXV
— <i>americana</i>	LXVII
— <i>bradyi</i>	LXVI
— <i>bruckenthali</i>	LXVI
— <i>elegans</i>	LXVI
— <i>legumen</i>	LXVI
— <i>var. arquata</i>	CXIV
— <i>linearis</i>	LXVII
— <i>margaritifera</i>	LXVI
— <i>patens</i>	LXVII
— <i>spinigera</i>	LXVII
— <i>spinigera</i>	CXIV
— <i>subelegans</i>	LXVI
— <i>tricarinata</i>	LXVII
<i>Vaginulinopsis pacifica</i>	LXVII
— <i>subalata</i>	LXVI
— <i>sublegumen</i>	LXVI
— <i>tasmanica</i>	LXVII
<i>Valvopavonina flabelliformis</i>	XLV
<i>Valvulina conica</i>	XLIX
— <i>fusca</i>	XLIX
<i>Valvulineria bradyi</i>	XCI
— <i>humilis</i>	XCIV
— <i>philippinensis</i>	CVI
— <i>rugosa</i>	LXXXVII
— <i>rugosa var. minuta</i>	XCI
VALVULINERIA SP. NOV.	XCI
<i>Verneuilina affixa</i>	XLVII
— <i>bradyi</i>	XLVII
— <i>polystropha</i>	XLVII
— <i>propinqua</i>	XLVII
— <i>pygmaea</i>	XLVII
— <i>scabra</i>	XLVII
— <i>spinulosa</i>	XLVII
— <i>triquetra</i>	XLVII
— <i>variabilis</i>	XLVII
<i>Vertebralina insignis</i>	XII
— <i>striata</i>	XII
<i>Virgulina bradyi</i>	LII
— <i>complanata</i>	LII
— <i>davisi</i>	LII
— <i>pauciloculata</i>	LII
— <i>rotundata</i>	LII
— <i>schreibersiana</i>	LII
— <i>subdepressa</i>	LII
— <i>subsquamosa</i>	LII
<i>Vulvulina pennatula</i>	XLV

W

<i>Webbina clavata</i>	XLI
— <i>hemisphaerica</i>	XLI
<i>Webbinella hemisphaerica</i>	XLI

Taxonomic Notes

EXPLANATION OF PLATE 1 (I)

Figs. 1-8, X 50; Figs. 9-15, 17, X 20; Fig. 16, X 25; Fig. 18, X 30; Figs. 19, 20, X 45.

Figures 1-4.—*Nodophthalmidium* sp. nov.

Fig. 1. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 2-4. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Nubecularia tibia* Jones and Parker (*N. lucifuga* Defr. var. *tibia* of Jones and Parker). Rhumbler (Nachr. K. Ges. Wiss. Göttingen, 1895, Heft 1, p. 87) proposed the genus *Nodobacularia* and Cushman (1917) designated *N. tibia* the genotype. Macfadyen (Jour. Roy. Micr. Soc., Ser. 3, Vol. 59, 1939, p. 167) has shown that *N. tibia* is a synonym of *Bullopore rostrata* Quenstedt, and is a Jurassic species. The Recent forms figured by Brady were placed by Macfadyen in *Nodophthalmidium* and require a new specific name.

Figures 5, 6.—*Parrina bradyi* (Millett).

Figures 7, 8.—*Parrina bradyi* (Millett) var. *sufflata* Rhumbler.

Figs. 5-8. Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *Nubecularia inflata* (figs. 5-8). As *inflata* was preoccupied (Terquem 1876), Millett (Jour. Roy. Micr. Soc., 1898, p. 261) proposed the name *bradyi*. Schubert (Pal. Zeitschr., Vol. 3, 1920, p. 166) proposed the genus *Silvestria*, with type *N. bradyi* Millett, but since *Silvestria* was preoccupied by Verhoeff 1895, Cushman (C.C.L.F.R., Vol. 7, 1931, p. 20) proposed the name *Parrina*. Rhumbler (Kiel Meeresf., Vol. 1, 1936, p. 197) split Brady's species into two varieties, *fistulata* (figs. 5, 6) and *sufflata* (figs. 7, 8). It appears unnecessary to make use of two varietal names, and the name *bradyi* has therefore been retained for Rhumbler's *bradyi* var. *fistulata* (figs. 5, 6), leaving figs. 7 and 8 as *bradyi* var. *sufflata* Rhumbler.

Figures 9-11, 13-16.—*Nubecularia lucifuga* Defrance.

Gulf of Bombah, Tripoli, Mediterranean.

This is the type of *Nubecularia*.

Figure 12.—*Nubecularia lucifuga* Defrance var. *lapidea* Wiesner.

Gulf of Bombah, Tripoli, Mediterranean.

Referred by Brady to *Nubecularia lucifuga* and by Howchin and Parr (Trans. Roy. Soc. S. Australia, Vol. 62, No. 2, 1938, p. 297) to *N. lucifuga* Defrance var. *lapidea* Wiesner (Die Miliolideen der östlichen Adria, Prague, 1923, p. 94).

Figures 17, 18.—*Nummoloculina irregularis* (d'Orbigny).

Fig. 17. Challenger Sta. 23, West Indies. (450 fathoms)

Fig. 18. Challenger Sta. 85, off the Canaries, Atlantic. (1125 fathoms)

Referred by Brady to *Biloculina* and by Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 46) to *Nummoloculina*.

Figures 19, 20.—*Triloculina cuneata* Karrer, "biloculine variety."

Off Tripoli, Mediterranean.

Above is the determination given by Brady, and his material may not be identical with the Tertiary species described by Karrer. Brady's figures show a more inflated form than those of Karrer and may be a variety or possibly new.

EXPLANATION OF PLATE 2 (II)

Figs. 1, 2, X 40; Fig. 3, X 30; Fig. 4, X 35; Fig. 5, X 25; Fig. 6, X 40; Figs. 7, 8, X 25; Fig. 9, X 45; Figs. 10, 11, X 50; Fig. 13, X 30; Fig. 14, X 20; Fig. 12, X 30; Figs. 15, 17, X 40; Fig. 16, X 35.

Figures 1-3.—*Nummuloculina contraria* (d'Orbigny), juv.

Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Referred by Brady to *Planispirina sigmoidea* and by Schlumberger (Bull. Soc. Zool. France, Vol. 12, 1887, p. 118) to *Sigmoilina* as genotype. Wiesner (Die Miliolid. östlich. Adria, Prague, 1923, p. 118) states that *sigmoidea* is the young stage of *Nummuloculina contraria* (d'Orbigny). If correct, then *Sigmoilina* Schlumberger becomes a synonym of *Nummuloculina* Steinmann 1881, and a new generic name is required for most species now placed in *Sigmoilina*.

Figure 4.—*Pyrgoella sphaera* (d'Orbigny).

Challenger Sta. 246, North Pacific. (2050 fathoms)

Referred by Brady to *Biloculina* and by Wiesner (1931) to *Miliolinella*. Cushman and White (C.C.L.F.R., Vol. 12, No. 4, 1936, p. 90) erected the genus *Pyrgoella* with *sphaera* as genotype.

Figures 5, 6.—*Pyrgo lucernula* (Schwager).

Fig. 5. Challenger Sta. 76, off the Azores, Atlantic. (900 fathoms)

Fig. 6. Porcupine Sta. 36, off Ireland, Atlantic. (725 fathoms)

Referred by Brady to *Biloculina* and by Cushman (Bernice P. Bishop Mus., Bull. 119, 1934, p. 108) to *Pyrgo*.

Figure 7.—*Pyrgo fornasinii* Chapman and Parr.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Biloculina ringens* (Lamarck). Schlumberger (Mém. Soc. Zool. France, Vol. 4, 1891, p. 557) referred this to *B. bradyi* Schlumberger, and also included *B. ringens* Brady (part) non Lamarck in the synonym of *B. sarsi* (l. c. supra, 1891, p. 553). Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 471) referred this figure to *B. sarsi*, ignoring Schlumberger's reference of the same figure to *B. bradyi*. Chapman and Parr (Jour. Roy. Soc. W. Australia, 1935, Vol. 21, p. 5) pointed out that the name *bradyi* had been used by Fornasini in 1886 for a different form and proposed the name *Pyrgo fornasinii*. *Pyrgo sarsi* (Schlumberger) appears to be different from Brady's figures.

Figure 8.—*Pyrgo vespertilio* (Schlumberger).

Challenger Sta. 78, North Atlantic. (1000 fathoms)

Referred by Brady to *Biloculina ringens* (Lamarck) and by Schlumberger (Mém. Soc. Zool. France, Vol. 4, 1891, p. 561) to *B. vespertilio*. Transferred to *Pyrgo* by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 295).

Figure 9.—*Pyrgo elongata* (d'Orbigny).

Challenger Sta. 24, West Indies. (690 fathoms)

Referred by Brady to *Biloculina* and by Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 70) to *Pyrgo*.

Figures 10, 11, 15.—*Pyrgo murrhyna* (Schwager).

Fig. 10. Challenger Sta. 224, North Pacific. (1850 fathoms)

Figs. 11, 15. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Biloculina depressa* var. *murrhyna* (figs. 10, 11) and to *Biloculina depressa* d'Orbigny (fig. 15). Referred to *Pyrgo murrhyna* (Schwager) by Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 71). Schlumberger (l. c. supra, 1891, p. 550) notes that fig. 15 is close to *murrhyna* but may be a different species.

Figures 12, 16, 17.—*Pyrgo depressa* (d'Orbigny).

Fig. 12. Challenger Sta. 352A, off Cape Verde Islands, Atlantic. (11 fathoms)

Fig. 16. Porcupine Sta. 23, off N.W. Ireland, Atlantic. (630 fathoms)

Referred by Brady to *Biloculina* and by Cushman (l. c. supra, 1929, p. 71) to *Pyrgo*.

Figures 13, 14.—*Pyrgo laevis* Defrance.

Fig. 13. Porcupine Sta. 28, off N.W. Ireland, Atlantic. (1215 fathoms)

Fig. 14. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Biloculina*. This is the genotype of *Pyrgo* Defrance.

MILIOLA (Biloculina.)

EXPLANATION OF PLATE 3 (III)

Figs. 1, 2, X 40; Fig. 3, X 25; Figs. 4, 5, X 40; Fig. 6, X 35; Figs., 7, 8, X 45; Fig. 9, X 40;
Figs. 10-13, X 50; Fig. 14, X 20; Fig. 15, X 40; Fig. 16, X 25; Fig. 17, X 50.

Figures 1, 2.—*Pyrgo depressa* (d'Orbigny).

Porcupine Sta. AA, off Skye, N. Atlantic. (45-60 fathoms)

Referred by Brady to *Biloculina*; see previous plate.

Figure 3.—*Pyrgo serrata* (L. W. Bailey).

Challenger Sta. 168, off New Zealand, S. Pacific. (1100 fathoms)

Referred by Brady to *Biloculina depressa* d'Orbigny var. *serrata*. The name *serrata* had been used previously by L. W. Bailey (Boston Jour. Nat. Hist., Vol. 7, 1862, p. 350) for the same species, according to Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 73).

Figures 4, 5.—*Pyrgo denticulata* (Brady).

Fig. 4a. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Figs. 4b, 5. Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *Biloculina ringens* (Lamarck) var. *denticulata* and by Cushman (l. c. supra, 1929, p. 69) to *Pyrgo denticulata* (Brady).

Figures 6, 14.—*Pyrgo lucernula* (Schwager).

Fig. 6. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Fig. 14. Challenger Sta. 76, off the Azores, Atlantic. (900 fathoms)

Referred by Brady to *Biloculina tubulosa* Costa (fig. 6) and *Miliolina trigonula* (Lamarck) (fig. 14). Referred to *Pyrgo lucernula* by Thalmann 1932.

Figures 7, 8.—*Pyrgo denticulata* (Brady) var. *striolata* (Brady).

Fig. 7. Challenger Sta. 187A, Torres Strait, Pacific. (8 fathoms)

Fig. 8. Challenger Sta. 187, off Papua, Pacific. (6 fathoms)

Referred by Brady to *Biloculina ringens* (Lamarck) var. *striolata* and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 296) to *Pyrgo*.

Figure 9.—*Pyrgo comata* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Biloculina* and by Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 73) to *Pyrgo*.

Figures 10-13.—Young Miliolidae.

Fig. 10. Challenger Sta. 205A, off Hong Kong, Pacific. (7 fathoms)

Figs. 11, 12. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Brady regards these as probably young stages of *Quinqueloculina pulchella* d'Orbigny, a West Indian species, which seems improbable as it has not been recorded from the Pacific as far as has been checked. Brady also refers the figures to "*Adelosina soldanii* d'Orbigny" (fig. 10), "*Adelosina laevigata* d'Orbigny" (fig. 11) and "*Adelosina semistriata* d'Orbigny" (fig. 12).

Figures 15, 16.—*Triloculina trigonula* (Lamarck).

Fig. 15a. Porcupine Sta. 23, N.W. of Ireland, Atlantic. (630 fathoms)

Fig. 15b. Porcupine Sta. AA, off Skye, N. Atlantic. (45-60 fathoms)

Referred by Brady to *Miliolina* and by d'Orbigny (Ann. Sci. Nat., Paris, Vol. 7, 1826, p. 299) to *Triloculina*. Lamarck's species was obtained from the Eocene of France and it is doubtful that the Recent form is the same species. It is probable, as remarked by Cushman and others, that this is distinct, and also that more than one species has been included under the name *trigonula* by subsequent authors.

Figure 17.—*Triloculina tricarinata* d'Orbigny.

Shell Cove, Port Jackson, Australia.

Referred by Brady to *Miliolina* and by d'Orbigny to *Triloculina*.

EXPLANATION OF PLATE 4 (IV)

Figs. 1, 2, X 20; Fig. 3, X 50; Figs. 4, 5, X 16; Fig. 6, X 50; Fig. 7, X 50; Fig. 8, X 27;
Fig. 9, X 35; Fig. 10, X 40.

Figures 1, 2.—*Planispirinoides bucculentus* (Brady) var. *placentiformis* (Brady).

Fig. 1. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 2. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Referred by Brady to *Miliolina* and by Wiesner to *Miliolinella*. Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 287) referred *Miliolina bucculenta* Brady to *Planispirinoides*, as genotype. (See note to Plate CXIV).

Figure 3.—*Miliolinella subrotunda* (Montagu).

Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Referred by Brady to *Miliolina circularis* (Bornemann), by Cushman and others to *Triloculina*, and by Wiesner (Deutsche Südpolar Exped. 1901-1903, Vol. 20 (Zool., Vol. 12), 1931, p. 107) to *Miliolinella*, as genotype. Parr in 1950 referred this species erroneously to *Triloculina* with no reference to Wiesner's genus *Miliolinella*.

Figures 4, 5.—*Triloculina subvalvularis* Parr.

Fig. 4. Challenger Sta. 168, off New Zealand, Pacific. (1100 fathoms)

Referred by Brady to *Miliolina valvularis* (Reuss) and by Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 296) to *Triloculina subvalvularis*.

Figure 6.—*Triloculina transversestriata* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Miliolina* and by Thalmann (1932) to *Triloculina*.

Figure 7.—*Miliolinella sublineata* (Brady).

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *Miliolina circularis* (Bornemann) var. *sublineata*. Wiesner (l. c. supra, 1931, p. 108) refers this figure to *Miliolinella subrotunda* (Montagu) var. *sublineata* (Brady), and Parr (l. c. supra, 1950, p. 295) to *Triloculina sublineata* (Brady).

Figure 8.—*Triloculina insignis* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Brady referred figs. 8 and 10 (see below) to *Miliolina insignis* Brady, but Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 458) referred fig. 8 to *Pyrgo comata* (Brady) (triloculine form) and fig. 10 to *Triloculina insignis* (Brady). In 1929 Cushman referred both figs. 8 and 10 to *T. insignis*. Thalmann (1932) referred fig. 8 to *Flintina grata* (Terquem) and Parr (Mining and Geol. Jour., Victoria, Vol. 2, No. 5, 1941, p. 305) restricted the name *insignis* to fig. 8 and re-identified fig. 10 (see below).

Figure 9.—*Flintina bradyana* Cushman.*

Challenger Sta. 233B, Japan. (15 fathoms)

Referred by Brady to *Miliolina fichteliana* (d'Orbigny) and by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 467) to *Flintina bradyana* (genotype of *Flintina*).

Figure 10.—*Triloculina striatotriconula* Parker and Jones.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Miliolina insignis* Brady and by Parr (Mining and Geol. Jour., Victoria, Vol. 2, No. 5, 1941, p. 305) to *Triloculina striatotriconula* Parker and Jones 1865.

*NOTE: Heron-Allen and Earland (Trans. Zool. Soc. London, Vol. 20, Pt. 17, 1915, p. 560) referred this figure to *Miliolina webbiana* (d'Orbigny) (*Triloculina* 1839) and the similarity to d'Orbigny's figures of that Atlantic form is striking. Comparison with the types or topotype material is indicated.

EXPLANATION OF PLATE 5 (V)

Figs. 1-7, X 50; Fig. 8, X 30; Fig. 9, X 40; Figs. 10, 11, 13, 14, X 50; Fig. 12, X 40; Fig. 15, X 12.

Figures 1, 2.—*Quinqueloculina cultrata* (Brady).

Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Miliolina* and by Thalmann, 1932, to *Quinqueloculina*.

Figure 3.—*Quinqueloculina tropicalis* Cushman.

Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Miliolina gracilis* (d'Orbigny) and by Cushman (Carnegie Inst. Washington, Publ. 342, 1924, p. 63) to *Quinqueloculina tropicalis*.

Figure 4.—*Miliolinella* (?) *oblonga* (Montagu).

Challenger Sta. 174B, off Fiji, Pacific. (610 fathoms)

Referred by Brady to *Miliolina* and by Cushman ("An Illustrated Key to the Genera of the Foraminifera," 1933, pl. 15, fig. 6) to *Miliolinella*. This does not appear to be a typical *Miliolinella* and moreover Cushman's figures differ considerably from those of Brady.

Figure 5.—*Quinqueloculina venusta* Karrer?

Challenger Sta. 142A, off South Africa. (15-20 fathoms)

Referred by Brady to *Miliolina*. Wiesner (Die Miliolideen der östlichen Adria, 1923, p. 67) notes that this is not the same as fig. 7 below but does not identify it with Karrer's species.

Figure 6.—*Quinqueloculina seminulum* (Linnaeus).

Fig. 6a. Porcupine Sta. AA, off Skye, Scotland, N. Atlantic. (45-60 fathoms)

Fig. 6b. Porcupine Sta. 23, W. of Scotland, N. Atlantic. (630 fathoms)

Referred by Brady to *Miliolina* and by Cushman and others to *Quinqueloculina*. Galloway and Wissler (Jour. Pal., Vol. 1, 1927, p. 38) refer fig. 6 to *Q. akneriana* d'Orbigny (followed by Cushman, Stewart and Stewart and by Thalmann) but from the figures and from material from the N. Atlantic it is believed that Brady was correct.

Figure 7.—*Quinqueloculina lamarckiana* d'Orbigny.

Challenger Sta. 346, South Atlantic. (2350 fathoms)

Referred by Brady to *Miliolina venusta* Karrer and by Wiesner (Die Miliolideen der östlichen Adria, Prague, 1923, p. 67) to *Q. lamarckiana* d'Orbigny.

Figures 8, 9.—*Quinqueloculina auberiana* d'Orbigny.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Miliolina*. Cushman (Carnegie Inst. Washington, Publ. 311, 1922, p. 64) places *auberiana* and *cuvieriana* in the synonymy of *lamarckiana* and Brady places *cuvieriana* with *lamarckiana*. It appears probable that *cuvieriana* is a synonym of *lamarckiana* but *auberiana* seems to be distinct.

Figures 10, 11.—*Miliolinella* (?) *australis* (Parr).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Miliolina subrotunda* (Montagu) and by Parr (Proc. Roy. Soc. Victoria, n.s., Vol. 44, Pt. 1, 1932, p. 7) to *Quinqueloculina australis*. In 1950, Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, p. 292) transferred this species to *Sigmoilina* Schlumberger, but as noted on Pl. II this appears to be a synonym of *Nummuloculina* and the present species appears to be congeneric with *subrotunda* (Montagu), the genotype of *Miliolinella*.

Figure 12.—*Quinqueloculina lamarckiana* d'Orbigny.

Challenger Sta. 233B, Japan. (15 fathoms)

Referred by Brady to *Miliolina cuvieriana* (d'Orbigny) with *M. lamarckiana* (d'Orbigny) in synonymy. Cushman (Carnegie Inst. Washington, Publ. 311, 1922, p. 64) places *cuvieriana* in the synonymy of *lamarckiana*, which appears to be correct since the latter has page priority.

Figures 13, 14.—*Miliolinella subrotunda* (Montagu).

Challenger Sta. 135, South Atlantic. (100-150 fathoms)

Referred by Brady to *Miliolina circularis* (Bornemann) and to *M. subrotunda* (Montagu) by Wiesner (Die Miliolideen der östlichen Adria, Prague, 1923, p. 69). As noted earlier *M. subrotunda* is the genotype of *Miliolinella* Wiesner 1931.

Figure 15.—Abnormal specimen of *Quinqueloculina* sp.

Challenger Sta. 246, North Pacific. (2050 fathoms)

EXPLANATION OF PLATE 6 (VI)

Figs. 1, 2, X 50; Figs. 3-5, X 45; Figs. 6-8, X 50; Fig. 9, X 40; Fig. 10, X 50; Figs. 11, 12, X 35; Fig. 13, X 25; Figs. 14-20, X 35.

Figures 1, 2.—*Pseudomassilina australis* (Cushman).

Challenger Sta. 187A, Booby Island, Torres Strait, Pacific. (8 fathoms)

Referred by Brady to *Massilina secans* (d'Orbigny) and by Lacroix (Bull. l'Inst. Oceanogr. Monaco, No. 750, 1938, p. 2) to *M. australis* Cushman. Lacroix later (l. c., No. 754, 1938, p. 3) transferred this species to *Pseudomassilina*. Cushman (Carnegie Inst. Washington, Publ. 342, 1924, p. 66) noted that Brady's figures were very close to his *M. pacificensis*, also a *Pseudomassilina* according to Lacroix. A third species closely allied is *Massilina agglutinans* (Keijzer, Temninckia, Vol. 1, 1936, p. 120) which may prove to be a variety of *P. australis*.

Figures 3-5.—*Miliolinella labiosa* (d'Orbigny).

Figs. 3, 5. Challenger Sta. 135, off Tristan d'Acunha, Atlantic. (100-150 fathoms)

Fig. 4. Challenger Sta. 306, W. of Patagonia, Pacific. (345 fathoms)

Referred by Brady to *Miliolina* and by Wiesner (Deutsche Südpolar Exped. 1901-1903, Vol. 20 (Zool., Vol. 12), 1931, p. 108) to *Miliolinella*.

Figures 6-8.—*Quinqueloculina bradyana* Cushman.

Figs. 6, 7. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 8. Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *Miliolina undosa* (Karrer) and by Cushman (U.S.N.M., Bull. 71, Pt. 6, 1917, p. 52) to *Quinqueloculina bradyana*.

Figure 9.—*Quinqueloculina bicornis* (Walker and Boys).

Porcupine Sta. AA, off Skye, N. Atlantic. (45-60 fathoms)

Referred by Brady to *Miliolina* and by Cushman and others to *Quinqueloculina*.

Figure 10.—*Quinqueloculina amygdaloides* (Brady).

Challenger Sta. 232, South of Japan. (345 fathoms)

Referred by Brady to *Miliolina* and by Cushman (U.S.N.M., Bull. 71, Pt. 6, 1917, p. 51) to *Quinqueloculina*.

Figures 11, 12.—*Quinqueloculina intricata* Terquem.

Porcupine Sta. AA, off Skye, Scotland, N. Atlantic. (45-60 fathoms)

Referred by Brady to *Miliolina bicornis* (Walker and Boys) and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 296) to *Quinqueloculina intricata* Terquem.

Figures 13, 14.—*Quinqueloculina pulchella* d'Orbigny.

Fig. 13. West of Scotland, Atlantic.

Fig. 14. Porcupine Sta. AA, off Skye, Scotland, Atlantic. (45-60 fathoms)

Referred by Brady to *Miliolina* and by d'Orbigny to *Quinqueloculina*.

Figures 15-20.—*Quinqueloculina granulocostata* Germeraad.

Figs. 15, 17, 19, 20. Challenger Sta. 260A, off Honolulu, Pacific. (40 fathoms)

Fig. 16. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 18. Challenger Sta. 187A, off Booby Island, Pacific. (8 fathoms)

Referred by Brady to *Miliolina linnaeana* (d'Orbigny), a triloculine species from Cuba. Germeraad (Geol. Central Seran, 1946, Amsterdam, p. 63) has pointed this out and proposed the name *Quinqueloculina granulocostata* for the Pacific species figured by Brady.

EXPLANATION OF PLATE 7 (VII)

Figs. 1-4, X 20; Figs. 5, 6, X 50; Figs. 7-10, X 30; Figs. 11, 12, X 100; Fig. 13, X 50;
Fig. 14, X 40; Figs. 15-22, X 50.

Figures 1-4.—*Ptychomiliola separans* (Brady).

Fig. 1. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figs. 2, 3. Storm Bay, Tasmania.

Fig. 4. Challenger Sta. 187A, Torres Strait, Pacific. (8 fathoms)

Referred by Brady to *Miliolina* and designated the genotype of *Ptychomiliola* Eimer and Fickert 1899, by Cushman (Foraminifera, 1928, p. 154).

Figures 5, 6.—*Pseudomassilina macilenta* (Brady).

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Miliolina* and by Lacroix (Bull. l'Inst. Oceanogr., Monaco, No. 754, 1938, p. 7) to *Pseudomassilina*.

Figures 7-12.—*Triloculina rupertiana* (Brady).

Figs. 7, 11. Challenger Sta. 187, S. of New Guinea, Pacific. (6 fathoms)

Fig. 8. Challenger Sta. 186, Torres Strait, Pacific. (7-8 fathoms)

Figs. 9, 12. Challenger Sta. 188, S. of Papua, Pacific. (28 fathoms)

Fig. 10. Challenger Sta. 187A, Torres Strait, Pacific. (8 fathoms)

Referred by Brady to *Miliolina* and by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 464) to *Triloculina*.

Figure 13.—*Quinqueloculina boueana* d'Orbigny.

Challenger Sta. 204A, Manila, Philippines. (4 fathoms)

Referred by Brady to *Miliolina* and by d'Orbigny to *Quinqueloculina*.

Figure 14.—*Quinqueloculina parkeri* (Brady).

Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *Miliolina* and by Cushman (U.S.N.M., Bull. 71, Pt. 6, 1917, p. 50) to *Quinqueloculina*.

Figures 15-17.—*Hauerina involuta* Cushman.

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *Hauerina ornatissima* (Karrer) and by Cushman (C.C.L.F.R., Vol. 22, Pt. 1, 1946, p. 13) to *H. involuta*.

Figures 18-20.—*Hauerina orientalis* Cushman.

Figs. 18, 19. Levuka, Ovalau, Fiji, Pacific.

Fig. 20. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred to *Hauerina ornatissima* (Karrer) by Brady and by Cushman (C.C.L.F.R., Vol. 22, Pt. 1, 1946, p. 12) to *H. orientalis*.

Figures 21, 22.—*Hauerina* sp.

Fig. 21. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 22. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Referred by Brady to *Hauerina ornatissima* (Karrer). Cushman (l. c. supra) makes no reference to these figures but expresses doubt that *H. ornatissima* (Karrer) occurs in the Recent. These figures may represent growth stages of *H. orientalis* Cushman, a new species, or possibly abnormal shells.

EXPLANATION OF PLATE 8 (VIII)

Figs. 1-7, X 50; Figs. 8-10, X 30; Figs. 11, 14, X 50; Fig. 13, X 18; Fig. 12, X 30;
Figs. 15-17, X 25; Fig. 18, X 40; Figs. 19, 20, X 25.

Figures 1-4.—*Sigmoilopsis schlumbergeri* (Silvestri).

Figs. 1, 2. Porcupine Sta. 23, W. of Ireland, Atlantic. (630 fathoms)

Fig. 3. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Fig. 4. Porcupine Sta. 37, off Ireland, Atlantic. (2435 fathoms)

Referred to *Planispirina celata* (Costa) by Brady and to *Sigmoilina schlumbergeri* by Silvestri (Mem. Pont. Nuovi Lincei, Vol. 22, 1904, p. 267). Finlay (N.Z. Jour. Sci. Techn., Sec. B, Vol. 28, 1947, p. 270) erected the genus *Sigmoilopsis* with *S. schlumbergeri* (Silvestri) as the genotype.

Figure 5.—*Flintina crassatina* (Brady).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Miliolina* and to *Flintina* by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 297).

Figures 6, 7.—*Dentostomina agglutinans* (d'Orbigny)?

Fig. 6. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 7. Porcupine Sta. 37, off Ireland, Atlantic. (2435 fathoms)

Referred by Brady to *Miliolina* and by d'Orbigny, Cushman and others to *Quinqueloculina*. The Cuban species of d'Orbigny shows a serrate aperture and was placed by Bermudez (Mem. Soc. Cub. Hist. Nat., Vol. 9, No. 3, 1935, p. 161) in *Dentostomina*. Brady's figures differ considerably from those of d'Orbigny and may represent a new species of *Quinqueloculina*.

Figures 8-10.—*Flintina triquetra* (Brady).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Miliolina* and transferred by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 466) to *Flintina*.

Figures 11?, 13, 14.—*Ammomassilina alveoliniformis* (Millett)?

Fig. 11. Porcupine Sta. 47, Faroe Channel, N. Atlantic. (542 fathoms)

Fig. 13. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 14. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Spiroloculina asperula* Karrer and by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 447) to *Massilina asperula* (Karrer). A study of original figures suggests that there may be three species here, *Praemassilina* sp. (fig. 11) *Praemassilina asperula* (Karrer, fig. 14) (see Lacroix, Bull. l'Inst. Oceanogr. Monaco, No. 754, 1938, p. 3) and *Ammomassilina alveoliniformis* (Millett) (fig. 13). Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 39) referred all three figures to *Massilina alveoliniformis* Millett and later (C.C.L.F.R., Vol. 9, Pt. 2, 1933, p. 32) made *alveoliniformis* Millett the genotype of *Ammomassilina* without further reference to Brady's figures.

Figure 12.—*Praemassilina arenaria* (Brady).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Spiroloculina* and by Lacroix (Bull. l'Inst. Oceanogr. Monaco, No. 754, 1938, p. 3) to *Praemassilina arenaria* (Brady).

Figures 15-20.—*Schlumbergerina alveoliniformis* (Brady).

Figs. 15, 16. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 17. Challenger Sta. 260A, off Honolulu, Pacific. (40 fathoms)

Fig. 18-20. Tongatabu, Pacific. (18 feet)

Referred by Brady to *Miliolina* and by Cushman first to *Quinqueloculina* and later (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 36) to *Schlumbergerina*.

EXPLANATION OF PLATE 9 (IX)

Fig. 1, X 50; Figs. 2-4, X 25; Figs. 5, 6, X 30; Figs. 7, 8, X 20; Fig. 9, X 50; Fig. 10, X 40;
Fig. 11, X 35; Figs. 12-15, X 50; Figs. 16, 17, X 30.

Figure 1.—*Vertebralina* sp. juv.

Challenger Sta. 174A, off Fiji, Pacific. (255 fathoms)

Referred by Brady to "*Miliolina* sp., or possibly an early stage of *Articulina*."

Figures 2, 3.—*Quinqueloculina pseudoreticulata* Parr.

Challenger Sta. 188, S. of New Guinea, Pacific. (28 fathoms)

Referred by Brady to *Miliolina reticulata* (d'Orbigny) and by Parr (Mining and Geol. Jour., Melbourne, Vol. 2, 1941, p. 305) to *Quinqueloculina pseudoreticulata*.

Figure 4.—*Quinqueloculina reticulata* d'Orbigny.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Miliolina* and by d'Orbigny to *Quinqueloculina*.

Figures 5, 6.—*Spiroloculina communis* Cushman and Todd.

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *S. excavata* d'Orbigny, and by Earland (MS) to *S. limbata* d'Orbigny. Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 40) referred these figures to *S. grateloupi* d'Orbigny and Cushman and Todd (C.L.F.R., Spec. Publ. No. 11, 1944, p. 63) to *S. communis*.

Figures 7, 8.—*Flintia robusta* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Spiroloculina* and by Schubert (Abhandl. k. k. Geol. Reichs., Vol. 20, 1911, p. 124) to *Flintia*, as genotype.

Figures 9, 10.—*Massilina milletti* (Wiesner).

Fig. 9. Challenger Sta. 233B, off Japan, Pacific. (15 fathoms)

Fig. 10. Challenger Sta. 187A, Torres Strait, Pacific. (8 fathoms)

Referred by Brady to *Spiroloculina nitida* d'Orbigny and by Wiesner (Archiv f. Protist., Vol. 25, 1912, p. 207) to *S. milletti*. Transferred to *Massilina* by Cushman and Todd in 1944 (C.L.F.R., Spec. Publ. No. 11, p. 76).

Figure 11.—*Spiroloculina henbesti* Petri.

Porcupine Sta. AA, off Skye, Scotland, N. Atlantic. (45-60 fathoms)

Referred by Brady to *S. planulata* (Lamarck), an Eocene species, the type of which, according to Cushman and Todd (C.L.F.R., Spec. Publ. No. 11, 1944, p. 76) is a *Quinqueloculina*. Referred to *Spiroloculina concava* by Petri (Univ. São Paulo, Brazil, Fac. Filos. Cienc. Let., Bull. No. 176 (Geol. No. 11), 1944, p. 53, pl. ii, figs. 3-6), preoccupied by *S. acutimargo* Brady var. *concava* Wiesner 1916. Renamed *S. henbesti* (see Thalmann, Contr. Cushman Found. For. Res., Vol. 6, No. 2, 1955, p. 82).

Figures 12-14.—*Hauerina fragilissima* (Brady).

Figs. 12, 13. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Fig. 14. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *Spiroloculina* and by Millett (Jour. Roy. Micr. Soc., 1898, p. 610) to *Hauerina*.

Figures 15, 16.—*Spiroloculina rotunda* d'Orbigny?

Challenger Sta. 344, Ascension Island, S. Atlantic. (420 fathoms)

Referred by Brady to *S. limbata* d'Orbigny and by Earland (MS) to *S. excavata* d'Orbigny. It appears to be most similar to *S. rotunda* d'Orbigny, but should also be compared with *S. soldanii* Fornasini.

Figure 17.—*Spiroloculina depressa* d'Orbigny?

Porcupine Sta. AA, off Skye, Scotland, N. Atlantic. (45-60 fathoms)

Referred by Brady to *S. limbata* d'Orbigny and reproduced as *S. depressa* d'Orbigny by Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, pl. ix, fig. 8). It does not appear to be very similar to d'Orbigny's model or later figures, except that copied by Fornasini from the "Planches inedites." It is closely related to *S. soldanii* Fornasini and *S. rotunda* d'Orbigny.

EXPLANATION OF PLATE 10 (X)

- Figs. 1, 2, X 30; Figs. 3-5, X 40; Fig. 6, X 75; Figs. 7-20, X 50; Figs. 21-23, X 30; Figs. 24-26, X 75.
- Figures 1, 2.**—*Spiroloculina* sp. nov.
 Challenger Sta. 189, S. of Papua, Pacific. (25-29 fathoms)
 Referred by Brady to *S. limbata* d'Orbigny var. This form is probably closer to *S. depressa* d'Orbigny than to any other species but differs in being more compressed, and in the very long narrow aperture. It is regarded as new and the name *S. bradyi* is proposed.
- Figures 3, 4.**—*Spiroloculina communis* Cushman and Todd.
 Challenger Sta. 217A, S. of Papua, Pacific. (37 fathoms)
 Referred by Brady to *S. impressa* Terquem and by Cushman and Todd (C.L.F.R., Spec. Publ. No. 11, 1944, p. 63) to *S. communis*.
- Figures 5, 6.**—*Spiroloculina tenuiseptata* Brady.
 Fig. 5. Challenger Sta. 191A, Kii Islands, Japan. (580 fathoms)
 Fig. 6. Challenger Sta. 174B, off Fiji, Pacific. (610 fathoms)
- Figures 7, 8, 11.**—"*Sigmoilina*" *tenuis* (Czjzek).
 Challenger Sta. 302, South Pacific. (1450 fathoms)
 Referred by Brady to *Spiroloculina* and by Cushman, Earland and others to *Sigmoilina*. As noted earlier Wiesner placed *Planispirina sigmoidea* Brady, the genotype of *Sigmoilina*, in *Nummoloculina*, hence a new generic name is required for *tenuis*.
- Figures 10, 9?**—*Spirophthalmidium pusillum* (Earland).
 Challenger Sta. 332, South Atlantic. (2200 fathoms)
 Referred by Brady to *Spiroloculina tenuis* (Czjzek) and by Earland (Discovery Repts., Vol. 10, 1934, p. 47) to *S. pusilla* nov. Transferred by Cushman and Todd (C.L.F.R., Spec. Publ. No. 11, 1944, p. 76) to *Spirophthalmidium* Cushman 1927, which genus was shown by Macfadyen (Jour. Roy. Micr. Soc., Ser. 3, Vol. 59, 1939, p. 164) to be synonymous with *Ophthalmidium* Zwingli and Kübler 1870. Wood and Barnard have subsequently reinstated *Spirophthalmidium* Cushman (Q.J.G.S., Vol. 102, 1946, p. 84), with *Spiroloculina acutimargo* Brady as genotype, and are followed here.
- Figure 12.**—*Spiroloculina elevata* Wiesner.
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *S. acutimargo* Brady, and by Wiesner (Die Miliol. der östlich. Adria, Prague, 1923, p. 36) to *S. elevata*. These figures have also been referred to *S. affixa* Terquem and *S. disparilis* Terquem by authors.
- Figure 13.**—*Spirophthalmidium acutimargo* (Brady).
 Challenger Sta. 120, off Pernambuco, W. Atlantic. (675 fathoms)
 Referred by Brady to *Spiroloculina* and by Cushman (C.C.L.F.R., Vol. 3, No. 1, 1927, p. 37) to *Spirophthalmidium*, as genotype. As noted above under fig. 10, Macfadyen regarded *Spirophthalmidium* as a synonym of *Ophthalmidium* Zwingli and Kübler, but Wood and Barnard (loc. cit. supra, 1946) have reinstated Cushman's genus for *S. acutimargo*.
- Figure 14.**—*Spiroloculina* sp. abnorm.
 Challenger Sta. 174A, off Fiji, Pacific. (255 fathoms)
 Referred by Brady to *S. acutimargo* Brady, and to *S. tenuirostra* Karrer by Heron-Allen and Earland, Jour. Linn. Soc., Vol. 35, 1924, p. 604. (See note to fig. 15 below).
- Figure 15.**—*Spiroloculina venusta* Cushman and Todd.
 Challenger Sta. 185A, Torres Strait, Pacific. (3-11 fathoms)
 Referred by Brady to *S. acutimargo* Brady, and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 297) to *S. tenuirostra* Karrer var. Since *tenuirostra* Karrer has been referred to *Quinqueloculina* by Cushman and Todd (l. c. supra, 1944, p. 77) a new name would be required. Since it appears to fall within the limits of variation of *S. venusta* Cushman and Todd 1944, however, it has been so identified here.
- Figures 16, 17, 22, 23.**—*Spiroloculina angulata* Cushman.
 Fig. 16. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)
 Fig. 17. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)
 Fig. 22. Shell Cove, Port Jackson, Australia.
 Fig. 23. Challenger Sta. 187A, Booby Island, Torres Strait, Pacific. (8 fathoms)
 Referred by Brady to *S. grata* Terquem and by Cushman and Todd (C.L.F.R., Spec. Publ. No. 11, 1944, p. 50) to *S. angulata* Cushman (*S. grata* var. *angulata* Cushman 1917).
- Figures 18-20.**—*Nodobaculariella convexiuscula* (Brady).
 Challenger Sta. 185, Torres Strait. (155 fathoms)
 Referred to *Spiroloculina* (?) by Brady but placed in *Nodobaculariella* by Cushman and Todd, C.L.F.R. Spec. Publ. No. 11, 1944, p. 75.
- Figure 21.**—*Spiroloculina antillarum* d'Orbigny.
 Challenger Sta. 122, S.E. of Pernambuco, Atlantic Ocean. (350 fathoms)
- Figures 24-26.**—*Hauerina speciosa* (Karrer).
 Fig. 24. Challenger Sta. 218A, Admiralty Islands. (16-25 fathoms)
 Figs. 25-26. Challenger Sta. 260A, Hawaii. (40 fathoms)
 Referred to *Spiroloculina* by Brady but placed in *Hauerina* by Cushman, C.C.L.F.R., 1946, Vol. 22, Pt. 1, p. 5.

EXPLANATION OF PLATE 11 (XI)

Figs. 1-4, X 30; Figs. 5, 6, X 15; Figs. 7-9, X 16; Figs. 10, 11, X 20; Figs. 12-16, X 50.

Figures 1-3.—*Cornuspira involvens* (Reuss).

Fig. 1. Challenger Sta. 23, 24, West Indies. (450 and 390 fathoms)

Fig. 2. Challenger Sta. 279C, Tahiti, Pacific. (620 fathoms)

Fig. 3. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Figure 4.—*Cornuspira carinata* (Costa).

Porcupine Sta. 11, W. of Ireland, N. Atlantic. (1630 fathoms)

Figures 5, 6.—*Cornuspiroides foliaceus* (Philippi).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Cornuspira* and by Wiesner (Foram. Deutsche Südpolar Exped. 1901-1903, 1931, p. 61) to *Cornuspiroides*.

Figure 7.—*Cornuspirella diffusa* (Heron-Allen and Earland).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cornuspira foliacea* (Philippi) and by Heron-Allen and Earland (Jour. Roy. Micr. Soc., 1913, p. 272) to *C. diffusa*. Transferred by Cushman (C.C.L.F.R., Vol. 4, Pt. 1, 1928, p. 4) to *Cornuspirella* as the genotype.

Figures 8, 9.—*Cornuspiroides primitivus* (Rhumbler).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Cornuspira foliacea* (Philippi) and by Rhumbler (Archiv f. Protist., Vol. 3, 1904, p. 285) to *C. primitiva*. Placed in *Cornuspiroides* by Thalmann (Eclog. geol. Helv., Vol. 26, No. 2, 1933, p. 251).

Figures 10, 11.—*Nummoloculina contraria* (d'Orbigny).

Fig. 10a. Challenger Sta. AA, off Skye, Scotland, N. Atlantic. (45-60 fathoms)

Figs. 10b, 11. Off the Hebrides, Scotland, N. Atlantic. (70-100 fathoms?)

Referred by Brady to *Planispirina* and by Wiesner (Die Miliol. der östlich. Adria, Prague, 1923, p. 91) to *Nummoloculina* Steinmann 1881.

Figures 12, 13.—*Hauerina bradyi* Cushman.

Fig. 12. Challenger Sta. 187A, Torres Strait, Pacific. (8 fathoms)

Fig. 13. Challenger Sta. 187, Booby Island, Pacific. (6 fathoms)

Referred by Brady to *Hauerina compressa* d'Orbigny and by Cushman (U.S.N.M., Bull. 71, Pt. 6, 1917, p. 62) to *Hauerina bradyi*.

Figures 14-16.—*Polysegmentina circinata* (Brady).

Figs. 14, 15. Challenger Sta. 187A, Torres Strait, Pacific. (8 fathoms)

Referred by Brady to *Hauerina* and by Cushman (C.C.L.F.R., Vol. 22, Pt. 1, 1946, p. 1) to *Polysegmentina* as genotype. *Polysegmentina* has been redefined by Loeblich and Tappan (Smiths. Misc. Coll., Vol. 128, No. 5, p. 16, 1955) and a lectotype designated for *P. circinata*.

EXPLANATION OF PLATE 12 (XII)

Figs. 1-4, X 50; Fig. 5, X 30; Figs. 6-24, X 50.

Figures 1-4.—*Planispirinella exigua* Brady.

Figs. 1, 2, 4. Challenger Sta. 187A, off Booby Island, Pacific. (8 fathoms)

Fig. 3. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred to *Planispirina* by Brady; made the type of *Planispirinella* by Wiesner (Deutsche Südpol. Exped. 1901-1903, Vol. 20, 1931, p. 69).

Figures 5, 7, 8.—*Hauerinella inconstans* (Brady).

Fig. 5. Challenger Sta. 120, off Pernambuco, W. Atlantic. (675 fathoms)

Figs. 7, 8. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Ophthalmidium*, and by Schubert (Pal. Zeitschr., Vol. 3, 1920, p. 162) to *Hauerinella* gen. nov., as genotype. Cushman ('Foraminifera . . .', 1928, and subsequently) placed *Hauerinella* in synonymy of *Ophthalmidium*, and Macfadyen (Jour. Roy. Micr. Soc., Vol. 59, 1939, p. 165) gave tacit agreement to this view by listing *inconstans* as *Ophthalmidium*. Wood and Barnard, however (Q.J.G.S., London, Vol. 102, 1946, p. 85), in a restudy of this group and Brady's types, reinstated *Hauerinella*, and designated fig. 5 of Brady as the holotype.

Figure 6.—*Hauerinella tumidulum* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Ophthalmidium*. Cushman (U.S.N.M., Bull. 104, Pt. 6, 1929, p. 89) placed *tumidulum* in synonymy with *H. inconstans* (Brady), as *Ophthalmidium*, and was followed by Thalmann. Macfadyen (l. c. supra, 1939, p. 165) listed *tumidulum* as a valid species of *Ophthalmidium*, with no reference to *Hauerinella*. Wood and Barnard, as noted above, have reinstated *Hauerinella* as valid, and *tumidulum*, which is regarded as distinct from *inconstans* has been placed in that genus.

Figures 9-11.—*Vertebralina insignis* Brady.

Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Figures 12, 13.—*Articulina pacifica* Cushman.

Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *A. sulcata* Reuss, a fossil species, and by Cushman (C.L.F.R., Spec. Publ. No. 10, 1944, p. 17) to *A. pacifica*.

Figures 14-16.—*Vertebralina striata* d'Orbigny.

Fig. 14. Challenger Sta. 187, S. of New Guinea, Pacific. (6 fathoms)

Figs. 15, 16. Challenger Sta. 187A, Torres Strait, Pacific.

Figures 17, 18.—*Articulina sagra* d'Orbigny.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *A. conico-articulata* (Batsch), a form of doubtful characteristics originally recorded from Rimini. Cushman (C.L.F.R. Spec. Publ. No. 10, 1944, p. 11) refers these figures to *A. sagra* d'Orbigny; he also (l. c., 1944, p. 17) suggests that Batsch's name should be allowed to lapse, as unidentifiable.

Figures 19-21.—*Articulina lineata* Brady.

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Figures 22-24.—*Articulina pacifica* Cushman?

Fig. 22. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Figs. 23, 24. Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *A. sagra* d'Orbigny. Although Cushman does not refer to these figures of Brady in his study of *Articulina* (C.L.F.R. Spec. Publ. No. 10, 1944) his description and figures of *A. pacifica* suggest that that species is represented here (see also figs. 12, 13 on this plate).

EXPLANATION OF PLATE 13 (XIII)

Figs. 1, 2, X 50; Figs. 3-11, X 30; Figs. 12-15, X 50; Figs. 16-19, X 40; Figs. 20, 21, X 60; Fig. 22, X 40; Fig. 23, X 200; Figs. 24, 25, X 75.

Figures 1, 2?—*Articulina mayori* Cushman.

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *A. conico-articulata* (Batsch) and by Cushman (C.L.F.R. Spec. Publ. No. 10, 1944, p. 14) to *A. mayori* Cushman. Fig. 2 may be the same form.

Figures 3-5.—*Tubinella inornata* (Brady).

Challenger Sta. 149D, Kerguelen Island, S. Pacific. (20-60 fathoms)

Referred by Brady to *Articulina funalis* Brady var. *inornata* and by Rhumbler (Zool. Jahrb., Vol. 24, 1906, p. 27) to *Tubinella inornata* (Brady). It was designated the genotype of *Tubinella* by Cushman in 1928.

Figures 6-11.—*Tubinella funalis* (Brady).

Figs. 6, 7, 9, 11. Challenger Sta. 145, Prince Edward Is., S. Pacific. (50-150 fathoms)

Figs. 8, 10. Challenger Sta. 149D, Kerguelen Is., S. Pacific. (20-60 fathoms)

Referred by Brady to *Articulina* and by Rhumbler (l. c. supra, 1906) to *Tubinella* Wiesner (Die Foram., Deutsche Südpol. Exped., 1901-1903, Vol. 30 (Zool., Vol. 12), 1931, p. 67, 108) erected *Tubinellina* to include *funalis*. This has been shown by Loeblich and Tappan (Smith. Misc. Coll., Vol. 128, No. 5, 1955, p. 19) to be a synonym of *Tubinella*.

Figures 12, 13.—*Puteolina bradyi* (Cushman).

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Peneroplis pertusus* (Forsk.) var. g (*P. laevigatus* of Karrer), and by Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 40) to *P. bradyi*? Hofker (Jour. Roy. Micr. Soc., Ser. III, Vol. 71, Pt. 4, 1952, p. 450) placed *bradyi* in *Puteolina* (genotype *Peneroplis proteus* d'Orbigny).

Figure 14.—*Peneroplis carinatus* d'Orbigny.

Challenger Sta. 352A, Cape Verde Islands, Atlantic. (11 fathoms)

Referred by Brady to *P. pertusus* (Forsk.) var. f (*P. carinatus* d'Orbigny), and by Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 36) to *P. carinatus* d'Orbigny.

Figure 15.—*Peneroplis planatus* (Fichtel and Moll).

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *P. pertusus* (Forsk.) var. a (*P. planatus* (Fichtel & Moll)) and by Cushman (U.S.N.M. Bull. 100, Vol. 4, 1921, p. 481) to *P. planatus* (F. & M.).

Figures 16, 17, 23.—*Peneroplis pertusus* (Forsk.).

Fig. 16. Challenger Sta. 185A, Torres Strait, Pacific. (3-11 fathoms)

Fig. 17. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *P. pertusus* var. b, and by Cushman (l. c. supra, 1921, p. 481) to *P. pertusus* (Forsk.).

Figures 18, 19, 22.—*Spirolina arietina* (Batsch).

Figs. 18, 19. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 22. The Aegean Sea, Mediterranean.

Referred by Brady to *Peneroplis pertusus* var. c (*P. arietinus* (Batsch)), and by Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 43) to *Spirolina arietinus* (Batsch).

Figures 20, 21.—*Spirolina acicularis* (Batsch).

Challenger Sta. 173A, off Fiji, Pacific. (12 fathoms)

Referred by Brady to *Peneroplis pertusus* var. d (*P. cylindraceus* (Lamarck)). Cushman (U.S.N.M. Bull. 161, Pt. 2, 1933, p. 63, pl. xix, figs. 6, 7) describes and figures very similar forms from the general region of the Fiji Islands as *S. acicularis* (Batsch) but does not refer to Brady's figures. He suggests a possible relationship with *Monalysidium* (see below).

Figures 24, 25 (?)—*Monalysidium politum* Chapman?

Challenger Sta. 352A, Cape Verde Islands, Atlantic. (11 fathoms)

Referred by Brady to *Peneroplis pertusus* (Forsk.) var. e (*P. lituus* (Gmelin)? and by Heron-Allen and Earland (Trans. Zool. Soc. London, Vol. 20, 1915, p. 603) to *Monalysidium polita* Chapman (q.v. for full discussion, pp. 594-601, 603-604). Chapman (Jour. Linn. Soc., Zool., Vol. 28, 1900, p. 3) suggests Brady's figures resemble *M. sollasi* Chapman but Heron-Allen and Earland regard this form as *Peneroplis*. Hofker (Jour. Roy. Micr. Soc., Vol. 71, 1951, p. 230) figures a form very similar to Brady's specimens as *Dendritina elegans* d'Orbigny, and shows *politum* Chapman as *Dendritina* (*Monalysidium*), which, he claims, is striate and not pitted or punctate.

EXPLANATION OF PLATE 14 (XIV)

Figs. 1-6, X 30; Figs. 7-9, X 20; Figs. 10-12, X 20-30; Fig. 13, X 100.

Figures 1, 2, 5, 6, 10-13.—*Archaias angulatus* (Fichtel and Moll).

Figs. 1, 5, 10, 11. Coral sand, Bermuda, Atlantic.

Fig. 2. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 6. Challenger Sta. 122, off Pernambuco, Atlantic. (350 fathoms)

Brady refers figs. 1, 2 to *Orbiculina adunca* (Fichtel and Moll), "very young, or nautiloid condition;—*Nautilus angulatus*, Fichtel and Moll." He refers figs. 5 and 6 to *O. adunca*, "young or intermediate stage; *Nautilus orbiculus* Fichtel and Moll" and figs. 10-13 to *O. adunca* (Fichtel and Moll), sections. Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 46) places *aduncus* in synonymy with *angulatus* (Fichtel and Moll), but does not refer to Brady's figures.

Figures 3, 4.—*Puteolina protea* (d'Orbigny).

Fig. 3. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 4. Coral sand, Bermuda, Atlantic.

Referred by Brady to *Orbiculina adunca* (Fichtel and Moll), "varieties analogous to the 'Spiroline' modifications of *Peneroplis*," and by Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 37) to *Peneroplis proteus* d'Orbigny. Hofker (Jour. Roy. Micr. Soc., Ser. III, Vol. 71, 1952, p. 450) made this species the genotype of *Puteolina*.

Figures 7-9.—*Archaias compressus* (d'Orbigny).

Fig. 7. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 8, 9. Challenger Sta. 352A, Cape Verde Islands, Atlantic. (11 fathoms)

Referred by Brady to *Orbiculina adunca* (Fichtel and Moll), "flabelliform adult shells; *Nautilus aduncus* Fichtel and Moll," (figs. 7, 8), and "adult specimens, discoidal form;—*Orbiculina compressa* d'Orbigny," (fig. 9). Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 48, pl. 17, figs. 1, 2) describes and figures similar forms as *Archaias compressus* (d'Orbigny), without reference to Brady. Silvestri (Palaeontogr. Italica, Vol. 32, Suppl. 2, 1937, p. 88) erected the genus *Cyclorbiculina* with *compressa* d'Orbigny as genotype. Henson (Middle Eastern Peneroplidae, 1950, p. 41, pl. 9, figs. 5, 7) figures Caribbean discoidal forms as seen in fig. 9 of Brady as *Meandropsina* sp. x, and notes that all Recent forms of this group require thorough revision. He figures flabelliform tests as *Archaias* sp. x (l. c., pl. 9, fig. 3) and notes the occurrence of another discoidal form *Taberina* sp. x (unfigured) in the same assemblages. He does not, however, refer to Brady's figures and does not state which form should receive the name *compressus* d'Orbigny, if any. Hofker (Jour. Roy. Micr. Soc., Vol. 71, 1952, p. 457) records this form as *Puteolina (Archaias) compressa* (d'Orbigny) but includes typical *angulatus* (as '*aduncus*') in synonymy. In view of Henson's work this does not seem feasible and moreover, should the forms be the same, then it is clear that the name *angulatus* has priority. In the same study Hofker describes and figures *angulatus* as a separate species of *Puteolina (Archaias)*, thus adding to the confusion.

EXPLANATION OF PLATE 15 (XV)

Figs. 1-5, X 30; Figs. 6, 7, X 20.

Figures 1-3, 5.—*Sorites marginalis* (Lamarck).* (*Sorites hofkeri* Lacroix?).

Figs 1-3. Challenger Sta. 260A, Honolulu reefs, Pacific. (40 fathoms)

Fig. 5. Challenger Sta. 173A, off Fiji, Pacific. (12 fathoms)

Referred by Brady to *Orbitolites* and by Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 49) to *Sorites* (citing Brady's figs. 1-5). Hofker (Jour. Roy. Micr. Soc., Vol. 72, Pt. 2, 1952, p. 109) has suggested that *Sorites*, *Amphisorus* and *Praesorites* should be placed in synonymy with *Orbitolites*, retaining *Praesorites* as a subgenus. Douvillé (Bull. Soc. géol. France, Ser. 4, Vol. 2, 1902, pp. 291-296) retains *Orbitolites*, *Praesorites* and *Sorites* as valid genera with *Amphisorus* in the synonymy of *Sorites*, and Henson (Middle Eastern Peneroplidae, 1950) retains the same three genera without mention of *Amphisorus*. Henson is followed here, but as noted earlier the Recent forms of this group need revising.

Figure 4.—*Praesorites orbitolitoides* Hofker.* (*Sorites hofkeri* subsp. *orbitolitoides* (Hofker)?—see note).

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Orbitolites marginalis* Lamarck. This figure is referred to *Praesorites orbitolitoides* Hofker here on the basis of Hofker's figures and description (Siboga Exped., Foraminifera Pt. II, 1930).

Figures 6, 7.—*Discospirina tenuissima* (Carpenter)?

Fig. 6b. Porcupine Sta. 24, West of Ireland, E. Atlantic. (?)

Figs. 6c, 7. Station 44 (Challenger, North Atlantic?) (?) (?) Porcupine Sta.).

Referred by Brady to *Orbitolites* and by Douvillé (Bull. Soc. géol. France, Ser. 4, Vol. 6, 1906, p. 596) to *Discospirina*. Munier-Chalmas (Bull. Soc. géol. France, Ser. 4, Vol. 2, 1902, p. 162) erected the genus *Discospirina* with *Pavonina italica* Costa as genotype. Douvillé (l. c. supra) placed *tenuissima* Carpenter in synonymy with *italica* Costa. Cushman ("Foraminifera," 1928, p. 165) ignoring Munier-Chalmas' reference to *italica* Costa, designated *tenuissima* Carpenter the genotype, and this reference and also in 1927 and 1929 referred to the genus as *Discospirinia*. These errors were corrected by Galloway (Manual, 1933, p. 113), who again noted that *tenuissima* is a synonym of *italica* Costa. Cushman (U.S.N.M. Bull. 104, Pt. 6, 1929, p. 93) stated that they might be the same but that Costa's types should be examined. It is therefore possible that these figures should be referred to *Discospirina italica* (Costa). Wiesner (Zool. Anzeiger, Vol. 51, p. 14, 1920) erected *Krumbachina* with *O. tenuissima* as genotype; this is regarded as a synonym of *Discospirina*.

*NOTE: E. Lacroix, in his paper "Les Orbitolites de la Baie de Cauda (Indochine)" (Bull. Inst. Ocean., Monaco, No. 787, 1940, pp. 6,7, 10-11) states that the forms figured by Brady in figs. 1-5 all belong to *Praesorites orbitolitoides* Hofker. He goes on to say that he does not regard these as belonging to *Praesorites* since they differ in their internal structure from that genus, and should be referred to *Sorites*. On p. 10 Lacroix renames Hofker's species *Sorites hofkeri*, this name referring to forms from the Pacific and based on material from Indochina, Australia and the east coast of Africa. He had no material from the West Indies and admits the existence of structural differences in Hofker's figures of specimens from this region. These, however, he considers to be of varietal significance only. It would therefore appear that Brady's figs. 1-3, 5 should be named *Sorites hofkeri* Lacroix, and fig. 4 *Sorites hofkeri* Lacroix subsp. *orbitolitoides* (Hofker). As noted the entire group needs further study and detailed comparison of material from all parts of the world.

ORBITOLITES

EXPLANATION OF PLATE 16 (XVI)

Figs. 1-4, X 30; Figs. 5, 6, X 20; Fig. 7, X 11; Figs. 8, 9, nat. size; Fig. 10, X 3; Fig. 11, X 12.

Figures 1-6.—*Marginopora vertebralis* Blainville.

Figs. 1, 4. Challenger Sta. 260A, Honolulu reefs, Pacific. (40 fathoms)

Figs. 2, 3. Loo Choo Islands, Formosa, Pacific.

Fig. 6. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Referred by Brady to *Orbitolites complanata* Lamarck, a fossil form from the Eocene of France, and by Douvillé to *Marginopora vertebralis* (Bull. Soc. géol. France, Ser. 4, Vol. 2, 1902, p. 296), attributing the species to Quoy and Gaimard, in de Blainville, and referring to the figures of Carpenter (1883 and 1856) but not to those of Brady. Cushman (C.L.F.R., Spec. Publ. No. 5, 1933, pl. 24, figs. 15, 16) reproduces figs. 5 and 6 of Brady as *Marginopora vertebralis* Blainville. Figures 1-4 show early stages of development and may not be the same species, but it seems probable that they are correctly identified.

Figure 7.—"Orbitolites duplex Carpenter."*

Challenger Sta. 173A, off Fiji, Pacific. (12 fathoms)

This is one of Carpenter's original figures of *O. duplex* and must therefore be authentic. He places *Amphisorus hemprichii* Ehrenberg 1839 in synonymy with his *Orbitolites duplex* 1883, however, (Zool. Voy. H.M.S. Challenger, Part XXI, 1883, p. 25), and this is followed by Douvillé (Bull. Soc. géol. France, Ser. 4, Vol. 2, 1902, p. 293) who regards *duplex* as *Sorites hemprichii* (Ehrenberg). Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 51) refers Brady's figure to *Amphisorus hemprichii* Ehrenberg and is followed by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 298). The question of the synonymy of *Amphisorus* with *Sorites* requires investigation, however. The present species should probably be referred to *Amphisorus hemprichii* Ehrenberg until further detailed studies can be made.

Figures 8-11.—*Marginopora vertebralis* Blainville var. *plicata* Dana.

Figs. 8-10. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 11. Challenger Sta. 172A?, Tongatabu Reef, Pacific. (? 18 fathoms)

Referred by Brady to *Orbitolites complanata* Lamarck var. *laciniata* Brady, and by Heron-Allen and Earland (Trans. Zool. Soc. London, Vol. 20, 1915, p. 606) to *Marginopora vertebralis* var. *plicata* Dana (C. Wilkes' U. S. Exploring Exped., Vol. 7, 1846, p. 706, pl. 60, fig. 9), though they refer this form to the synonymy of *Orbitolites complanata* Lamarck (see note on figs. 1-6 above). Hofker (Siboga Exped., Foraminifera Pt. II, 1930, p. 84) states that this form is his "Forma B" or microspheric generation of *Marginopora vertebralis*.

*NOTE: Lacroix (Bull. l'Inst. Oceanogr., Monaco, No. 787, 1940, p. 14) retains the name *Amphisorus hemprichii* Ehrenberg (erroneously recorded as "*hemprichi*") but does not refer to Brady. He also makes *Amphisorus* a subgenus of *Marginopora*. This paper (also l. c., No. 794, 1941) should be studied by anyone working on this complex and little understood group.

EXPLANATION OF PLATE 17 (XVII)

Figs. 1-6, X 12; Figs. 7-10, X 15; Figs. 11, 12, X 25; Figs. 13-15, X 50.

Figures 1-6.—*Marginopora vertebralis* Blainville.

Gulf of Suez. (15-20 fathoms)

Referred by Brady to *Orbitolites complanata* Lamarck, "monstrous specimens, showing the results of redundant and inequilateral growth." Douvillé has placed *Orbitolites complanata* of Carpenter and others, not of Lamarck, in the synonymy of *M. vertebralis* Blainville (see note to preceding plate). Yabe and Hanzawa (Sci. Rep. Tohoku Imp. Univ., Sendai, Japan, 2nd. ser. (Geol.), Vol. 11, No. 3, 1929, p. 182) refer these figures and those of "*O. complanata*" on Plate XVI to *Orbitolites (Marginopora) vertebralis* Quoy and Gaimard.

Figures 7-12.—*Alveolinella quoyi* (d'Orbigny).

Figs. 9, 10. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Figs. 11, 12. Admiralty Islands, Pacific. (16 fathoms)

Referred by Brady to the fossil species, *Alveolina boscii* (Defrance). Hofker (Siboga Exped., Foraminifera Pt. II, 1930, p. 166) refers Recent forms of *Alveolina* to *Alveolinella quoyi* (d'Orbigny), with reference to Carpenter, Moebius and Cushman. M. Reichel (Mém. Soc. Pal. Suisse, Vol. LIX, 1937, p. 116) refers the present figures to *A. quoyi* (d'Orbigny).

Figures 13-15.—*Neoalveolina melo* (Fichtel and Moll).

Fig. 14. Coral sand, Bermuda and Ascension, Atlantic.

Fig. 15. Off Ascension Island, Atlantic.

Referred by Brady to *Alveolina* and by Reichel (Mém. Soc. Pal. Suisse, Vol. LIX, 1937, p. 107) to *Neoalveolina*. Reichel notes that the name *Neoalveolina bradyi* (Silvestri), proposed by Silvestri (Ann. R. Lic. Sci. "Vittorio Veneto," Milan, Anno 1926-27, fasc. 2, 1927, p. 227) for Recent forms attributed to *Alveolina melo*, could be used but that he could distinguish no important differences between Recent specimens and the Miocene *A. melo*. He also noted that further study is needed to determine whether the Recent *Neoalveolina pulchra* (d'Orbigny) from Cuba is also a synonym of *Neoalveolina melo*.

EXPLANATION OF PLATE 18 (XVIII)

Figs. 1, X 20; Figs. 2-8, X 40; Figs. 9-17, X 15; Figs. 18, 19, X 20.

Figures 1, 5-8.—*Psammospaera fusca* Schulze.

Fig. 1. Porcupine Sta. 16, W. of Ireland, E. Atlantic. (?)

Figs. 5, 8. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 6. Challenger Sta. 23, West Indies. (450 fathoms)

Fig. 7. Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Figures 2-4.—*Psammospaera parva* Flint.

Figs. 2, 3. Challenger Sta. 286, South Pacific. (2335 fathoms)

Fig. 4. Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Referred by Brady to *P. fusca* Schulze and by Cushman (U.S.N.M. Bull. 71, Pt. 1, 1910, p. 36) to *P. parva* Flint. Flint (Rept. of U.S.N.M. for 1897, 1899, p. 268) noted that his species was included in *P. fusca* by Brady but did not refer to Brady's figures.

Figures 9, 10.—*Sorosphaera confusa* Brady.

Fig. 9. Porcupine Sta. 23, N.W. of Ireland, E. Atlantic. (650 fathoms)

Fig. 10. Challenger Sta. 76, off the Azores, Atlantic. (900 fathoms)

Figures 11-15, 17.—*Saccammina sphaerica* M. Sars.

Figs. 11, 13. North Atlantic, deep water.

Fig. 15. Hardanger Fiord, Norway. (400-500 fathoms)

Fig. 17. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Figure 16.—*Saccammina sphaerica* Sars var. *catenulata* Cushman.

Porcupine Sta. 23, N.W. of Ireland, E. Atlantic. (630 fathoms)

Referred by Brady to *S. sphaerica* M. Sars, and by Cushman (Proc. U.S.N.M., Vol. 51, No. 2172, p. 652) to *S. sphaerica* var. *catenulata* (described by Cushman from the Philippines).

Figures 18, 19.—*Saccammina socialis* Brady.

Challenger Sta. 246, North Pacific. (2050 fathoms)

EXPLANATION OF PLATE 19 (XIX)

Figs. 1-3, 5-9, X 8; Figs. 4, 10, X 100.

Figures 1-4.—*Astrorhiza limicola* Sandahl.

Figs. 1, 3, 4. Off the coast of Norway.

Fig. 2. Off Torquay, England.

Figures 5-10.—*Astrorhiza arenaria* Norman.

Fig. 6. Faroe Channel, North Atlantic.

Figs. 8-10. Porcupine, Faroe Channel, North Atlantic.

EXPLANATION OF PLATE 20 (XX)

Figs. 1-8, 10-22, X 8; Figs. 9, 23, X 100.

Figures 1-9.—*Psammosiphonella crassatina* (Brady).

Figs. 3, 5, 9. Porcupine Sta. 64, Faroe Channel, N. Atlantic. (?)

Referred by Brady to *Astrorhiza*; placed in *Psammosiphonella* by M. Avnimelech (Contr. Cush. Found. Foram. Res., Vol. 3, No. 2, 1952, p. 65).

Figures 10-13.—*Astrorhiza angulosa* Brady.

Challenger Sta. 78, S.E. of the Azores, Atlantic. (1000 fathoms)

Figures 14-23.—*Amphitremonidea granulosa* (Brady).

Challenger Sta. 78, S.E. of the Azores, Atlantic. (1000 fathoms)

Referred by Brady to *Astrorhiza* but transferred to *Amphitremonidea* by M. Avnimelech (Contr. Cush. Found. Foram. Res., Vol. 3, No. 2, 1952, p. 65). This species was first described as a *Marsipella*.

ASTRORHIZA

EXPLANATION OF PLATE 21 (XXI)

Figs. 1-11, X 10; Figs. 12, 13, X 60.

Figures 1-13.—*Rhabdammina abyssorum* M. Sars.

Fig. 1. Challenger Sta. 78, S.E. of the Azores, Atlantic. (1000 fathoms)

Figs. 4, 7. Challenger Sta. 195, Banda Sea, Pacific. (1425 fathoms)

Figs. 8-12. Challenger Sta. 218, N. of Papua, Pacific. (1070 fathoms)

Fig. 13. Porcupine Sta. 23, N.W. of Ireland, E. Atlantic. (630 fathoms)

Brady notes that fig. 9 is a fragment of a variety "with branched arms (*Rhabdammina irregularis*, Carpenter?)." Cushman (U.S.N.M. Bull. 104, Pt. 1, 1918, p. 60, pl. 8, fig. 1) raises this branched variety to specific rank, although Carpenter's original note was not accompanied by any figure. The name *abyssorum* M. Sars was a *nomen nudum* and the species was first figured, as *R. abyssorum* Sars, by Carpenter (The Microscope, Ed. 6, 1881, text figures 321c, d). For this reason Cushman and others have attributed the species to Carpenter; Sherborn, however, attributes it to M. Sars, and is followed here.

EXPLANATION OF PLATE 22 (XXII)

Figs. 1-5, X 10; Fig. 6, X 60; Figs. 7-9, X 10; Fig. 10, X 8; Figs. 11, 13, X 15;
Fig. 12, X 13; Figs. 14-22, X 12.

Figures 1-6.—*Oculosiphon linearis* (Brady).

Figs. 1-3, 5, 6. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 4. Porcupine Sta. 16, West of Ireland. (?)

Placed in *Rhabdammina* by Brady, but transferred to *Oculosiphon* as genotype by M. Avnimelech in 1952 (Contr. Cush. Found. Foram. Res., Vol. 3, No. 2, p. 65).

Figures 7-10. *Psammosiphonella discreta* (Brady).

Fig. 8. Porcupine Sta. 4, North Atlantic. (?)

Fig. 9. Porcupine Sta. 23, N.W. of Ireland. (630 fathoms)

Fig. 10. H.M.S. "Valorous," off Sydney, Australia.

Placed in *Rhabdammina* by Brady, but transferred to *Psammosiphonella* by M. Avnimelech in 1952 (Contr. Cush. Found. Foram. Res., Vol. 3, No. 2, p. 65).

Figures 11-13.—*Rhabdammina cornuta* (Brady).

Figs. 11, 12. Challenger Sta. 122, S.E. of Pernambuco. (350 fathoms)

Fig. 13. Porcupine Sta. 28, N.W. of Ireland. (1215 fathoms)

Described by Brady in 1879 as *Astrorhiza* but transferred by him to *Rhabdammina* in 1882.

Figures 14-18.—*Jaculella acuta* Brady.

Figs. 14, 16-18. Challenger Sta. 122, S.E. of Pernambuco. (350 fathoms)

Figures 19-22.—*Jaculella obtusa* Brady.

Figs. 19-22. Knight Errant Sta. 7, Faroe Channel. (530 fathoms)

Thalmann, Eclog. geol. Helvet., Vol. 25, Pt. 2, 1932, p. 298, refers these figures to the synonymy of *J. acuta* Brady. No other reference to this synonymy has been found and no reasons are given, so Cushman, Earland and others have been followed here in retaining Brady's *Jaculella obtusa* as a valid species.

EXPLANATION OF PLATE 23 (XXIII)

Figs. 1-4, 6-14, X 10; Fig. 5, X 20; Figs. 15-19, X 16.

Figures 1-3, 5, 6.—*Hyperammmina friabilis* Brady.

Fig. 1. Challenger Sta. 122, S.E. of Pernambuco. (350 fathoms)

Fig. 2. Porcupine Sta. 47, Faroe Channel, N. Atlantic. (542 fathoms)

Fig. 3. Challenger Sta. 195, Banda Sea, Pacific. (1425 fathoms)

Fig. 6. Porcupine Sta. 47, Faroe Channel, N. Atlantic. (542 fathoms)

Figures 4, 7.—*Hyperammmina cylindrica* Parr.

Fig. 4. Off Cumbrae, N. Atlantic. (60-65 fathoms)

Fig. 7. Challenger Sta. 323, S. Atlantic. (1900 fathoms)

Referred by Brady to *Hyperammmina elongata* Brady. Parr, B.A.N.Z. Antarctic Res. Exped., p. 254, 1950, placed these in *H. cylindrica*.

Figure 8.—*Hyperammmina elongata* Brady.*

Challenger Sta. 24, West Indies. (390 fathoms)

Figures 9, 10.—*Hyperammmina laevigata* Wright.

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Hyperammmina elongata* Brady. Wright described *H. laevigata* as a variety of *H. elongata* Brady in 1891 and Cushman in 1910 (U.S.N.M. Bull. 71, Pt. 1, p. 61) referred Brady's figures 9, 10 to the variety. In 1918 Cushman (U.S.N.M. Bull. 104, Pt. 1, p. 77) raised the variety to specific rank.

Figures 11-14.—*Hyperammmina subnodosa* Brady.

Referred in text to N. Atlantic, East Indies and Pacific.

Figures 15-19.—*Saccorhiza ramosa* (Brady).

Figs. 15, 17-19. Porcupine Sta. 23, N.W. of Ireland. (630 fathoms)

Fig. 16. Challenger Sta. 246, North Pacific. (2050 fathoms)

Referred to *Hyperammmina* by Brady. Placed in *Saccorhiza* by Eimer and Fickert, Zeitschr. Wiss. Zool., Vol. 65, 1899, p. 670.

*NOTE: *Hyperammmina elongata* Brady was cited by Eimer and Fickert for their new genus *Bactrammina* (Zeitschr. Wiss. Zool., Vol. 65, 1899, p. 601) but this genus has been relegated to the synonymy of *Hyperammmina* by Cushman, Galloway and other workers.

EXPLANATION OF PLATE 24 (XXIV)

Figs. 1-17, 20-22, X 15; Figs. 18, 19, X 60.

Figures 1-5. *Tolypammina vagans* (Brady).

Figs. 1, 2. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Figs. 3-5. Porcupine Sta. 23, N.W. of Ireland, Atlantic. (630 fathoms)

Referred to *Hyperammina* by Brady. Placed in *Tolypammina* by Rhumbler, Nachr. Kongl. Ges. Wiss. Göttingen, 1895, p. 83.

Figures 6-9.—*Tolypammina schaudinni* Rhumbler.

Fig. 6. Porcupine Sta. 23, N.W. of Ireland, Atlantic. (630 fathoms)

Figs. 7-9. Challenger Sta. 244, North Pacific. (2900 fathoms)

Referred by Brady to *Hyperammina vagans* Brady. For *Tolypammina schaudinni* see Rhumbler, Arch. f. Protist., Vol. 3, 1903, p. 277, fig. 126. In the Foraminifera of the Plankton Expedition, 1911, Rhumbler referred this and the preceding to *Girvanella*, and was followed by Cushman in U.S.N.M. Bull. 104, Pt. 1, 1918. Chapman (note in "Nature") pointed out that *Girvanella* is probably an alga, so *Tolypammina* is used here.

Figures 10-19.—*Marsipella elongata* Norman.

Figs. 10, 11. Porcupine Sta. 47, Faroe Channel, N. Atlantic. (542 fathoms)

Figs. 12-14. Porcupine Sta. 23, N.W. of Ireland, Atlantic. (630 fathoms)

Figs. 15-17. Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Figs. 18-19. Porcupine Sta. 24, Off Ireland, Atlantic. (?)

Figures 20-22.—*Marsipella cylindrica* Brady.

Knight Errant Sta. 7, Faroe Channel, N. Atlantic. (?)

EXPLANATION OF PLATE 25 (XXV)

Figs. 1-3, X 12; Figs. 4-6, X 100; Figs. 7, 8, X 50; Fig. 9, X 40; Fig. 10, X 30; Fig. 11, X 25; Fig. 12, X 100; Figs. 13, 14, X 25; Figs. 15-20, X 20.

Figures 1-6.—*Pilulina jeffreysii* Carpenter.

Figs. 1-3. Porcupine Sta. 28, N.W. of Ireland, N. Atlantic. (1215 fathoms)

Figs. 5, 6. Porcupine, West of Ireland, N. Atlantic.

Figure 7.—*Technitella bradyi* Earland.

Challenger Sta. 344, Ascension Island, Atlantic.

Earland, 1934 (Discovery Reports, Vol. 10, Foraminifera Part III, p. 65) referred this figure and Cushman's 1918 reference (U.S.N.M. Bull. 104, Pt. 1, p. 60, pl. 16, fig. 6) to *Technitella bradyi*.

Referred to *Technitella melo* Norman by Brady.

Figures 8-12.—*Technitella legumen* Norman.

Figs. 8, 12. Challenger Sta. 276, South Pacific. (2350 fathoms)

Fig. 10. Challenger Sta. 1491, Kerguelen Islands, S. Pacific. (120 fathoms)

Fig. 11. Off Cumbrae, 60 fathoms, N. Atlantic.

Figures 15-17.—*Storthosphaera albida* Schulze.

Figs. 15, 17. Kors Fjord, Norway, N. Atlantic.

Fig. 16. Bukenfiord, Norway, N. Atlantic. (365 fathoms)

Figures 18-20.—*Pelosina rotundata* Brady.

Figs. 18, 20. Porcupine Sta. 23, N.W. of Ireland, N. Atlantic. (630 fathoms)

EXPLANATION OF PLATE 26 (XXVI)

Figs. 1-9, X 9; Figs. 10-14, X 45; Figs. 15, 16, X 3; Figs. 17-19, X 60; Fig. 20, X 200.

Figures 1-6.—*Pelosina cylindrica* Brady.

Figs. 1,4-6. Challenger Sta. 246, North Pacific. (2050 fathoms)

Figs. 2, 3. Canaries, Atlantic.

Figures 7-9.—*Pelosina variabilis* Brady.

Northeast coast of New Zealand.

Figures 10-14.—*Hippocrepina indivisa* Parker.

Figs. 10-12. Gaspé Bay, Mouth of St. Lawrence River, N. Atlantic.

Figures 15-20.—*Bathysiphon filiformis* M. Sars.

Figs. 17-20. Off coast of Norway, N. Atlantic.

EXPLANATION OF PLATE 27 (XXVII)

Figs. 1-10, X 15; Fig. 11, X 10; Figs. 12-15, X 15.

Figures 1, 2, 4-11.—*Aschemonella scabra* Brady.

Figs. 1, 2, 4, 5, 7. Challenger Sta. 244, North Pacific. (2900 fathoms)

Figs. 6, 8-10. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 11. Challenger Sta. 28?, North Atlantic.

Referred by Brady to *Aschemonella catenata* (Norman), described without a figure, as *Astrorhiza catenata* by Norman in 1876. Brady, text p. 271, notes that *Aschemonella scabra* Brady, figured as the genotype of *Aschemonella* by Brady in 1879, is the same as *A. catenata* (Norman). This view has been followed by Cushman throughout his work on Recent Foraminifera, also by Earland (Discovery Repts., Vol. 13, 1936, p. 30), but Hofker (Foram. Siboga Exped., Pt. II, 1930, p. 119) and Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 299) refer these figures to *A. scabra* Brady. Hofker apparently does this in error since he places the earlier (1876) name *catenata* in the synonymy of *scabra* (1879), and Thalmann does not cite any authority. Loeblich and Tappan (personal communication, 1956) remark as follows, "Brady often gave wide limits to a species. Examination of British Museum types show that *A. catenata* is a much smaller, delicate species, and has more bulbous chambers. We regard them as distinct species." Although Brady had large amounts of material at his disposal, including Norman's specimens, he did not recognize the existence of two species. His broad views on species limits, however, as noted by Loeblich and Tappan, are evident throughout the Challenger Report, and the view of Loeblich and Tappan is followed here.

Figure 3.—*Aschemonella catenata* (Norman).

Valorous Sta. 8, lat. 62° 6' N., long. 55° 56' W., Davis Strait. (1350 fathoms)

This is one of Norman's original specimens, figured by Brady for comparison with Challenger specimens which he originally referred to *A. scabra*, but later referred to *A. catenata* (Norman) in synonymy.

Figures 12-15.—*Aschemonella ramuliformis* Brady.

Challenger Sta. 244, North Pacific. (2900 fathoms)

EXPLANATION OF PLATE 27A (XXVIIA)

Figs. 1, 3, 4, 6, X 20; Fig. 2, X 12; Fig. 5, X 50; Figs. 7, 8, X 30; Fig. 9, X 150; Figs. 10-12, X 45.

Figures 1, 2, 3?—*Aschemonella catenata* (Norman).

Challenger Sta. 244, North Pacific. (2900 fathoms)

These occur at the same station as *Aschemonella scabra* Brady, as figured on the preceding plate (see notes on this form given there), but appear from their slender, delicate form and small size to be closer to *A. catenata* than to typical *scabra*. Figure 3 does not appear to be typical for either species but Brady notes that it represents a specimen incrustated with mud, and therefore identification is uncertain without reference to the original.

Figures 4, 5.—*Haliphysema tumanowiczii* Bowerbank.

Fig. 5. Coast of Devon, England.

Described by Bowerbank (Phil. Trans. Roy. Soc., London, Vol. 152, 1862, p. 1105) as the genotype of *Haliphysema*, a new genus of sponge. Carter (Ann. Mag. Nat. Hist., Ser. 4, Vol. 5, 1870, p. 310) recognized the true nature of this form and referred it to the foraminiferal genus *Squamulina* Schultze 1854, changing the specific name to *scopula* in the belief that this would completely remove it from the sponges. As noted by numerous authors *Squamulina* of Carter is not the same as *Squamulina* Schultze except in part, and *Haliphysema* must stand as a valid genus. The specific name *tumanowiczii* Bowerbank 1862, furthermore, has priority over *scopula* Carter 1870, which becomes a synonym. Brady in his text also records this species from the Mediterranean.

Figures 6.—*Haliphysema ramulosa* Bowerbank.

Recorded in Brady's text from the British Isles, Florida and Mauritius.

Like the preceding species this was regarded by Bowerbank as a sponge, but transferred to the Foraminifera by Brady.

Figures 7-9.—*Dendrophrya erecta* Strethill Wright.

Recorded in the text from off the coast of Scotland.

Figures 10-12.—*Dendrophrya radiata* Strethill Wright.

Recorded in the text from off the coast of Scotland.

EXPLANATION OF PLATE 28 (XXVIII)

Fig. 1, Natural size; Figs. 2-5, X 8; Figs. 6, 7, 9-11, X 40; Fig. 6, X 15; Fig. 12, X 20; Fig. 13, X 100; Figs. 14, 15, X 10.

Figures 1-11.—*Rhizammima algaeformis* Brady.

Figs. 1, 2, 6. Challenger Sta. 299, South Pacific. (2160 fathoms)

Remainder (from text) probably from Porcupine Sta. 37, North Atlantic (2435 fathoms)

Figures 12, 13.—*Psammotodendron arborescens* Norman MS., Brady.

In the text Brady refers to this species from Challenger Sta. 122, off Pernambuco, Atlantic (350 fathoms), off Holstenberg, Greenland (20 fathoms), soundings off Nova Zemlya (10 to 219 fathoms) and Franz Josef Land (89 to 145 fathoms), both in the Arctic, and off Cumbrae, Scotland. In 1881 Brady (Ann. Mag. Nat. Hist., Ser. 5, Vol. 8, 1881, p. 404) referred this species to *Psammotodendron* MS., as *P. arborescens* Norman MS. In the Challenger Report (p. 257, 262) he placed *Psammotodendron* in the synonymy of *Hyperammima*, referring to *Hyperammima arborescens* Norman MS., Brady. Eimer and Fickert (Zeitschr. Wiss. Zool., Vol. 65, 1899, p. 670), Cushman and others have reinstated *Psammotodendron* with *arborescens* as type, and are followed here.

Figures 14, 15.—*Sagenina frondescens* (Brady).

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Since Brady's name *Sagenella* had been used previously by James Hall for a genus of Polyzoa, Chapman (Jour. Linn. Soc., Zool., Vol. 28, No. 179, 1900, p. 4) proposed the name *Sagenina* for *Sagenella* Brady.

NAT SIZE

EXPLANATION OF PLATE 29 (XXIX)

Figs. 1-3, X 20; Fig. 4, X 30; Figs. 5-7, X 12; Figs. 8-18, X 10.

Figures 1-3.—Chitinous Rhizopod-tubes, probably related to *Rhizammina*.
South Pacific.

Figure 4.—Similar organism, with sarcode filaments (filose pseudopodia?) extended.

Figures 5-7.—*Testulosiphon indivisa* (Brady).

Faroe Channel, Cape of Good Hope and Fiji (in text).

Referred to *Rhizammina* by Brady but transferred to *Testulosiphon* as genotype by M. Avnimelech in 1952
(Contr. Cush. Found. Foram. Res., Vol. 3, No. 2, p. 65).

Figures 8-18.—*Botellina labyrinthica* Brady.

Porcupine Sta. 51, Faroe Channel, N. Atlantic. (440 fathoms)

EXPLANATION OF PLATE 30 (XXX)

Figs. 1-6, X 50; Figs. 7-11, X 60; Figs. 12, 13, 17, X 30; Fig. 14, X 50; Fig. 15, X 40;
Fig. 16, X 20; Figs. 18, 20, X 25; Fig. 19, X 10; Fig. 21, X 35; Fig. 22, X 40;
Fig. 23, X 20; Fig. 24, X 17.

Figures 1-4.—*Reophax difflugiformis* Brady.

Figs. 1-3. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 4. Challenger Sta. 276, Tahiti, S. Pacific. (2350 fathoms)

Brady regarded *Proteonina* Williamson 1858 as in part synonymous with *Reophax* Montfort 1808, and included *P. fusiformis* Williamson, later made the type of *Proteonina* (see below), in that genus. *Proteonina* was retained by Rhumbler, Cushman, Galloway, and most recent workers but is now placed in the synonymy of *Reophax* by Loeblich and Tappan (Smiths. Misc. Coll., Vol. 128, No. 5, 1955, p. 7). Millett (Jour. Roy. Micr. Soc., 1899, p. 253) referred figs. 1 and 5 (below) to *Proteonina difflugiformis* var. *lagenarium* (Berthelin), and has been followed in this by Rhumbler, Cushman and Thalmann. Earland (Discovery Repts., Vol. 10, 1934, Foraminifera III, p. 64) has disputed this and refers figs. 1-5 to *difflugiformis*. More recently F. L. Parker (Bull. Mus. Comp. Zool., Harvard, Vol. 106, No. 9, 1952, p. 393) has referred fig. 1 to *difflugiformis*, with no reference to var. *lagenarium* and has separated fig. 5 as *Proteonina atlantica* Cushman; these opinions are followed here.

Figure 5.—*Reophax atlantica* (Cushman).

Porcupine Sta. 47, Faroe Channel, North Atlantic. (542 fathoms)

Referred by Brady to *R. difflugiformis* and by Millett (l. c. supra, 1899), Rhumbler, Cushman and others to *Proteonina difflugiformis* var. *lagenarium* (Berthelin). Cushman described *Proteonina atlantica* (C.L.F.R. Spec. Publ. No. 12, 1944, p. 5) from shallow water off the New England coast, and F. L. Parker (l. c. supra, 1952, p. 393) referred Brady's fig. 5 to this species, although Cushman had made no reference to Brady. Parker is followed here.

Figure 6.—*Reophax ampullacea* Brady.

Challenger Sta. 149I, Kerguelen Is., South Pacific. (120 fathoms)

Referred to *Proteonina* Williamson by Rhumbler (Arch. Protist., Vol. 3, 1903 (1904), p. 248) and authors.

See note above on synonymy of *Proteonina* with *Reophax*.

Figures 7-11.—*Reophax fusiformis* (Williamson).

Figs. 7, 8. Loch Fyne, Scotland, N. Atlantic.

Figs. 9, 10. Cumbrae, Scotland, N. Atlantic.

Fig. 11. Philippine Islands, Pacific.

This was originally described as *Proteonina* and was designated the type of that genus by Rhumbler (Arch. Protist., Vol. 3, 1903 (1904), p. 244). As noted above this is now regarded as a synonym of *Reophax*.

Figures 12, 14-17.—*Reophax scorpiurus* Montfort.

Fig. 12. Off the Hebrides, W. Scotland, N. Atlantic.

Fig. 14. Challenger Sta. 323, S. Atlantic. (1900 fathoms)

Fig. 15. Challenger Sta. 260A, Honolulu reefs, Pacific. (40 fathoms)

Figs. 16-17. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figure 13. *Reophax agglutinatus* Cushman.

Referred by Brady to *R. scorpiurus* Montfort. Cushman, 1913, U.S.N.M. Proc., Vol. 44, p. 637, pl. 79, fig. 6, referred this figure to *Reophax agglutinatus*. Earland, 1934, (Discovery Reports, Vol. X, Foraminifera Part III, p. 79) suggests that it is at most a variety of *R. scorpiurus*, and is the same as *R. scorpiurus* var. *testacea* Wiesner, 1931, Foram. Deutsche Südpolar Exped., p. 89, pl. 8 fig. 100, pl. 9 fig. 101, Wiesner referring Brady's figs. 13 and 16 to this variety.

Figures 18-20. *Reophax pilulifer* Brady.

Fig. 18. Porcupine Sta. 31, North Atlantic. (?)

Figures 21-22.—*Reophax dentaliniformis* Brady.

Fig. 21. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Fig. 22. Porcupine Sta. 23, N.W. of Ireland, N. Atlantic. (630 fathoms)

Thalmann, 1932 (Eclog. geol. Helvet., Vol. 25, No. 2, p. 299), refers these two figures to *R. scorpiurus* Montfort. This is not in accord with other workers, insofar as the writer can ascertain, and as no grounds for this are given, Brady's name has been retained.

Figures 23, 24.—*Reophax bacillaris* Brady.

Valorous Sta. 8. North Atlantic.

EXPLANATION OF PLATE 31 (XXXI)

Figs. 1, 2, X 7; Figs. 3-9, X 10; Figs. 10-17, X 50; Figs. 18-22, X 15; Figs. 23-26, X 30.

Figures 1-9.—*Reophax nodulosus* Brady.

Figs. 1, 2. Challenger Sta. 156, Antarctic. (?)

Figs. 3, 4, 6-9. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 5. Challenger Sta. 195, off Amboyna, Pacific. (1425 fathoms)

Figures 10-15.—*Reophax guttifer* Brady.

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Figures 16, 17.—*Reophax spiculifer* Brady.

Fig. 16. Challenger Sta. 279C, Tahiti, Pacific. (620 fathoms)

Fig. 17. Challenger Sta. 174A, Fiji, Pacific. (255 fathoms)

Figures 18-22.—*Reophax distans* Brady.

Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Figures 23-26.—*Reophax aduncus* Brady.

Fig. 23. Porcupine Sta. 28, N.W. of Ireland, N. Atlantic. (1215 fathoms)

Fig. 24. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 25. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific.

Fig. 26. Challenger Sta. 160, Southern Ocean. (S. Pacific). (2600 fathoms)

EXPLANATION OF PLATE 32 (XXXII)

Figs. 1-4, X 50; Figs. 5, 6, X 9; Figs. 7-9, X 20; Figs. 10, 11, X 40; Fig. 12, X 12;
Figs. 13-18, X 15; Fig. 19, X 25; Figs. 20, 24-26, X 40; Figs. 21-23, X 50.

Figures 1-4.—*Nodellum membranaceum* (Brady).

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Reophax*. Made the genotype of *Nodellum* by Rhumbler, Foram. Plankton-Exped., Pt. 2, 1913, p. 474.

Figures 5, 6.—*Reophax sabulosus* Brady.

Cold Area, Faroe Channel, N. of Scotland.

Figures 7-9.—*Reophax cylindricus* Brady.

Fig. 9. Challenger Sta. 144, Prince Edward Island, S. Pacific. (1570 fathoms)

Figures 10, 11.—*Protoschista findens* (Parker).

Gaspé Bay, mouth of St. Lawrence, Canada. (18-20 fathoms)

Referred by Brady to *Reophax*. Made the genotype of *Protoschista* by Eimer and Fickert, 1899 (Zeitschr. Wiss. Zool., Vol. 65, p. 677). Genus retained by Galloway but placed in synonymy of *Reophax* Montfort by Cushman.

Figures 12, 14-18.—*Liebusella soldanii* (Jones and Parker).

Fig. 12. Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Figs. 14, 16, 18. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 17. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Haplostiche soldanii*.

Thalmann (1932) placed these figures in *Haplostiche dubia* (d'Orbigny) (a fossil form from Sienna, not a *Liebusella*) and in 1937 (Eclog. geol. Helvet., Vol. 30, No. 2, p. 340) changed the designation to *Liebusella dubia*. It seems highly probable, both from the figure and from the locality, that figure 12 is *Cylindroclavulina bradyi* (Cushman 1911), a Pacific species figured by Brady on pl. 48, figures 32-38, although Cushman does not refer to the earlier figure.

Figure 13.—*Liebusella soldanii* (Jones & Parker) var. *intermedia* (van den Broeck)

Challenger Sta. 33, off Bermuda, Atlantic. (390 fathoms)

Referred by Brady to *Haplostiche soldanii* (Jones and Parker) and to *Liebusella soldanii* var. *intermedia* by Dorothy Palmer, Mem. Soc. Cub. Hist. Nat., Vol. XII, No. 4, 1938.

Figures 19-21, 24-26.—*Ammobaculites agglutinans* (d'Orbigny).

Figs. 19, 21, 25, 26. Challenger Sta. 216, N. of Papua.

Fig. 20. Porcupine Sta. 23, N.W. of Ireland, N. Atlantic. (630 fathoms)

Fig. 24. Challenger Sta. 64, North Atlantic. (2750 fathoms)

It seems probable that further study will show the Pacific forms (figs. 19, 25, 26) to belong to a different species, the Pacific form in fig. 21 probably to a second species, and the Atlantic material to d'Orbigny's *A. agglutinans*. Referred to *Haplophragmium* by Brady.

Figures 22, 23.—*Ammobaculites agglutinans* var. *filiformis* Earland.

Challenger Sta. 5, Canaries, Atlantic. (2740 fathoms)

Brady referred these to *Haplophragmium agglutinans* (d'Orbigny). Figure 22 was referred to *A. reophaciiformis* by Cushman, 1910, U.S.N.M., Proc., Vol. 38, p. 440, a large species occurring on coral reefs in the Pacific and the West Indies. Earland's variety is very close to Brady's figures, to which he refers, and is minute in size and occurs in deep water. Earland's name has been retained since Cushman's reference to Brady appears to be erroneous. (See Earland, Discovery Reports, Vol. 10, 1934, p. 92).

EXPLANATION OF PLATE 33 (XXXIII)

Figs. 1-4, X 35; Figs. 5-12, X 18; Figs. 13-16, X 25; Figs. 17-19, X 35;
Figs. 20-25, X 40; Figs. 26-28, X 25.

Figures 1-4.—*Ammoscalaria pseudospiralis* (Williamson).

Fig. 1. Porcupine Sta. 1, West of Ireland. (370 fathoms)

Figs. 2-4. Porcupine Sta. AA, Skye, W. of Scotland. (45-60 fathoms)

Referred by Brady to *Haplophragmium pseudospirale* and by Hofker (Pubbl. Staz. Zool. Napoli, Vol. 12, 1932, p. 87) to *Ammobaculites prostomum*, pointing out that they are not in accord with Williamson's description (test thin, compressed, . . . test coarsely arenaceous and granular . . . etc.). Höglund (1947, Zool. Bidr. fr. Uppsala, Vol. 26, pp. 159-162) and Parker, Phleger and Peirson (1953, Cushman Found. Foram. Res., Spec. Publ. No. 2, p. 6) do not agree with Hofker, and place his *prostomum* in the synonymy of *pseudospiralis* (Williamson) in Höglund's genus *Ammoscalaria*.

Figures 5, 7-12.—*Ammobaculites calcareus* (Brady).

Figs. 5, 8, 12. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 7, 9-11. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred to *Haplophragmium* by Brady. It seems probable that figs. 7, 9-11 may represent a different species from figs. 5, 8 and 12, as the form and texture are entirely different, and moreover one is a West Indian species and the other from the tropical Pacific. It is suggested that the name *A. calcareus* be restricted to the West Indian species (figs. 5, 8, 12).

Fig. 6.—"Ammobaculites cylindricus Cushman."

Challenger Sta. 24, West Indies. (390 fathoms)

Haplophragmium calcareum, part, of Brady. See Cushman, 1910, Proc. U.S.N.M., Vol. 38, p. 441, figs. 15, 16. It would appear that Cushman was in error in referring this figure of Brady to his *A. cylindricus*.

Fig. 6 is regarded as *Ammobaculites calcareus* (Brady).

Figures 13-16.—*Ammoscalaria tenuimargo* (Brady).

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Haplophragmium* and by Höglund (Zool. Bidr. fr. Uppsala, Vol. 26, 1947, p. 154) to *Ammoscalaria*.

Figures 17-19.—*Ammotium cassis* (Parker).

Gaspé Bay, Mouth of St. Lawrence River, Canada. (16 fathoms)

Referred by Brady to *Haplophragmium* and by Cushman (U.S.N.M. Bull. 104, Pt. 2, 1920, p. 63) to *Ammobaculites*. Loeblich and Tappan (Smiths. Misc. Coll., Vol. 121, No. 7, 1953, p. 33) made this the genotype of *Ammotium*.

Figures 20-25.—*Ammomarginulina foliaceus* (Brady).

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Haplophragmium* and by Cushman (U.S.N.M. Bull. 104, Pt. 2, 1920, p. 64) to *Ammobaculites*. It was figured by Cushman in 1933 as *Ammomarginulina* (C.L.F.R., Spec. Publ. No. 4, pl. 10, figs. 6a-b).

Figures 26-28.—*Discammina compressa* (Goës).

Fig. 26. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 27, 28. Challenger Sta. 23, West Indies. (450 fathoms)

Referred by Brady to *Haplophragmium emaciatum* Brady and by Cushman (U.S.N.M. Bull. 71, Pt. 1, 1910, p. 102) to *Haplophragmoides emaciatum* (Brady). However Goës (Bull. Mus. Comp. Zool. Harvard, Vol. 29, No. 1, 1896, p. 31) placed this species in the synonymy of *Haplophragmium compressum* (Goës) (described as *Lituolina irregularis* Roemer var. *compressa* by Goës in 1882. This synonymy was accepted by Millett (Jour. Roy. Micr. Soc., 1899, p. 359) and Heron-Allen and Earland (Trans. Zool. Soc. London, Vol. 20, Pt. 17, 1915, p. 613) and discussed in detail by Lacroix (Bull. l'Inst. Oceanogr. Monaco, No. 667, 1935, p. 15) who placed it in the genus *Discammina* Lacroix 1932.

EXPLANATION OF PLATE 34 (XXXIV)

Figs. 1-4, X 20; Figs. 5, 6, X 50; Figs. 7, 8, X 20; Fig. 9, X 15; Fig. 10, no magnification;
Figs. 11-14, X 40; Figs. 15-18, X 100.

Figures 1-4.—*Ammobaculites americanus* Cushman.

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred to *Haplophragmium fontinense* Terquem by Brady. Cushman, U.S.N.M. Bull. 71, Pt. 1, p. 117, 1910, described and figured specimens from the West Coast of Mexico, and referred to the present figures of Brady. His figures appear to indicate the same species, or certainly one very closely similar.

Figures 5, 6.—*Haplophragmoides rotulatum* (Brady).

Challenger Sta. 5, North Atlantic. (2740 fathoms)

Referred by Brady to *Haplophragmium*.

Figures 7, 8, 10, 14?—*Alveolophragmium subglobosum* (G.O. Sars).

Fig. 7. Challenger Sta. 300, N. of Juan Fernandez. (1375 fathoms)

Fig. 8. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 10. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 14. Challenger Sta. 174C, Fiji. (210 fathoms)

Referred by Brady to *Haplophragmium latidorsatum* (Bornemann), Cushman referred the above figures to *Haplophragmoides subglobosum* (G.O. Sars) in 1910 (U.S.N.M. Bull. 71, p. 105), separating Brady's fig. 9 (see below) as *Cribrostomoides bradyi*. Höglund, 1947 (Zool. Bidrag. fr. Uppsala, Vol. 26, p. 144) placed *subglobosum* in his new genus *Labrospira*. Loeblich and Tappan (Smithson. Misc. Coll., Vol. 121, 1953, No. 7, p. 9) have shown that *Labrospira* is a synonym of *Alveolophragmium* Tschedrina 1936, and are followed here.

Figure 9.—"Cribrostomoides bradyi Cushman."

Challenger Sta. 246, North Pacific. (2050 fathoms)

Referred by Brady to *Haplophragmium latidorsatum* (Bornemann) (see above). Cushman (U.S.N.M. Bull. 71, Pt. 1, 1910, p. 108) erected a new genus, *Cribrostomoides*, with *C. bradyi* as genotype, referring to Brady's figure 9, and basing the genus on multiple apertures. Earland (Discovery Reports, Vol. 10, Foraminifera—III, 1934, p. 89) states that these are an end development in large specimens of *Haplophragmoides subglobosum* (Sars), and places *C. bradyi* Cushman in the synonymy of that species. He is followed by Höglund (1947, see above). Fig. 9 is therefore *Alveolophragmium subglobosum* (G.O. Sars).

Figures 11-13.—*Alveolophragmium scitulum* (Brady).

Figs. 11, 12. Porcupine Sta. 47, Faroe Channel, N. Atlantic. (542 fathoms)

Fig. 13. Knight Errant Sta. 7, Faroe Channel, N. Atlantic. (530 fathoms)

Referred by Brady to *Haplophragmium*, by later authors to *Haplophragmoides*, and by Parker (Bull. Mus. Comp. Zool., Harvard, Vol. 111, No. 10, 1954, p. 487) to *Alveolophragmium*.

Figures 15-18.—*Adercotryma glomeratum* (Brady).

Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Referred by Brady to *Haplophragmium* and by Cushman and later authors to *Haplophragmoides*. Loeblich and Tappan (Jour. Washington Acad. Sci., Vol. 42, No. 5, 1952, p. 141) made it the genotype of their new genus *Adercotryma*.

EXPLANATION OF PLATE 35 (XXXV)

Figs. 1-3, 5, X 50; Fig. 4, X 30; Fig. 6, X 120; Figs. 7, 8, X 60; Fig. 9, X 40;
Figs. 10-12, X 25; Figs. 13-17, X 20; Figs. 18, 19, X 12.

Figures 1-3, 5.—*Haplophragmoides canariensis* (d'Orbigny).

Fig. 1. Challenger Sta. 135, South Atlantic. (100-150 fathoms)

Figs. 2, 5. The Hebrides, Scotland, N. Atlantic.

Fig. 3. Challenger Sta. 145, Prince Edward Is., S. Pacific. (50-150 fathoms)

Referred by Brady to *Haplophragmium* (was *Nonionina* d'Orbigny 1839), and transferred to *Haplophragmoides* by Cushman (U.S.N.M. Bull. 71, Pt. 1, 1910, p. 101). Regarding these figures Miss F. L. Parker writes as follows: "If this form is indeed d'Orbigny's *canariensis* (which it may well be), then *Alveolophragmium* and *Haplophragmoides* are synonymous, since this species obviously has an 'interio-areal' aperture and *canariensis* is the type species of *Haplophragmoides*. A study of d'Orbigny's type, if available, is indicated to decide this" (personal communication).

Figure 4.—*Alveolophragmium crassimargo* (Norman).

Dogger Bank, North Sea. (40-50 fathoms)

Included by Brady in *Haplophragmium canariensis* (d'Orbigny). Norman (Mus. Normannianum, 1892, p. 17) gave no figure of *H. crassimargo*, but referred to Brady, fig. 4, in a footnote. Höglund (Zool. Bidr. fr. Uppsala, Vol. 26, 1947, pp. 141-144) discussed *crassimargo* fully and made it the type of a new genus, *Labrospira*. More recently Loeblich and Tappan (Smith. Misc. Coll., Vol. 121, No. 7, 1953, pp. 28-31) have investigated the generic and specific characters of *crassimargo* and have placed *Haplophragmoides major* Cushman and *Alveolophragmium orbiculatum* Stschedrina 1936 (the type of *Alveolophragmium*) in synonymy. *Labrospira* Höglund 1947 thus becomes a synonym of *Alveolophragmium* Stschedrina 1936.

Figures 6-8.—*Trochammina nana* (Brady).

Fig. 6. Franz Josef Land, N. Atlantic. (113 fathoms)

Figs. 7, 8. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Referred by Brady to *Haplophragmium*.

Figure 9.—*Recurvoides turbinatus* (Brady).

Challenger Sta. 346, South Atlantic. (2350 fathoms)

Referred by Brady to *Haplophragmium*. Placed in *Recurvoides* by Earland, 1934 (Discovery Reports, Vol. 10, Foraminifera Pt. III, p. 91).

Figures 10, 11.—*Ammoglobigerina globigeriniformis* (Parker and Jones).

Fig. 10. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 11. Challenger Sta. 78, S.E. of the Azores, Atlantic. (1000 fathoms)

Referred by Brady to *Haplophragmium*. *Ammoglobigerina* was proposed for this species by Eimer and Fickert, Zeitschr. Wiss. Zool., Vol. 65, 1899, p. 704, with *A. globigeriniformis* regarded as the same as *Globigerina bulloides* Williamson non d'Orbigny (apparently an error, however). Cushman places *Ammoglobigerina* in the synonymy of *Trochammina*, Galloway retains it as a valid genus and Glaessner places it under *Trochammina* as a subgenus.

Figs. 12-15.—*Globotextularia anceps* (Brady).

Fig. 13. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Figs. 14, 15. Challenger Sta. 296, South Pacific. (1825 fathoms)

Referred by Brady to *Haplophragmium* and made the type of *Globotextularia* by Eimer and Fickert, Zeitschr. Wiss. Zool., Vol. 65, 1899, p. 679.

Figures 16, 17.—*Tholosina bulla* (Brady).

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Placopsilina* and later made the type of *Tholosina* Rhumbler, Nachr. Königl. Ges. Wiss. Göttingen, 1895, p. 82. (Type designated by Cushman, 1918.)

Figures 18, 19.—*Tholosina vesicularis* (Brady).

Porcupine Sta. 23, N.W. of Ireland, N. Atlantic. (630 fathoms)

Referred by Brady to *Placopsilina* and to *Tholosina* by Rhumbler, Archiv. f. Prot., Vol. 3, 1903, p. 227. Thalmann, Amer. Midland Nat., Vol. 28, No. 2, 1942, p. 463, refers these figures to *T. vesicularis* var. *erecta* Heron-Allen and Earland 1929 but reference to Heron-Allen and Earland (Jour. Roy. Micr. Soc., Vol. 49, 1929, p. 325) suggests that they regard Brady's figures as true *T. vesicularis*; this is confirmed by reference to Heron-Allen and Earland, Discovery Reports, Vol. 4, 1932, p. 331.

EXPLANATION OF PLATE 36 (XXXVI)

Fig. 1, X 15; Fig. 2, X 30; Fig. 3, X 50; Figs. 4, 5, X 15; Figs. 6, 7, X 30;
Figs. 9-15, X 50; Figs. 16-18, X 100.

Figure 1.—*Placopsilina bradyi* Cushman and McCulloch.*

Challenger Sta. 195A, off Amboyna, E. Indies. (15-20 fathoms)

Referred by Brady to *P. cenomana* d'Orbigny and to *P. bradyi* by Cushman and McCulloch, Univ. S. Calif. Publ., Allan Hancock Pacific Exped., Vol. 6, 1939, p. 112.

Figures 2, 3.—*Placopsilina confusa* Cushman.*

Fig. 2. Porcupine Sta. 12, West of Ireland, Atlantic.

Fig. 3. Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Referred to *P. cenomana* d'Orbigny by Brady and to *P. confusa* by Cushman, U.S.N.M. Bull. 104, Pt. 2, 1920, p. 71.

Figures 4-6.—*Bdelloidina aggregata* Carter.

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

M.K. Elias (Jour. Pal., Vol. 24, No. 3, 1950, p. 301) referred these figures to *B. aggregata* var. *bradiei*, since Brady shows the presence of secondary septa not figured or noted by Carter in *aggregata*. Loeblich and Tappan (Smith. Misc. Coll., Vol. 128, No. 5, 1955, p. 22) have redescribed *Bdelloidina* and placed var. *bradiei* Elias in synonymy with typical *B. aggregata* Carter.

Figures 7-18.—*Thurammina papillata* Brady, variations.

Fig. 7. Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Figs. 8, 15. Porcupine Sta. 23, West of Ireland, Atlantic. (630 fathoms)

Figs. 9-11. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Figs. 12, 14. Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Fig. 13. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Figs. 16-18. Porcupine Sta. 24, Off Ireland.

Heron-Allen and Earland, in 1917 (Jour. Roy. Micr. Soc., pp. 530-557), gave a detailed study of this species. They regard all Brady's figured specimens as being abnormal, and suggest that fig. 8 approaches var. *parallela* Heron-Allen and Earland; fig. 9 is probably a form of var. *castanea* Heron-Allen and Earland, and figs. 13, 14 represent var. *haeusleri* Heron-Allen and Earland. Thalmann (Eclog. geol. Helvet., Vol. 26, No. 2, 1933, p. 252) refers all Brady's figs. 7-18 to *Thurammina castanea* Heron-Allen and Earland, apparently based on a reference to Heron-Allen and Earland, Discovery Reports, Vol. 4, Foraminifera Part I, 1932, p. 328. However Earland later (l. c., Foraminifera Part II, 1933, p. 66) refers Brady's figs. 7, 8 to *T. papillata* Brady and figs. 13, 14 to *Thurammina haeusleri* Heron-Allen and Earland. Again, in Discovery Reports, Vol. 10, 1934, Foraminifera Part III, pp. 70-71 he raises the former varieties of Heron-Allen and Earland 1917 to specific rank, but makes no further references to Brady's figures. In 1933 he states that he reduces the number of varietal names, employing specific names for purposes of convenience, but does not believe them to be true species in the case of *Thurammina*.

*NOTE: Confusion exists here. Cushman and McCulloch in 1939 refer all of Brady's figures 1-3 to *P. bradyi*, ignoring Cushman's 1920 account of *P. confusa*, in which he refers Brady's fig. 3 to that species. Thalmann first referred fig. 3 to *P. confusa* (1932), then figures 2, 3 to that species (1937), following Earland (Discovery Reports, Vol. 10, 1934, Foraminifera Pt. III, p. 94) (as is followed here), and later (in 1942, Amer. Midland Nat., Vol. 28, p. 463) transferred all three figures to *P. bradyi*, following Cushman and McCulloch, 1939.

LITUOLA (Placopsilina-Bdelloidina)-THURAMMINA

EXPLANATION OF PLATE 37 (XXXVII)

Figs. 1-6, X 50; Fig. 7, X 100; Figs. 8-15, 17-22, X 15; Figs. 16, 23, X 30.

Figure 1.—*Thurammina compressa* Brady.

Porcupine Sta. 23, West of Ireland, Atlantic. (630 fathoms)

This was referred to *T. papillata* Brady var. *compressa* Brady by Heron-Allen and Earland in 1917, but Earland later reinstated the name *T. compressa* (see note to preceding plate).

Figures 2-7.—*Thurammina albicans* Brady.

Figs. 2-4. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred to *T. papillata* var. *albicans* Brady by Heron-Allen and Earland, 1917, later to *T. albicans* by Earland, 1934. (See note to preceding plate.)

Figures 8-16.—*Cyclammina cancellata* Brady.*

Fig. 8. Porcupine, North Atlantic.

Fig. 9. Challenger Sta. 168, off New Zealand, S. Pacific. (1100 fathoms)

Figs. 12, 14, 16. Challenger Sta. 24, West Indies. (390 fathoms)

Figures 17, 18.—*Cyclammina orbicularis* Brady.

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Figure 19.—*Cyclammina orbicularis* Brady var. *asellina* Rhumbler.

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *C. orbicularis* but referred to var. *asellina* Rhumbler, in Wiesner, Deutsche Südpolar Exped., Vol. 20, Die Foraminiferen, p. 97.

Figures 20-23.—*Cyclammina pusilla* Brady.

Challenger Sta. 323, South Atlantic. (1900 fathoms)

*NOTE: Hugo Friese (Abhandl. geol. Dienst. Berlin, N.F., Part 227, 1951, p. 12) placed *Cyclammina cancellata* Brady in the synonymy of *C. miocenica* (Karrer), described as a *Trochammina* in 1877. Friese's figures suggest that he was dealing with the same form as Brady's *Cyclammina cancellata* or a closely similar species, but Karrer's figure and description leave much to be desired and do not even indicate with certainty that he was describing a *Cyclammina*. Until his types can be examined it seems preferable to use Brady's name for the well-known form figured here.

EXPLANATION OF PLATE 38 (XXXVIII)

Figs. 1, 3, 5, 6, X 15; Figs. 2, 4, X 25; Figs. 7-16, X 70; Fig. 17-19, X 100; Figs. 20-22, X, 12.

Figures 1, 3.—*Involutina anguillae* (Höglund).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Ammodiscus incertus* (d'Orbigny). Höglund (Zool. Bidr. fr. Uppsala, Vol. 26, 1947, p. 128) regarded these figures as most probably representing his West Indian *Ammodiscus anguillae*. Loeblich and Tappan (Jour. Wash. Acad. Sci., Vol. 44, No. 10, 1954, pp. 21-22) have shown *Ammodiscus* Reuss 1862 to be a junior synonym of *Spirillina* Ehrenberg 1843, comprising hyaline, calcareous forms. Agglutinated forms such as *anguillae* Höglund are referred to *Involutina* Terquem 1862 by Loeblich and Tappan (l. c. supra).

Figure 2.—*Cornuspira incerta* (d'Orbigny)?

Challenger Sta. 332, South Pacific. (2200 fathoms)

Referred by Brady to *Ammodiscus* (see notes above). Brady's specimen is so small and his figure so indefinite that until the material can be re-examined it seems preferable to query this identification. Loeblich and Tappan (l. c. supra, 1954, p. 308, fig. 1) have examined d'Orbigny's types of *Operculina incerta* from Cuba and figured a lectotype. They place the species in *Cornuspira*.

Figure 4.—*Involutina intermedia* (Höglund)? (immature specimen).

Challenger Sta. 46, North Atlantic. (1350 fathoms)

Referred by Brady to his Pacific species, *Ammodiscus tenuis*. This appears to be a juvenile individual and may perhaps be referable to *Ammodiscus intermedius* Höglund 1947, from off the Swedish coast (l. c. supra, 1947, p. 126). See note above on *Involutina*.

Figures 5, 6.—*Involutina tenuis* (Brady).

Challenger Sta. 168, N.E. coast of New Zealand. (1100 fathoms)

Referred by Brady to *Ammodiscus*, and transferred here to *Involutina* in accordance with the findings of Loeblich and Tappan.

Figures 7-9.—*Glomospira gordialis* (Jones and Parker).

Figs. 7, 8. Challenger Sta. 5, Canaries, Atlantic. (2740 fathoms)

Fig. 9. Challenger Sta. 174B, Fiji, Pacific. (610 fathoms)

Referred by Brady to *Ammodiscus*.

Figures 10-16.—*Glomospira charoides* (Jones and Parker).

Figs. 10-12, 15. Challenger Sta. 46, North Atlantic. (1350 fathoms)

Figs. 13, 14. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 16. Challenger Sta. 218, North of Papua. (1070 fathoms)

Referred by Brady to *Ammodiscus* and to *Glomospira* Rzehak 1888 by Cushman, 1918, and Rhumbler, 1909. Earlier (1895) Rhumbler referred this and the preceding species to his genus *Gordiammina*, a synonym of *Glomospira*.

Figures 17-19.—*Turritellella shoneana* (Siddall).

Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Referred by Brady to *Ammodiscus*. This is the genotype of *Turritellella* Rhumbler 1903 (Arch. f. Protist., Vol. 3, p. 283).

Figures 20-22.—*Turritellella spectabilis* (Brady).

Porcupine, North Atlantic. (358 fathoms)

Referred by Brady to *Ammodiscus* and by Rhumbler to *Turritellella* (l. c. supra, 1903, p. 283).

EXPLANATION OF PLATE 39 (XXXIX)

Figs. 1-9, X 15; Figs. 10-23, X 10.

Figures 1-6.—*Hormosina globulifera* Brady.

Figs. 1, 2, 5. Challenger Sta. 246, North Atlantic. (2050 fathoms)

Figs. 3, 4. Porcupine Sta. 23, off N.W. Ireland, N. Atlantic. (630 fathoms)

Fig. 6. Challenger Sta. 218, North of Papua, Pacific. (1070 fathoms)

Figures 7-9.—*Hormosina ovicula* Brady.

Fig. 7. Challenger Sta. 241, North Pacific. (2300 fathoms)

Fig. 8b. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Figs. 8a, 9. Challenger Sta. 246, North Pacific. (2050 fathoms)

Figures 10-13.—*Hormosina monile* Brady.

Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Figures 14-18.—*Hormosina carpenteri* Brady.

Figs. 14-16. Challenger Sta. 78, E. of the Azores, Atlantic. (1000 fathoms)

Figs. 17, 18. Challenger Sta. 76, off the Azores, Atlantic. (900 fathoms)

Figures 19-23.—*Hormosina normani* Brady.

Valorous, North Atlantic. (1750 fathoms)

TROCHAMMINA [Trochammina]

EXPLANATION OF PLATE 40 (XL)

Figs. 1-3, X 25; Figs. 4-7, 10-12, X 20; Figs. 8, 9, 13, 14, X 30; Fig. 15, X 50; Fig. 16, X 60;
Fig. 17, X 45; Fig. 18, X 30; Figs. 19-23, X 50.

Figures 1-3.—*Trochamminoides proteus* (Karrer).

Figs. 1, 2. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Fig. 3. Challenger Sta. 24, West Indies. (390 fathoms)

Referred to *Trochammina* by Brady; made the genotype of *Trochamminoides* by Cushman, 1910 (U.S.N.M. Bull. 71, Pt. 1, p. 97).

Figures 4-7.—*Lituotuba lituiformis* (Brady).

Fig. 4. Challenger Sta. 76, off the Azores, Atlantic. (900 fathoms)

Figs. 5, 6. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Fig. 7. Challenger Sta. 24, West Indies. (390 fathoms)

Placed in *Trochammina* by Brady; the genotype of *Lituotuba* Rhumbler 1895 (Nachr. Königl. Ges. Wiss. Göttingen, p. 83).

Figures 8, 9.—*Trochammina conglobata* Brady.

Challenger Sta. 23, West Indies. (450 fathoms)

Figures 10-12.—*Haplophragmoides coronatum* (Brady).

Fig. 10. Challenger Sta. 23, West Indies. (450 fathoms)

Fig. 11. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Fig. 12. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Trochammina*; placed in *Haplophragmoides* by Cushman, 1910 (U.S.N.M. Bull. 71, Pt. 1, p. 99).

Figure 13.—*Cyclammina trullissata* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Trochammina trullissata* Brady and by Cushman to *Cyclammina bradyi* (U.S.N.M. Bull. 71, Pt. 1, 1910, p. 113). Parker (Bull. Mus. Comp. Zool., Harvard, Vol. 106, No. 9, 1952, p. 400) has pointed out that Brady's original figures 10a-b of *T. trullissata* (Jour. Roy. Micr. Soc., 1879, pl. 5) are identical with the present figures 13a-b, therefore the name *trullissata* must be retained for this form.

Figures 14, 15.—*Alveolophragmium wiesneri* (Parr).

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Trochammina trullissata* and by Cushman to *Haplophragmoides trullissata*. Parker, l. c. supra, named this form *Labrospira arctica* but Brady's figures had already been referred to *Labrospira wiesneri* by Parr, 1950 (B.A.N.Z. Antarctic Res. Exped., Foraminifera, p. 272) who also reaches the conclusion that Fig. 13 is *Cyclammina trullissata* (Brady). Loeblich and Tappan, as already noted, have shown that *Labrospira* Höglund is a synonym of *Alveolophragmium* Tschedriner 1936.

Figure 16.—NOT IDENTIFIED (inner surface of the test of "*Trochammina trullissata*").

Figures 17, 18.—*Alveolophragmium ringens* (Brady).

Fig. 17. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 18a. Challenger Sta. 98, W. coast of Africa. (1750 fathoms)

Fig. 18b. Challenger Sta. 70, N. Atlantic. (1675 fathoms)

Referred by Brady to *Trochammina* and by Eimer and Fickert (Zeitschr. Wiss. Zool., 1899, Vol. 65, p. 692) to *Ammochilostoma*. Parker (Bull. Mus. Comp. Zool. Harvard, Vol. 111, No. 10, 1954, p. 487) has transferred it to *Alveolophragmium*.

Figures 19-23.—*Cystammina galeata* (Brady).

Figs. 19, 20, 23. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Figs. 21, 22. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *Trochammina* and by Eimer and Fickert to their new genus *Ammochilostoma* (l. c. supra, 1899). Galloway, Manual of the Foraminifera, 1933, p. 186, points out that *Ammochilostoma* is a synonym of *Cystammina* Neumayr 1889, genotype *Trochammina pauciloculata* Brady, designated by Galloway and also by Cushman, 1933.

EXPLANATION OF PLATE 41 (XLI)

Figs. 1-8, X 50; Figs. 9, 10, X 100; Figs. 11-16, X 25.

Figures 1, 2.—*Cystammina pauciloculata* (Brady).

Fig. 1. Challenger Sta. 300, North of Juan Fernandez, E. Pacific. (1375 fathoms)

Fig. 2. Challenger Sta. 279C, Tahiti, Pacific. (620 fathoms)

Referred by Brady to *Trochammina* and designated the genotype of *Ammochilostoma* Eimer and Fickert 1899 (Zeitschr. Wiss. Zool., Vol. 65, p. 692) by Cushman, 1910 (U.S.N.M. Bull. 71, Pt. 1, p. 126). In 1933 Galloway (Manual of Foraminifera, p. 186) and Cushman (Foraminifera, Their Classification and Economic Use, p. 170) placed *Ammochilostoma* in the synonymy of *Cystammina* Neumayr 1889 (Die Stamme des Thierreichs, Vol. 1, p. 167) with the same genotype.

Figure 3.—*Trochammina squamata* Jones and Parker.

Challenger Sta. 24, West Indies. (390 fathoms)

Figure 4.—*Trochammina inflata* (Montagu).

Almouth, Northumberland, England (brackish water).

Figures 5, 6.—*Trochammina nitida* Brady.

Fig. 5. Challenger Sta. 135, Tristan d'Acunha, Atlantic. (100-150 fathoms)

Fig. 6. Challenger Sta. 145, Prince Edward Is., S. Pacific. (50-150 fathoms)

Figures 7-10.—*Carterina spiculotesta* (Carter).*

Gulf of Suez. (40 fathoms)

Figure 11.—*Hemisphaerammina bradyi* Loeblich and Tappan.**

Off Redcliff, Durham, England. (30 fathoms)

Referred by Brady to *Webbina hemisphaerica* Jones, Parker and Brady and transferred by Lacroix (Arch. Zool. Exp. et Gen., Vol. 77, No. 2, 1935, p. 88) to *Webbinella*.

Figures 12-16.—*Ammolagena clavata* (Parker and Jones).

Figs. 12, 13. Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Fig. 14. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 16. Challenger Sta. 164A, off Sydney, Australia. (410 fathoms)

Referred by Brady to *Webbina* and by Cushman to *Ammolagena* Eimer and Fickert 1899, as genotype (Cushman, 1910, U.S.N.M. Bull. 71, Pt. 1, p. 67). Eimer and Fickert also refer to *A. clavata*.

*NOTE: *Carterina* has recently been redefined by Loeblich and Tappan (Smith. Misc. Coll., Vol. 128, No. 5, 1955, p. 27).

**NOTE: Loeblich and Tappan (U.S.N.M. Bull. 215, 1957, p. 224) regard *Webbinella* as an attached calcareous polymorphinid. They propose the genus *Hemisphaerammina* for agglutinated forms such as this figured by Brady, and refer this figure to *H. bradyi*.

EXPLANATION OF PLATE 42 (XLII)

Figs. 1-5, X 60; Figs. 6, 7, X 70; Figs. 8-14, 17, 18, X 35;

Figs. 15, 16, 25-29, X 30; Figs. 19-24, X 25.

Figures 1, 2.—*Bolivinella folium* (Parker and Jones).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred to *Textularia* by Brady. Designated the genotype of *Bolivinella* by Cushman, 1927 (C.C.L.F.R., Vol. 2, p. 79).

Figures 3-5.—*Bolivinella elegans* Parr.

Fig. 3. Challenger Sta. 174A, Fiji, Pacific. (255 fathoms)

Fig. 4, 5. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Textularia folium* (Parker and Jones) and to *Bolivinella elegans* by Parr (Proc. Roy. Soc. Victoria, n.s., Vol. 44, 1932, p. 223).

Figure 6.—*Patellinella inconspicua* (Brady).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred to *Textularia* by Brady, and made the genotype of *Patellinella* gen. nov. by Cushman (C.C.L.F.R., Vol. 4, 1928, p. 5). Hofker (Foraminifera of the Siboga Exped., Pt. III, 1951, p. 431) refers this species to a new genus, *Discobolivina*, in which he includes *Patellina*, *Patellinella* and *Patellinelloides*. As he selects *P. corrugata* Williamson (the genotype of *Patellina*) as the genotype of *Discobolivina* that genus immediately becomes an isotypic junior synonym of *Patellina* and therefore invalid (Loeblich and Tappan, personal communication).

Figure 7.—*Patellinella jugosa* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Textularia* and to *Patellinella* by Cushman, Todd and Post (U.S.G.S. Prof. Paper 260-H, 1954, p. 358). See notes to figure 6 above on *Discobolivina*.

Figures 8-12.—*Bolivinella quadrilatera* (Schwager).

Fig. 8. Challenger Sta. 164A, off Sydney, Australia. (410 fathoms)

Figs. 9-12. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *Textularia* and by Cushman to *Bolivinella* as genotype (C.C.L.F.R., Vol. 2, 1927, p. 90).

Figures 13, 14.—*Siphotextularia concava* (Karrer).

Fig. 13. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Fig. 14. Challenger Sta. 308, West of Patagonia, E. Pacific. (175 fathoms)

Referred by Brady to *Textularia* but the apertural characters are those of *Siphotextularia* Finlay 1939 (Trans. Roy. Soc. New Zealand, Vol. 68, p. 510). The Recent Pacific form may prove to be distinct from the Miocene Hungarian form described by Karrer in 1868 as *Plecanium concavum*, but a careful comparison of original material from both localities will be necessary to decide this.

Figures 15, 16.—*Textularia pseudocarinata* Cushman.

Challenger Sta. 209, Philippine Islands. (95-100 fathoms)

Referred by Brady to *Textularia carinata* d'Orbigny (Recent, Adriatic) and later made the type of *T. pseudocarinata* by Cushman (U.S.N.M. Bull. 100, Vol. 4, 1921, p. 121).

Figures 17, 18.—*Textularia sagittula* DeFrance.

Porcupine, Atlantic (no locality).

Figures 19-22.—*Textularia sagittula* DeFrance var. *fistulosa* Brady.

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Figure 23.—*Gaudryina* (*Siphogaudryina*) *rugulosa* Cushman.

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *Textularia rugosa* (Reuss) and by Cushman to *Gaudryina rugulosa* sp. nov. (U.S.N.M. Bull. 161, Pt. 1, 1932, p. 15).

Figure 24.—*Textularia indenta* Galloway and Heminway?

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *Textularia rugosa* (Reuss) and by Galloway and Heminway to *Textularia indenta* sp. nov., from the Upper Oligocene of Puerto Rico. Cushman referred both figures 23 and 24 to his *Gaudryina rugulosa* and it may be that this is correct. Galloway and Heminway (Sci. Surv. Porto Rico, New York Acad. Sci., Vol. 3, Pt. 4, 1941, p. 331) refer to Cushman but state that the Puerto Rican form has no triserial portion and is therefore a *Textularia*. Comparison of material from Puerto Rico with Brady's types may show that the two are different, as would seem probable in view of the difference in age and locality, in which case figure 24 will probably be referred also to *Gaudryina rugulosa*.

Figures 25-29.—*Gaudryina* (*Siphogaudryina*) *siphonifera* (Brady).

Figs. 25, 28a. Challenger Sta. 260A, Honolulu, Pacific. (40 fathoms)

Fig. 26. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Figs. 27, 28b. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Fig. 29. Honolulu.

Referred by Brady to *Textularia* and to *Gaudryina* by Cushman (C.C.L.F.R. Vol. 4, 1928, p. 109) and later, in 1937, also by Cushman, to *Gaudryina* (*Siphogaudryina*) (C.L.F.R. Spec. Publ. No. 7, p. 83).

EXPLANATION OF PLATE 43 (XLIII)

Figs. 1-4, X 25; Figs. 5-8, X 20; Figs. 9, 11, X 30; Fig. 10, X 18;
Figs. 12, 17, 19, X 25; Figs. 13-16, 18, X 40.

Figures 1-3.—*Textularia agglutinans* d'Orbigny.

Fig. 1. Challenger Sta. 135, Tristan d'Acunha, Atlantic. (100-150 fathoms)

Fig. 2. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 3. Off the Shetlands, North Atlantic. (70-100 fathoms)

Figure 4.—*Textularia porrecta* Brady.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Textularia agglutinans* var. *porrecta* Brady, and by Egger (Abhandl. kon. bay. Akad. Wiss. München, Cl. II, Vol. 18, p. 269) and later workers to *Textularia porrecta* Brady.

Figures 5-8.—*Planctostoma luculenta* (Brady).

Figs. 5, 7. Challenger Sta. 23, West Indies. (450 fathoms)

Figs. 6, 8. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Textularia*, and by Loeblich and Tappan (Smith. Misc. Coll., Vol. 128, No. 5, 1955, p. 8) to *Planctostoma* as the genotype.

Figures 9, 10.—*Textularia pseudogramen* Chapman and Parr.

Fig. 9. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 10. Challenger Sta. 260A, Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *Textularia gramen* d'Orbigny, and by Chapman and Parr (Sci. Repts. Australasian Antarctic Exped., 1911-1914, Vol. 1, 1937, p. 153) to *Textularia pseudogramen*.

Figure 11.—*Siphotextularia* sp. nov.

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Textularia concava* (Karrer). This species, as figured by Brady, shows the aperture of a *Siphotextularia*, and from a study of available literature appears to be new. *S. concava* (Karrer) is figured by Brady on Plate XLII and is a very different form.

Figure 12.—*Cribrogoesella bradyi* Cushman.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Textularia agglutinans* d'Orbigny, a deformed specimen. Cushman (Smith. Misc. Coll., Vol. 91, No. 21, 1935, p. 4) referred this figure to *Cribrogoesella bradyi*.

Figures 13, 14.—*Textularia conica* d'Orbigny.

Fig. 13. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 14. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figures 15, 16, 18.—*Textularia* sp. nov.

Figs. 15, 18. Challenger Sta. 188, New Guinea, Pacific. (28 fathoms)

Referred by Brady to *Textularia trochus* d'Orbigny. This is one of the species figured by Brady which has been inextricably confused by later workers. Cushman first attributed these figures to *T. pseudotrochus* Cushman. (U.S.N.M. Bull. 104, Pt. 2, 1922, p. 21), a species from shallow reef conditions off the S.E. coast of the United States and Florida. His figures do not appear to show the same species as Brady. In 1937 (C.L.F.R. Spec. Publ. No. 8, p. 66) he referred them to another West Indian species, *Textulariella barrettii* (Jones and Parker) with *T. pseudotrochus* in synonymy. Lalicker and McCulloch in 1940 (Southern California Univ. Publ., Allan Hancock Pacific Exped., Vol. 6, No. 2, p. 136, pl. 15 fig. 17) refer Brady's figures 15-19 to *Textularia orbica* with no reference to Cushman's *T. pseudotrochus* or his placing of this in the synonymy of *Textulariella barrettii*. Their figures are again different from those of Brady and from those of Cushman and furthermore Brady's fig. 17 represents the West Indian *T. barrettii* and is from a West Indian locality. They also point out that *T. trochus* d'Orbigny is a *Marssonella* and therefore not congeneric with the form figured by Brady. Reference to the literature has failed to reveal any form identical with Brady's figures 15, 16 and 18 and it is believed to be new.

Figure 17.—*Textulariella barrettii* (Jones and Parker).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Textularia trochus* d'Orbigny (see above) and by Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 15) to *T. goesii* Cushman, from the Hawaiian Islands. Original material from Challenger Sta. 24 contains large numbers of *Textulariella barrettii* (Jones and Parker) in various stages of growth, some of which are identical with this figure. Brady mentions the labyrinthic nature of his "*Textularia trochus*" and figures a section of an Atlantic specimen on Plate XLIV fig. 3 which is certainly *T. barrettii*. *Textularia goesii* Cushman is regarded as entirely distinct, most probably the form figured by Brady on Plate XLIV figs. 1, 2.

A. T. Hollick ad nat. del. et lith.

TEXTULARIA

diagram comp.

EXPLANATION OF PLATE 44 (XLIV)

Figs. 1, 2, X 35; Fig. 3, X 25; Fig. 4, X 18; Fig. 5, X 15; Fig. 6, X 18; Fig. 7, X 20; Fig. 8, X 30;
Figs. 9-13, X 20-25; Figs. 14-21, 24, X 35; Fig. 23, X 60.

Figures 1, 2.—*Textularia goesii* Cushman.

Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Referred by Brady to *T. trochus* d'Orbigny (a *Marssonella*, as noted earlier) and to *T. goesii* by Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 15) a Hawaiian species.

Figure 3.—*Textulariella barrettii* (Jones and Parker).

Challenger Sta. 122, South Atlantic. (350 fathoms)

Referred by Brady to *T. trochus* d'Orbigny, and by Cushman to *T. goesii* (see above), a Hawaiian species with non-labyrinthic textularian structure.

Figures 4, 5.—*Dorothia pseudoturris* (Cushman).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Textularia turris* d'Orbigny and by Cushman to *Textularia pseudoturris* (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 19). Cushman later (C.L.F.R. Spec. Publ. No. 8, 1937, p. 100) transferred this species to *Dorothia*.

Figures 6-8.—*Textulariella barrettii* (Jones and Parker)?

Figs. 6, 8. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 7. Challenger Sta. 23, West Indies. (390 fathoms)

Referred by Brady and most later authors to *Textularia barrettii* Jones and Parker and placed in *Textulariella* (as genotype) by Cushman (C.C.L.F.R., Vol. 3, p. 24). Palmer (Mem. Soc. Cubana Hist. Nat., Vol. 12, No. 4, 1938, p. 300) suggests that these may be a form of *Cuneolina angusta* Cushman. Hofker (Spolia Zool. Mus. Hauniensis, Vol. 15, 1956, p. 31) from a study of West Indian material reached the conclusion that *Cuneolina angusta* is the microspheric form of *Textulariella barrettii*.

Figures 9-11.—*Tectularia aspera* Brady.

Figs. 9, 11. Porcupine, N. Atlantic (deep water).

Fig. 10. Knight Errant Sta. 7, Faroe Channel, N. Atlantic. (530 fathoms)

Thalmann refers figs. 9-13 to *Textularia tuberosa* d'Orbigny (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 301) but as no grounds for this are presented and moreover Brady's figures differ considerably from the Fornasini figures of *T. tuberosa*, these figures have been selected as representing *T. aspera* Brady. (See below for figs. 12, 13.)

Figures 12, 13.—*Dorothia scabra* (Brady).

Challenger Sta. 23, West Indies. (450 fathoms)

Referred by Brady to *Textularia aspera*, with figs. 9-11 (see above). These can be matched quite closely to specimens of *D. scabra* from Challenger Sta. 24, West Indies, and are also very similar to figures of that species given by Cushman (C.L.F.R. Spec. Publ. 8, 1937, pl. 11, figs. 4a-b).

Figures 14-18.—*Bigenerina nodosaria* d'Orbigny.

Figs. 14-17. Porcupine Sta. 10, West of Ireland, Atlantic.

Fig. 18. Porcupine Sta. 6, off Ireland, Atlantic. (90 fathoms)

Figures 19-24.—*Bigenerina cylindrica* Cushman.

Fig. 19. Porcupine Sta. 18, West of Ireland, N. Atlantic. (183 fathoms)

Figs. 20-22. Porcupine Sta. AA, off Skye, Scotland, N. Atlantic. (45-60 fathoms)

Referred by Brady to *Bigenerina digitata* d'Orbigny and by Cushman (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 26) to *Bigenerina cylindrica*. Hofker (Pubbl. Staz. Zool. di Napoli, Vol. 12, Fasc. 1, 1932, pp. 97-100) placed Brady's figures 19-24 and Cushman's *Bigenerina cylindrica* in synonymy with *Clavulina cylindrica* d'Orbigny. Comparison with d'Orbigny's original reference ("espèce finement striée en long") and the later figure and description of Fornasini (Riv. Ital. Pal., Vol. 3, 1897, p. 14, tf.) indicate that d'Orbigny's *Clavulina cylindrica* and the present species are two different forms, and Cushman's name has been retained here. Should it be found that Brady and Cushman's species is triserial in the initial portion and not biserial as held by Cushman, then a new name will be required.

EXPLANATION OF PLATE 45 (XLV)

Figs. 1-8, X 20; Figs. 9-16, X 14; Fig. 17, X 50; Figs. 18-24, X 60;
Fig. 25, X 100; Figs. 26-27, X 100.

Figures 1-8.—*Vulvulina pennatula* (Batsch 1791).

Figs. 1, 3, 5, 7. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 2, 4. Challenger Sta. 23, West Indies. (450 fathoms)

Fig. 6. Porcupine Sta. 27, Northwest of Ireland, N. Atlantic.

Fig. 8. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Figs. 1-4 referred by Brady to *Bigenerina capreolus* (d'Orbigny) and by Fornasini, 1902 (Mem. Accad. Sci. Ist. Bologna, Ser. V, Vol. 10, p. 14) to *Vulvulina pennatula* (Batsch). Figs. 5-8 referred by Brady to *Bigenerina pennatula* (Batsch) and by Fornasini (l. c., 1901) to *Vulvulina*. Silvestri (Mem. Pont. Accad. Rom. N. Lincei, Vol. 22, 1904, p. 242) refers figs. 3, 4 of Brady to *Spiroplecta corrugata* (Costa), a fossil form from Italy, but examination of a series from Challenger Sta. 24, confirms Brady's opinion that these figures represent the young stage of *pennatula*. Figs. 1-4 represent the microspheric form and figs. 5-8 the megalospheric.

Figures 9-16.—*Cribrogoesella robusta* (Brady).

Figs. 9, 14-16. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 10-13. Challenger Sta. 122, S.E. of Pernambuco, Atlantic. (350 fathoms)

Referred to *Bigenerina* by Brady and made the genotype of a new genus *Cribrogoesella*, by Cushman in 1935 (Smith. Misc. Coll., Vol. 91, No. 21, p. 4).

Figures 17, 19-21.—*Pavonina flabelliformis* d'Orbigny.

Fig. 17. Challenger Sta. 260A, Honolulu, Pacific. (40 fathoms)

Figs. 19, 20. Tamatavé, Madagascar, Indian Ocean.

Hofker (Foraminifera Siboga Exped., Pt. III, 1951, p. 35) selected this as the genotype of *Valvopavonina*, but as it is already the type of *Pavonina* d'Orbigny (monotypic), *Valvopavonina* becomes an isotypic junior synonym of d'Orbigny's genus.

Figure 18.—*Pavonina atlantica* Cushman.

Challenger Sta. 24, West Indies. (390 fathoms)

Placed in *P. flabelliformis* d'Orbigny by Brady, and referred to *Pavonina atlantica* by Cushman (U.S.N.M., Proc., Vol. 67, Art. 25, 1922, p. 21).

Figures 22, 23.—*Spiroplectella earlandi* nom. nov.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Spiroplecta annectens* (Parker and Jones), which was designated the genotype of *Spiroplectinata* by Cushman (Foram., Class. and Econ. Use, 1st. ed., 1928, p. 235). This is a Cretaceous species and Earland (Discovery Repts., Vol. 10, Foram. Pt. III, 1934, p. 113) has shown that it differs generically and specifically from the Recent species figured by Brady. He transferred the latter to *Spiroplectella*, retaining the specific name of *annectens*. Loeblich and Tappan (personal communication) have pointed out that *annectens* should then be attributed to Earland, not Brady, and that to avoid confusion it is preferable to propose a new name. *Spiroplectella earlandi* nom. nov. is therefore proposed for this species.

Figure 24.—*Spiroplectammina* sp. nov.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Spiroplecta americana* Ehrenberg. Thalmann refers this to "*Spiroplectammina* sp. nov. aff. *Spiroplecta americana* Brady non Ehrenberg" (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 301).

Figures 25-27.—*Spiroplectammina biformis* (Parker and Jones).

Fig. 25. Challenger Sta. 285, South Pacific. (2375 fathoms)

Figs. 26, 27. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Spiroplecta* and made the genotype of a new genus, *Spiroplectammina*, by Cushman (C.C.L.F.R., Vol. III, 1927, p. 23).

EXPLANATION OF PLATE 46 (XLVI)

Figs 1-4, X 30; Fig. 5, X 25; Fig. 6, X 40; Figs. 7-10, X 20; Fig. 11, X 60; Fig. 12, X 50;

Fig. 13, X 20; Fig. 14, X 35; Fig. 15, X 20; Fig. 16, X 25; Figs. 17-19, X 40; Figs. 20, 21, X 70.

Figures 1-4.—*Karreriella bradyi* (Cushman).

Figs. 1, 2, 3. Porcupine Sta. 42, S.W. of Ireland, Atlantic. (862 fathoms)

Fig. 2b. Challenger Sta. 224, North Pacific. (1850 fathoms)

Fig. 4. Challenger Sta. 300, N. of Juan Fernandez, Chile. (1375 fathoms)

Referred by Brady to *Gaudryina pupoides* d'Orbigny and to *Gaudryina bradyi* by Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 67). Transferred to *Karreriella* by Cushman in 1937 (C.L.F.R. Spec. Publ. No. 8, p. 135). Figures 5, 6?—*Textularia philippinensis* Keijzer.

Fig. 6. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *Gaudryina pupoides* d'Orbigny var. *chilostoma* Reuss, and by Thalmann (Amer. Mid. Nat., Vol. 28, No. 2, 1942, p. 463) to *Karreriella chilostoma* (Reuss.) Keijzer (Leidse Geol. Med., Vol. 17, 1953, p. 271) examined similar material from Buton, Malaya, and found the species to be completely biserial. He named his species *Textularia philippinensis* and referred Brady's fig. 5 to his synonymy. Fig. 6 is doubtful. Figure 7.—*Dorothia scabra* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred to *Gaudryina* by Brady and transferred to *Dorothia* by Cushman in 1937 (C.L.F.R. Spec. Publ. No. 8, p. 98).

Figures 8-10.—*Karreriella novangliae* (Cushman).

Porcupine Sta. 28, N.W. of Ireland, N. Atlantic. (1215 fathoms)

Referred to *Gaudryina baccata* Schwager by Brady and to *G. baccata* var. *novangliae* by Cushman in 1922 (U.S.N.M. Bull. 104, Pt. 3, p. 76). In 1937 (C.L.F.R. Spec. Publ. No. 8, p. 136) Cushman transferred it to *Karreriella* and raised the variety to specific rank.

Figure 11.—?

Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Referred by Brady to *Gaudryina baccata* Schwager (see figs. 8-10, and note above). In view of the locality it seems improbable that this is the same species as that figured in figs. 8-10.

Figure 12.—*Dorothia exilis* Cushman.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Gaudryina filiformis* Berthelin, a Lower Cretaceous species. Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 70) referred to "*Gaudryina pseudofiliformis*, new name—*G. filiformis* H. B. Brady (not *G. filiformis* Berthelin) Rep. Voy. Challenger, Zoology, Vol. 9, 1884, p. 380, pl. 46, figs. 12a-c" and cited two Pacific records. In 1936 (C.L.F.R. Spec. Publ. No. 6, p. 30) he erected the species *Dorothia exilis*, with types from Challenger Sta. 24, cited the present figure of Brady, and noted that it was distinct from his earlier *G. pseudofiliformis*. Unfortunately Thalmann (Amer. Mid. Nat., Vol. 28, No. 2, 1942, p. 403) read Cushman's reference of 1911 as an indication that Brady's figure represented the type of *G. pseudofiliformis* sp. nov. (not nom. nov.), and that as *G. filiformis* Brady (not Berthelin) had already been renamed, *Dorothia exilis* becomes a *nomen deletum*. Loeblich and Tappan (personal communication) point out that the holotype of *G. pseudofiliformis* is Cush. Coll. 23758, from Albatross Sta. H-2923 (Pacific), and furthermore that Cushman himself pointed out the distinction between the form figured here and his earlier *G. pseudofiliformis*. *Dorothia exilis* is therefore valid.

Figure 13.—*Dorothia bradyana* Cushman.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Gaudryina subrotundata* Schwager and by Cushman to *Dorothia bradyana* (C.L.F.R., Spec. Publ. No. 6, 1936, p. 31).

Figures 14-16.—*Gaudryina* (*Pseudogaudryina*) sp. nov.

Fig. 14. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Fig. 15. Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Fig. 16. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Gaudryina rugosa* d'Orbigny, an Upper Cretaceous species from Europe. Brady's Pacific specimens are more triangular in the later chambers than *G. rugosa*, and in form tend to approach the Atlantic species *G. (Pseudogaudryina) altantica* (Bailey) but are somewhat more elongate and much coarser in texture. They may prove to be a variety of *G. collinsi* Cushman.

Figures 17-19.—*Karreriella* (*Karrerulina*) *apicularis* (Cushman).

Fig. 17. Challenger Sta. 218, North of Papua, Pacific. (1070 fathoms)

Figs. 18, 19. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Referred by Brady to *Gaudryina siphonella* Reuss. In 1911 Cushman (U.S.N.M. Bull. 71, Pt. 2, p. 69) referred Brady's figures to *Gaudryina apicularis* "non. nov." In 1937 (C.L.F.R. Spec. Publ. No. 8) he transferred this species to *Plectina* Marsson. Finlay (Trans. Proc. Roy. Soc. New Zealand, Vol. 69, Pt. 4, 1940, p. 450) made *apicularis* the type of his new subgenus *Karrerulina*, characterized by the terminal aperture.

Figures 20, 21.—*Chrysalidinella dimorpha* (Brady).

Fig. 20. Challenger Sta. 205A, Hong Kong, Pacific. (7 fathoms)

Fig. 21. Challenger Sta. 260A, Honolulu, Pacific. (40 fathoms)

Referred by Brady to *Chrysalidina* and made the genotype of *Chrysalidinella* by Schubert in 1907 (Neues Jahrb. f. Min., Pal., Vol. 25, p. 242).

EXPLANATION OF PLATE 47 (XLVII)

Figs. 1-3, X 70; Figs. 4, 6, X 35; Fig. 5, X 25; Fig. 7, X 120; Figs. 8, 9, 13, 14, X 20;
Figs. 10, 11, X 14; Fig. 12, no magnification; Figs. 15-17, X 60; Figs. 18, 21-24, X 14;
Figs. 19, 20, X 20.

Figure 1.—*Reussella simplex* (Cushman)?

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Verneuilina spinulosa* Reuss, a European Miocene species. This appears to agree well with Cushman's figures of *R. simplex* (*Trimosina simplex* Cushman, Jour. Washington Acad. Sci., Vol. 19, 1929, p. 158; *Reussella simplex*, C.C.L.F.R., Vol. 21, Pt. 2, 1945, p. 40) but since he makes no reference to Brady's figures, with which he was undoubtedly familiar, the identification has been queried.

Figures 2?, 3.—*Reussella aculeata* Cushman.

Challenger Sta. 217A Papua, Pacific. (37 fathoms)

Referred by Brady to *Verneuilina spinulosa* Reuss, and by Cushman to *Reussella aculeata* (C.C.L.F.R., Vol. 21, Pt. 2, 1945, p. 41). The (?) after fig. 2 is taken from Cushman.

Figures 4-7.—*Eggerella bradyi* (Cushman).

Figs. 4, 5. Challenger Sta. 296, South Pacific. (1825 fathoms)

Fig. 6. Challenger Sta. 23, West Indies. (450 fathoms)

Fig. 7. Challenger Sta. 296B, South Pacific. (1825 fathoms?)

Referred by Brady to *Verneuilina pygmaea* (Egger). Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 54) referred these figures to *Verneuilina bradyi* and in 1933 (C.C.L.F.R., Vol. 9, p. 33) transferred the species to *Eggerella*.

Figures 8-12.—*Eggerella propinqua* (Brady).

Figs. 8, 9, 12. Challenger Sta. 98, off Africa, Atlantic. (1750 fathoms)

Figs. 10, 11?. Challenger Sta. 246, North Pacific. (2050 fathoms)

Referred by Brady to *Verneuilina* and transferred by Cushman to *Eggerella* in 1937 (C.L.F.R. Spec. Publ. No. 8, p. 53).

Figures 13, 14.—*Eggerella affixa* (Cushman).

Challenger Sta. 78, East of the Azores, Atlantic. (1000 fathoms)

Referred by Brady to *Verneuilina propinqua* and by Cushman to *V. affixa* in 1911 (U.S.N.M. Bull. 71, Pt. 2, p. 56) and later transferred to *Eggerella* (C.L.F.R. Spec. Publ. No. 8, 1937, p. 54).

Figures 15-17.—*Eggerella scabra* (Williamson).

Fig. 15. In the Clyde, Scotland.

Figs. 16, 17. Challenger Sta. 354A, off Spain, E. Atlantic. (11 fathoms)

Referred by Brady to *Verneuilina polystropha* (Reuss) and to *V. scabra* by Cushman (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 55); later transferred by Cushman to *Eggerella* (C.L.F.R. Spec. Publ. No. 8, 1937, p. 50).

Figure 18.—*Gaudryina atlantica* (Bailey).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Verneuilina triquetra* (Munster). Brady's figure agrees very closely with specimens regarded as *Gaudryina* (*Pseudogaudryina*) *atlantica* (Bailey) from off the East Coast of the United States and with original material from Challenger Sta. 24.

Figures 19, 20.—*Gaudryina* (*Pseudogaudryina*) sp. nov.?

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Verneuilina triquetra* (Munster). No comparable species has been found in the literature.

Figures 21-24.—*Triplasia variabilis* (Brady 1884).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Verneuilina*. Franke, 1928 (Abh. preuss. geol. Landes. Berlin, n.s., No. 111, p. 166) referred this species to *Ammobaculites*. Bartenstein and Brand (Abhandl. Senckenb. naturf. Ges., No. 439, 1937, p. 185) and Loeblich and Tappan (Smiths. Misc. Coll., Vol. 117, No. 15, 1952, p. 48) have transferred the species to *Triplasia* Reuss. Thalmann (Amer. Midland Nat., Vol. 28, No. 2, 1942, p. 463) refers these figures to *Frankeina* and cites Finlay, 1939 (reference not seen) but as Loeblich and Tappan place *Frankeina* in the synonymy of *Triplasia* the latter genus has been used here. Majzon, 1948, also referred *variabilis* to *Frankeina* but suggested that one of Brady's figures (fig. 24) might belong to his new genus *Centenarina* (Földtani Közlöny, Vol. 78, 1948, p. 24). Loeblich and Tappan (l. c. supra, 1952, pp. 1, 6, 49) have suppressed *Centenarina* Majzon 1948 as a synonym of *Triplasia* Reuss 1854.

EXPLANATION OF PLATE 48 (XLVIII)

Figs. 1, 2, 5, 6, X 25; Figs. 3, 4, 7, 8, X 30; Figs. 9-12, X 15; Fig. 13, X 100; Figs. 14-16, X 18; Figs. 17, 18, X 30; Figs. 19-21, 25-31, X 40; Figs. 22-24, X 35; Figs. 32-37, X 20; Fig. 38, X 15.

Figures 1, 2, 5.—*Martinottiella bradyana* (Cushman).

Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Referred by Brady to *Clavulina communis* d'Orbigny and by Cushman (C.L.F.R. Spec. Publ. No. 6, 1936, p. 40) to *Listerella bradyana*. Thalmann (Amer. Midland Nat., Vol. 28, 1942, p. 457) has pointed out that *Listerella* Cushman 1933 is a primary homonym of *Listerella* Jahn 1906, and proposed the name *Schenckiella*. This species was transferred to *Martinottiella* by Cushman in 1947 (Cush. Lab. Foram. Res., Spec. Publ. 8A, p. 50).

Figures 3, 4, 6, 7, 8.—*Martinottiella communis* (d'Orbigny).

Fig. 3. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 6-8. Challenger Sta. 323, South Atlantic.

Referred by Brady to *Clavulina communis* d'Orbigny and by Cushman (C.C.L.F.R., Vol. 9, 1933, p. 37) to *Martinottiella*. In 1936 (C.L.F.R. Spec. Publ. No. 8, p. 148) Cushman placed *Martinottiella* in the synonymy of *Listerella* (now *Schenckiella*, see above), but Thalmann (Amer. Midland Nat., Vol. 28, 1942, p. 457) has pointed out that it should be regarded as valid, an opinion later accepted by Cushman and others. Notwithstanding the fact that *M. communis* is the genotype of *Martinottiella*, however, Thalmann has referred these figures to *Schenckiella communis* (Amer. Midland Nat., Vol. 28, 1942, p. 463) which has tended to increase the confusion.

Figures 9-13.—*Martinottiella nodulosa* (Cushman).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Clavulina communis* d'Orbigny and by Cushman (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 85) to *C. communis* var. *nodulosa*. In 1936 (Geol. Soc. Amer., Bull., Vol. 47, p. 428) Cushman transferred this form to *Listerella* and raised it to specific rank. As noted under figs. 1, 2, 5, *Listerella* is pre-occupied and *Schenckiella* was proposed to replace it. Cushman, however referred this species to *Martinottiella* in 1947 (Cush. Lab. Foram. Res., Spec. Publ. 8A, p. 50).

Figures 14-16.—*Pseudoclavulina serventyi* (Chapman and Parr).

Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Referred by Brady to *Clavulina parisiensis* d'Orbigny. The large size and coarse texture, as well as the general shape agree well with the original figure of Chapman and Parr (Jour. Roy. Soc. Western Australia, Vol. 21, 1935, p. 5, pl. i, fig. 7), but no reference is made to Brady.

Figures 17, 18.—*Clavulina multicamerata* Chapman.

Challenger Sta. 187A, Torres Strait, Pacific. (8 fathoms)

Referred by Brady to *Clavulina parisiensis* d'Orbigny. Brady's figures agree well with those of Chapman (Jour. Quekett Micr. Club, Ser. 2, Vol. 10, 1907, p. 127, pl. ix, fig. 5) and of Cushman (C.L.F.R. Spec. Publ. No. 8, 1937, p. 24, pl. 3, figs. 13-16) and show the valvular tooth in the aperture which mark the genus *Clavulina*. No reference is made to Brady's figures by either Chapman or Cushman.

Figures 19-21.—*Pseudoclavulina humilis* (Brady).

Challenger Sta. 209, Philippine Islands. (95-100 fathoms)

Referred by Brady to *Clavulina parisiensis* var. *humilis*, and to *Pseudoclavulina humilis* (Brady) by Cushman (C.L.F.R., Spec. Publ. No. 7, 1937, p. 116).

Figures 22-24.—*Clavulina pacifica* Cushman.

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *Clavulina angularis* d'Orbigny and by Cushman to *C. pacifica* (Carnegie Inst. Washington, Publ. No. 342, 1924, p. 22).

Figures 25-31.—*Clavulina difformis* Brady.

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *C. angularis* var. *difformis* and raised to specific rank by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 156).

Figures 32-38.—*Cylindroclavulina bradyi* (Cushman).

Figs. 32, 34-38. Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Fig. 33. Kandavu, Fiji, Pacific.

Referred by Brady to *Clavulina cylindrica* Hantken, and by Cushman to *Clavulina bradyi* nov. (U.S.N.M., Bull. 71, Pt. 2, 1911, p. 73). Placed in *Liebusella* by Cushman (C.L.F.R., Spec. Publ. No. 8, 1937, p. 169) and again in *Clavulina* by Mrs. D. K. Palmer in 1938 (Mem. Soc. Cub. Hist. Nat., Vol. 12, No. 4, p. 290). In 1952 it was made the genotype of *Cylindroclavulina* by Bermúdez and Key (Mem. Loc. Sci. Nat. La Salle, Venezuela, Vol. 12, No. 31, p. 76).

EXPLANATION OF PLATE 49 (XLIX)

Figs. 1-5, X 16; Fig. 6, X 30; Fig. 7, X 120; Figs. 8, 9, X 35; Figs. 10, 11, X 25; Fig. 12, X 80; Figs. 13, 15, X 50; Figs. 14, 16, X 40.

Figures 1, 2, 4-7.—*Tritaxilina caperata* (Brady).

Figs. 1, 2, 5, 6. Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Fig. 7. Challenger Sta. 174, Fiji, Pacific.

Referred to *Tritaxia* by Brady and to *Tritaxilina* by Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 71).

Figure 3.—*Tritaxilina atlantica* Cushman.

Challenger Sta. 23, West Indies. (450 fathoms)

Referred by Brady to *Tritaxia caperata* and by Cushman to *Tritaxilina atlantica* (as *T. caperata* var.) (U.S. N.M. Bull. 104, Pt. 3, 1922, p. 79). Raised to specific rank by Cushman in 1937 (C.L.F.R., Spec. Publ. No. 8, p. 158).

Figures 8-9.—*Clavulinoides* aff. *instar* Finlay (sp. nov.?).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Tritaxia tricarinata* (Reuss), a European Cretaceous species. Thalmann (Eclog. geol. Helvet., Vol. 26, No. 2, 1933, p. 252) gives *Clavulina tricarinata* (Reuss) but the figure shows no indication of a valvular tooth in the aperture and there *Clavulinoides* is indicated. The closest described species appears to be *C. instar* Finlay (Trans. Proc. Roy. Soc. New Zealand, Vol. 69, 1939, p. 94).

Figures 10, 11.—*Clavulinoides indiscretus* (Brady).

Fig. 10. Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Referred by Brady to *Tritaxia* and transferred to *Clavulinoides* by Cushman (C.L.F.R., Spec. Publ. No. 7, 1937, p. 135).

Figure 12.—*Angulogerina* (?) *lepida* (Brady).

Challenger Sta. 45, North Atlantic. (1240 fathoms)

Referred by Brady to *Tritaxia* and placed in *Angulogerina*? (or *Triplasia*?) by Thalmann (Amer. Midland Nat., Vol. 28, 1942, p. 464).

Figures 13, 14.—*Tritaxis fusca* (Williamson).

Fig. 13. Challenger Sta. VIII, off the Canaries, Atlantic. (620 fathoms)

Fig. 14. Challenger Sta. 166, off New Zealand, S. Pacific. (275 fathoms)

Referred by Brady to *Valvulina*. Cushman (Foram. Class. Econ. Use, 1st. ed., 1928, p. 171) designated *Rotalina fusca* Williamson the genotype of *Tritaxis* Schubert 1920, and placed that genus in the synonymy of *Trochammina* Parker and Jones 1860. Loeblich and Tappan (Smith. Misc. Coll., Vol. 128, No. 5, 1955, p. 19) have reinstated *Tritaxis* Schubert, with *fusca* as genotype, and they have pointed out that since *Trochammina siphonifera* Cushman 1943 is congeneric with *Tritaxis fusca*, *Trochammina* is a junior synonym of *Tritaxis* and must be suppressed.

Figures 15, 16.—*Tritaxis conica* (Parker and Jones).

Fig. 15. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Valvulina* but as the apertural characters appear to be those of *Tritaxis*, with no evidence of a valvular tooth, it is transferred here to that genus.

EXPLANATION OF PLATE 50 (L)

Figs. 1, 5, 6, 11, 12, X 60; Figs. 2-4, 8-10, 13, 14, X 50; Fig. 7, X 40; Fig. 15, X 45;
Figs. 16, 18, 20-24, X 80; Fig. 17, X 60; Fig. 19, X 70.

Figures 1-4.—*Bulimina gibba* Fornasini.

Figs. 1, 2. Porcupine Sta. 11, West of Ireland, Atlantic. (1630 fathoms)

Figs. 3, 4. Porcupine Sta. 10, West of Ireland, Atlantic.

Referred by Brady to *B. elegans* d'Orbigny. Cushman and Parker, in 1940 (C.C.L.F.R., Vol. 16, Pt. 1, p. 14), placed *B. fusiformis* Fornasini, *B. elegans* of Brady, *non* d'Orbigny, *B. fusiformis* var. *baccata* Fornasini and *B. gibba* Fornasini in the synonymy of *B. baccata* Fornasini. Thalmann (Amer. Midland Nat., Vol. 28, 1942, p. 464) pointed out that the name *baccata* was preoccupied by Yokoyama 1890, and proposed the name *B. parkeri* for these figures. *B. parkeri* however had already been used by Terquem and Terquem 1886, so Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 125) have proposed reverting to the earliest valid name, *B. gibba* Fornasini. Fornasini (Mem. R. Acc. Sci. Ist. Bologna, Ser. V, Vol. 9, 1901, p. 377) referred figures 3, 4 of Brady to *Bulimina fusiformis* Williamson (megalospheric form) but since this species is now regarded as a *Virgulina* his views are not followed.

Figures 5, 6.—*Bulimina exilis* Brady.

Porcupine Sta. 20, N.W. of Ireland, N. Atlantic. (1443 fathoms)

Referred by Brady to *B. elegans* var. *exilis* nov.

Figures 7-10.—*Globobulimina pacifica* Cushman?

Figs. 7, 8. Challenger Sta. 75, off the Azores, Atlantic. (450 fathoms)

Fig. 9. Challenger Sta. 168, off New Zealand. (1100 fathoms)

Fig. 10. Challenger Sta. 192, Ki Islands, C. Pacific. (129 fathoms)

Referred by Brady to *Bulimina pyrula* d'Orbigny and by Galloway and Wissler (Jour. Pal., Vol. 1, 1927, p. 74) to *Globobulimina pacifica* Cushman. Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 337) also gives this determination. Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 134) refer these figures doubtfully to *G. glabra* Cushman and Parker, an Italian Pliocene species. This identification is questioned, but, as pointed out by Cushman and Parker, Brady's figures may represent more than one species.

Figures 11, 12.—*Bulimina pyrula* d'Orbigny var. *spinescens* Brady.

Challenger Sta. 191A, Ki Islands, C. Pacific. (580 fathoms)

Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 249) makes this the genotype of *Praeglobobulimina*, and should this genus prove to be valid that name will stand, as *Praeglobobulimina spinescens* (Brady).

Figure 13.—*Bulimina notovata* Chapman.

Challenger Sta. 168, East of New Zealand. (1100 fathoms)

Referred by Brady to *B. ovata* d'Orbigny. Galloway and Heminway (N.Y. Acad. Sci., Sci. Surv. Porto Rico, Vol. 3, No. 4, 1941, p. 423) refer Brady's figures to *Bulimina socialis* Bornemann, but preference is given here to Chapman's *B. notovata* (Trans. Roy. Soc. South Australia, Vol. 65, 1941, p. 166).

Figure 14.—*Bulimina pupoides* d'Orbigny?

Challenger Sta. 306, West of Patagonia, E. Pacific (345 fathoms)

Referred by Brady to *B. affinis* d'Orbigny but regarded as probably *B. pupoides* (microspheric form) by Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 105). If correct it should perhaps be termed *Proglobobulimina pupoides* (d'Orbigny) (Hofker, Siboga Exped., Foraminifera Pt. III, 1951, p. 254).

Figure 15.—*Bulimina pupoides* d'Orbigny.

Challenger Sta. 306, West of Patagonia, E. Pacific. (345 fathoms)

Hofker (Siboga Exped., Foraminifera Part III, 1951, p. 254) places this species in *Proglobobulimina*, and should the validity of this genus be established that name will stand.

Figure 16.—*Robertina subcylindrica* (Brady).

Challenger Sta. 120, off Pernambuco, W. Atlantic. (675 fathoms)

Referred by Brady to *Bulimina* and transferred to *Robertina* by Cushman and Parker (C.C.L.F.R., Vol. 12, 1936, p. 95).

Fig. 17.—*Robertina tasmanica* Parr?

Challenger Sta. 174B, Fiji, Pacific. (610 fathoms)

Referred by Brady to *Bulimina subteres* Brady 1881. Cushman and Parker (U.S.G.S. Prof. Paper 210 D, 1947, p. 76) have pointed out that neither of Brady's figs. 17 or 18 of the present plate are the same as the *Bulimina subteres* originally described in 1881, which is a North Atlantic species. Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Reports, Ser. B, Vol. 5, 1950, Pt. 6, p. 369) notes that his *R. tasmanica* may be the same as the present fig. 17 of *B. subteres*.

Figure 18. *Robertinoides bradyi* Cushman and Parker.*

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Bulimina subteres* Brady 1881 (see above) and by Cushman and Parker (C.C.L.F.R., Vol. 12, 1936, p. 99) to *Robertina bradyi*.

*NOTE: J. Hofker (Spolia Zool. Mus. Hauniensis, Vol. 15, 1956, p. 128) has placed *Robertina bradyi* Cushman and Parker in *Robertinoides* Höglund 1947. Though he does not refer to Brady's figure his conclusion was based on a careful study of West Indian material and is regarded as correct.

EXPLANATION OF PLATE 50 (L), CONTINUED

Figure 19.—*Robertina oceanica* Cushman and Parker.

Challenger Sta. 191A, Ki Islands, C. Pacific. (580 fathoms)

Referred by Brady to *Bulimina declivis* Reuss and by Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 75) to *Robertina oceanica*.

Figures 20-22.—*Buliminella elegantissima* (d'Orbigny).

Challenger Sta. 315A, Falkland Islands, S. Atlantic. (6 fathoms)

Referred by Brady to *Bulimina* and transferred to *Buliminella* by Cushman in 1911 (U.S.N.M. Bull. 71, Pt. 2, p. 89).

Figures 23, 24.—*Buliminella basicostata* Parr.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Bulimina elegantissima* var. *seminuda* Terquem and to *Buliminella basicostata* by Parr (B.A.N.Z. Antarctic Research Exped., 1929-1931, Vol. 5, Pt. 6, 1950, p. 336). Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 61) refers fig. 23 tentatively to *Buliminella madagascariensis* (d'Orbigny) and fig. 24, also tentatively to *Buliminella semi-nuda* (Terquem)?

EXPLANATION OF PLATE 51 (LI)

Fig. 1, X 70; Figs. 2-6, 14-19, X 80; Figs. 7-13, 21, 23, X 60; Fig. 20, X 40; Fig. 22, X 70.

Figures 1, 2.—*Bulimina elongata* d'Orbigny var. *subulata* Cushman and Parker.

Porcupine Sta. 23, N.W. of Ireland, N. Atlantic. (630 fathoms)

Brady referred fig. 1 to *B. elongata* d'Orbigny and fig. 2 to an intermediate form between *elongata* and *B. ovata* d'Orbigny. Fornasini (Mem. R. Acc. Sci. Ist. Bologna, Ser. V, Vol. 9, p. 377) put these figures in synonymy with *B. elongata* var. *ariminensis* d'Orbigny. Clodius next referred them to *B. elongata* var. *cuspidata* (Ver. Freunde Naturg. Mecklenburg, Arch., Jahrg. 75, 1922, p. 101) from the U. Miocene of Germany. Cushman (U.S.N.M. Bull. 161, Pt. 3, 1942, p. 11) regards figs. 1, 2 as *B. elongata* var. *subulata* Cushman and Parker 1937, from the Miocene of the Vienna Basin. Since varietal names must be regarded as homonyms (see Thalmann, Amer. Midland Nat., Vol. 28, 1942, p. 459) then *B. elongata* var. *cuspidata* Clodius 1922 becomes a homonym of *B. cuspidata* Franzenau 1894 and the correct name is *B. elongata* var. *subulata* Cushman and Parker.

Figures 3-5.—*Bulimina marginata* d'Orbigny.

Porcupine Sta. 11, West of Ireland, N. Atlantic. (1630 fathoms)

Figure 6.—*Bulimina subornata* Brady.

Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Figures 7-9.—*Bulimina aculeata* d'Orbigny.

Challenger Sta. 191A, Ki Islands, C. Pacific. (580 fathoms)

Figures 10, 12.—*Bulimina striata* d'Orbigny var. *mexicana* Cushman?

Challenger Sta. 191A, Ki Islands, C. Pacific. (580 fathoms)

Referred by Brady to *B. inflata* Seguenza. Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 119) note that Brady's figs. 10-13 represent a form similar to *B. striata* var. *mexicana* but distinguished by somewhat less sharp spines (see also note below).

Figures 11, 13.—*Bulimina costata* d'Orbigny?

Fig. 11. Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Fig. 13. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *B. inflata* Seguenza and to *B. costata* d'Orbigny by Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 115). There appear to be marked differences between these figures and those of *B. costata* d'Orbigny and the identity is queried. Brady's form would appear to be more closely allied to *B. striata* d'Orbigny.

Figures 14, 15.—*Bulimina rostrata* Brady.

Challenger Sta. 191A, Ki Islands, C. Pacific. (580 fathoms)

Figures 16, 17.—*Buliminoides williamsonianus* (Brady).

Fig. 16. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Fig. 17. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Bulimina* and made the type of *Buliminoides* by Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 90).

Figures 18, 19.—*Bulimina* sp. nov.

Challenger Sta. 192, Ki Islands, C. Pacific. (129 fathoms)

Referred to *B. buchiana* d'Orbigny by Brady. This species differs from *B. buchiana* in possessing fewer costae which are continuous over the sutures, and appears to be new.

Figure 20.—*Pleurostomella brevis* Schwager.

Challenger Sta. 192, Ki Islands, C. Pacific. (129 fathoms)

Figure 21.—*Pleurostomella rapa* Gümbel var. *recens* Dervieux.

Challenger Sta. 192, Ki Islands, C. Pacific. (129 fathoms)

EXPLANATION OF PLATE 51 (LI), CONTINUED

Referred to *P. rapa* Gümbel by Brady and to *P. rapa* var. *recens* by Dervieux (Boll. Soc. Geol. Ital., Vol. 18, 1899, p. 76).

Figure 22.—*Pleurostomella acuminata* Cushman.

Challenger Sta. 192, Ki Islands, C. Pacific. (129 fathoms)

Referred by Brady to *P. alternans* Schwager and by Cushman (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 50) to *P. acuminata*, recorded by Cushman from the Caribbean in 821 fathoms.

Figure 23.—*Pleurostomella* sp. nov.

Challenger Sta. 192, Ki Islands, C. Pacific. (129 fathoms)

Referred by Brady to *P. alternans* Schwager. Search through the available literature has failed to reveal any species which compares closely with Brady's figures 23a, b, and they are believed to represent a new species.

EXPLANATION OF PLATE 52 (LII)

Figs. 1-3, 10, 11, 20-21, 23-25, 31-34, X 70; Figs. 4, 5, 29, 30, X 80; Figs. 6, 14-17, X 40; Figs. 7-9, 12, 13, 22, 26-28, X 50; Figs. 18, 19, X 60.

Figures 1, 3.—*Virgulina davis* Chapman and Parr.

Challenger Sta. 276, South Pacific. (2350 fathoms)

Referred by Brady to *V. schreibersiana* Czjzek and to *V. davis* by Chapman and Parr (Australasian Antarctic Exped. 1911-1914, Sc. Rep., Ser. C, Vol. 1, No. 2, 1937, p. 88).

Figure 2.—*Cassidella pacifica* Hofker?

Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *V. schreibersiana* Czjzek. This figure is very close to *V. complanata* Egger, especially as figured by Cushman (U.S.N.M. Bull. 161, Pt. 3, 1942, and in C.L.F.R., Spec. Publ. No. 9, 1937, pl. 4, fig. 15). Hofker (Siboga Exp. Foraminifera Pt. 3, 1951, p. 273) refers this figure of Cushman to *Cassidella pacifica* but does not refer to Brady. He also refers Egger's *complanata* to this genus but his figures are totally different from those of Egger and it may be that Brady's figure is *Cassidella complanata* (Egger). Cushman (l. c. supra, 1937, p. 14) notes that Brady's fig. 2 is "probably to be referred to *Bulimina*" but does not amplify this statement.

Figures 4, 5.—*Virgulina pauciloculata* Brady.

Challenger Sta. 217A, Papua, Pacific. (37 fathoms)

Figures 6.—*Virgulina texturata* Brady.

Challenger Sta. 296, South Pacific. (1825 fathoms)

Figures 7, 8.—*Cassidulinoides* sp.?

Challenger Sta. 279C, off Tahiti. (620 fathoms)

Referred by Brady to *Virgulina subsquamosa* Egger, and tentatively by Cushman (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 115) to *V. bradyi*, a Western Atlantic species. These figures appear to represent *Cassidulinoides*.

Figures 9.—*Virgulina bradyi* Cushman.

Challenger Sta. 279C, off Tahiti. (620 fathoms)

Referred by Brady to *V. subsquamosa* Egger and by Cushman (l. c. supra, 1922, p. 115) to *V. bradyi*, Brady's figures differ from those of Egger.

Figures 10, 11.—*Virgulina rotundata* Parr.

Challenger Sta. 279C, off Tahiti. (620 fathoms)

Referred by Brady to *V. subsquamosa* Egger and by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, Pt. 6, 1950, p. 337) to *V. rotundata* Hofker (Siboga Exped., Foraminifera Pt. 3, 1951, p. 304, 305) figures specimens rather close to Brady's figures as *Cassidulinoides subsquamosa* (Egger) but does not refer to Cushman (l. c. supra, 1937) or to Parr.

Figures 12, 13.—*Pleurostomellina* (?) sp. nov.

Fig. 12. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Fig. 13. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *Pleurostomella subnodosa* Reuss, genotype of *Pleurostomella* from the U. Cretaceous of Europe. The predominantly uniserial nature of the test suggests *Pleurostomellina* but the aperture appears different. It appears to be a new species.

Figures 14-17.—*Virgulina subdepressa* Brady.

Challenger Sta. 296, South Pacific. (1825 fathoms)

Figures 18-19.—*Bolivina earlandi* Parr.

Challenger Sta. 151, Heard Island, S. Pacific. (75 fathoms)

Referred by Brady to *B. punctata* d'Orbigny. The figures show no sign of the carinate periphery of *B. punctata* and probably represent *B. earlandi* Parr (B.A.N.Z. Antarctic Res. Exped., Ser. B, Vol. 5, No. 6, 1950, p. 339).

Figures 20, 21.—*Bolivina spathulata* (Williamson).

Porcupine Sta. 18, West of Ireland, E. Atlantic. (183 fathoms)

Referred to *B. dilatata* Reuss by Brady and to *B. spathulata* (Williamson) (*Textularia variabilis* Williamson var. *spathulata*, 1858) by Cushman (C.L.F.R., Spec. Publ. No. 9, 1937, p. 162).

Figure 22.—*Loxostomum porrectum* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

EXPLANATION OF PLATE 52 (LII), CONTINUED

Referred to *Bolivina* by Brady and transferred to *Loxostomum* by Cushman (C.L.F.R., Spec. Publ. No. 9, 1937, p. 190).

Figure 23.—*Bolivina* sp. nov., Thalmann 1933.

Challenger Sta. 174B, Fiji, Pacific. (610 fathoms)

Referred by Brady, with figs. 24, 25, to *B. textularioides* Reuss and by Cushman to *B. subspinescens* Cushman 1922 (C.L.F.R., Spec. Publ. No. 9, 1937, p. 157). Parr (1950) follows Cushman but queries fig. 23 being the same as figs. 24, 25. Thalmann (Eclog. geol. Helvet., Vol. 26, No. 2, 1933, p. 252) says of fig. 23: "*Bolivina* n. sp. aff. *textularioides* Brady (non Reuss) (n. sup. aff. Thalmann)" but in 1942 (Amer. Midland Nat., Vol. 28, p. 464) refers this fig. also to *B. subspinescens* Cushman. (See below.)

Figures 24, 25.—*Bolivina subspinescens* Cushman.

Porcupine Sta. 18, West of Ireland, E. Atlantic. (183 fathoms)

Referred by Brady to *B. textularioides* Reuss. Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 46) proposed *B. spinescens* "nom. nov." for Brady's figures 24, 25, but figured and described a different form, from the North Pacific; his later figures (C.L.F.R., Spec. Publ. No. 9, 1937, pl. 18 figs. 17-19) show the distinction even more clearly. In 1922 Cushman described a new species, *B. subspinescens* from the Atlantic, off the East Coast of the U.S. (U.S.N.M. Bull. 104, Pt. 3, p. 48) with no reference to Brady's figures. Later (C.L.F.R. Spec. Publ. No. 9, 1937, p. 157) he referred Brady's figures 23-25 to *B. subspinescens* with no mention of his earlier *B. spinescens*. His figures and localities leave no doubt that this is the species figured by Brady, and Parr has since referred Brady's figures to *B. subspinescens* Cushman. Loeblich and Tappan (personal communication) have pointed out that Cushman should have described *B. spinescens* as sp. nov. not "new name", and that the type of this species (Cushman Coll. No. 17080, from Albatross Sta. D 2192) is from the Pacific. The Atlantic form is therefore recorded here as *B. subspinescens* Cushman.

Figures 26-28.—*Loxostomum limbatum* (Brady).

Fig. 26. Challenger Sta. 260A, Honolulu reefs, Pacific. (40 fathoms)

Fig. 27. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 28. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Bolivina* and transferred by Cushman to *Loxostomum*.

Figure 29.—*Bolivina subtenuis* Cushman.

Challenger Sta. 174A, Fiji, Pacific. (255 fathoms)

Referred by Brady to *B. tenuis* Brady, a homonym of *B. tenuis* Marsson 1878, and named *B. subtenuis* by Cushman (C.L.F.R., Spec. Publ. No. 6, 1936, p. 57).

Figure 30.—*Bolivina nitida* Brady.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figures 31, 32.—*Sigmavirgulina tortuosa* Brady.*

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred to *Bolivina* by Brady.

Figures 33, 34.—*Sigmavirgulina* (?) *tortuosa* Brady var. *atlantica* (Cushman).

Challenger Sta. 352, Cape Verde Islands, Atlantic. (11 fathoms?)

Referred by Brady to *B. tortuosa* and by Cushman to *B. tortuosa* var. *atlantica* (C.L.F.R., Spec. Publ. No. 6, 1936, p. 57). This is probably a *Sigmavirgulina*.

*NOTE: Loeblich and Tappan regard *tortuosa* Brady as generically distinct from *Bolivina* and propose *Sigmavirgulina* with *tortuosa* as genotype (U.S.N.M. Bull. 215, 1957, p. 227). *B. tortuosa* var. *atlantica* Cushman probably belongs to this new genus also (Loeblich and Tappan, personal communication).

EXPLANATION OF PLATE 53 (LIII)

Figs. 1, 2, 10, 11, 24, 25, 28, 29, X 50; Figs. 3-9, 12-15, 18-21, 26, 27, 32, 33, X 60;

Figs. 16, 17, X 40; Figs. 22, 23, X 80; Figs. 30-31, X 70.

Figure 1.—*Bolivina bradyi* Asano.

Challenger Sta. 305, West of Patagonia, E. Pacific. (120 fathoms)

Referred by Brady to *B. beyrichi* Reuss and by Asano (Jour. Geol. Soc. Japan, Vol. 45, 1938, p. 603) to *B. bradyi*.

Figures 2-4.—*Bolivina alata* Seguenza.

Fig. 2. Challenger Sta. 191, Arrou Islands, N. Pacific. (800 fathoms)

Fig. 3. Challenger Sta. 209, Philippines, Pacific. (95-100 fathoms)

Referred by Brady to *B. beyrichi* Reuss var. *alata* Seguenza.

Figures 5, 6.—*Bolivina pygmaea* Brady.

Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Figures 7-9.—*Bolivina robusta* Brady.

Fig. 7. Challenger Sta. 191A, Ki Islands, C. Pacific. (580 fathoms)

Figs. 8-9. Challenger Sta. 174B, Fiji, Pacific. (610 fathoms)

EXPLANATION OF PLATE 53 (LIII), CONTINUED

Figures 10, 11.—*Bolivina subaenariensis* Cushman var.

Fig. 10b. Porcupine Sta. 17, West of Ireland, N. Atlantic. (1230 fathoms)

Figs. 10a, 11. Porcupine Sta. 11, West of Ireland, N. Atlantic. (1630 fathoms)

Referred by Brady to *B. aenariensis* (Costa) and by Cushman (C.L.F.R. Spec. Publ. No. 9, 1937, p. 156) to *B. subaenariensis* Cushman var.

Figures 12, 13.—*Bolivina decussata* Brady.

Challenger Sta. 300, North of Juan Fernandez, E. Pacific. (1375 fathoms)

Figures 14, 15.—*Loxostomum* sp. nov.

Fig. 14. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Fig. 15. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *Bolivina nobilis* Hantken. This is regarded as quite distinct from Hantken's species from the European Eocene and belonging to the genus *Loxostomum* rather than to *Bolivina*. As far as can be ascertained it appears to be undescribed.

Figures 16-18.—*Bolivina hantkeniana* Brady.

Fig. 16. Challenger Sta. 279A, off Tahiti, Pacific. (420 fathoms)

Fig. 17. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Figures 19-21.—*Loxostomum karrerianum* (Brady).

Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Referred by Brady to *Bolivina* and by Cushman (C.L.F.R., Spec. Publ. No. 9, 1937, p. 184) to *Loxostoma* (*Loxostomum*).

Figures 22, 23.—*Loxostomum lobatum* (Brady).

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Bolivina* and by Cushman (l. c. supra, 1937, p. 188) to *Loxostomum*.

Figures 24, 25.—*Bolivina schwageriana* Brady.

Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Figures 26, 27.—*Bolivina semicostata* Cushman.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Bolivina costata* d'Orbigny and by Cushman (U.S.N.M. Bull. 71, Pt. 2, 1911, p. 43) to *B. semicostata* new name.

Figures 28, 29.—*Loxostomum amygdalaeformis* (Brady).

Challenger Sta. 209, Philippines, N. Pacific. (95-100 fathoms)

Referred by Brady to *Bolivina* and transferred by Cushman (C.L.F.R. Spec. Publ. No. 9, 1937, p. 183) to *Loxostomum*.

Figures 30, 31.—*Bolivina subreticulata* Parr.

Challenger Sta. 177, New Hebrides, S. Pacific. (125 fathoms)

Referred by Brady to *B. reticulata* Hantken and by Parr (Proc. Roy. Soc. Victoria, n.s., Vol. 44, 1932, p. 12) to *B. subreticulata* nov.

Figures 32, 33.—*Bolivinita subangularis* (Brady).

Challenger Sta. 209, Philippines, N. Pacific. (95-100 fathoms)

Referred by Brady to *Bolivina* and transferred to *Bolivinita* by Thalmann (Eclog. geol. Helvet., Vol. 30, 1937, No. 2, p. 341)

EXPLANATION OF PLATE 54 (LIV)

Figs. 1-3, 5-16, X 75; Figs. 4, 17, 18, X 60.

Figure 1.—*Cassidulina teretis* Tappan.

Porcupine Sta. 11, West of Ireland, North Atlantic. (1630 fathoms)

Referred by Brady to *C. laevigata* d'Orbigny, and by Loeblich and Tappan (Smith. Misc. Coll., Vol. 121, No. 7, 1953, p. 121) to *C. teretis* Tappan 1951. They also refer figures 2 and 3 to this species but the smaller size and marked keel appears to differentiate these.

Figures 2, 3.—*Cassidulina carinata* Silvestri?

Fig. 2. Challenger Sta. 167, New Zealand. (150 fathoms)

Fig. 3. Porcupine Sta. 11, N. Atlantic. (1630 fathoms)

Referred by Brady to *C. laevigata* d'Orbigny. Fig. 3 was referred by Phleger, Parker and Peirson (Swedish Deep-Sea Exped., 1947-48, Vol. 7, 1954, p. 44) to *C. carinata* Silvestri. Both figures 2 and 3, however, show a similar keeled development and small, compressed test. The identity with *carinata* Silvestri is queried and it is thought that Brady's specimens should be compared with *C. laevigata* var. *carinata* Cushman (i.e. *Cassidulina neocarinata* Thalmann).

Figures 4, 5.—*Cassidulina crassa* d'Orbigny.

Fig. 4. Challenger Sta. 151, off Heard Island, S. Pacific. (75 fathoms)

Fig. 5. Porcupine Sta. 11, West of Ireland, N. Atlantic. (1630 fathoms)

Cushman (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 124) and Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2,

ASSIDULINA

EXPLANATION OF PLATE 54 (LIV), CONTINUED

1932, p. 302) suggest that fig. 4 is *C. oblonga* Reuss, but Heron-Allen and Earland, Wiesner and others retain both figures 4 and 5 in *Cassidulina crassa* and Marks (Contr. Cush. Found. Foram. Res., Vol. 2, Pt. 2, 1951, p. 68) places *C. oblonga* in the synonymy of *C. crassa*.

Figures 6-9.—*Cassidulinoides bradyi* (Norman).

Porcupine Sta. 35, South of Ireland, Atlantic.

Placed by Brady in *Cassidulina* and transferred to *Cassidulinoides* by Cushman (Florida Geol. Surv., Bull. 4, 1930, p. 58).

Figure 10.—*Cassidulinoides orientale* (Cushman).

Challenger Sta. 305, West of Patagonia, E. Pacific. (120 fathoms)

Referred by Brady to *Cassidulina bradyi* Norman, and to *C. orientale* by Cushman (C.C.L.F.R., Vol. 1, 1925, p. 37). Transferred to *Cassidulinoides*.

Figures 11-16.—*Cassidulinoides parkerianus* (Brady).

Figs. 11, 12. Challenger Sta. 308, West of Patagonia, E. Pacific. (175 fathoms)

Figs. 13, 15. Challenger Sta. 305, West Coast of Patagonia. (120 fathoms)

Fig. 14. Challenger Sta. 304, Gulf of Penas, Patagonia, E. Pacific. (45 fathoms)

Fig. 16. Challenger Sta. 306, Gulf of Penas, Patagonia, E. Pacific. (345 fathoms)

Referred by Brady to *Cassidulina* and by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 302) to *Cassidulinoides*.

Figure 17.—*Cassidulina subglobosa* Brady.

Challenger Sta. 120, off Pernambuco, Atlantic Ocean. (675 fathoms)

Figure 18.—*Ceratobulimina pacifica* Cushman and Harris.

Challenger Sta. 191A, Ki Islands, N. Pacific. (580 fathoms)

Referred by Brady to *Bulimina contraria* Reuss and by Chapman and Parr (Sci. Rep. Australasian Antarctic Exped. 1911-1914, Ser. C, Vol. I, Pt. 2, 1937, p. 80) to *Ceratobulimina pacifica* Cushman and Harris.

EXPLANATION OF PLATE 55 (LV)

Figs. 1, 3-5, X 75; Figs. 2, 6, 7-11, 24-25, X 60; Figs. 12-20, 23, X 50; Figs. 21, 22, X 70; Fig. 26, X 100.

Figure 1.—*Ehrenbergina pupa* (d'Orbigny).

Challenger Sta. 75, off the Azores, Atlantic. (450 fathoms)

Figures 2, 3, ?5.—*Ehrenbergina trigona* Goës.

Fig. 2. Challenger Sta. 296, S.W. of Juan Fernandez, Pacific. (1825 fathoms)

Fig. 3. Challenger Sta. 283, South Pacific. (2075 fathoms)

Fig. 5. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *E. serrata* Reuss and by Goës (Bull. Mus. Comp. Zool., Harvard, Vol. 29, 1896, p. 49) to *E. serrata* var. *trigona* Goës, including also Brady's figures 4, 6 and 7. Cushman (U.S.N.M., Proc., Vol. 70, Art. 16, 1927, p. 5) referred figs. 2, 3, ?5 to *E. bradyi* Cushman, a species which in 1922 he had referred to Brady's figures 6 and 7. The question is discussed in full by Phleger, Parker and Peirson in Repts. Swedish Deep-Sea Exped. 1947-48, Vol. 7, 1954, p. 46.

Figures 4?, 6, 7.—*Ehrenbergina pacifica* Cushman.

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *E. serrata* Reuss, by Goës to *E. trigona* (see above), and by Cushman (U.S.N.M. Bull. 104, Pt. 3, 1922, p. 134) to *E. bradyi*. Later, Cushman (Proc. U.S.N.M., Vol. 70, Art. 16, 1927, p. 5) stated that this was an error and referred figs. 4?, 6 and 7 to *E. pacifica*, restricting figs. 2, 3, and 5? to *E. bradyi*. As noted above *E. bradyi* is regarded as a synonym of *E. trigona* Goës.

Figures 8-11.—*Ehrenbergina hystrix* Brady.

Challenger Sta. 280, South Pacific. (1940 fathoms)

Figures 12-14, 17, 18.—*Chilostomella oolina* Schwager.

Figs. 12, 14, 17. Challenger Sta. 191A, Ki Islands, C. Pacific. (580 fathoms)

Fig. 13. Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Fig. 18. Challenger Sta. 209, Philippines, N. Pacific. (95-100 fathoms)

Referred by Brady to *C. ovoidea* Reuss and to *C. oolina* Schwager by Thalmann (Eclog. geol. Helv., Vol. 26, No. 2, 1933, p. 252).

Figures 15, 16, 19-23.—*Chilostomella ovoidea* Reuss.

Figs. 15, 16, 20. Challenger Sta. 33, off Bermuda, W. Atlantic. (435 fathoms)

Figs. 19, 23. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Figs. 21, 22. Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Figures 24-26.—*Allomorphina pacifica* Hofker.

Fig. 24. Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Figs. 25, 26. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *A. trigona* Reuss, and by Hofker (Siboga Expedition, Foraminifera Pt. 3, 1951, p. 139) to *A. pacifica*.

LAGENIDAE (PLATES 56-61, LVI-LXI)

Brady, Sidebottom (Lagenae of the Pacific), Cushman (Monographs of the North Pacific, Atlantic and Philippine Foraminifera), Heron-Allen and Earland (Discovery Reports, Foraminifera), Buchner (Die Lagenen des Golfes von Neapel, 1940) and Matthes (Die Lagenen des deutschen Tertiärs, 1939) all make use of the genus *Lagena* only, including under this heading *Entosolenia*, *Fissurina*, *Ellipsolagena*, *Oolina*, etc. This tends to overload the genus, and render specific identification a rather tedious process. This was recognized by W. J. Parr and in 1945 he published his paper, "The Lagenid Foraminifera and Their Relationships" (Proc. Roy. Soc. Victoria, N.S., Vol. 68, Pts. I-II, published 1947, pp. 116-130, pls. vi-vii).

Parr had access to a very large amount of comparative material and great experience with both recent and fossil foraminifera. He proposed the following classification:

LAGENA Walker and Boys 1784 (with apertural neck and no entosolenian tube).

Genotype: *L. sulcata* Walker and Jacob 1798.

OOLINA d'Orbigny 1839 (with entosolenian tube, with or without an apertural neck and circular in cross-section. *Entosolenia* in synonymy).

Genotype: *Oolina laevigata* d'Orbigny 1839.

FISSURINA Reuss 1850 (with entosolenian tube, with or without an apertural neck and compressed in cross-section).

Genotype: *F. laevigata* Reuss 1850.

PARAFISSURINA Parr, nov. (with entosolenian tube and with a subterminal aperture).

Genotype: *Lagena ventricosa* A. Silvestri 1904.

Parr gives an admirable summary of the history of Lagenid nomenclature and his classification is regarded as an eminently practical one. As far as possible it has been adopted in the notes to the figures on plates LVI-LXI.

EXPLANATION OF PLATE 56 (LVI)

Figs. 1-3, X 60-75; Figs. 4-18, 30-32, X 75; Figs. 19-29, X 60; Figs. 33-35, X 75; Fig. 36, X 50.

Figures 1-3.—*Oolina globosa* (Montagu).

Fig. 1. Challenger Sta. 224, North Pacific. (1850 fathoms)

Fig. 2. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 3. Challenger Sta. 300, North Pacific. (1375 fathoms)

Referred by Brady to *Lagena* and by Parr (B.A.N.Z. Antarctic Research Exped., Repts., Ser. B, Vol. 5, Pt. 6, 1950, p. 302) to *Oolina*.

Figure 4.—*Oolina felsinea* (Fornasini).

Challenger Sta. 276, South Pacific. (2350 fathoms)

Referred by Brady to *Lagena apiculata* (Reuss). The entosolenian tube will place this in *Oolina* according to Parr 1947. Fornasini (1894, privately printed note) referred this figure to *Lagena felsinea*.

Figure 5.—*Oolina ovum* (Ehrenberg).

Challenger Sta. 241, North Pacific. (2300 fathoms)

Referred by Brady to *Lagena*.

Figure 6.—*Oolina botelliformis* (Brady).

Challenger Sta. 352A, Cape Verde Islands. (11 fathoms)

Referred by Brady to *Lagena*.

Figures 7-9.—*Lagena laevis* (Montagu).

Figs. 7, 8. Challenger Sta. 315A, Falkland Islands, S. Atlantic. (6 fathoms)

Fig. 9. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figures 10, 11.—*Lagena hispidula* Cushman.

Fig. 10. Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Fig. 11. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *L. laevis* (Montagu) and by Cushman to *L. laevis* var. *nebulosa* (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 29). Cushman also referred figs. 12 and ?13, ?14 to this variety (see below) but in 1913 (U.S.N.M. Bull. 71, Pt. 3, p. 14) had already referred figs. 10, 11 to *L. hispidula*. Buchner (Nova Acta Leopoldina, n.f., Vol. 9, No. 62, 1940, p. 421) refers figs. 10-12, not 13, 14 to *L. nebulosa* Cushman with no reference to *L. hispidula*. *L. nebulosa* is restricted here to fig. 12. Matthes (1939) referred fig. 10 and ?11 to *L. hispidula* Reuss.

Figure 12.—*Lagena nebulosa* Cushman.

Challenger Sta. 279C, Tahiti, Pacific. (620 fathoms)

Referred by Brady to *L. laevis* (Montagu) and by Cushman (l. c. supra) and Buchner (l. c. supra) to *L. nebulosa*.

Figure 13.—*Lagena hispidula* Cushman?

Challenger Sta. 5, S.W. of the Canaries, Atlantic. (2740 fathoms)

Referred by Brady to *L. laevis* (Montagu).

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EXPLANATION OF PLATE 56 (LVI), CONTINUED

Figure 14.—*Lagena* sp. aff. *laevis* (Montagu).

Challenger Sta. 224, North Pacific. (1850 fathoms)

Figures 15, 16.—*Oolina apiculata* Reuss.

Porcupine Sta. 67-68, East of the Shetlands, Scotland. (64-75 fathoms)

Referred by Brady to *Lagena* and by Reuss, originally to *Oolina*.

Figures 17, 18.—*Parafissurina lateralis* (Cushman).

Porcupine Sta. 67-68, East of the Shetlands, Scotland. (64-75 fathoms)

Referred by Brady to *Lagena apiculata* (Reuss) and tentatively to *Lagena lateralis* by Cushman, 1913 (U.S.N.M. Bull. 71, Pt. 3, p. 10). Chapman and Parr (Australasian Antarctic Exped., 1911-1914, Sci. Repts., Ser. C, Vol. 1, No. 2, 1937, p. 98) regarded these species as *Ellipsolagena* sp. nov. Parr (1947, l. c. antes) placed *Ellipsolagena* in the synonymy of *Fissurina*, and referred *L. lateralis* Cushman to *Parafissurina*. Buchner (Nova Acta Leopoldina, n.f., Vol. 9, 1940, p. 520) definitely refers figs. 17, 18 to *L. lateralis* Cushman.

Figures 19-26.—*Lagena gracillima* (Seguenza).

Fig. 19. Challenger Sta. 151, Heard Island, S. Pacific. (75 fathoms)

Fig. 20. Challenger Sta. 149E, Kerguelen Islands, S. Pacific. (28 fathoms)

Figs. 21, 22. Challenger Sta. 168, N.E. of New Zealand. (1100 fathoms)

Fig. 23. Challenger Sta. 279C, Tahiti, Pacific. (620 fathoms)

Figs. 24, 26. Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Fig. 25. Challenger Sta. 189, South of New Guinea, Pacific. (25-29 fathoms)

Brady referred Figs. 19-28 to *L. gracillima* and was followed by Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 6, No. 6, 1950, p. 300) and others. Considerable uncertainty exists, however, since Cushman queries figs. 19, 20, 23, 27, 28 as being this species (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 11), and later (l. c., 1913, p. 12) refers figs. 27, 28 to *L. elongata* (Ehrenberg). He repeats these references in 1923 (U.S.N.M. Bull. 103, Pt. 4, pp. 15 and 23). Buchner (Nova Acta Leopoldina, n.f., Vol. 9, 1940, p. 415) refers only figs. 19, 22, 24-26 to *L. gracillima* (Seguenza) with no reference to the other figures.*

Figures 27-29.—*Lagena elongata* (Ehrenberg).

Fig. 27. Challenger Sta. 217A, Papua Pacific. (37 fathoms)

Fig. 28. Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Fig. 29. Challenger Sta. 218, North of Papua, Pacific. (1070 fathoms)

Brady refers figs. 27, 28 to *L. gracillima* (Seguenza) (see above). Cushman (l. c. supra) and Buchner (l. c. supra, 1940, p. 413) refer figs. 27-29 to *Lagena elongata* (Ehrenberg).

Figure 30.—*Lagena laevis* (Montagu) var.

Challenger Sta. 205A, Hong Kong, N. Pacific. (7 fathoms)

Figures 31, 32.—*Lagena truncata* Brady.

Fig. 31. Challenger Sta. 5, West of Canaries and Sta. 283, S. Pacific. (2740 and 2075 fathoms)

Fig. 32. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Figures 33-35.—*Oolina globosa* (Montagu) var. *setosa* (Earland).

Fig. 33. Challenger Sta. 5, S.W. of the Canaries, Atlantic. (2740 fathoms)

Fig. 34. Challenger Sta. 218, N. of Papua, Pacific. (1070 fathoms)

Fig. 35. Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Referred by Brady to *L. longispina* Brady, globular form, and by Earland (Discovery Repts., Vol. 10, Foraminifera Pt. III, 1934, p. 150) to *Lagena globosa* (Montagu) var. *setosa*.

Figure 36.—*Oolina longispina* (Brady), globular form.

Challenger Sta. 146, Southern Ocean. (1375 fathoms)

Referred by Brady to *Lagena*.

*NOTE: Silvestri (Mem. Pont. Accad. Rom. Nuovi Lincei, Vol. 19, 1902, p. 33) referred figs. 20, 24-26 to *Lagena gracilis* (Costa), which is probably correct. Figure 19 may well be *L. elongata* (Seguenza), leaving only figs. 21-22 in *L. gracillima* (Seguenza) (Fig. 23 not identified).

EXPLANATION OF PLATE 57 (LVII)

Figs. 1-5, 8, 9, 12, 13, 19, 22-30, 33, 34, X 60; Figs. 6, 7, X 75; Figs. 10, 11, X 45;

Figs. 14-18, 20, 21, 35, 36, X 75; Figs. 31-32, X 60-75.

Figures 1-4.—*Lagena hispida* Reuss.

Fig. 1. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Figs. 2, 4. Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Fig. 3. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figure 5.—*Lagena ampulla-distoma* (Rymer-Jones).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figures ?6, 7, 10-12.—*Lagena aspera* Reuss.

Figs. 6, 7. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Fig. 10. Challenger Sta. 218, N. of Papua, Pacific. (1070 fathoms)

Fig. 11. Challenger Sta. 241, N. Pacific. (2300 fathoms)

Fig. 12. Challenger Sta. 279C, Tahiti, Pacific. (620 fathoms)

EXPLANATION OF PLATE 57 (LVII), CONTINUED

Figures 8-9.—*Lagena gibbera* Buchner.

Fig. 8. Challenger Sta. 323, S. Atlantic. (1900 fathoms)

Fig. 9. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Referred by Brady to *L. aspera* Reuss and by Buchner (Nova Acta Leopoldina, n.f., Vol. 9, No. 62, 1940, p. 423) to *L. gibbera*.

Figure 13.—*Oolina lineata* (Williamson).

Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Referred by Brady to *Lagena*.

Figures 14, 16, 17, ?18.—*Lagena laevis* (Montagu).

Fig. 14. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 16. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Fig. 17. Porcupine Sta. 67-68, E. of Shetlands, Scotland, N. Atlantic. (64-75 fathoms)

Fig. 18. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *L. semistriata* Williamson and by Buchner (Nova Acta Leopoldina, n.f., Vol. 9, No. 62, 1940, p. 418) to *L. laevis* (Montagu) but with no reference to fig. 18, which is queried by Brady.

Figures 15, 21.—*Lagena crenata* Parker and Jones.

Fig. 15. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 21. Porcupine Sta. 11, West of Ireland, N. Atlantic. (1630 fathoms)

Figure 20.—*Lagena sidebottomi* Earland.

Challenger Sta. 276, North of Tahiti, Pacific. (2350 fathoms)

Referred by Brady to an intermediate between *L. crenata* and *L. semistriata*; by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 29) to *L. intermedia* Sidebottom, and by Earland (Discovery Repts., Vol. 10, Foraminifera Pt. III, 1934, p. 161) to *L. sidebottomi*, nom. nov. for *L. intermedia* Sidebottom 1912, non Rzehak.

Figures 19, 28.—*Lagena striata* (d'Orbigny)?

Fig. 19. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Fig. 28. Challenger Sta. 285, South Pacific. (2375 fathoms)

Included by Brady in *L. striata* but not by Buchner (Nova Acta Leopoldina, n. f., Vol. 9, No. 62, 1940, p. 424) who refers only to figs. 22, 24 of Brady.

Figures 22, 24.—*Lagena striata* (d'Orbigny).

Fig. 22. Challenger Sta. 217A, Papua, Pacific. (37 fathoms)

Fig. 24. Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Figures 23, 25-27.—*Lagena laevis* (Montagu) variants.

Figs. 23, 25. Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Fig. 26. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Fig. 27. Challenger Sta. 218, N. of Papua, Pacific. (1070 fathoms)

Referred by Brady to *Lagena sulcata* (Walker and Jacob) (figs. 23, 26) and to *L. sulcata* var. *interrupta* Williamson (figs. 25, 27), and by Buchner (Nova Acta Leopoldina, n. f., Vol. 9, 1940, p. 419) to *L. laevis* (Montagu) variants. O. L. Bandy (Bull. Amer. Pal., Vol. 32, No. 131, 1949, p. 57) has referred fig. 23 to *L. sulcata* var. *spirata* (M. Eocene, Mississippi), and this may prove to be valid. In view of the great variation in *Lagena laevis* postulated by Buchner it is thought preferable to retain his classification here, but further study of the Lagenidae will probably require many taxonomic changes, and many of the identifications given here must be regarded as provisional only.

Figures 29, 30.—*Lagena advena* Cushman.

Fig. 29. Challenger Sta. 338, South Atlantic. (1990 fathoms)

Fig. 30. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Referred by Brady to *L. striata* d'Orbigny and in part (fig. 30) to *L. advena* by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 6).

Figure 31.—*Lagena* sp. nov. (1).

Challenger Sta. 151, off Heard Island, S. Pacific. (75 fathoms)

Referred by Brady to *L. acuticosta* Reuss. Brady was followed by most later authors in this determination, but Matthes (Palaeontogr., Vol. 90, Abt. A, 1939, p. 58) referred this figure, also fig. 32, and pl. 58, fig. 21, to *L. elegantissima* (Bornemann, 1855), an Oligocene species. Figures of Recent specimens referred to *L. acuticosta* by Cushman, Sidebottom, Buchner and others agree fairly well with this figure of Brady but in the opinion of the writer these do not represent the fossil form described by Reuss, nor that of Bornemann. It is regarded as representing a new species.

Figure 32.—*Lagena elegantissima* (Bornemann)?

Challenger Sta. 276, South Pacific. (2350 fathoms)

Referred by Brady and later authors to *L. acuticosta* Reuss. Matthes (l. c. supra, 1939, p. 58) referred this figure to *L. elegantissima* (Bornemann) and cited figures from Silvestri (Mem. Pont. Accad. Rom. N. Lincei, Vol. 19, 1902, p. 155, figs. 46-49) which agree fairly well with that of Brady. Bornemann's figure shows a number of differences and the south Pacific form may belong to a new species.

Figures 33, 34.—*Lagena sulcata* (Walker and Jacob).

Fig. 33. Challenger Sta. 271, South Pacific. (2425 fathoms)

Fig. 34. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Brady and Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, Pt. 6, 1950, p. 301) also refer

EXPLANATION OF PLATE 57 (LVII), CONTINUED

figs. 23 and 26 to this species but Buchner does not agree with this (l. c. supra), and the figures seem to bear him out.

Figures 35, 36.—*Lagena stelligera* Brady.

Fig. 35. Challenger Sta. 276, Tahiti and Sta. 271, S. Pacific. (2350 and 2425 fathoms)

Fig. 36. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

EXPLANATION OF PLATE 58 (LVIII)

Figs. 11-15, X 45-60; Fig. 16, X 40; Fig. 34, X 60; remaining figs. X 75.

Figure 1.—*Fissurina exsculpta* (Brady).

Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Referred by Brady to *Lagena* and by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, Pt. 6, p. 308) to *Fissurina*.

Figures 2, 3, 7-10.—*Lagena gracilis* Williamson.

Figs. 2, 8. Challenger Sta. 276, North of Tahiti, Pacific. (2350 fathoms)

Fig. 3. Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Fig. 7. Challenger Sta. 283, South Pacific. (2075 fathoms)

Fig. 9. Challenger Sta. 306, West Coast of Patagonia, E. Pacific. (345 fathoms)

Fig. 10. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Figures 4-6, 17?, 18?—*Lagena sulcata* (W. & J.) var. *spicata* Cushman and McCulloch?

Figs. 4-6. Challenger Sta. 276, North of Tahiti, Pacific. (2350 fathoms)

Fig. 18. Challenger Sta. 232, South of Japan, Pacific. (345 fathoms)

Brady referred Figs. 4, 17? and 18 to apiculate forms of *L. sulcata* (Walker and Jacob) and figs. 5, 6 to *L. sulcata* var. *interrupta* Williamson, apiculate forms. Some confusion exists among subsequent authors. Silvestri (Mem. Pont. Acc. Nuovi Lincei, Vol. 19, 1902, p. 163) referred fig. 4 to *L. lyelli* (Seguenza 1862) and figs. 5 and 6 to broken chambers of *Nodosaria scalaris* var. *separans* Brady. This last opinion is seriously questioned, though figs. 4-6 may well be *L. lyelli* or variants of that species. Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 23) referred figs. 4, 17? to *L. sulcata* var. *apiculata*, a homonym of *L. apiculata* (Reuss). Cushman and McCulloch (Allan Hancock Pacific Exped., Vol. 6, No. 6, 1950, p. 360) renamed the variety *L. sulcata* var. *spicata* though no mention is made of *L. lyelli* and the views of Silvestri. The identity of fig. 18 remains highly uncertain but it seems probable that the remaining figures represent either variants of *L. lyelli* (Seguenza) or *L. sulcata* var. *spicata* Cushman and McCulloch with the possibility that the two are synonymous.

Figures 11-15.—*Lagena distoma* Parker and Jones MS., Brady.

Fig. 11. Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Figs. 12-15. Porcupine Sta. 67-68, E. of Shetlands, N. Atlantic. (64-75 fathoms)

Figure 16.—*Lagena distoma-margaritifera* Parker and Jones.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Figure 19.—*Lagena meridionalis* Wiesner.

Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Referred by Brady to *L. gracilis* Williamson and by Wiesner (Foram. Deutsche Südpolar Exped. 1901-1903, 1931, p. 117) to *L. gracilis* var. *meridionalis*. Raised to specific rank by Loeblich and Tappan (Smiths. Misc. Coll., Vol. 121, No. 7, 1953, p. 59).

Figure 20.—*Lagena* sp. nov. (2)

Challenger Sta. 241, North Pacific. (2300 fathoms)

Referred by Brady to *L. acuticosta* Reuss but it has little in common with that species and from a survey of the available literature it appears to be new.

Figure 21.—*Lagena* sp. nov.?

Challenger Sta. 271, South Pacific. (2425 fathoms)

Referred by Brady to *L. acuticosta* Reuss. Matthes (l. c. antes, 1939, p. 58) has referred this figure to *L. elegantissima* (Bornemann) and Loeblich and Tappan (Smith. Misc. Coll., Vol. 121, No. 7, 1953, p. 59) to *L. apiopleura*. They cite Brady, pl. 58, fig. 2 (not pl. 57, figs. 31, 32, and not pl. 58, fig. 20), but their "fig. 2" is an error for fig. 21 (personal communication). Loeblich and Tappan figure a form with incipient reticulate ornamentation at the upper end of the test, below the aperture, but do not indicate this feature in their description. Their figure of *L. apiopleura* suggests that they are dealing with *Oolina williamsoni* (Alcock), with which should probably be included *Oolina tasmanica* Parr. Brady's fig. 21 is closely related to this form but does not show the reticulate portion between the longitudinal ribs and the smooth apertural collar. It may prove to be a distinct species, or a variety of *Oolina williamsoni*. Until examination of actual material shows the presence of an internal tube it is regarded as preferable to leave it provisionally in *Lagena*.

Figures 22-24.—*Lagena gracilis* Williamson.

Figs. 22, 23. Challenger Sta. 276, North of Tahiti. (2350 fathoms)

Fig. 24. Challenger Sta. 271, South Pacific. (2425 fathoms)

Buchner (l. c. supra, 1940, p. 426) includes fig. 19 in this species, but excludes fig. 22 and queries fig. 24.

EXPLANATION OF PLATE 58 (LVIII), CONTINUED

Figures 25, 26?, 27.—*Lagena plumigera* Brady.

Figs. 25, 27. Challenger Sta. 271, South Pacific. (2425 fathoms)

Fig. 26. Challenger Sta. 276, North of Tahiti. (2350 fathoms)

Figures 28-31.—*Oolina melo* d'Orbigny.

Fig. 28. Challenger Sta. 151, Heard Island, South Pacific. (75 fathoms)

Fig. 29. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Fig. 31. Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Referred by Brady to *L. squamosa* (Montagu). Silvestri (Mem. Pont. Acc. Rom. Nuovi Lincei, Vol. 19, 1902, p. 153) referred fig. 31 to *L. montagui* Silvestri (not *Entosolenia montagui* Alcock 1865) and 28-30 to *L. squamosa*. Buchner (Nova Acta Leopoldina, n. f., Vol. 9, No. 62, 1940, p. 435) referred figs. 28-31 to *L. squamosa*, with *montagui* Silvestri in synonymy. Loeblich and Tappan (Smiths. Misc. Coll., Vol. 121, No. 7, 1953, p. 71) refer all four figures to *Oolina melo* d'Orbigny.

Figures 32, 33.—*Oolina hexagona* (Williamson).

Fig. 32. Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Fig. 33. Challenger Sta. 271, South Pacific. (2425 fathoms)

Referred by Brady to *Lagena* and by Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, p. 304) to *Oolina*. Matthes (Palaeontogr., Vol. 90, Abt. A, 1939, p. 67) used the name *L. reticulata* (McGillavray), as used by Reuss, as a prior name for *L. hexagona* (Williamson) but McGillavray's description is inadequate and he gave no figure, and *L. reticulata* Reuss 1862 is antedated by Williamson 1848.

Figure 34.—*Oolina seminuda* (Brady)?

Challenger Sta. 302, South Pacific. (1450 fathoms)

Referred by Buchner (l. c. supra, 1940, p. 438) to *Lagena foveolata* (Seguenza) but from Seguenza's figures this is not too convincing. It may well be a variety of that species however. Referred by Brady to *Lagena*.

Figure 35.—*Lagena favoso-punctata* Brady.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Lagena*, but he states it may be ecto- or entosolenian suggesting that he had more than one species, one being an *Oolina*.

Figure 36.—*Lagena hertwigiana* Brady.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figures 37, 40.—*Oolina striatopunctata* (Parker and Jones).

Fig. 37. Challenger Sta. 241, North Pacific. (2300 fathoms)

Fig. 40. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Lagena* and by Loeblich and Tappan (l. c. supra, 1953, p. 74) to *Oolina* d'Orbigny.

Figures 38, 39.—*Lagena feildeniana* Brady.

Fig. 38. Challenger Sta. 241, North Pacific. (2300 fathoms)

Fig. 39. Challenger Sta. 332, South Atlantic. (2200 fathoms)

This may prove to be an *Oolina* but no internal tube was described by Brady.

Figure 41.—*Oolina* (?) *torquata* (Brady).

Challenger Sta. 300, N. of Juan Fernandez, W. Pacific. (1375 fathoms)

Referred by Brady to *Lagena* but related to *desmophora*, which is an *Oolina*.

Figures 42, 43.—*Oolina desmophora* (Rymer Jones)

Fig. 42. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Fig. 43. Challenger Sta. 224, North Pacific. (1850 fathoms)

Referred by Brady to *Lagena* but the internal tube shows it to be *Oolina*. Matthes (Palaeontogr., Vol. 90, Abt. A, 1939, p. 62) referred these figures to *striatopunctata* but Buchner retained them in *desmophora* and is followed here, though the specimens are large for that species and not typical.

EXPLANATION OF PLATE 59 (LIX)

Figs. 1-5, 9-11, 15, 16, X 75; Figs. 6, 7, 12, X 60; Figs. 8, 27, X 45; Figs. 13, 14, X 30;
Figs. 17, 19, X 60-75; Figs. 18, 20, X 75-90; Fig. 21, X 45; Fig. 22, X 40; Fig. 23, X 25;
Fig. 24, X 45; Fig. 25, X 30; Fig. 26, X 60; Figs. 28-30, X 45-60.

Figure 1.—*Fissurina seguenziana* (Fornasini)?

Challenger Sta. VIII, off the Canaries, Atlantic. (620 fathoms)

Referred to *Lagena orbignyana* (Seguenza) by Brady, and so referred to by Buchner and most later authors. Fornasini (Boll. Soc. Geol. Ital., Vol. V, 1886 (1887), p. 350) described *L. seguenziana*, based on *Fissurina marginata* Seguenza, non Walker and Boys. Earland (Discovery Repts., Vol. 10, 1934, Foraminifera Pt. III, p. 160) tentatively refers Brady's fig. 1 to this species.

Figures 2, 5.—*Fissurina hispida* (Reuss), compressed var.

Fig. 2. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 5. Challenger Sta. 241, North Pacific. (2300 fathoms)

Referred by Brady to *Lagena*.

Figure 3.—*Fissurina quadrata* (Williamson).

Porcupine Sta. 67-68, East of the Shetlands, Scotland (64-75 fathoms)

Referred by Brady to *Lagena* and by Williamson to *Entosolenia*.

Figure 4.—*Lagena favoso-punctata* Brady, compressed form.

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

See also Pl. LVIII, fig. 35 and Pl. LXI, fig. 2. Brady refers this species to *Lagena* but notes that it may be ectosolenian or entosolenian, and here figures a compressed form. It therefore appears that some specimens show characters of *Lagena*, and the present one of *Fissurina*. There may be several species confused, and that on Pl. LXI, fig. 2 has been referred to *L. ampulla-distoma* (Rymer Jones).

Figure 6.—*Fissurina crebra* (Matthes).

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Lagena acuta* Reuss (not typical) and by Earland (Discovery Repts., Vol. 10, Foraminifera III, 1934, p. 156) to *L. marginata* var. *spinifera* nov. Matthes (Palaeontogr., Vol. 90, Abt. A, 1939, p. 72) referred this figure to *L. crebra*, apparently in ignorance of Earland's work, and Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 8) to *L. sacculus* Fornasini, which is clearly erroneous since Fornasini states that his form was not carinate (Mem. Acc. Sci. Ist. Bologna, Ser. V, Vol. 9, 1901, p. 49). Since *spinifera* Earland is a homonym of *L. aspera* var. *spinifera* Chapman (P.Z.S., London, 1895, p. 27) Matthes' name is retained.

Figure 7.—*Fissurina annectens* (Burrows and Holland)?

Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *Lagena quadricostulata* Reuss? See notes on Figure 15, this plate. Burrows and Holland do not refer to this figure, therefore the identification is queried.

Figures 8-11.—*Fissurina kerguelensis* Parr.

Fig. 8. Challenger Sta. 151, Heard Island, S. Pacific. (75 fathoms)

Figs. 9, 10. Challenger Sta. 149D, Kerguelen Islands. (20-60 fathoms)

Fig. 11. Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Referred to *Lagena staphyllearia* (Schwager) by Brady, and by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 305) to *Fissurina kerguelensis*.

Figure 12.—*Fissurina unguiculata* (Brady).

Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *Lagena*.

Figures 13, 14.—*Oolina longispina* (Brady), compressed form.

Challenger Sta. 98, off West Africa. (1750 fathoms)

Referred by Brady to *Lagena*. This variant approaches a *Fissurina*.

Figure 15.—*Fissurina annectens* (Burrows and Holland).

Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Referred by Brady to *Lagena quadricostulata* Reuss and by Burrows and Holland (Monogr. Crag. Foram., Pt. II, 1895, p. 203) to *L. annectens*. Millett (Jour. Roy. Micr. Soc., 1901, p. 495) refers this figure to *L. fasciata* (Egger), with *L. quadricostulata* Reuss, in synonymy and no mention of *annectens*. Silvestri (Mem. Pont. Accad. Nuovi Lincei, Vol. 19, 1902, p. 143) refers it to *L. quadricostulata* var. *sexcostulata*, again without mention of *annectens*.

Figure 16.—*Fissurina quadrata* (Williamson) var. *carinata* Chapman.

Challenger Sta. 135, Tristan d'Acunha, Atlantic. (100-150 fathoms)

Referred by Brady to *L. quadrata* (Williamson), partially carinate specimen. Chapman ("Subantarctic Islands of New Zealand," Article 15, Rept. on the Foraminifera, 1909, p. 339) refers this figure to *Lagena quadrata* (Williamson) var. *carinata* nov.

Figures 17, 19.—*Fissurina semimarginata* Reuss.

Fig. 17. Challenger Sta. 145, Prince Edward Is., S. Pacific. (50-150 fathoms)

Fig. 19. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *Lagena marginata* (Walker and Boys) var. *semimarginata* Reuss, and raised to specific rank by Loeblich and Tappan (Smith. Misc. Coll., Vol. 121, No. 7, 1953, p. 78) as *Fissurina semimarginata* (Reuss).

EXPLANATION OF PLATE 59 (LIX), CONTINUED

Figures 18, 20.—*Fissurina orbignyana* Seguenza, vars.

Fig. 18. Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Referred by Brady to *Lagen*a. Silvestri (Mem. Pont. Accad. Rom. Nuovi Lincei, Vol. 19, 1902, p. 140) compares figure 20 to *F. romettensis* Seguenza, but this does not appear to be justified by the figures.

Figures 21, 22.—*Fissurina submarginata* (Boomgart).

Challenger Sta. 300, North of Juan Fernandez, E. Pacific. (1375 fathoms)

Referred by Brady to *Lagen*a *marginata* (Montagu), and by Boomgart ("Smaller foraminifera from Bodjonegoro (Java)," Utrecht Univ., doct. diss., 1949, p. 107) to *Entosolenia submarginata*.

Figure 23.—*Fissurina wiesneri* nom. nov.

Challenger Sta. 168, N.E. of New Zealand. (1100 fathoms)

Referred by Brady to *Lagen*a *marginata* (Walker and Boys), and by Wiesner (Deutsche Südpolar Exped. 1901-1903, Die Foraminiferen, 1931, p. 121) to *Lagen*a *marginata* var. *carinata*. This is a homonym of *L. quadrata* var. *carinata* Chapman 1909, and of *Fissurina carinata* Reuss 1863, and the name *wiesneri* nom. nov. is therefore proposed for this form.

Figure 24.—*Fissurina bradii* Silvestri.

Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (50-150 fathoms)

Referred by Brady to *Lagen*a *orbignyana* (Seguenza) and by Silvestri (Mem. Pont. Accad. Rom. Nuovi Lincei, Vol. 19, 1902, p. 147) to *F. bradii*. Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 41) referred it to *L. orbignyana* var. *caribaea* nov., and in 1945 Cushman and Stainforth transferred this form to *Entosolenia flintiana* (Cushman) var. *caribaea* (Cushman) (C.L.F.R., Spec. Publ. No. 14, p. 42).

Figure 25.—*Fissurina cucullata* Silvestri?

Challenger Sta. 296, S.W. of Juan Fernandez, E. Pacific. (1825 fathoms)

Referred by Brady to *Lagen*a *orbignyana* (Seguenza) and compared by Silvestri (Mem. Pont. Accad. Rom. Nuovi Lincei, Vol. 19, 1902, p. 146) to *F. cucullata* Silvestri. It appears to be very close indeed to this species.

Figure 26.—*Fissurina orbignyana* Seguenza.

Challenger Sta. 271, South Pacific. (2425 fathoms)

Referred by Brady to *Lagen*a.

Figure 27.—*Fissurina siliqua* (Rymer Jones).

Challenger Sta. 346, South Atlantic. (2350 fathoms)

Referred by Brady to *Lagen*a, the original description appears to indicate the presence of an entosolenian tube.

Figures 28-30.—*Fissurina seminiformis* (Schwager).

Fig. 28. Challenger Sta. 224, North Pacific. (1850 fathoms)

Fig. 29. Challenger Sta. 296, South Pacific. (1825 fathoms)

Fig. 30. Challenger Sta. 283, South Pacific. (2075 fathoms)

Referred by Brady to *Lagen*a but most probably a *Fissurina*.

EXPLANATION OF PLATE 60 (LX)

Figs. 1-5, 8, 22, 35-37, X 75; Figs. 6, 7, 9, 11-16, X 60-75; Figs. 10, 20, 21, 23, 24, 26-34, 38, X 60;

Fig. 17, X 90; Figs. 18, 19, X 50; Fig. 25, X 40.

Figures 1, 2.—*Fissurina lacunata* (Burrows and Holland).

Fig. 1. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Lagen*a *castrensis* Schwager and by Burrows and Holland (Palaeontogr. Soc., Foram. Crag., Pt. II, 1895, p. 205) to *L. lacunata*. Transferred by Parr (Proc. Roy. Soc. Victoria, n. s., Vol. 56, 1945, p. 203) to *Fissurina*. Millett, Sidebottom, Buchner and others regard this as a variety of *F. orbignyana* Seguenza, which may prove to be correct.

Figure 3.—*Fissurina contusa* Parr.

Challenger Sta. 185, Torres Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Lagen*a *castrensis* Schwager?, and by W. J. Parr Proc. Roy. Soc. Victoria, n. s., Vol. 56, 1945, p. 203) to *Fissurina contusa*.

Figure 4.—*Fissurina clathrata* (Brady).

Challenger Sta. 191, Arrou Islands or Sta. 191A, Ki Islands, C. Pacific. (800 or 580 fathoms)

Referred by Brady to *Lagen*a and transferred by Parr (B.A.N.Z. Antarctic Exped., Repts., Ser. B, Vol. 5, Pt. 6, 1950, p. 310) to *Fissurina*. Regarded by some authors as a variety of *L. orbignyana* (Seguenza).

Figure 5.—*Fissurina quadrata* (Williamson) var. *rizzae* Seguenza?

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Lagen*a *quadrata* var. and by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 35) to *L. quadrata* var. *rizzae* (Seguenza). It would appear questionable that Brady's figure represents the species of Seguenza. It may perhaps be *F. quadrata* var. *semi-alata* (Balkwill and Millett 1884).

Figures 6, 7?, 9, 12.—*Fissurina lagenoides* (Williamson).

EXPLANATION OF PLATE 60 (LX), CONTINUED

- Fig. 6. Challenger Sta. 164A, off Sydney, Australia. (410 fathoms)
 Fig. 7. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)
 Fig. 9. Challenger Sta. 5, S.W. of the Canaries. (2740 fathoms)
 Fig. 12. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Lagena*. Fig. 7 may be an abnormality or new?
Figure 8 (18 on plate).—*Fissurina pacifica* Parr.
 Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)
 Referred by Brady to *Lagena formosa* Schwager? and by Parr (B.A.N.Z. Antarctic Res. Exped., Repts., Ser. B, Vol. V, No. 6, 1950, p. 314) to *Fissurina pacifica*.
Figure 10.—*Fissurina* sp. nov.
 Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)
 Referred by Brady to *Lagena formosa* Schwager. Parr (l. c. supra, p. 313) notes that this is not Schwager's species but does not name it. It appears to be new.
Figure 11.—*Fissurina lagenoides* (Williamson) var. *tenuistriata* (Brady).
 Challenger Sta. 338, South Atlantic. (1990 fathoms)
 Referred by Brady to *Lagena*.
Figures 13, 14.—*Fissurina radiata* Seguenza.
 Fig. 13. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Fig. 14. Challenger Sta. 85, off the Canaries, Atlantic. (1125 fathoms)
 Referred by Brady to *L. lagenoides* (Williamson) and by Cushman (U.S.N.M. Bull. 71, Pt. 3, p. 40) to *L. sublagenoides*. Buchner (Nova Acta Leopoldina, N.F., Vol. 9, No. 62, 1940, p. 450) places *L. sublagenoides* Cushman in the synonymy of *L. radiata* (Seguenza) referring to Brady, fig. 14 only. This follows Silvestri (Mem. Pont. Accad. Rom. Nuovi Lincei, Vol. 19, 1902, p. 145).
Figures 15, 16.—*Fissurina radiata* Seguenza var. *striatula* Cushman.
 Fig. 15. Challenger Sta. 338, South Atlantic. (1990 fathoms)
 Fig. 16. Porcupine Sta. 23, Northwest of Ireland, N. Atlantic. (630 fathoms)
 Referred by Brady to *L. lagenoides* var. *tenuistriata* Brady and by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 40) to *L. sublagenoides* var. *striatula*. As noted earlier Buchner has placed *sublagenoides* in synonymy with *radiata*.
Figure 17.—*Fissurina* sp. indet.
 Challenger Sta. 352, Cape Verde Islands, Atlantic. (? 11 fathoms)
 Referred by Brady to *L. formosa* Schwager, but clearly not that species. It may prove to be new.
Figures 18, 19.—*Fissurina* sp. nov.
 Fig. 18. Challenger Sta. 283, South Pacific. (2075 fathoms)
 Fig. 19. Challenger Sta. 218, North of Papua, Pacific. (1070 fathoms)
 Referred by Brady to *Lagena formosa* Schwager. Parr (B.A.N.Z. Antarctic Res. Exped., Repts., Ser. B, Vol. 5, Pt. 6, 1950, p. 313) notes that these are not *L. formosa* Schwager but does not name them. He notes that they are the same as *L. formosa* of Cushman 1933 (U.S.N.M. Bull. 161, Pt. 2, pl. 6, figs. 9, 10).
Figure 20.—*Fissurina foliformis* Buchner.
 Challenger Sta. 283, South Pacific. (2075 fathoms)
 Referred by Brady to *L. formosa* Schwager and by Buchner (Nova Acta Leopoldina, N.F., Vol. 9, No. 62, 1940, p. 454) to *Lagena foliformis*.
Figure 21.—*Fissurina formosa* (Schwager) var. *favosa* (Brady).
 Challenger Sta. 224, North Pacific. (1850 fathoms)
 Referred by Brady to *Lagena*.
Figure 22.—*Fissurina formosa* (Schwager) var. *comata* (Brady).
 Challenger Sta. 224, North Pacific. (1850 fathoms)
 Referred by Brady to *Lagena*.
Figure 23.—*Fissurina squamoso-alata* (Brady).
 Porcupine Sta. 23, Northwest of Ireland, North Atlantic. (650 fathoms)
 Referred by Brady to *Lagena*.
Figure 24.—*Fissurina squamoso-marginata* (Brady).
 Challenger Sta. 168, off New Zealand. (1100 fathoms)
 Referred by Brady to *Lagena*.
Figure 25.—*Fissurina alveolata* (Brady) var. *caudigera* (Brady).
 Challenger Sta. 296, South Pacific. (1825 fathoms)
 Referred by Brady to *Lagena*.
Figures 26-28.—*Fissurina fimbriata* (Brady).
 Fig. 26. Challenger Sta. 271, South Pacific. (2425 fathoms)
 Fig. 27. Challenger Sta. 276, North of Tahiti, Pacific. (2350 fathoms)
 Fig. 28. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)
 Referred by Brady to *Lagena* and transferred by Parr (B.A.N.Z. Antarctic Res. Exped., Rept., Ser. B, Vol. 5, Pt. 6, 1950, p. 307) to *Fissurina*.
Figure 29.—*Fissurina auriculata* (Brady).
 Challenger Sta. 276, South Pacific. (2350 fathoms)

EXPLANATION OF PLATE 60 (LX), CONTINUED

- Referred by Brady to *Lagena*.
Figures 30, 32.—*Fissurina alveolata* (Brady).
 Fig. 30. Challenger Sta. 64, North Atlantic. (2750 fathoms)
 Fig. 32. Challenger Sta. 332, South Atlantic. (2200 fathoms)
 Referred by Brady to *Lagena* and by Parr (l. c. supra, 1950, p. 307) to *Fissurina*.
Figure 31.—*Fissurina auriculata* (Brady) var. *linearituba* (Cushman).
 Challenger Sta. 346, South Atlantic. (2350 fathoms)
 Referred by Brady to *Lagena auriculata* Brady? and by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 33) to *L. auriculata* Brady var. *linearituba*.
Figure 33.—*Fissurina auriculata* (Brady) var. *duplicata* (Sidebottom).
 Challenger Sta. 5, S.W. of the Canaries, Atlantic. (2740 fathoms)
 Referred by Brady to *Lagena auriculata* Brady and by Cushman (U.S.N.M. Bull. 161, Pt. 2, 1933, p. 22) to *L. auriculata* var. *duplicata* Sidebottom.
Figure 34.—*Fissurina alveolata* (Brady) var. *semisculpta* Parr.
 Challenger Sta. 146, Southern Ocean. (1375 fathoms)
 Referred by Brady to *Lagena alveolata* var. *substriata* Brady (not *substriata* Williamson). Renamed var. *semisculpta* by Parr (B.A.N.Z. Antarctic Res. Exped., Repts., Ser. B, Vol. 5, No. 6, 1950, p. 307).
Figures 35-37.—Winged variety of *Fissurina sulcata* (Walker and Jacob).
 Fig. 35. Challenger Sta. 276, North of Tahiti, Pacific. (2350 fathoms)
 Fig. 36. Challenger Sta. 5, Southwest of the Canaries, Atlantic. (2740 fathoms)
 Fig. 37. Challenger Sta. 224, North Pacific. (1850 fathoms)
 Referred by Brady to *Lagena*.
Figure 38.—*Fissurina auriculata* (Brady) var. *costata* (Brady).
 Challenger Sta. 276, South Pacific. (2350 fathoms)
 Referred by Brady to *Lagena* and transferred to *Fissurina* by Cushman, Todd and Post (U.S.G.S. Prof. Paper 260-H, 1954, p. 350).

EXPLANATION OF PLATE 61 (LXI)

- Figs. 1, 4, 5, 11, X 75; Figs. 2, 3, 12, 13, 15, 16, X 100; Figs. 6-10, X 90; Fig. 14, X 60;
 Figs. 17-22, 28-32, X 30; Figs. 23-27, X 50.
- Figure 1.**—*Oolina variata* (Brady).
 Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)
 Referred by Brady to *Lagena*.
Figure 2.—*Lagena ampulla-distoma* Rymer Jones.
 Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)
 Referred by Brady to *L. favoso-punctata* Brady and by Cushman (U.S.N.M. Bull. 161, Pt. 2, 1933, p. 37) to *L. ampulla-distoma* Rymer Jones. (See plate LVIII, fig. 35, for *L. favoso-punctata*).
Figure 3.—*Lagena quadralata* Brady.
 Challenger Sta. 160, Southern Ocean. (2600 fathoms)
Figure 4.—*Oolina multicostata* (Karrer).
 Challenger Sta. 346, South Atlantic. (2350 fathoms)
 Referred by Brady to *Lagena*. Probably an *Oolina*.
Figure 5.—*Fissurina exsculpta* (Brady).
 Challenger Sta. 168, N.E. of New Zealand. (1100 fathoms)
 Referred by Brady to *Lagena* and by Parr (B.A.N.Z. Antarctic Res. Exped., Repts. Ser. B, Vol. 5, Pt. 6, 1950, p. 308) to *Fissurina*.
Figures 6, 7.—*Fissurina wrightiana* (Brady).
 Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)
 Referred by Brady to *Lagena*.
Figures 8, 9.—*Fissurina radiato-marginata* (Parker and Jones).
 Fig. 9. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Lagena* and by Parr (Proc. Roy. Soc. Victoria, n.s., Vol. 58 (1945), 1947, p. 122) to *Fissurina*.
Figure 10.—*Fissurina? schulzeana* (Brady).
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Lagena* and probably a *Fissurina*.
Figure 11.—*Fissurina trigono-oblonga* (Seguenza and Siddall).
 Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)
 Referred by Brady to *Lagena*. May be a true *Lagena*?
Figures 12, 13.—*Fissurina trigono-marginata* (Parker and Jones).
 Fig. 12. Porcupine Sta. 6, West of Ireland, N. Atlantic. (90 fathoms)

EXPLANATION OF PLATE 61 (LXI), CONTINUED

Fig. 13. Challenger Sta. 241, North Pacific.

Referred by Brady to *Lagena* but probably a *Fissurina*.

Figure 14.—*Fissurina trigono-ornata* (Brady).

Challenger Sta. 218, North of Papua, Pacific. (1070 fathoms)

Referred by Brady to *Lagena* but probably a *Fissurina*.

Figures 15, 16.—*Fissurina quinquelatera* (Brady).

Fig. 15. Challenger Sta. 276, South Pacific. (2350 fathoms)

Fig. 16. Challenger Sta. 145, off Prince Edward Island, S. Pacific. (50-150 fathoms)

Referred by Brady to *Lagena* but probably a *Fissurina*.

Figures 17-19.—*Rectoglandulina rotundata* (Reuss).

Porcupine Sta. 36, S.W. of Ireland, Atlantic. (725 fathoms)

Referred by Brady to *Nodosaria* (*Glandulina*) and by Chapman and Parr (Australasian Antarctic Exped., 1911-1914, Ser. C, Vol. 1, Pt. 2, 1937, p. 62) to *Pseudoglandulina*. According to Loeblich and Tappan (Smiths. Misc. Coll. Vol. 126, No. 3, 1955, p. 6) *Pseudoglandulina* should be suppressed, forms of the present type belonging to *Rectoglandulina*.

Figures 20-22.—*Rectoglandulina torrida* (Cushman).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Nodosaria* (*Glandulina*) *laevigata* (d'Orbigny). Cushman noted that the early chambers in *Glandulina* are biserial and placed this genus in the *Polymorphinidae*. He also (U.S.N.M. Bull 104, Pt. 4, 1923, p. 65) remarks that Brady's specimens here figured are probably his *Nodosaria* (*Glandulina*) *laevigata* var. *torrida*. Since *laevigata* is a true *Glandulina* and this form appears to be nodosarian it would belong to the genus *Pseudoglandulina* of Cushman, and now placed in *Rectoglandulina*.

Figures 23-27.—*Nodosaria calomorpha* Reuss.

Figs. 23-26. Challenger Sta. 315A, South Atlantic. (6 fathoms)

Fig. 27. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Figures 28-31.—*Nodosaria radricula* (L.) var. *glanduliniformis* Dervieux.

Figs. 28, 31. Challenger Sta. 166, W. of New Zealand. (275 fathoms)

Fig. 29, 30. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Nodosaria radricula* (Linnaeus) and by Dervieux (Boll. Soc. Geol. Ital., Vol. 12 (1893), 1894, p. 599) to *N. radricula* (L.) var. *glanduliniformis*. Silvestri (Atti Accad. Pont. Nuovi Lincei, Vol. 54, 1901, pp. 6, 7) referred Brady's figures to *N. radricula* (L.) and made this species the genotype of *Glandulodosaria*. This has since been placed in synonymy with *Nodosaria* by Galloway and Cushman.

Figure 32.—*Rectoglandulina* (?) *aequalis* (Reuss).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Nodosaria* (*Glandulina*) *aequalis*. The species appears to be uniserial throughout and resembles forms referred to *Pseudoglandulina* Cushman. As noted earlier this genus has been replaced by *Rectoglandulina* Loeblich and Tappan, and Brady's figures are tentatively referred to this genus pending examination of type material.

EXPLANATION OF PLATE 62 (LXII)

Figs. 1-3, 7, 8, 23, 24, 27-29, X 50; Figs. 4-6, 19-22, X 35-40; Fig. 9, X 30;

Figs. 10-12, X 30-40; Figs. 13-16, X 12; Figs. 17, 18, 25, 26, X 15; Figs. 30, 31, X 40.

Figures 1, 2.—*Orthomorphina jedlitschkai* (Thalmann).

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Nodosaria radricula* var. *annulata* Terquem and Berthelin, and by Thalmann (Eclog. geol. Helv., Vol. 30, No. 2, 1937, p. 341) to *Nodogenerina jedlitschkai* nom. nov. Transferred to *Orthomorphina* by Stainforth (Contr. Cush. Found. For. Res., Vol. 3, Pt. 1, 1952, p. 9). Silvestri in 1901 (Atti Accad. Pont. Nuovi Lincei, Anno LIV, p. 5) refers figs. 1-3 to *Ellipsoglandulina rotundata* (d'Orbigny) but the present form is certainly not an *Ellipsoglandulina*.

Figure 3.—*Orthomorphina ambigua* (Neugeboren).

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Nodosaria radricula* var. *ambigua* and by Stainforth (l. c. supra, p. 8) to *Orthomorphina*. Silvestri (l. c. supra) referred this fig. and figs. 1, 2 to *Ellipsoglandulina rotundata* (d'Orbigny), with *N. ambigua* in synonymy. D'Orbigny's *rotundata* is probably *Ellipsoglandulina* but *ambigua* from the original description is clearly an *Orthomorphina* and Brady's fig. agrees fairly well with those of Neugeboren.

Figures 4, 5, ?6.—*Nodosaria simplex* Silvestri.

Figs. 4, 5. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Fig. 6. Challenger Sta. 166, W. coast of New Zealand. (275 fathoms)

Figures 7, 8.—*Stilostomella fistuca* (Schwager).

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Nodosaria subtertenuata* Schwager and by Fornasini (Mem. R. Accad. Sci. Ist. Bologna, Ser. V, Vol. 8, 1900, p. 379) to *N. fistuca* Schwager. Transferred to *Siphonodosaria* by Stainforth, 1952 (l. c. supra), which is a synonym of *Stilostomella* Guppy (Finlay, N.Z. Jour. Sci. Techn., Vol. 28, 1947, pp. 272-275).

Figure 9.—*Nodosaria inflexa* Reuss.

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Figures 10-12.—*Dentalina guttifera* d'Orbigny.

Fig. 10. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Figs. 11, 12. Challenger Sta. 209, Philippine Islands. (95-100 fathoms)

Referred by Brady to *Nodosaria pyrula* d'Orbigny and by Chapman and Parr (Australasian Antarctic Exp., 1911-1914, Ser. C, Vol. 1, No. 2, 1937, p. 60) to *D. guttifera* d'Orbigny.

Figures 13-16.—*Dentalina subsoluta* (Cushman).

Figs. 13, 14. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 15, 16. Porcupine Sta. 23, N.W. of Ireland, N. Atlantic. (630 fathoms)

Referred by Brady to *Nodosaria soluta* (Reuss) and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 74) to *Nodosaria subsoluta*. Referred to *Dentalina* by Cushman and McCulloch (Allan Hancock Pac. Exp., Vol. 6, No. 6, 1950, p. 315).

Figures 17, 18.—*Dentalina farcimen* (Soldani).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Nodosaria* and by Reuss (1863) to *Dentalina*. Brady notes that these specimens are not typical.

Figures 19, 20.—*Dentalina inornata* d'Orbigny var. *bradyensis* (Dervieux).

Fig. 19. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 20. Challenger Sta. 33, off Bermuda. (435 fathoms)

Referred by Brady to *Nodosaria communis* (d'Orbigny) and by Dervieux (Boll. Soc. Geol. Ital., Vol. 12 (1893) 1894, p. 610) to *N. inornata* d'Orbigny var. *bradyensis*.

Figures 21, 22.—*Dentalina communis* d'Orbigny.

Challenger Sta. 174A, off Fiji, Pacific. (255 fathoms)

Referred by Brady to *Nodosaria*.

Figures 23, 24.—*Stilostomella consobrina* (d'Orbigny).

Fig. 23. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Fig. 24. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Referred by Brady to *Nodosaria* and transferred to *Siphonodosaria* (a synonym of *Stilostomella*) by Stainforth (l. c. supra, 1952, p. 12).

Figures 25, 26.—*Dentalina subemaciata* Parr?

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Nodosaria consobrina* var. *emaciata*. Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 78) expresses doubt that these are the same as Reuss's original species and Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, Pt. 6, 1950, p. 329) states it is definitely not the same, as *D. emaciata* Reuss is the microspheric form of *D. consobrina* d'Orbigny (now placed in *Stilostomella*). It appears to be extremely close to *Dentalina subemaciata* Parr 1950 (l. c. supra, p. 329, pl. 12, fig. 1) and at most a variety of that species.

Figures 27-31.—*Dentalina intorta* (Dervieux).

Fig. 27. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

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NODOSARIA

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EXPLANATION OF PLATE 62 (LXII), CONTINUED

Figs. 28, 29, 31. Challenger Sta. 332, S. Atlantic. (2200 fathoms)

Fig. 30. Challenger Sta. 272, South Pacific. (2600 fathoms)

Referred by Brady to *Nodosaria mucronata* (Neugeboren) and by Dervieux (Boll. Soc. Geol. Ital., Vol. 12, (1893) 1894, p. 610) to *Nodosaria intorta*. Figs. 30, 31 are monstrous forms.

EXPLANATION OF PLATE 63 (LXIII)

Figs. 1, 2, 4, 5, 8, 9, X 20; Fig. 3, X 10; Figs. 6, 7, 17, X 50; Figs. 10, 11, X 75; Fig. 12, X 45;

Figs. 13, 14, 27, X 30; Figs. 15, 16, X 25; Figs. 18, 22, 34, X 100; Figs. 19-21, X 35;

Figs. 23-26, X 15; Figs. 28-31, X 45-50; Figs. 32, 33, 35, X 40.

Figure 1.—*Dentalina advena* (Cushman).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Nodosaria roemeri* (Neugeboren) and to *D. advena* by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 79).

Figure 2.—*Dentalina plebeia* Reuss.

Challenger Sta. 33, off Bermuda. (435 fathoms)

Referred by Brady to *Nodosaria*, and by Franke (Jahrb. Preuss. Geol. Landes., Vol. 48, 1927, p. 669) to *Dentalina*.

Figures 3-5.—*Dentalina filiformis* (d'Orbigny).

Figs. 3, 4. Challenger Sta. 33, off Bermuda. (435 fathoms)

Fig. 5. Challenger Sta. 145, Prince Edward Island, S. Pacific.

Referred by Brady to *Nodosaria*, and by Thalmann (Eclog. geol. Helv., Vol. 25, 1932, p. 304) to *Dentalina*.

Figure 6.—*Glandulina?* *armata* Reuss.

Porcupine Sta. 36, S.W. of Ireland, Atlantic. (725 fathoms)

Referred by Brady to *Nodosaria* (*Glandulina*). It appears probable that this is not a true *Glandulina* but a *Rectoglandulina*.

Figure 7.—*Orthomorphina retrorsa* (Reuss).

Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Referred by Brady to *Nodosaria*. This appears to be an *Orthomorphina* but should examination of the type reveal a toothed aperture it would have to be transferred to *Stilostomella*.

Figures 8, 9.—*Stilostomella abyssorum* (Brady).

Challenger Sta. 296, South Pacific. (1825 fathoms)

Referred by Brady to *Nodosaria* (?) and by Stainforth (Contr. Cush. Found. For. Res., Vol. 3, Pt. 1, 1952, p. 11) to *Siphonodosaria*, a synonym of *Stilostomella*. Jedlitschka (Berh. Nat. Ver. Brunn., Vol. 66, 1935, p. 66) placed *abyssorum* in the synonymy of *Siphonodosaria pauperata* (d'Orbigny) but this has not been accepted by later workers, and does not appear to be justified.

Figures 10-16.—*Amphicoryna hirsuta* (d'Orbigny).

Fig. 10. Challenger Sta. 174C, Fiji, Pacific. (210 fathoms)

Fig. 11. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Figs. 12-14. Challenger Sta. 167, W. coast of New Zealand. (150 fathoms)

Fig. 15. Challenger Sta. 166, W. coast of New Zealand. (275 fathoms)

Fig. 16. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 10, 11 referred by Brady to *Nodosaria papillosa* Silvestri? and the remainder to *Nodosaria hispida* d'Orbigny. D'Orbigny himself places *hispida* in the synonymy of *N. hirsuta* 1826. Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. I, No. 2, p. 328) notes that the microspheric form shows the same chamber arrangement as *Amphicoryne falx* and he therefore refers this species to *Amphicoryne*. Thalmann (Eclog. geol. Helv., Vol. 43, No. 2, 1951, p. 221) has pointed out that Schlumberger named this genus *Amphicoryna* in 1881, and the spelling was changed to *Amphicoryne* by Brady, 1884. This is an objective homonym of *Amphicorine* Quatrefages 1850, and Thalmann therefore points out that Schlumberger's original name *Amphicoryna* should be reverted to. Stainforth (Contr. Cush. Found. For. Res., Vol. 3, Pt. 1, 1952, p. 12) refers this species to *Siphonodosaria hispida* (Soldani), and if this is so the name should be *Stilostomella hispida* (Soldani) (see above). However examination shows that specimens from Challenger Sta. 24 do not have a toothed aperture and should therefore be placed in *Orthomorphina* Stainforth rather than in *Stilostomella*. Since Soldani is not consistently binomial his name is invalid, the species becoming *Amphicoryna* (or *Orthomorphina?*) *hirsuta* (d'Orbigny) in the opinion of the writer.

Figures 17, 18.—*Orthomorphina* (?) sp. nov.

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Nodosaria verruculosa* Neugeboren, a species with an apertural neck and quite distinct from the form figured here. Brady's figures show a form allied to *Orthomorphina multicosta* (Neugeboren), *Nodosaria rugosa* d'Orbigny, *Nodosaria* (?) *subperversa* Cushman and *Orthomorphina tornata* (Schwager), but characterized by longitudinal rows of pustules or warts. The nature of the aperture can only be ascertained by examination of Brady's specimens, and the species may prove to be a *Nodosaria*.

EXPLANATION OF PLATE 63 (LXIII), CONTINUED

Figures 19-22.—*Amphicoryna? sublineata* (Brady).

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Nodosaria hispida* var. *sublineata* and by Parr (B.A.N.Z. Antarctic Res. Exp. 1929-1931, Ser. B, Vol. 5, Pt. 6, 1950, p. 328) to *Amphicoryne*. No material confirming the *Amphicoryne* characters noted by Parr has been observed and the species may belong in *Orthomorphina*. The generic name should be *Amphicoryna* (vide antes).

Figures 23-27.—*Dentalina guttifera* (d'Orbigny) var. *semirugosa* (d'Orbigny).

Figs. 23, 25-27. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 24. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Nodosaria costulata* Reuss and by Cushman (U.S.N.M. Bull. 100, Vol. 4, 1921, p. 187) to *N. pyrula* var. *semirugosa*. As noted for figs. 10-12 on plate LXII *Nodosaria pyrula* d'Orbigny has been placed in synonymy with *Dentalina guttifera* d'Orbigny by Chapman and Parr so the present form becomes *Dentalina guttifera* var. *semirugosa*.

Figures 28-31.—*Amphicoryna scalaris* (Batsch).

Fig. 28. Porcupine Sta. 10, W. of Ireland, North Atlantic.

Figs. 29-31. Challenger Sta. 209, Philippines, Pacific. (95-100 fathoms)

Referred by Brady to *Nodosaria* and if congeneric with *N. scalaris* var. *separans* Brady would be placed in *Lagenonodosaria* Silvestri, of which *separans* is the type. Parr, however (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 227), places *Lagenonodosaria* in the synonymy of *Amphicoryne*. This is based on Silvestri (Atti Accad. Pont. Nuovi Lincei, Vol. 55, 1902, p. 50) who has shown that *Amphicoryne falx* (Jones and Parker), the genotype of *Amphicoryne* Schlumberger, is the microspheric form of *Nodosaria scalaris* (Batsch). Hofker (Pubbl. Staz. Zool. di Napoli, Vol. 12, fasc. 1, 1932, p. 115) has also placed *Amphicoryne falx* in synonymy with *scalaris* but placed this species in *Marginulina*, with var. *separans* Brady in synonymy. (See also note to figs. 7-9, plate LXV and earlier note to figs. 10-16 on spelling *Amphicoryna*.)

Figures 32-34.—*Nodosaria catenulata* Brady.

Challenger Sta. 209, Philippines, Pacific. (95-100 fathoms)

Figure 35.—*Nodosaria vertebralis* (Batsch) subsp. nov.

Challenger Sta. 209, Philippines, Pacific. (95-100 fathoms)

Referred by Brady to *Nodosaria vertebralis* (Batsch) and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 87) to *N. vertebralis* var. *albatrossi*. In 1921 Cushman referred his Philippine material to *N. vertebralis* and cited Brady's figures. In the reference cited above however he notes that he regards the Philippine specimens as distinct from var. *albatrossi*, though he includes Brady's fig. 35 under var. *albatrossi*. Cushman notes that the chambers are longer and the apertural end much more extended in the subspecies from the Philippines, which is regarded here as new.

EXPLANATION OF PLATE 64 (LXIV)

Figs. 1-5, X 50; Figs. 6-10, X 15; Figs. 11-13, X 15-18; Fig. 14, X 30; Fig. 15, X 60;
Figs. 16-19, X 40; Figs. 20-22, X 16; Fig. 23, X 40; Fig. 24, X 80; Figs. 25-27, X 50-60;
Fig. 28, X 15.

Figures 1-5.—*Rectoglandulina comatula* (Cushman).

Figs. 1, 2, 4, 5. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 3. Challenger Sta. 23, West Indies. (450 fathoms)

Referred by Brady to *Nodosaria comata* (Batsch) and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 83) to *N. comatula*. This was later transferred to *Pseudoglandulina* Cushman, a genus now suppressed by Loeblich and Tappan and in part replaced by *Rectoglandulina* (Smiths. Misc. Coll., Vol. 126, No. 3, 1955, pp. 2-4).

Figures 6-10.—*Nodosaria lamnulifera* Boomgart.

Challenger Sta. 174C, off Fiji, C. Pacific. (210 fathoms)

Referred by Brady to *Nodosaria raphanus* (Linnaeus) and by Boomgart (Thesis, Univ. Utrecht, 1949, p. 79) to *N. bradyi*. *N. bradyi* being preoccupied the name was later changed to *N. lamnulifera* (Contr. Cush. Found. Foram. Res., Vol. 1, Pts. 3-4, 1950, p. 42).

Figures 11-14.—*Nodosaria albatrossi* Cushman.

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Nodosaria vertebralis* (Batsch) and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 87) to *N. vertebralis* var. *albatrossi*. Thalmann (Eclog. geol. Helvet., Vol. 30, No. 2, 1937, p. 341) refers this species to *Nodogenerina* (now *Orthomorphina*) but in view of the typically nodosarian radiate aperture of *N. albatrossi* this cannot be upheld.

Figure 15.—*Amphicoryna proxima* (Silvestri).

Challenger Sta. 209, Philippines, North Pacific. (95-100 fathoms)

Referred by Brady to *Nodosaria*. The form of this would place it in the genus *Lagenonodosaria* Silvestri, but as noted earlier (see note to Pl. LXIII) this has been placed by Parr in the synonymy of *Amphicoryna*.

EXPLANATION OF PLATE 64 (LXIV), CONTINUED

Figures 16-19.—*Amphicoryna separans* (Brady).

Challenger Sta. 166, W. coast of New Zealand, S. Pacific. (275 fathoms)

Referred to *Nodosaria scalaris* (Batsch) var. *separans* and designated the genotype of *Lagenonodosaria* Silvestri by Galloway (Man. Foram., 1933, p. 247) which was placed in the synonymy of *Amphicoryne* by Parr. This then becomes *Amphicoryna separans* (Brady) (see note to plate LXIII, figs. 28-31).

Figures 20-22.—*Nodosaria flintii* Cushman.

Figs. 20, 21. Porcupine Sta. 51, Faroe Channel, Scotland. (440 fathoms)

Fig. 22. Porcupine Sta. 23, N.W. of Ireland, N. Atlantic. (630 fathoms)

Referred by Brady to *Nodosaria obliqua* (L.) and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 85) to *N. flintii*.

Figures 23, 24.—*Nodosaria substriatula* Cushman.

Challenger Sta. 279A, off Tahiti, C. Pacific. (420 fathoms)

Referred by Brady to *N. subcanaliculata* Neugeboren var., and by Cushman (Proc. U.S.N.M., Vol. 51, 1917, p. 655) to *N. substriatula*.

Figures 25-27.—*Orthomorphina challengeriana* (Thalmann).

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Nodosaria perversa* Schwager and by Thalmann (Eclog. geol. Helvet., Vol. 30, No. 2, 1937, p. 341) to *Nodogenerina challengeriana*. Stainforth (Contr. Cushman Found. Foram. Res., Vol. 3, Pt. 1, 1952, p. 8) transferred this species to *Orthomorphina*.

Figure 28.—*Dentalina subsoluta* (Cushman).

Challenger Sta. 23, West Indies. (450 fathoms)

Referred by Brady to *Nodosaria soluta* Reuss, striate specimen, and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 74) to *Nodosaria subsoluta*. It was referred to *Dentalina* by Cushman and McCulloch in 1950 (Allan Hancock Pac. Exp., Vol. 6, No. 6, p. 315).

EXPLANATION OF PLATE 65 (LXV)

Figs. 1, 2, X 40; Figs. 3, 4, X 100; Figs. 5, 6, 11, X 30; Figs. 7-9, X 50-60; Fig. 10, X 40;

Figs. 12, 13, 23, X 20; Figs. 14, 15, X 12; Figs. 16, 17, X 90; Figs. 18, 19, X 60; Figs. 20-22, X 15.

Figures 1-4.—*Amphicoryna* (?) *intercellularis* (Brady).

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Nodosaria* and by Jedlitschka (Berh. Nat. Ver. Brünn., Vol. 66, 1935, p. 70) to *Nodogenerina*, now regarded as a synonym of *Stilostomella* (Finlay, N.Z. Jour. Sci. Techn., Vol. 28, 1947, p. 275). In view of the similarity in aperture between *intercellularis* as shown by Brady and *Amphicoryna scalaris* and *A. separans*, it is provisionally referred to *Amphicoryna*, pending re-examination of the type. Should *Lagenonodosaria* Silvestri be separated from *Amphicoryna*, then *intercellularis* should be transferred to that genus in the opinion of the writer.

Figures 5, 6.—*Marginulina obesa* Cushman.

Challenger Sta. 246, North Pacific. (2050 fathoms)

Referred by Brady to *M. glabra* d'Orbigny. Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 128) notes that Brady's N. Atlantic specimens of *M. glabra* may prove to be his *M. glabra* var. *obesa*, and Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, Pt. 6, p. 326) refers these figures to *M. obesa* Cushman.

Figures 7-9.—*Amphicoryna scalaris* (Batsch).

Challenger Sta. 166, W. coast of New Zealand. (275 fathoms)

Referred by Brady to *A. falx* (Jones and Parker). Jones and Parker noted that this form is always associated with *Nodosaria longicauda* d'Orbigny and regarded it as a variant of that species. *N. longicauda* has been placed by Brady and others in the synonymy of *N. scalaris* (Batsch) and Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 328) states that *scalaris* is the megalospheric form and *falx* the microspheric form of the same species. Parr also notes that *scalaris* var. *separans* is the genotype of *Lagenonodosaria* and therefore places that genus in the synonymy of *Amphicoryna*, Schlumberger 1881. The question is also discussed by Buchner (Nova Acta Leopoldina, N.F., Vol. 9, No. 62, 1940, p. 404, pl. 12) with excellent figures of various forms of *Amphicoryna scalaris*. See also note to Plate LXIII.

Figures 10?, 11-13.—*Marginulinopsis bradyi* (Goës).

Fig. 10. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Fig. 11. Challenger Sta. 26, W. Indies, W. Atlantic.

Fig. 12. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 13. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Marginulina costata* (Batsch). Fig. 11 was referred by Goës (Kongl. Sven. Vet.—Ak. Handl., Vol. 25, No. 9, 1894, p. 64) to *Cristellaria bradyi* nov., and figs. 11, 12 by Thalmann (Eclog. geol. Helv., Vol. 30, No. 2, 1937, pp. 341, 348) to *Marginulinopsis densicostata* nov. Although Cushman made no reference to Brady or to Goës it seems probable that his *Vaginulina advena* (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 134) is also a synonym of Goës's species, or at most a variant. It is possible that Brady's figures include

EXPLANATION OF PLATE 65 (LXV), CONTINUED

more than one species, fig. 10 being especially questionable, but examination of specimens of *M. costata* (Batsch) from Rimini appears to rule this species out entirely.

Figures 14, 15.—*Lingulina seminuda* Hantken.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *L. carinata* d'Orbigny var. *seminuda* Hantken.

Figure 16.—*Frondicularia bradii* (Silvestri).

Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Referred by Brady to *Lingulina carinata* d'Orbigny, an entirely distinct species. Silvestri (Atti Accad. Pont. Nuovi Lincei, Vol. 56, 1903, p. 48) referred this figure to *Lingulonodosaria bradii*. *Lingulonodosaria* is regarded as a synonym of *Lingulina* (Galloway, Manual, 1933) and the present species has a radiate aperture which would place it in *Frondicularia*. The present species therefore becomes *Frondicularia bradii* (Silvestri). Ignoring the reference to Silvestri, and the radiate aperture clearly shown in the figures, Buchner (Nova Acta Leopoldina, N.F., Vol. 11, 1942, p. 106) named the species *Lingulina eggeri*, referring to *Lingulina carinata* Egger 1893 non d'Orbigny, and to Brady's figure 16. His name is regarded as a synonym of that of Silvestri. *Frondicularia bradyi* Cushman 1913 (see note on fig. 18) is a homonym and requires a new name.

Figure 17.—*Lingulina* sp. nov.

Challenger Sta. 135, Tristan d'Acunha. (100-150 fathoms)

Referred by Brady to *L. carinata* d'Orbigny (see above). This form does not appear to have been previously described.

Figure 18.—*Frondicularia kiensis* nom. nov.

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *F. spathulata* Brady, non Williamson 1858, and named *F. bradyi* by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 82). This is a homonym of *F. bradii* (Silvestri) (see note on fig. 16, earlier), and requires a new name. The name *F. kiensis* is proposed here.

Figure 19.—*Frondicularia compta* Brady.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Figures 20-23.—*Frondicularia sagittula* van den Broeck.

Fig. 20. Challenger Sta. 24, West Indies. (390 fathoms)

Figs. 21-23. Challenger Sta. 33, off Bermuda. (435 fathoms)

Referred by Brady to *F. alata* d'Orbigny. Cushman (C.C.L.F.R., Vol. 19, Pt. 2, 1943, pls. 5-6) figures forms identical with van den Broeck's *sagittula* and *lanceolata* under the name *F. sagittula*, and this procedure is followed here, although Cushman, in 1923 (U.S.N.M. Bull. 104, Pt. 4, p. 143) referred these figures to *F. sagittula* van den Broeck var. *lanceolata* van den Broeck. (Both *sagittula* and *lanceolata* were described by van den Broeck as varieties of *F. alata* d'Orbigny.)

EXPLANATION OF PLATE 66 (LXVI)

Fig. 1, X 75; Figs. 2, 18, 19, X 17; Figs. 3-5, X 15-20; Figs. 6-11, 20, X 60; Fig. 12, X 45;

Figs. 13-15, X 30; Fig. 16, X 13; Fig. 17, X 25; Fig. 21, X 35; Figs. 22-25, X 20.

Figures 1, 2.—*Frondicularia robusta* Brady.

Fig. 1. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Fig. 2. Challenger Sta. 260A, off Honolulu. (40 fathoms)

Figures 3-5.—*Frondicularia sagittula* van den Broeck.

Figs. 3, 5. Challenger Sta. 33, off Bermuda. (435 fathoms)

Fig. 4. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *F. alata* d'Orbigny. Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 143) refers these figures, and Plate LXV, figs. 20-23, to *F. sagittula* van den Broeck var. *lanceolata* v. den Broeck (both *lanceolata* and *sagittula* being originally described as varieties of *F. alata* d'Orb.). As noted earlier, Cushman later (C.C. L.F.R., Vol. 19, Pt. 2, 1943, pls. 5-6) figured forms covering this range in variation as *F. sagittula* van den Broeck.

Figures 6, 7.—*Parafrondicularia helenae* Chapman.

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Frondicularia interrupta* Karrer (a homonym of *F. interrupta* Costa 1855), and by Chapman (Roy. Soc. S. Austr., Trans., Vol. 65, Pt. 2, 1941, pp. 154, 170) to *Parafrondicularia helenae*. Chapman does not refer to *F. interrupta* Costa, but differentiates the Australasian species from the Austrian Miocene form described by Karrer.

Figures 8-12.—*Parafrondicularia advena* (Cushman).

Figs. 8-10. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Figs. 11, 12. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Frondicularia inaequalis* Costa and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 141) to *F. advena*. Transferred by Boomgart (Thesis, Univ. Utrecht, 1949, p. 85) to *Parafrondicularia* Asano 1938.

Figures 13, 14.—*Vaginulinopsis sublegumen* Parr.

EXPLANATION OF PLATE 66 (LXVI), CONTINUED

Mounts Bay, Cornwall, England.

Referred by Brady to *Vaginulina legumen* (Linnaeus) and by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 325) to *Vaginulinopsis sublegumen* nov.

Figure 15.—*Vaginulina subelegans* Parr?

Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *V. legumen* d'Orbigny. Cushman refers similar specimens to *V. elegans* d'Orbigny (U.S.N.M. Bull. 161, Pt. 2, 1933, p. 16, pl. 3, fig. 10) which Parr regards as *V. subelegans* (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, p. 326). Parr does not refer to Brady's figures.

Figure 16.—*Vaginulina margaritifera* (Batsch).

Porcupine Sta. 27, Rockall Bank, E. Atlantic.

Figure 17.—*Lenticulina obtusata* (Reuss)?

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Cristellaria* and transferred to *Lenticulina* by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 304). See also figs. 21-23.

Figures 18, 19.—*Vaginulina bradyi* Cushman.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *V. bruckenthali* Neugeboren and by Cushman (Proc. U.S.N.M., Vol. 51, 1917, p. 661) to *V. bradyi*.

Figure 20.—*Amphicoryna bradii* (Silvestri).

Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to "intermediate specimen with Vaginuline commencement, and final Nodosarian chamber." Silvestri (Atti Pont. Accad. Nuovi Lincei, Vol. 55, 1902, p. 53) referred this to *Nodosariopsis bradii* and Millett (Jour. Roy. Micr. Soc., 1903, p. 260) placed *Nodosariopsis* in the synonymy of *Amphicoryne*, referring Brady's figure to *A. bradii* (Silvestri). See pl. LXIII on spelling *Amphicoryna*.

Figures 21-23.—*Marginulina tenuis* Bornemann?

Fig. 21. Challenger Sta. 166, W. Coast of New Zealand. (275 fathoms)

Figs. 22, 23. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Cristellaria tenuis* (Bornemann). According to the classification of Bartenstein (Senckenbergiana, Vol. 29, 1948, pp. 41-65) this would probably be *Lenticulina* (*Marginulinopsis*). Cushman follows Brady in identifying the Pacific Recent species with the German Oligocene species of Bornemann. Cushman (U.S.N.M. Bull. 100, Vol. 4, 1921, p. 250) placed *Cristellaria perprocera* Schwager, from the younger Tertiary of Kar Nicobar, in synonymy with *M. tenuis*, which may be erroneous as the two differ somewhat. The "*Lenticulina obtusata* (Reuss)" of fig. 17 may be an abnormal development of this same species.

Figures 24, 25.—*Lenticulina albatrossi* (Cushman).*

Challenger Sta. 23, West Indies. (450 fathoms)

Referred by Brady to *Cristellaria obtusata* var. *subalata* and by Thalmann (Eclog. geol. Helvet., Vol. 30, No. 2, 1937, p. 341) to *Vaginulinopsis subalata* (Cushman). Chapman and Parr (Australasian Antarctic Exped. 1911-1914, Sci. Rep., Ser. C, Vol. 1, No. 2, 1937, p. 57) have pointed out that the name *subalata* is a homonym of *C. subalata* Reuss 1854, and suggest *Lenticulina albatrossi* (Cushman) as the first available name for this species. The species is regarded as a *Vaginulinopsis*, and using Bartenstein's terminology would be *Lenticulina* (*Vaginulinopsis*) *albatrossi* (Cushman).

*See footnote to explanation of plate LXIX on nomenclature proposed by Bartenstein.

EXPLANATION OF PLATE 67 (LXVII)

Figs. 1-6, 15, 16, X 75; Figs. 7, 18, X 25; Figs. 8, 17, X 60; Figs. 9, 19, 20, X 50;

Figs. 10-12, X 15; Figs. 13, 14, X 17; Fig. 18, X 25.

Figures 1-3.—*Trifarina bradyi* Cushman.

Figs. 1, 2. Challenger Sta. 33, off Bermuda. (435 fathoms)

Fig. 3. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Rhabdognium tricarinatum* (d'Orbigny). Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 99) renamed this species *Trifarina bradyi* (not *Vaginulina tricarinata* d'Orbigny) and made it the type of *Trifarina*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 196) has referred these figures to *Angulogerina* (*Trifarina*) *tricarinata* (d'Orbigny), ignoring the name *bradyi* and making *Trifarina* a subgenus of *Angulogerina*.

Figures 4-6.—*Trifarina reussi* Cushman.

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Rhabdognium minutum* Reuss and by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 63) to *Triplasia reussi*. In 1926 (C.C.L.F.R., Vol. 1, p. 87) Cushman transferred this species to *Trifarina*.

Figure 7.—*Vaginulinopsis tasmanica* Parr?

Challenger Sta. 33, off Bermuda. (435 fathoms)

Referred by Brady to *Cristellaria schloenbachi* Reuss but as noted by Cushman in 1923 it is extremely doubt-

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RHABDOCONIUM-VAGINULINA-CRISTELLARIA

EXPLANATION OF PLATE 67 (LXVII), CONTINUED

- ful that this is the Upper Cretaceous species described by Reuss. It appears to be very close to *Vaginulinopsis tasmanica* Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 324).
- Figure 8.**—*Vaginulinopsis pacifica* (Cushman and Hanzawa).
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to "anomalous specimen, probably the same species" (i.e. *Cristellaria schloenbachi* Reuss, of Fig. 7). Cushman and Hanzawa (C.C.L.F.R., Vol. 12, Pt. 2, 1936, p. 47) named this form *Polymorphinella pacifica*. Thalmann (1933, Eclog. geol. Helvet., Vol. 26, No. 2, p. 252) placed this, with fig. 7, in *Astacolus schloenbachi* but later followed Cushman and Hanzawa. Parr (l. c. supra, 1950, p. 325) transferred the species to *Vaginulinopsis*, regarding *Polymorphinella* as an irregular, abnormal, development of a single species of *Vaginulinopsis*.
- Figure 9.**—*Saracenaria italica* Defrance var. *volpicelli* (Costa).
 Challenger Sta. 335, S. Atlantic. (1425 fathoms)
 Referred by Brady to *Cristellaria*.
- Figures 10-12.**—*Vaginulina americana* Cushman.
 Challenger Sta. 24, West Indies. (390 fathoms)
 Referred by Brady to *V. linearis* (Montagu) and by Cushman (U.S.N.M., Bull. 104, Pt. 4, 1923, p. 135) to *V. americana*.
- Figures 13, 14.**—*Vaginulina spinigera* Brady.
 Fig. 13. Porcupine Sta. 51, Faroe Channel, N. Atlantic. (440 fathoms)
 Fig. 14. Porcupine Sta. 23, N.W. of Ireland, Atlantic. (630 fathoms)
- Figures 15, 16.**—*Vaginulina patens* Brady.
 Challenger Sta. 209, Phillipines. (95-100 fathoms)
 Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 305) placed this species in *Planularia* but Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 326) returned it to *Vaginulina*.
- Figure 17.**—*Astacolus insolitus* (Schwager).
 Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)
 Referred by Brady to *Cristellaria crepidula* (Fichtel and Moll) and by Galloway and Heminway (N.Y. Acad. Sci., Sci. Surv. Porto Rico, etc., Vol. 3, Pt. 4, 1941, p. 334) to *Astacolus insolitus* (Schwager).
- Figure 18.**—*Astacolus* sp. nov. aff. *latus* (Brady) non (Cornuel), Thalmann.
 Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)
 Referred by Brady to *Cristellaria lata* (Cornuel) but regarded as *Astacolus* sp. nov. by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 305).
- Figure 19.**—*Astacolus* sp. nov. aff. *crepidulus* (Brady) non (Fichtel and Moll).
 Challenger Sta. 75, off the Azores, Atlantic. (450 fathoms)
 Referred by Brady to *Cristellaria crepidula* (F. & M.) but regarded by Thalmann (l. c. supra, 1932, p. 305) as *Planularia* sp. nov. aff. *crepidula*, and later (1933) as *Astacolus* sp. nov.
- Figure 20.**—*Astacolus crepidulus* (Fichtel and Moll).
 Fig. 20a. Challenger Sta. 23, West Indies. (450 fathoms)
 Fig. 20b. Challenger Sta. 33, off Bermuda. (435 fathoms)
 Referred by Brady to *Cristellaria crepidula* (Fichtel and Moll) and by Thalmann (l. c. supra, 1932, p. 305) to *Robulus subarcuatulus* (Williamson). *Nautilus subarcuatulus* was described by Walker and Jacob in 1798, and according to Williamson (Recent Foraminifera of Great Britain, 1858, p. 29) includes Fichtel and Moll's *Cristellaria crepidula* in synonymy, with the date 1803. It is evident from the original figures that *subarcuatulus* is an entirely distinct species and Fichtel and Moll's *crepidula* is used here in accordance with common usage of later writers.

EXPLANATION OF PLATE 68 (LXVIII)

- Figs. 1, 3, 4, 11-16, X 50; Fig. 2, X 100; Figs. 5-9, X 35; Fig. 10, X 30; Figs. 17, 18, 20-23, X 15-20; Fig. 19, X 20.
- Figures 1, 2.**—*Astacolus crepidula* (Fichtel and Moll).
 Referred by Brady to *Cristellaria*. (See earlier.)
- Figures 3, 4.**—*Planularia australis* Chapman var.
 Fig. 3. Challenger Sta. 209, Philippines. (95-100 fathoms)
 Fig. 4. Challenger Sta. 167, W. Coast of New Zealand. (150 fathoms)
 Referred by Brady to *Cristellaria tricarinnella* Reuss. Cushman (U.S.N.M. Bull. 100, Vol. 4, 1921, p. 230) notes that Philippine specimens appear to differ from the figures of Reuss, and the species may be new. Chapman named similar forms *Planularia australis* ("Endeavor," Sci. Res., Vol. 3, Pt. 1, 1915, p. 24) and noted that his specimens differed from Brady's figures in lacking the carination of the border. This is regarded as probably of varietal significance only.
- Figures 5-9.**—*Planularia siddalliana* (Brady).
 Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)
 Referred by Brady to *Cristellaria* and by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 305) to *Planularia*.

EXPLANATION OF PLATE 68 (LXVIII), CONTINUED

- Figure 10.**—*Planularia cassis* (Fichtel and Moll) var. nov., Thalmann.
Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)
Referred by Brady to *Cristellaria* and by Thalmann (l. c. supra, 1932, p. 305) to *P. cassis* var. nov. It appears to represent an abnormal specimen.
- Figures 11-16.**—*Lenticulina peregrina* (Schwager).
Figs. 11, 12, 16. Porcupine Sta.?, North Atlantic.
Fig. 13. Challenger Sta. 24, West Indies. (390 fathoms)
Figs. 14, 15. Challenger Sta. VIII, off the Canaries. (620 fathoms)
Referred by Brady to *Cristellaria variabilis* Reuss and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 113) to *C. peregrina* Schwager. Thalmann has transferred this species to *Lenticulina*.
- Figures 17, 18, 20-23.**—*Saracenaria italica* Defrance.
Fig. 17. Challenger Sta. 24, West Indies. (390 fathoms)
Fig. 18, 20-23. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)
Referred by Brady to *Cristellaria*, but is the genotype of *Saracenaria*.
- Figure 19.**—*Saracenaria latifrons* (Brady).
Challenger Sta. 167, West coast of New Zealand. (150 fathoms)
Referred by Brady to *Cristellaria* and by Thalmann (1932) to *Saracenaria*.

EXPLANATION OF PLATE 69 (LXIX)

- Figs. 1-4, X 20; Figs. 5, 11, 12, X 35; Fig. 6, X 40; Fig. 7, X 50; Fig. 8, 9, X 25; Fig. 10, X 16;
Fig. 13, X 12; Figs. 14-17, X 30.
- Figures 1-4.**—*Lenticulina (Robulus)* sp.
Challenger Sta. 135, Tristan d'Acunha. (100-150 fathoms)
Referred by Brady to *Cristellaria articulata* Reuss, "wild-growing forms." These appear to be abnormal specimens of doubtful identity.
- Figure 5.**—*Robulus pliocaenicus* (Silvestri).
Porcupine Sta. 42, S.W. of Ireland, Atlantic. (862 fathoms)
Referred by Brady to *Cristellaria* sp. Fornasini (Boll. Soc. Geol. Ital., Vol. 19, 1900, p. 148) refers *Poly-morphina pliocaena* Silvestri to *Cristellaria* and cites Brady, plate LXIX, fig. 5. The form "*R. pliocaenicus*" is taken from Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 252).
- Figures 6, 7.**—*Lenticulina convergens* (Bornemann).
Fig. 6. Challenger Sta. 224, North Pacific. (1850 fathoms)
Fig. 7. Challenger Sta. 300, N. of Juan Fernandez. (1375 fathoms)
Referred by Brady to *Cristellaria*.
- Figures 8, 9.**—*Lenticulina gibba* (d'Orbigny).
Challenger Sta. 24, West Indies. (390 fathoms)
Referred by Brady to *Cristellaria*, and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 305) to *Lenticulina*.
- Figures 10-12.**—*Robulus atlanticus* nom. nov.
Fig. 10. Challenger Sta. 24, West Indies. (390 fathoms)
Figs. 11, 12. Challenger Sta. 135, off Tristan d'Acunha. (100-150 fathoms)
Referred by Brady to *Cristellaria articulata* Reuss and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 111) to *C. lucida* nov. Thalmann (Eclog. geol. Helvet. Vol. 30, No. 2, 1937, p. 341) has pointed out that *lucida* is preoccupied by *Robulina lucida* Silvestri 1880, and a new name is therefore required. The name *Robulus atlanticus* nom. nov. is proposed.
- Figure 13.**—*Robulus thalmani* Hessland.
Challenger Sta. 24, West Indies. (390 fathoms)
Referred by Brady to *Cristellaria rotulata* (Lamarck) and by Hessland (Bull. Geol. Inst., Univ. Uppsala, Vol. 31, 1943, p. 265) to *Robulus thalmani*.
- Figures 14-16.**—*Robulus vortex* (Fichtel and Moll).
Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)
Referred by Brady to *Cristellaria*.
- Figure 17.**—*Robulus orbicularis* (d'Orbigny)?
Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)
Referred by Brady to *Cristellaria orbicularis* (d'Orbigny). Cushman has expressed doubt that Recent specimens from the Pacific and Atlantic are the same as d'Orbigny's form from the Tertiary of Italy. Specimens very like this from off Tasmania have been named *Lenticulina (Robulus) suborbicularis* by Parr (B.A.N.Z. Antarctic Res. Exped., Ser. B, Vol. 5, No. 6, 1950, p. 321) and it seems possible that the present form is new or a variation of that of Parr.

NOTE: Bartenstein (Entwicklung der Gattung *Lenticulina* (Lenticulina) Lamarck 1804 mit ihren Unter-Gattungen, Senckenbergiana, Vol. 29, 1948, pp. 41-65) and Parr (B.A.N.Z. Antarctic Research Expedition 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 321) treat *Robulus* Montfort as a subgenus of *Lenticulina* Lamarck. There is still confusion in the treatment of the group, however, and no attempt has been made to clarify the question here, the generic names in nearly all cases being quoted unchanged.

EXPLANATION OF PLATE 70 (LXX)

Fig. 1, X 40; Fig. 2, X 30; Figs. 3, 13, 14, X 25; Fig. 4, X 16; Fig. 5, X 15; Fig. 6, X 35;
Figs. 7, 8, 16-18, X 20; Figs. 9-12, 15, X 35.

Figure 1.—*Robulus crassus* (d'Orbigny).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria* and by Thalmann to *Robulus*.

Figure 2.—*Robulus nitidus* (d'Orbigny).

Challenger Sta. 209, Philippines, N. Pacific. (95-100 fathoms)

Referred by Brady to *Cristellaria* and by Thalmann to *Robulus*.

Figure 3.—*Astacolus reniformis* (d'Orbigny).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Cristellaria*, and by Thalmann to *Astacolus*.

Figures 4-6.—*Lenticulina iota* (Cushman).

Figs. 4, 5. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 6. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria cultrata* (Montfort), and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 111) to *C. iota* nov. Transferred to *Lenticulina* by Thalmann.

Figures 7, 8.—*Lenticulina denticulifera* (Cushman).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria cultrata* (Montfort) and by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 75) to *C. denticulifera*. Transferred to *Lenticulina* by Thalmann.

Figures 9-12.—*Lenticulina calcar* (Linnaeus).

Figs. 9, 10. Challenger Sta. 209, Philippines. (95-100 fathoms)

Fig. 11. Challenger Sta. 23, West Indies. (450 fathoms)

Fig. 12. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Cristellaria* and transferred by Thalmann to *Lenticulina*. The Philippine form (figs. 9, 10) differs from that from the West Indies and may constitute a distinct variety?

Figures 13, 14, ?15.—*Lenticulina formosa* (Cushman).

Figs. 13, 14. Challenger Sta. 23, West Indies. (450 fathoms)

Fig. 15. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria calcar* (L.) and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 110) to *C. formosa*. Cushman cites only figs. 13, 14 of Brady but it seems probable that fig. 15 represents the same species, though from a very different locality. Transferred to *Lenticulina* by Thalmann.

Figure 16.—*Lenticulina papillosa* (Fichtel and Moll).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria* and transferred by Thalmann to *Lenticulina*.

Figures 17, 18.—*Lenticulina submamilligera* (Cushman).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria mamilligera* Karrer and by Cushman (Proc. U.S.N.M., Vol. 51, 1917, p. 657) to *C. submamilligera*. Transferred to *Lenticulina* by Thalmann.

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CRISTELLARIA

EXPLANATION OF PLATE 71 (LXXI)

Fig. 1, X 30; Figs. 2, 3, X 20; Figs. 4, 5, X 25; Figs. 6-9, X 35; Figs. 10, 11, 15, 16, X 50;
Fig. 12, X 40; Figs. 13, 14, X 75; Figs. 17-19, X 60.

Figures 1-3.—*Lenticulina papilloechinata* (Fornasini).

Fig. 1. Challenger Sta. 209, Philippines. (95-100 fathoms)

Figs. 2, 3. Challenger 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria echinata* (d'Orbigny) and by Fornasini (Mem. R. Acc. Sci. Ist. Bologna, Ser. V, Vol. 4, 1894, p. 222) to *C. papilloechinata*. The only distinction from *echinata* is the beading of the sutures and it seems probable that this may be a varietal character only.

Figures 4, 5.—*Marginulinopsis subaculeatus* (Cushman).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Cristellaria aculeata* d'Orbigny and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 123) in *C. subaculeata*. Confusion exists regarding this species since Goës also referred to Brady's figs. 4 and 5 in his description of *C. aculeata* d'Orbigny var. *marginulinoides* (Bull. Mus. Comp. Zool., Harvard, Vol. 29, No. 1, 1896, p. 56). Goës's specimens were slenderer and more elongate than Brady's figures indicate and it seems probable that he referred to Brady's figures as typical *aculeata* rather than as representing his variety. Cushman (U.S.N.M. Bull. 104, 1923) reported both *marginulinoides* and *subaculeatus* and as he had type material of Brady's *C. aculeata* his name has been adopted. The species may perhaps be a *Robulus*, but some of Cushman's figures suggest *Marginulinopsis*.

Figures 6, 7.—*Planularia gemmata* (Brady).

Fig. 6. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Fig. 7. Challenger Sta. 209, Philippines. (95-100 fathoms)

Referred by Brady to *Cristellaria* and by Thalmann to *Planularia*.

Figure 8.—*Robulus* sp. nov.

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Cristellaria costata* (F. & M.) and by Cushman (U.S.N.M. Proc., Vol. 51, 1917, p. 659) to *C. bradyi*. The name *bradyi* is preoccupied by *Cristellaria bradyi* Goës 1894 (Kongl. Sv. Vet. Akad. Handl., Vol. 25, No. 9, p. 64), necessitating a new name for *C. bradyi* Cushman.

Figure 9.—*Robulus costatus* (Fichtel and Moll).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Cristellaria* and transferred to *Robulus* by Thalmann.

Figure 10.—*Astacolus* sp., abnormal specimen.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

The above determination is from Thalmann (Eclog. geol. Helvet., Vol. 26, No. 2, 1933, p. 253).

Figures 11, 12.—*Globulina gibba* d'Orbigny.

Fig. 11. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 12. Dog's Bay, Connemara, Ireland.

Brady referred fig. 11 to *Polymorphina lactea* (Walker and Jacob) and fig. 12 to *Polymorphina gibba* d'Orbigny. Both figures are referred by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 306) to *Globulina gibba* d'Orbigny.

Figure 13.—*Globulina inaequalis* Reuss.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Polymorphina amygdaloides* (Reuss) but Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 73) regard this as a synonym of the earlier *Globulina inaequalis* Reuss.

Figure 14.—*Pyrulina gutta* d'Orbigny.

Challenger Sta. 241, North Pacific. (2300 fathoms)

Referred by Brady to *Polymorphina lactea* (Walker and Jacob) and by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 306) to *Pyrulina gutta* d'Orbigny.

Figures 15, 16.—*Globulina minuta* (Roemer).

Fig. 15. Porcupine Sta. 84, Faroe Channel, North Atlantic. (155 fathoms)

Fig. 16. Challenger Sta. 205A, Hong Kong, Pacific. (7 fathoms)

Referred by Brady to *Polymorphina sororia* Reuss 1863, which was placed in the synonymy of *Globulina minuta* (Roemer) by Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 83).

Figures 17-19.—*Pyrulina fusiformis* (Roemer).

Fig. 17. Challenger Sta. 146, Southern Ocean. (1375 fathoms)

Figs. 18, 19. Porcupine Sta. 18, W. of Ireland, Atlantic. (183 fathoms)

Referred by Brady to *Polymorphina sororia* var. *cuspidata* Brady, which was placed in the synonymy of *P. fusiformis* (Roemer) by Cushman and Ozawa (U.S.N.M., Proc., Vol. 77, Art. 6, 1930, p. 55) though Cushman and Ozawa cite Brady's figures under the heading "*P. angusta* H.B. Brady (not Egger)."

EXPLANATION OF PLATE 72 (LXXII)

Figs. 1-3, X 45-60; Figs. 4, 12-15, 19, X 50; Figs. 5, 6, X 45; Figs. 7, 8, X 25; Fig. 9, X 18;
Fig. 10, X 25; Figs. 11, 16, 17, 20, X 40; Fig. 18, X 18.

Figures 1-3.—*Pyrulina angusta* (Egger).

Fig. 1. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Fig. 2. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Fig. 3. Challenger Sta. 300, N. of Juan Fernandez. (1375 fathoms)

Referred by Brady to *Polymorphina*, and as such recorded by Earland from the "Discovery" collections.

Figure 4.—*Pyrulina fusiformis* (Roemer).

Porcupine Sta. 2, West of Ireland, Atlantic.

Referred by Brady to *Polymorphina sororia* Reuss var. *cuspidata* Brady, and placed in the synonymy of *P. fusiformis* (Roemer) by Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 55).

Figures 5, 6.—*Pyrulina cylindroides* (Roemer).

Fig. 5. Challenger Sta. 296, South Pacific. (1825 fathoms)

Fig. 6. Challenger Sta. 146, Southern Ocean. (1375 fathoms)

Referred by Brady to *Polymorphina lanceolata* Reuss and by Thalmann (Eclog. geol. Helvet., Vol. 25, Pt. 2, 1932, p. 306) to *Pyrulina cylindroides* (Roemer).

Figures 7, 8.—*Pseudopolymorphina ovalis* Cushman and Ozawa.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Polymorphina ovata* d'Orbigny, and by Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 103) to *Pseudopolymorphina ovalis*, nom. nov. for *Polymorphina ovata* d'Orbigny 1846, non d'Orbigny 1826.

Figures 9-11.—*Pseudopolymorphina ligua* (Roemer).

Figs. 9, 10. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 11. Dog's Bay, Connemara, Ireland.

Referred by Brady to *Polymorphina compressa* d'Orbigny 1846, which, according to Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 89) is a synonym of *Pseudopolymorphina ligua* (Roemer 1838).

Figure 12.—*Sigmoidella elegantissima* (Parker and Jones) var. nov., Thalmann.

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Fig. 12b. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Polymorphina*, and to a new variety by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 306).

Figure 13.—*Sigmoidella elegantissima* (Parker and Jones).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Polymorphina* and by Thalmann to *Sigmoidella*.

Figures 14, 15.—*Guttulina* (*Sigmoidina*) *pacifica* (Cushman and Ozawa).

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Polymorphina elegantissima* Parker and Jones, and to *Guttulina* (*Sigmoidina*) *pacifica* (Cushman and Ozawa) by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 306).

Figures 16, 17.—*Guttulina* (*Sigmoidina*) *seguenzana* (Brady).

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Polymorphina* and transferred by Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 50) to *Guttulina* (*Sigmoidina*).

Figure 18.—*Guttulina dawsoni* Cushman and Ozawa.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Polymorphina thouini* d'Orbigny and by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 306) to *Guttulina dawsoni*.

Figures 19, 20.—*Guttulina problema* d'Orbigny.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 19 was referred to *Polymorphina communis* (d'Orbigny) and fig. 20 to *Polymorphina problema* (d'Orbigny), but Cushman and Ozawa (Proc., U.S.N.M., Vol. 77, Art. 6, 1930, p. 20) have placed *communis* in the synonymy of *Guttulina problema* d'Orbigny.

EXPLANATION OF PLATE 73 (LXXIII)

Figs. 1-4, X 40; Figs. 5-8, 15, X 30; Figs. 9, 10, X 60-75; Figs. 11-13, X 35-50;
Figs. 14, 17, X 50; Fig. 16, X 35; Figs. 18, 19, X 50-60.

Figure 1.—*Guttulina problema* d'Orbigny.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Polymorphina*.

Figures 2, 3.—*Guttulina yabei* Cushman and Ozawa.

Fig. 2. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 3. Challenger Sta. 163C, Port Jackson, Australia. (6 fathoms)

Referred by Brady to *Polymorphina oblonga* d'Orbigny and by Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 30) to *Guttulina yabei*.

Figure 4.—*Guttulina austriaca* d'Orbigny.

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Polymorphina oblonga* d'Orbigny and by Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 29) to *Guttulina austriaca* d'Orb.

Figures 5, 6.—*Globulina* sp. nov., Thalmann 1932.

Fig. 5. Challenger Sta. 296, South Pacific. (1825 fathoms)

Fig. 6. Challenger Sta. 224, North Pacific. (1850 fathoms)

Referred by Brady to *Polymorphina rotundata* (Bornemann) but regarded as new by Thalmann (Eclog. geol. Helvet, Vol. 25, No. 2, 1932, p. 306).

Figures 7, 8.—*Globulina rotundata* (Bornemann).

Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Referred by Brady to *Polymorphina*, and by Cushman and Ozawa to *Globulina*.

Figures 9, 10.—*Globulina gibba* d'Orbigny var. *myristiformis* (Williamson).

Mounts Bay, Cornwall.

Referred by Brady to *Polymorphina myristiformis* Williamson and by Cushman and Ozawa (Proc. U.S.N.M., Vol. 77, Art. 6, 1930, p. 66) to *Globulina gibba* var. *myristiformis* (Williamson).

Figures 11-13.—*Guttulina regina* (Brady, Parker and Jones).

Figs. 11, 12. Challenger Sta. 163C, Port Jackson, Australia. (6 fathoms)

Fig. 13. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Polymorphina* and by Cushman and Ozawa to *Guttulina*.

Figures 14-17.—*Polymorphinidae, formae fistulosae*.

Fig. 14. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 15. Challenger Sta. 246, North Pacific. (2050 fathoms)

Fig. 16. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 17. Challenger Sta. 33, Bermuda, Atlantic. (435 fathoms)

Brady refers these figures to fistulose forms of *P. lactea* (fig. 14), *P. sororia* (fig. 15), *P. gibba* (fig. 16) and *P. compressa* (fig. 17). Thalmann unites them under the heading given above (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 306).

Figures 18, 19.—*Pyrulina extensa* (Cushman).

Fig. 18. Challenger Sta. 283, South Pacific. (2075 fathoms)

Fig. 19. Challenger Sta. 338, South Atlantic. (1990 fathoms)

Referred by Brady to *Polymorphina longicollis* Brady 1881 (not of Karrer 1870) which was renamed *P. extensa* by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 156) and transferred to *Pyrulina* by Cushman and Ozawa, 1930.

EXPLANATION OF PLATE 74 (LXXIV)

Figs. 1, 4, 5, 11, 12, X 50; Figs. 2, 13-20, X 60; Fig. 3, X 75; Figs. 6, 7, X 45; Figs. 8-10, X 30;
Figs. 21-23, X 70; Figs. 24-26, X 40-55.

Figures 1-3.—*Uvigerina canariensis* d'Orbigny.

Fig. 1. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 2. Challenger Sta. 309, W. coast of Patagonia. (40-140 fathoms)

Fig. 3. Challenger Sta. 33, off Bermuda. (435 fathoms)

Figures 4-7.—*Uvigerina cushmani* Todd.

Figs. 4, 5. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figs. 6, 7. Challenger Sta. 151, Heard Is., South Pacific. (75 fathoms)

Referred by Brady to *U. tenuistriata* Reuss, an Oligocene species. Since Cushman and Edwards (C.C.L.F.R., Vol. 14, Pt. 4, 1938, p. 84) have referred topotypes of *U. tenuistriata* Reuss to *Angulogerina* and figured a form very different from that shown here it is clear that Brady was in error. Hofker (Foram. Siboga Exped., Pt. III, 1951, p. 218) followed Brady and Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 95) in his interpretation of this form and referred it to *Euvigerina*. Todd (Allan Hancock Pacific Exped., Vol. 6, No. 5, 1948, p. 257) has figured a form regarded as the same as Brady's as *U. cushmani*, and is followed here, although she does not refer to Brady or to *U. tenuistriata* Reuss. The toothplate of this form is not known, but it may belong to Hofker's *Euvigerina*.*

Figures 8-10.—*Uvigerina schwageri* Brady.

Figs. 8, 9. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Fig. 10. Challenger Sta. 209, Philippines. (95-100 fathoms)

Hofker (Siboga Exped., Foraminifera Pt. 3, 1951, p. 226) suggests that this is the magalospheric form of *Euvigerina aculeata* (d'Orbigny), since it was commonly found associated with that species. The association is regarded as due to environment in all probability and Brady's name is retained.

Figures 11, 12.—*Euvigerina peregrina* (Cushman).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Uvigerina pygmaea* d'Orbigny but Cushman (C.C.L.F.R., Vol. 6, Pt. 3, 1930, p. 63) has pointed out that neither of Brady's figures represent typical *U. pygmaea* and probably are of two distinct species, which he does not name. Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 166) erected *U. peregrina* for forms occurring off the N.E. coast of the United States, and placed *U. pygmaea* of Flint, non d'Orbigny, in synonymy. This is a very variable species and it appears to include these forms figured by Brady. Hofker (Pubbl. Staz. Zool. Napoli, Vol. 12, Fasc. 1, 1932, p. 118) has figured a similar form as *U. mediterranea*, which was placed by Höglund (Zool. Bidr. fr. Uppsala, Vol. 26, 1947, p. 279) in synonymy with *U. peregrina* Cushman. Hofker (Foram. Siboga Exped., Pt. III, 1951, pp. 219-226) in a detailed discussion of *peregrina* refutes Höglund's views, and retains *Euvigerina mediterraneensis* (Hofker) (sic) and *E. peregrina* (Cushman) as valid species in his new genus *Euvigerina*, referring Höglund's "*U. peregrina*" to *Aluvigerina pygmaea* (d'Orbigny). Since *pygmaea* is the genotype of *Uvigerina* d'Orbigny, *Aluvigerina* Hofker 1951 is a synonym of that genus and cannot be upheld. More recently Hofker (Spolia Zool. Mus. Hauniensis, Vol. 15, 1956, pp. 82-84, pl. 9) has referred forms from the West Indies to *Euvigerina peregrina* (Cushman) and in spite of discrepancies between Brady's figures and typical *peregrina* it is felt that Brady was almost certainly dealing with a form of that highly variable species.

Figures 13, 14.—*Uvigerina bifurcata* d'Orbigny.

Challenger Sta. 232, South of Japan, N. Pacific. (345 fathoms)

Referred by Brady to *U. pygmaea* d'Orbigny. Brady's figures agree well with figures of *U. bifurcata* given by d'Orbigny and by Heron-Allen and Earland.

Figures 15, 16.—*Angulogerina angulosa* (Williamson).

Challenger Sta. 145, Prince Edward Island, South Pacific. (50-150 fathoms)

Referred by Brady to *Uvigerina* and by Cushman to *Angulogerina*, 1927, as the genotype (C.C.L.F.R., Vol. 3, Pt. 1, p. 69).

Figure 17.—*Angulogerina carinata* Cushman var. *bradyana* Cushman.

Challenger Sta. 300, North of Juan Fernandez, E. Pacific. (1375 fathoms)

Referred by Brady to *Uvigerina angulosa* Williamson and to *Angulogerina carinata* Cushman var. *bradyana* by Cushman (C.C.L.F.R., Vol. 8, Pt. 2, 1932, p. 45).

Figure 18.—*Angulogerina carinata* Cushman.

Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Referred by Brady to *Uvigerina angulosa* Williamson and by Cushman (Bull. Scripps Inst. Oceanogr., California Univ., Tech. Ser., Vol. 1, 1927, p. 159), to *Angulogerina carinata*.

Figures 19, 20.—*Angulogerina carinata* Cushman var. *spinipes* (Brady).

Challenger Sta. 135, off Tristan d'Acunha, S. Atlantic. (100-150 fathoms)

Referred by Brady to *Uvigerina angulosa* Williamson var. *spinipes* and by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 306) to *Angulogerina carinata* var. *spinipes* (Brady).

*NOTE: Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 168) suggests that specimens from off Bermuda and the N.E. coast of the United States referred by Brady to *U. tenuistriata* Reuss are *U. peregrina* var. *bradyana* Cushman. This is a homonym of *U. bradyana* Fornasini 1900, and the name *U. hollicki* has been proposed for Cushman's var. *bradyana* by H. E. Thalmann (Contr. Cush. Found. Foram. Res., Vol. 1, Pt. 3-4, 1950, p. 45).

EXPLANATION OF PLATE 74 (LXXIV), CONTINUED

Figures 21-23.—*Neouvierina porrecta* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Uvigerina* and by Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 213) to *Neouvierina*.

Figures 24-26.—*Uvigerina bradyana* Fornasini.

Figs. 24, 25. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Fig. 26. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Referred by Brady to *Uvigerina* sp. intermediate between *U. pygmaea* d'Orbigny and *U. aculeata* d'Orbigny. Fornasini (Mem. R. Acc. Sci. Ist. Bologna, Ser. V, Vol. 8, 1900, p. 390) referred these figures to his *U. bradyana*. Miss Ruth Todd (Allan Hancock Pacific Exped., Vol. 6, No. 5, 1948, p. 267) has suggested that Brady's fig. 26, not figs. 24, 25, may be *U. peregrina* Cushman var. *dirupta* Todd. In the absence of comparative material, however, Fornasini has been followed here, but future workers should keep in mind the possibility that these figures of Brady may represent more than one species, especially since his material came from widely separated localities.

NOTE: Since Hofker's new genera allied to *Uvigerina* (*Euuvigerina*, *Neouvierina*, *Praeuuvigerina* and *Aluvigerina*) proposed in 1951 (Siboga Exped., Foraminifera Part III) depend for their identification upon toothplate structure it is not possible to allot Brady's species to them, except in those cases where Hofker has studied the internal structure of species regarded as the same as those figured by Brady. As noted earlier the genus *Aluvigerina* is a synonym of *Uvigerina* d'Orbigny (same genotype).

EXPLANATION OF PLATE 75 (LXXV)

Figs. 1-3, X 35; Figs. 4, 5, 15-17, 24-26, X 45; Figs. 6-8, 18-20, X 50; Fig. 9, X 40;

Figs. 10, 11, 21-23, X 60; Figs. 12-14, X 70.

Figures 1-3.—*Euuvigerina aculeata* (d'Orbigny).

Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Referred by Brady to *Uvigerina* and by Hofker (Siboga Exped., Foraminifera Part III, 1951, p. 226) to *Euuvigerina aculeata* (d'Orbigny).

Figures 4, 5.—*Uvigerina brunnensis* Karrer.

Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Figures 6-9.—*Uvigerina asperula* Czjzek.

Figs. 6, 7, 9. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Fig. 8. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Fig. 9 referred by Brady to *U. asperula* var. *auburiana* d'Orbigny and to *U. asperula* by Thalmann (Eclog. geol. Helvet., Vol. 25, No. 2, 1932, p. 307).

Figures 10, 11.—*Neouvierina ampullacea* (Brady).

Challenger Sta. 344, Ascension Island, S. Atlantic. (420 fathoms)

Referred by Brady to *Uvigerina asperula* var. *ampullacea* and by Hofker to *Neouvierina ampullacea* (Brady) (Siboga Exped., Foraminifera Part III, 1951, p. 208). Thalmann (Eclog. geol. Helvet., Vol. 30, No. 2, 1937, p. 341) refers these figures to *U. asperula* var. *proboscidea* Schwager. This is probably based on Cushman (Bernice P. Bishop Mus., Bull. 119, 1934, p. 126) who remarks, "Brady records *U. asperula* and variety *ampullacea* from Fiji, which may be this species" (*U. proboscidea* Schwager).

Figures 12-14.—*Neouvierina interrupta* (Brady).

Figs. 12, 13. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Fig. 14. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Uvigerina* and by Hofker (l. c. supra, 1951, p. 213) to *Neouvierina*.

Figures 15-17.—*Rectobolivina columellaris* (Brady).

Figs. 15, 16. Challenger Sta. VIII, off the Canaries, Atlantic. (620 fathoms)

Fig. 17. Challenger Sta. 162, Bass Strait, Pacific. (28-40 fathoms)

Referred by Brady to *Sagrina columellaris* Brady and by Egger, Cushman and others to *Siphogenerina*. Thalmann (Eclog. geol. Helvet., Vol. 30, No. 2, 1937, p. 341) refers these figures to *Siphogenerina zitteli* (Karrer) but Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 68) has shown that *columellaris* should be placed in *Rectobolivina*, and a careful comparison of original figures shows marked differences between the forms of Karrer and Brady.

Figures 18-20.—*Rectobolivina bifrons* (Brady).

Challenger Sta. 232, off Japan. (345 fathoms)

Referred by Brady to *Sagrina* and transferred by Cushman (C.C.L.F.R., Vol. 3, 1927, p. 68) to *Rectobolivina* as the genotype.

Figures 21-24.—*Siphogenerina raphanus* (Parker and Jones).

Fig. 21. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 22. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 23b. Challenger Sta. 209, Philippines. (95-100 fathoms)

Fig. 24. Challenger Sta. 279A, off Tahiti, Pacific. (420 fathoms)

Referred by Brady to *Sagrina*; by Schlumberger 1883 to his new genus *Siphogenerina*.

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EXPLANATION OF PLATE 75 (LXXV), CONTINUED

Figures 25-26.—*Siphogenerina striata* (Schwager) var. *curta* Cushman.

Fig. 25. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Fig. 26. Challenger Sta. 209, Philippines. (95-100 fathoms)

Referred by Brady to *Sagrina striata* (Schwager) and by Cushman (Proc. U.S.N.M., Vol. 67, Art. 25, 1926, p. 8) to *Siphogenerina striata* var. *curta*.

EXPLANATION OF PLATE 76 (LXXVI)

Figs. 1-3, 20, X 60; Figs. 4-7, 11-16, X 70; Figs. 8-10, X 50-70; Figs. 17, 18, X 75;

Fig. 19, X 150; Fig. 21, X 100; Figs. 22-28, X 35.

Figures 1-3.—*Rectobolivina dimorpha* (Parker and Jones) var. *pacifica* Cushman.

Fig. 1. Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Figs. 2, 3. Challenger Sta. 279A, off Tahiti, Pacific. (420 fathoms)

Referred by Brady to *Sagrina dimorpha* (P. & J.) and by Cushman (Proc. U.S.N.M., Vol. 67, Art. 25, 1926, p. 13) to *Siphogenerina dimorpha* var. *pacifica*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 116) shows *dimorpha* to be biserial, then uniserial, and therefore a *Rectobolivina*, and it is assumed that the var. *pacifica* should also be placed in that genus.

Figures 4-7.—*Rectobolivina* (?) *virgula* (Brady).

Fig. 4. Challenger Sta. 195A, off Amboyna, Pacific. (15-20 fathoms)

Figs. 5-7. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Sagrina* and by Egger and Cushman to *Siphogenerina*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 93) refers forms regarded as *virgula* to *Rectobolivina*, but as his figures show considerable differences from those of Brady there is doubt that he was dealing with the same species, and if not, there is a possibility that the true *virgula* is a *Siphogenerina*.

Figure 8.—*Stilostomella bradyi* (Cushman).

Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Referred by Brady to *Sagrina virgula* Brady and by Cushman (C.C.L.F.R., Vol. II, 1927, p. 79) to *Nodogenerina bradyi*, as the genotype of *Nodogenerina*. Finlay (N.Z. Jour. Sci. and Techn., Vol. 28, No. 5, 1927, p. 273) has shown that *Nodogenerina* is a synonym of *Stilostomella* Guppy.

Figures 9, 10.—*Stilostomella antillea* (Cushman).

No locality given but this species was referred to the Atlantic by Cushman.

Referred by Brady to *Sagrina virgula* Brady and by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, p. 91) to *Nodosaria antillea*. Referred to *Nodogenerina* by Church (Jour. Pal., Vol. 1, 1928, p. 267) and to *Siphonodosaria*, regarded as the prior name to *Nodogenerina*, by Stainforth (Contr. Cush. Found. Foram. Res., Vol. 3, Pt. 1, 1952, p. 11). As noted above *Stilostomella* is regarded as the correct generic name for these forms.

Figures 11-16.—*Nubeculina divaricata* (Brady).

Figs. 11-15. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Fig. 16. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Referred by Brady to *Nubecularia* and by Cushman (Carnegie Inst. Washington Publ. 342, 1924, p. 52) to *Nubeculina* as genotype.

Figures 17-19.—*Schubertia tessellata* (Brady).

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Sagrina* (?) and to *Millettia* Schubert (non Duncan) by Schubert. Renamed *Schubertia* by Silvestri (Riv. Ital. Pal., Vol. 18, 1912, p. 68), as type species. Fig. 17 designated lectotype of *S. tessellata* by Loeblich and Tappan (Smiths. Misc. Coll., Vol. 128, No. 5, 1955, p. 24).

Figures 20, 21.—*Siphogenerina* (?) *annulata* (Brady).

Challenger Sta. 260A, reefs off Honolulu, Pacific. (40 fathoms)

Referred by Brady to *Sagrina* (?) and by Cushman (U.S.N.M. Bull. 71, Pt. 3, 1913, p. 109) to *Siphogenerina* (?). This appears to be a new genus.

Figures 22-28.—*Ramulina globulifera* Brady.

Figs. 22-24, 27. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Figs. 26. Challenger Sta. 23, West Indies. (450 fathoms)

EXPLANATION OF PLATE 77 (LXXVII)

Globigerina bulloides d'Orbigny. X 200.

EXPLANATION OF PLATE 78 (LXXVIII)

Orbulina universa d'Orbigny. X 40.

EXPLANATION OF PLATE 79 (LXXIX)

All figures X 50.

Figures 1-2.—*Globigerina* sp. nov.?

Referred by Brady to *G. bulloides* d'Orbigny var. *triloba* Reuss. These figures have been referred by later authors to *G. triloba* Reuss, but as Cushman (C.C.L.F.R., Vol. 22, Pt. 1, 1946, p. 21) has placed this species in the genus *Globigerinoides* a new name is required for the form figured here.

Figures 3-7.—*Globigerina bulloides* d'Orbigny.

Figures 8-10.—*Globigerina inflata* d'Orbigny.

Figs. 8, 9. Either Challenger Sta. 232, South of Japan, or Sta. 323, South Atlantic. (345 or 1900 fathoms)

Figures 11-16.—*Globigerinoides rubra* (d'Orbigny).*

Figs. 11, 13-15. Challenger Sta. 338, South Atlantic. (1990 fathoms)

Fig. 12. Challenger Sta. 344, Ascension Island, South Atlantic. (420 fathoms)

Fig. 16. Challenger Sta. 346, South Atlantic. (2350 fathoms)

Referred to *Globigerina* by Brady and to *Globigerinoides* by Cushman (C.C.L.F.R., Vol. 3, No. 1, 1927, p. 87).

Figure 17.—*Globigerina eggeri* Rhumbler.

Challenger Sta. 300, North of Juan Fernandez, E. Pacific. (1375 fathoms)

Referred by Brady to *G. dubia* Egger and to *G. eggeri* by Rhumbler (Nordische Plankton, Pt. 14, Foraminiferen, 1900, p. 19). Cushman (Bull. Scripps Inst. Oceanogr., Techn. Ser., Vol. 1, No. 10, 1927, p. 172) referred these figures to the adult form of *G. conglomerata* Schwager (see pl. LXXXI for figures referred to that species).

*R. Todd (U.S.G.S. Prof. Paper 260-H, 1955, p. 368, footnote) cites Roland W. Brown as being of the opinion that a generic name ending in *-oides*, an adjectival suffix meaning like, takes its gender from the gender of the generic name on which it is based, thus *Globigerina* is feminine, therefore the present species becomes *Globigerinoides rubra* (d'Orbigny).

EXPLANATION OF PLATE 80 (LXXX)

All figures X 50.

Figures 1-5.—*Globigerinoides conglobata* (Brady).

Fig. 2. Challenger Sta. 64, North Atlantic? (2750 fathoms)

Referred by Brady to *Globigerina* and to *Globigerinoides* by Cushman (Bull. Scripps Inst. Oceanogr., Techn. Ser., Vol. 1, No. 10, 1927, p. 173).

Figures 6-10.—*Hastigerinella digitata* (Brady).

Figs. 6, 7, 9. Challenger Sta. 276, South Pacific. (2350 fathoms)

Figs. 8, 10. Challenger Sta. 338, South Atlantic. (1990 fathoms)

Referred by Brady to *Globigerina* and by Galloway (Manual Foram., 1933, p. 333) to *Hastigerinella*.

Figures 11-17.—*Globigerinoides sacculifera* (Brady).

Figs. 11, 13, 14. Challenger Sta. 224, North Pacific. (1850 fathoms)

Fig. 12. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Globigerina* and by Cushman (Bull. Scripps Inst. Oceanogr., Techn. Ser., Vol. 1, No. 10, 1927, p. 173) to *Globigerinoides*.

Figures 18-21.—*Hastigerina aequilateralis* (Brady).

Fig. 19. Challenger Sta. 224, North Pacific. (1850 fathoms)

Referred by Brady to *Globigerina* and by Cushman (C.C.L.F.R., Vol. 3, No. 1, 1927, p. 87) to *Globigerinella* as the genotype. Bolli, Loeblich, and Tappan have recently placed *Globigerinella* Cushman 1927 in synonymy with *Hastigerina* Thomson 1876 (U.S.N.M., Bull. 215, 1957, p. 29).

EXPLANATION OF PLATE 81 (LXXXI)

Figs. 22, 23, X 100; remaining figures X 50.

Figure 1.—*Globigerina conglomerata* Schwager.

Challenger Sta. 155, Antarctic. (1300 fathoms)

Referred by Brady to *G. dutertrei* d'Orbigny and to *G. conglomerata* by Cushman (Bull. Scripps Inst. Oceanogr., Techn. Ser., Vol. 1, No. 10, 1927, p. 172).

Figures 2, 3.—*Globigerina tricamerata* Tolmachoff.

Challenger Sta. 344, Ascension Island. (420 fathoms)

Referred by Brady to *G. bulloides* var. *triloba* Reuss and by Tolmachoff (Ann. Carnegie Mus., Pittsburgh, Vol. 23, 1934, p. 324) to *G. tricamerata*.

Figures 4, 5.—*Globigerina helicina* d'Orbigny.

Fig. 4. Challenger Sta. 338, South Atlantic. (1990 fathoms)

Fig. 5. Challenger Sta. 85, Canaries, Atlantic. (1125 fathoms)

Figures 6, 7.—*Globigerina* sp., wild-growing, monstrous forms.

Fig. 6. Challenger Sta. 338?, South Atlantic. (1990 fathoms)

Fig. 7. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Brady notes that these are bottom specimens.

Figures 8-26.—*Orbulina universa* d'Orbigny.

Fig. 8. Challenger Sta. 246, North Pacific. (2050 fathoms)

Fig. 9. ? Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 10. ? Off Seaham, Durham, England. (40-48 fathoms)

Fig. 11. Off Shetland, 50-60 fathoms?

Fig. 21. Challenger Sta. 78, E. of the Azores, Atlantic. (1000 fathoms)

Fig. 26. Challenger Sta. 302, W. coast of Patagonia. (1450 fathoms)

Figure 27.—*Orbulina porosa* Terquem.

EXPLANATION OF PLATE 82 (LXXXII)

Figs. 1-19, X 50; Fig. 20, X 100.

Figures 1-3.—*Orbulina universa* d'Orbigny.

Fig. 2. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Fig. 3. Challenger Sta. 166, W. coast of New Zealand. (275 fathoms)

Figure 4.—*Globigerinoides sacculifera* (Brady).

Challenger Sta. 36 (surface), North Atlantic.

Referred by Brady to *Globigerina* and by Cushman, 1927 (vide antes) to *Globigerinoides*.

Figure 5.—*Globigerinoides conglobata* (Brady).

No locality, surface.

Referred by Brady to *Globigerina* and by Cushman, 1927, to *Globigerinoides*.

Figures 6, 7.—*Hastigerinella digitata* (Brady).

Challenger Sta. 191A, Ki Islands, or Sta. 291A, off Tahiti, Pacific.

Referred by Brady to *Globigerina* and by Galloway, 1933, to *Hastigerinella* (vide antes, plate LXXX, figs. 6-10).

Figures 8, 9.—*Globigerina bradyi* Wiesner.

Challenger Sta. 144, Southern Ocean. (1570 fathoms)

Referred by Brady to *Globigerina* sp., minute forms, and by Wiesner (Foram. Deutsche Südpolar Exped. 1901-1903, 1931, p. 138) to *G. bradyi*.

Figure 10.—*Hastigerina* (?) *subcretacea* (Lomnicki).

Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Referred by Brady to *G. cretacea* d'Orbigny?, and by Lomnicki (Naturf. Ver. Brunn., Verh., Vol. 39 (1900), 1901, p. 17) to *G. subcretacea*. Also referred to *G. subcretacea* (not of Lomnicki) by Chapman (Jour. Linn. Soc. London, Zool., Vol. 28, 1902, p. 410). Referred to *Globigerinella* by Thalmann 1932, p. 307. Bolli, Loeblich and Tappan (U.S.N.M., Bull. 215, 1957, p. 29) have placed *Globigerinella* Cushman 1927 in the synonymy of *Hastigerina* Thomson 1876.

Figure 11.—*Globigerina cretacea* d'Orbigny.

White Chalk, Iowa, U. S. A. (for comparison).

Referred by Brady to *Globigerina* and by Thalmann, 1932, to *Globigerinella*. Cushman retains this species in *Globigerina*, as does Bronnimann (Bull. Amer. Pal., Vol. 34, No. 140, 1952, p. 14).

Figure 12.—*Globotruncana linneana* (d'Orbigny).

No locality but noted as a fossil specimen, and not found in living condition by Brady. D'Orbigny's material came from the shore sands of Cuba and is regarded as derived from the Upper Cretaceous. Recorded as *Globigerina* by Brady.

Figures 13-20.—*Candeina nitida* d'Orbigny.

Fig. 13. Philippines (surface).

Fig. 14. Challenger Sta. 338, South Atlantic. (1990 fathoms)

Figs. 15-17. Challenger Sta. 280, South Pacific. (1940 fathoms)

Figs. 18-20. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

EXPLANATION OF PLATE 83 (LXXXIII)

Fig. 1, X 43; Fig. 2, X 47; Figs. 3-8, X 50.

Figures 1-8.—*Hastigerina murrayi* Thomson.

Figs. 5-8. Challenger Sta. 338, South Atlantic. (1990 fathoms)

Referred by Brady to *Hastigerina pelagica* d'Orbigny, but according to Bolli, Loeblich and Tappan (U.S. N.M., Bull. 215, 1957, p. 29) these figures represent *H. murrayi* Thomson.

EXPLANATION OF PLATE 84 (LXXXIV)

All figures X 50.

Figures 1-7.—*Sphaeroidina bulloides* d'Orbigny.

Fig. 1. Challenger Sta. 323, South Atlantic. (1900 fathoms)

Figs. 2, 5-7. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Figs. 3, 4. Challenger Sta. 279A, off Tahiti, Pacific. (420 fathoms)

According to Cushman and Todd (C.C.L.F.R., Vol. 25, Pt. 1, 1949, p. 21) figures 3, 4, 6 and 7 are probably not *S. bulloides* and the material needs restudying.

Figures 8-11.—*Sphaeroidinella dehiscens* (Parker and Jones).

Figs. 8, 9, 11. Challenger Sta. 224, North Pacific. (1850 fathoms)

Referred by Brady to *Sphaeroidina* and by Cushman to *Sphaeroidinella*, as the genotype (C.C.L.F.R., Vol. 3, Pt. 1, p. 90).

Figures 12, 13.—*Pullenia bulloides* (d'Orbigny).

Fig. 12. Challenger Sta. 224, North Pacific. (1850 fathoms)

Fig. 13. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Referred by Brady to *Pullenia sphaeroides* (d'Orbigny). Cushman and Todd (C.C.L.F.R., Vol. 19, Pt. 1, p. 13) refer Brady's figures to *P. bulloides* (d'Orb.) and suggest that d'Orbigny's name *sphaeroides*, as a *Pullenia*, should be allowed to lapse.

Figures 14, 15.—*Pullenia subcarinata* (d'Orbigny).

Fig. 14. Challenger Sta. 149I, Kerguelen Islands, Pacific. (120 fathoms)

Fig. 15. Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Referred by Brady to *Pullenia quinqueloba* (Reuss) and retained as such by Cushman and Todd (l. c. supra, 1943, p. 11). Heron-Allen and Earland, however (Discovery Reports, Vol. 4, Foraminifera Part I, 1932, p. 403), have stated that the Falkland Islands form is *P. subcarinata* (d'Orbigny), that d'Orbigny's came from that region and also show both five- and six-chambered tests. They reached the conclusion that *P. quinqueloba* (Reuss) is a synonym of *P. subcarinata* (d'Orbigny).

Figures 16-20.—*Pulleniatina obliquiloculata* (Parker and Jones).

Figs. 16, 20. Challenger Sta. 224, North Pacific. (1850 fathoms)

Fig. 17. Challenger Sta. 5, Atlantic, S. W. of the Canaries. (2740 fathoms)

Fig. 19. Challenger Sta. 344, Ascension Island, mid-Atlantic. (420 fathoms)

Referred by Brady to *Pullenia* and by Cushman (C.C.L.F.R., Vol. 3, Pt. 1, 1927, p. 90) to *Pulleniatina*, as genotype.

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EXPLANATION OF PLATE 85 (LXXXV)

Figs. 1-5, X 100; Figs. 6-11, X 120; Figs. 12, 13, 15, 17, 19, 20, 22-25, X 50;
Figs. 14, 16, X 45; Figs. 18, 21, X 60.

Figures 1-4.—*Spirillina vivipara* Ehrenberg.

Fig. 1. Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Fig. 2a. Challenger Sta. 260A, Honolulu Reefs, Pacific. (40 fathoms)

Fig. 2b. Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Fig. 3. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Fig. 4. Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Figure 5.—*Spirillina vivipara* Ehrenberg var. *revertens* Rhumbler.

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *S. vivipara* Ehrenberg, and by Rhumbler (Zool. Jahrb., Vol. 24, 1906, p. 32) to *S. vivipara* var. *revertens*. Galloway (Manual of Foram., 1933, p. 88) raised this variety to specific rank and designated it the type of *Mychostomina* Berthelin 1881. Cushman (Foram., Class. and Econ. Use, ed. 2, 1933, p. 233, and subsequently) placed *Mychostomina* in the synonymy of *Spirillina* Ehrenberg 1843. Loeblich and Tappan (personal communication) are presently studying *Mychostomina*, and this figure of Brady may require revision subsequently.

Figures 6, 7.—*Spirillina obconica* Brady.

Fig. 6. Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Fig. 7. Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Figures 8-11.—*Spirillina inaequalis* Brady.

Figs. 8, 10. Challenger Sta. 260A, Honolulu Reefs, Pacific. (40 fathoms)

Figs. 9, 11. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Figures 12-16.—*Spirillina tuberculata* Brady.

Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Figure 17.—*Spirillina denticulata* Brady.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *S. limbata* var. *denticulata* nov., and by Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, p. 351) to *S. denticulata* Brady. Parr places *S. denticulogranulata* Chapman in synonymy with this species.

Figures 18-21.—*Spirillina limbata* Brady.

Fig. 18. Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Figs. 19, 20. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Figures 22-25.—*Spirillina decorata* Brady.

Figs. 22, 24, 25. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Fig. 23. Challenger Sta. 85, off the Canaries, Atlantic. (1125 fathoms)

EXPLANATION OF PLATE 86 (LXXXVI)

Figs. 1-5, X 120; Figs. 6, 7, X 150; Figs. 8, 9, 12, X 75; Figs. 10, 11, X 75-90; Fig. 13, X 50.

Figures 1-7.—*Patellina corrugata* Williamson.

Fig. 1. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 2. Challenger Sta. 174A, off Fiji, Pacific. (255 fathoms)

Figs. 3-5. Challenger Sta. 145, Prince Edward Is., S. Pacific. (50-150 fathoms)

Fig. 6. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Fig. 7. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Figure 8.—*Rosalina bradyi* (Cushman).

Challenger Sta. 205A, off Hong Kong, Pacific. (7 fathoms)

Referred by Brady to *Discorbina globularis* (d'Orbigny) and by Cushman (U.S.N.M. Bull. 71, Pt. 5, 1915, p. 12) to *Discorbis globularis* (d'Orbigny) var. *bradyi*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 456) refers this form to *Discopulvinulina* but Hornibrook and Vella (The Micropal., N.Y., Vol. 8, No. 1, 1954, p. 26) place it in *Rosalina* and point out that it is not congeneric with *bertheloti*, the genotype of *Discopulvinulina*. See also note on fig. 13 below.

Figure 9.—*Rosalina vilardeboana* d'Orbigny.

Challenger Sta. 151, Heard Island, S. Pacific. (75 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. It is clearly not congeneric with *Discorbis vesicularis*, genotype of *Discorbis* and has been placed here in *Rosalina*, as originally designated by d'Orbigny. Heron-Allen and Earland (Proc. Roy. Irish Acad., Vol. 31, Pt. 64, 1913, p. 118) referred this figure to *Discorbina mediterraneensis* (d'Orbigny), a very different species from the figures and description. In 1932 after seeing d'Orbigny's types they figured specimens from the Falkland Islands as typical (Discovery Repts., Vol. IV, p. 409, pl. xiii, figs. 37-39), and referred Brady's figs. 9 and 12 (see below) to this species. Their figures closely resemble fig. 9 but not fig. 12.

Figures 10, 11.—*Discopulvinulina* (?) *araucana* (d'Orbigny).

Fig. 10. Challenger Sta. 149I, Kerguelen Islands, S. Pacific. (120 fathoms)

Fig. 11. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Discorbina* and by Cushman (as "*auracana*", U.S.N.M. Bull. 71, Pt. 5, 1915, p. 15) to *Discorbis*. Hofker (Siboga Exped., Foraminifera, Pt. III, 1951, p. 462) refers to it as *Discopulvinulina araucana* but it seems questionable that it is congeneric with *bertheloti*, the type.

Figure 12.—*Rosalina* sp. nov.?

Challenger Sta. 168, N.E. coast of New Zealand. (1100 fathoms)

Referred by Brady to *Discorbina vilardeboana* (d'Orbigny). *D. vilardeboana* was described as possessing a rounded periphery and the original figures and description differ very markedly from the present figure of Brady. This form is unlike any found in the literature and is regarded as a new species of *Rosalina*. Cushman (Proc. U.S.N.M., Vol. 56, p. 625 and U.S.N.M. Bull. 100, Vol. 4, 1921, p. 304) had a similar form from the Philippines which he left as *D. vilardeboana*?, noting that it was distinct from d'Orbigny's species.

Figure 13.—*Rosalina globularis* d'Orbigny.

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Discorbina* and by Galloway and Wissler (Jour. Pal., Vol. 1, 1927, p. 62) to *Rosalina* d'Orbigny, as the genotype. Brotzen (Sver. Geol. Undersok., Ser. C, Vol. 42, 1948, p. 72) has included forms later separated by Hofker as *Neoconorbina*, and is followed by Bermúdez (1952). Hornibrook and Vella (The Micropal., N.Y., Vol. 8, No. 1, 1954, p. 26) restrict *Rosalina* to the *globularis* group of species and retain *Neoconorbina* for *orbicularis* (Terquem) and allied forms. Rhumbler (Kieler Meeresf., Vol. 11, 1938, p. 207) refers fig. 8 above, but not fig. 13, to *D. globularis* var. *cyprinodon*, apparently in ignorance of Cushman's *R. bradyi*.

EXPLANATION OF PLATE 87 (LXXXVII)

Figs. 1, 6, 7, X 100; Fig. 2, X 35; Figs. 3, 8, X 60; Fig. 4, X 50; Fig. 5, X 75.

Figure 1.—*Conorboides advena* (Cushman).

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *Discorbina rosacea* (d'Orbigny) and by Cushman (Carnegie Inst., Washington, Publ. 311, 1922, p. 40) to *Discorbis advena*. Bermúdez has figured it as *Discopulvinulina advena* (Bol. de Geol., Caracas, Venezuela, Vol. 2, No. 4, 1952, pl. 3, fig. 1) but it is clearly not congeneric with *bertheloti*, and Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 418) has listed it as *Conorbis* (not *Conorbis* Swainson; later re-named *Conorboides*).

Figure 2.—*Discorbis* sp. nov.

Shore sand, Melbourne, Australia; or, Challenger Sta. 187A, off Booby Island, Pacific. (8 fathoms)

Referred by Brady to *Discorbina vesicularis* (Lamarck), and by Parr (Proc. Roy. Soc. Victoria, n.s., Vol. 44, Pt. 2, 1932, p. 227) to *Discorbis vesicularis* var. *dimidiata* (Parker and Jones). Later (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 353) Parr listed it as *Discorbis dimidiatus* (Parker and Jones). Bermúdez (Bol. de Geol., Caracas, Vol. 2, No. 4, 1952, p. 39) then erected the genus *Lamellodiscorbis* with *Discorbina dimidiata* Parker and Jones as genotype, reproducing the present figure of Brady as that species. Hornibrook and Vella (The Micropal., N.Y., Vol. 8, No. 1, 1954, p. 27) after a study of Australian material and Paris Basin Eocene specimens of *D. vesicularis* reached the conclusion that Parr (l. c. supra, 1932) was dealing with three species, *Lamellodiscorbis dimidiatus* (Parker and Jones) (distinct from Brady's figure under discussion here), and two new species of *Discorbis*, one of which is that shown here, and the other that figured by Brady as *Discorbina rosacea* (d'Orbigny) on the present plate, figure 4. These two species have not yet been named.

Figure 3.—*Valvulineria rugosa* (d'Orbigny).

Challenger Sta. 185, Torres Strait, Pacific.

Referred by Brady to *Discorbina rugosa* (d'Orbigny). Placed in *Discorbis* by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 306) and referred here to *Valvulineria*.

Figure 4.—*Discorbis* sp. nov.

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Discorbina rosacea* (d'Orbigny) and by Cushman (U.S.N.M., Bull. 71, Pt. 5, 1915, p. 13) to *Discorbis*. Bermúdez (Soc. Cienc. Nat. "La Salle", Caracas, Venezuela, Vol. 12, No. 32, 1952, p. 206) placed it in *Asterigerinata*. It does not appear to be the same as d'Orbigny's *Rotalia rosacea* and will be discussed in a forthcoming paper by Hornibrook and Vella (see also Hornibrook and Vella, The Micropal., N.Y., Vol. 8, No. 1, 1954, p. 28).

Figures 5-7.—*Discorbis australis* Parr.

Fig. 5. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 7. Challenger Sta. 172, off Fiji, Pacific. (18 fathoms)

Referred by Brady to *Discorbina valvulata* (d'Orbigny) and by Parr (Proc. Roy. Soc. Victoria, n.s., Vol. 44, Pt. 2, 1932, p. 227) to *Discorbis australis*.

Figure 8.—*Discorbina* (?) *mira* (Cushman).

Challenger Sta. 352A, off Cape Verde Islands, Atlantic. (11 fathoms)

Referred by Brady to *Discorbina turbo* (d'Orbigny), the type of *Discorbina* Parker and Jones, 1862. Cushman (Carnegie Inst., Washington, Publ. 311, 1922, p. 39) referred this figure to *Discorbis mira*. The ventral surface suggests *Discorbis* but that genus lacks the umbilical plug indicated in this species, and it appears closer to *Discorbina*. *Discorbina* is usually placed in synonymy with *Discorbis* Lamarck, 1804, but Hornibrook and Vella (The Micropal., N.Y., Vol. 8, No. 1, 1954, p. 26) have reinstated the genus of Parker and Jones, with *Rotorbinella* Bandy, 1944, in synonymy. D'Orbigny (Ann. Sci. Nat., Vol. 7, 1826, p. 274) referred to *Rotalia* (*Trochulina*) *turbo*, and the name *Trochulina* has since been used by Ehrenberg, 1840, and Basset, 1885, the latter using it subgenerically with the specific name *turbo*. Loeblich and Tappan (personal communication) regard *Discorbina* as a synonym of *Discorbis* and a junior synonym of *Trochulina* d'Orbigny 1840 (the latinization of the name dating to Ehrenberg). The writer does not regard *Discorbina* as synonymous with *Discorbis* Lamarck, but it is possible that the name *Trochulina* should be reinstated, and if so *mira* would be placed in that genus.

EXPLANATION OF PLATE 88 (LXXXVIII)

Figs. 1-3, 5, 10, X 100; Fig. 4, X 90; Figs. 6, 9, X 50; Fig. 7, X 75; Fig. 8, X 60.

Figure 1.—*Gavelinopsis lobatulus* (Parr.)

Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *Discorbina isabelleana* (d'Orbigny), and by Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 354) to *Discorbis lobatulus*. It is regarded as a *Gavelinopsis*.

Figure 2.—*Rosalina* sp. nov.

Challenger Sta. 233B, Inland Sea, Japan. (15 fathoms)

Referred by Brady to *Discorbina vilardeboana* (d'Orbigny), a non-carinate species of *Rosalina* figured on Plate LXXXVI, fig. 9. Cushman and Kellett (Proc. U.S.N.M., Vol. 75, Art. 25, 1929, p. 9) referred these figures to *Discorbis isabelleanus* (d'Orbigny) but Heron-Allen and Earland (Discovery Repts., Vol. 4, 1932, p. 411-412) have shown that this is clearly erroneous. From a study of the available literature this form appears to be new and is regarded as belonging to d'Orbigny's genus *Rosalina*.

Figure 3.—*Pileolina* (?) *patelliformis* (Brady).

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. Brotzen (Sver. Geol. Unders. Avh., Ser. C, Vol. 30, 1936, p. 141) referred it to *Conorbina*, and Hofker to *Conorbella*. *Conorbella* is a synonym of *Glabratella* Dorreen (see note on fig. 10 below) and *patelliformis* is removed from that genus by Hornibrook and Vella (The Micropal., N.Y., Vol. 8, No. 1, 1954, p. 25). It is possible that *Pileolina* may be available for this and allied species (see Hornibrook and Vella, l. c.).

Figures 4-8.—*Neoconorbina terquemi* (Rzehak), et sp.

Fig. 4. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 5. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Figs. 6, 7. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Fig. 8. Challenger Sta. 163B, off Port Jackson, Australia. (2-10 fathoms)

Referred by Brady to *Discorbina orbicularis* (Terquem), which is a homonym of *Rosalina orbicularis* d'Orbigny 1850, and was renamed *Discorbina terquemi* by Rzehak (Verh. Geol. Reichsanst., Wien, 1888, p. 228). It was placed in *Rosalina* by Bermúdez (1952) and in *Conorbina* by Brotzen (1936). Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 435) placed it in *Neoconorbina*, and stated that at least three species had previously been confused under the heading *Discorbina orbicularis* (Terquem). It is thought that fig. 5 here is probably *N. terquemi*, with figs. 6-8 as probable variants, and that fig. 4 is very close to *N. pacifica* Hofker and *N. marginata* Hofker. Comparative material should be studied to determine the identity of figure 4, and whether figures 6-8 are conspecific with *N. terquemi*.*

Figure 9.—*Rosalina* (?) *eximia* (Hantken).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. The generic position of this form is uncertain but it seems probable that it should be placed in *Rosalina*.

Figure 10.—*Glabratella pulvinata* (Brady).

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. Dorreen (Jour. Pal., Vol. 22, No. 3, 1948, p. 294) placed it in *Glabratella*, and Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 470), apparently in ignorance of the work of Dorreen, made it the genotype of *Conorbella*. Hornibrook and Vella (The Micropal., N. Y., Vol. 8, No. 1, 1954) have shown that *Conorbella* is a synonym of *Glabratella* Dorreen, although Hofker included in that genus a number of species not congeneric with the type.

*Fornasini (Mem. R. Acc. Sci. Ist. Bologna, Ser. V, Vol. 10, 1902, p. 56) referred these figures to *Discorbina subrotunda* (d'Orbigny). This is a *nomen nudum* so Rzehak's name must stand.

A. T. Hollick ad nat. del. et hth.

DISCORBINA

Hanhart imp.

EXPLANATION OF PLATE 89 (LXXXIX)

Figs. 1-9, 12, X 100; Fig. 10, X 90; Fig. 11, X 60.

Figure 1.—*Pileolina* (?) *patelliformis* (Brady).

Challenger Sta. 187, South of Papau, Pacific. (6 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. Brotzen (Sver. Geol. Unders. Avh., Vol. 30, No. 3, Ser. C, 1936, p. 141) placed it in *Conorbina* and Bermúdez (Bol. de Geol., Caracas, Venezuela, Vol. 2, No. 4, 1952, p. 37) in *Conorbella* Hofker. For a discussion of *Pileolina* see Hornibrook and Vella (The Micropal., N.Y., Vol. 8, No. 1, 1954, pp. 24-25).

Figures 2-4.—*Pileolina* (?) *australensis* (Heron-Allen and Earland).

Figs. 2, 4. Shore-sand, Port Elizabeth, Algoa Bay, S. Africa.

Fig. 3. Challenger Sta. 163B, Port Jackson, Australia. (2-10 fathoms)

Referred by Brady to *Discorbina pileolus* (d'Orbigny) and by Heron-Allen and Earland (Discovery Repts., Vol. 4, Foraminifera Pt. 1, 1932, p. 416) to *Discorbis australensis*. If *Pileolina* be accepted in a modified form then this species should probably be placed there (see Hornibrook and Vella, l. c. supra).

Figures 5-7.—*Pileolina* (?) *tabernacularis* (Brady).

Figs. 5, 6. Challenger Sta. 187, S. of Papua, Pacific. (6 fathoms)

Fig. 7. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 470) places this species in *Conorbella*, which is a synonym of *Glabratella* Dorreen. It may perhaps belong in *Pileolina* (see Hornibrook and Vella, l. c. supra).

Figures 8, 9.—*Pileolina* (?) *opercularis* (d'Orbigny)?

Fig. 8a. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figs. 8b-d, 9. Curtis Strait, Queensland, Australia.

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. Bermúdez (l. c. supra, 1952, p. 37) refers it to *Conorbella* (synonym of *Glabratella*, see earlier) as "*Discorbina opercularis* Brady (no de d'Orbigny)". It seems possible that it is a *Pileolina*, and according to Bermúdez is not the species described from Cuba by d'Orbigny. It is probably new if distinct from d'Orbigny's species.

Figure 10.—*Discopulvinulina subbertheloti* (Cushman).

Challenger Sta. 209, Philippines. (95-100 fathoms).

Referred by Brady to *Discorbina bertheloti* (d'Orbigny) and by Cushman (Carnegie Inst., Washington, Publ. 342, 1924, p. 33) to *Discorbis subbertheloti*. The species is very close indeed to *D. bertheloti*, which is the type of *Discopulvinulina* Hofker, and is therefore referred to the same genus.

Figures 11, 12.—*Discopulvinulina bertheloti* (d'Orbigny).

Fig. 11. Challenger Sta. 209, Philippines. (95-100 fathoms)

Fig. 12. Porcupine Sta. 6, West of Ireland, Atlantic. (90 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 449) made this species the genotype of *Discopulvinulina*. Hofker and Bermúdez both included under this heading a variety of "*Discorbis*" species, such as *D. globularis* (which is a *Rosalina*), *D. advena*, *D. turbo* (a *Discorbina* according to Hornibrook and Vella), *D. bradyi* (a *Rosalina*), etc., but Hornibrook and Vella (l. c. supra) restrict the genus to forms of the *D. bertheloti* type.

EXPLANATION OF PLATE 90 (XC)

Figs. 1-3, X 75; Figs. 4, 7, 8, 10, 11, X 100; Figs. 5, 6, X 40; Figs. 9, 12, X 90.

Figure 1.—*Discopulvinulina baconica* (Hantken)?

Fig. 1a. Porcupine Sta. 17, West of Ireland, Atlantic. (1230 fathoms)

Figs. 1b, c. Challenger Sta. VIII, off the Canaries, Atlantic. (620 fathoms)

Referred by Brady to *Discorbina bertheloti* var. *baconica* Hantken. This is regarded as a *Discopulvinulina* but it is improbable that Brady was dealing with the same species as Hantken, which was obtained from the Eocene of Hungary. It is probably new.

Figure 2, 3.—*Planodiscorbis rarescens* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Discorbina* and by Cushman and others to *Discorbis*. Bermúdez (Bol. de Geol., Caracas, Venezuela, Vol. 2, No. 4, 1952, p. 40) erected the genus *Planodiscorbis* with *rarescens* as the genotype. Keijzer (Leidse Geol. Med., Vol. 17, 1953, p. 279) has suggested that *rarescens* may belong to his genus *Ruttenella*. If this should prove correct then *Ruttenella* will become a synonym of *Planodiscorbis*.

Figure 4.—*Planodiscorbis circularis* (Sidebottom).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Discorbina*, "carinate form possibly related to *D. rarescens*." This appears to be a *Planodiscorbis* and was referred by Sidebottom (Jour. Roy. Micr. Soc., 1918, p. 253) to *Discorbina circularis*.

Figures 5, 6, 9-12.—*Pileolina* (?) *wiesneri* (Parr).

Figs. 5, 10-12. Challenger Sta. 149D, Kerguelen Islands, S. Pacific. (20-60 fathoms)

Fig. 6. Challenger Sta. 149E, Kerguelen Islands, S. Pacific. (28 fathoms)

Referred by Brady to *Discorbina parisiensis* (d'Orbigny) and by Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, p. 356) to *Discorbis wiesneri*. If the genus *Pileolina* be accepted (see Hornibrook and Vella, The Micropal., N.Y., Vol. 8, No. 1, 1954, p. 25) and used for *Discorbis*-like forms with an umbilicus, swept-back sutures and radiating lines of ventral papillae then this species would appear to belong in that genus.

Figures 7, 8.—*Rosalina concinna* (Brady).

Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *Discorbina*. Cushman (C.C.L.F.R., Vol. 10, No. 4, 1934, p. 96) placed this species in *Tretomphalus* but Bermúdez (l. c. supra, 1952, p. 34) transferred it to *Rosalina* d'Orbigny.

EXPLANATION OF PLATE 91 (XCI)

Fig. 1, X 30; Figs. 2, 3, X 60; Fig. 4, X 90; Fig. 5, X 100; Figs. 6-9, X 50.

Figure 1.—*Epistomaroidea polystomelloidea* (Parker and Jones).

Challenger Sta. 186, Wednesday Island, Pacific. (7-8 fathoms)

Referred by Brady to *Discorbina* and by Uchio (Jap. Jour. Geol. Geogr., Vol. 22, 1952, p. 158) to *Epistomaroidea* as genotype.

Figure 2.—*Discorbinella biconcava* (Jones and Parker).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Discorbina* and by Parr (Min. & Geol. Jour., Victoria, Vol. 2, No. 5, 1941, p. 305) to *Planulinoides* as genotype. In 1945 (Proc. Roy. Soc. Victoria, n.s., Vol. 56, p. 211) Parr transferred this species to *Discorbinella*, making *Planulinoides* a synonym of that genus.

Figure 3.—*Heronallenia lingulata* (Burrows and Holland).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Discorbina biconcava* Parker and Jones and to *Heronallenia lingulata* (Burrows and Holland) by Chapman and Parr (Proc. Roy. Soc. Victoria, n.s., Vol. 43, Pt. 2, 1931, p. 236).

Figure 4.—*Valvulineria rugosa* (d'Orbigny) var. *minuta* (Schubert).

Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Referred by Brady to *Discorbina rugosa* (d'Orbigny) and by Schubert (Jahrb. Geol. Reichsanst., Wien, Vol. 53, 1904, p. 420) to *D. rugosa* var. *minuta*. Parr and others placed this species in *Discorbis* but it appears to belong in the genus *Valvulineria*. Fornasini (Mem. R. Acc. Sci. Ist. Bologna, Ser. V, Vol. 8, 1900, p. 394) noted that this figure is very close to *Discorbina bradyana* Fornasini from the Mediterranean. The Pacific form of Brady seems distinct to the writer so Schubert's name has been used here.

Figures 5, 8.—*Valvulineria bradyi* Brotzen.

Fig. 5. Challenger Sta. 209, Philippines. (95-100 fathoms)

Fig. 8. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Discorbina allomorphinoides* (Reuss) and by Brotzen (Sver. Geol. Unders. Avh., Ser. C, No. 396, Vol. 30, No. 3, 1936, p. 154) to *Valvulineria bradyi*.

Figure 6.—*Lamarckina* sp. nov.

Challenger Sta. 279C, off Tahiti, Pacific. (620 fathoms)

Referred by Brady to *Discorbina saulcyi* (d'Orbigny) but Cushman (U.S.N.M. Bull. 100, Vol. 4, 1921, p. 307) regards d'Orbigny's species as quite distinct and leaves Brady's form as "*Discorbis* sp?". It does not appear from Brady's figures to be either *Discorbis* or *Rosalina*, and has been placed in *Lamarckina* as a new species.

Figure 7.—*Lamarckina ventricosa* (Brady).

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Discorbina* and by Cushman (C.C.L.F.R., Vol. 2, Pt. 1, 1926, p. 12) to *Lamarckina*.

Figure 9.—*Valvulineria* (?) sp. nov.

Challenger Sta. 344, Ascension Island, Atlantic. (420 fathoms)

Referred by Brady to *Discorbina obtusa* (d'Orbigny)? Brady himself expresses doubt that his species was the same as d'Orbigny's *obtusa* and the figures indicate considerable differences. It is probably a new species allied to *D. subobtusa* Cushman. It is not a *Discorbis* as that genus has been restricted by Hornibrook and Vella (The Micropal., Vol. 8, No. 1, 1954, pp. 27-28) but appears to be closely related to *Valvulineria*.

This scientific plate contains 30 numbered illustrations of fossil shells, likely brachiopods, arranged in a grid-like fashion. Each illustration is labeled with a number and a letter (a, b, or c) indicating different views or specimens.

- Figure 1:** Three views (a, b, c) of a large, rounded shell with a prominent central depression and radiating ribs.
- Figure 2:** Two views (a, b) of a shell showing internal structure, with a small detail (c) showing a cross-section of the hinge.
- Figure 3:** Three views (a, b, c) of a small, rounded shell with a distinct hinge line.
- Figure 4:** Three views (a, b, c) of a small, rounded shell with a distinct hinge line.
- Figure 5:** Three views (a, b, c) of a small, rounded shell with a distinct hinge line.
- Figure 6:** Three views (a, b, c) of a small, rounded shell with a distinct hinge line.
- Figure 7:** Three views (a, b, c) of a small, rounded shell with a distinct hinge line.
- Figure 8:** Three views (a, b, c) of a small, rounded shell with a distinct hinge line.
- Figure 9:** Three views (a, b, c) of a small, rounded shell with a distinct hinge line.

The illustrations are rendered in a detailed, stippled style, showing the texture and structure of the fossil shells. The numbers 1 through 9 are placed centrally near their respective groups of views.

EXPLANATION OF PLATE 92 (XCII)

Figs. 1-3, X 35-45; Figs. 4-6, X 35; Figs. 7-9, X 30; Fig. 10, X 60.

Figures 1-3.—*Planorbulina mediterranensis* d'Orbigny.

Fig. 1. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 2. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 3. Porcupine Sta. 23, N.W. of Ireland, Atlantic. (450 fathoms)

Figure 4.—*Planorbulina acervalis* Brady.

Challenger Sta. 187A, Booby Island, Pacific. (8 fathoms)

Figures 5, 6.—*Planorbulinella larvata* (Parker and Jones).

Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Referred by Brady to *Planorbulina* and transferred by Cushman (C.C.L.F.R., Vol. 3, Pt. 1, 1927, p. 96) to *Planorbulinella*, as the genotype.

Figures 7-9.—*Cibicides refulgens* Montfort.

Figs. 7, 9. Porcupine Sta. 36, S.W. of Ireland, Atlantic. (725 fathoms)

Fig. 8. Challenger Sta. 305, W. coast of Patagonia, Pacific. (120 fathoms)

Referred by Brady to *Truncatulina*, but is the genotype of *Cibicides* Montfort.

Figure 10.—*Cibicides lobatulus* (Walker and Jacob).

Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Referred by Brady to *Truncatulina* and to *Cibicides* by Cushman and others.

EXPLANATION OF PLATE 93 (XCIII)

Fig. 1, X 60; Figs. 2, 3, X 60-100; Figs. 4, 5, X 40; Figs. 6, 7, X 50;
Figs. 8, 9, X 50-60; Figs. 10, 11, X 55-60.

Figures 1, 4, 5.—*Cibicides lobatulus* (Walker and Jacob).

Fig. 1. Challenger Sta. 354A, Vigo Harbor, Spain, Atlantic. (11 fathoms)

Fig. 4. Challenger Sta. 246, North Pacific. (2050 fathoms).

Fig. 5. Challenger Sta. 300, N. of Juan Fernandez, Pacific. (1375 fathoms)

Referred by Brady to *Truncatulina* and by Cushman and others to *Cibicides*.

Figure 2.—*Parvicarinina altocamerata* (Heron-Allen and Earland).

Challenger Sta. 166, W. coast of New Zealand. (275 fathoms)

Referred by Brady to *Truncatulina tenuimargo* Brady, and transferred to *Laticarinina tenuimargo* (Brady), with fig. 3, by Cushman (Bernice P. Bishop Mus., Bull. 119, 1934, p. 137). Heron-Allen and Earland (British Antarctic "Terra Nova" Exped. 1910, Zool. Vol. 6, No. 2, 1922, p. 209) referred this figure to *Truncatulina tenuimargo* var. *altocamerata*, and Finlay (Trans. Proc. Roy. Soc. New Zealand, Vol. 69, Pt. 1, 1940, p. 467) made it the genotype of *Parvicarinina* as *P. altocamerata* (Heron-Allen and Earland).

Figure 3.—*Cibicides tenuimargo* (Brady).

Challenger Sta. 174A, off Fiji, Pacific. (255 fathoms)

Referred by Brady to *Truncatulina*, and by Galloway and Wissler, with fig. 2, to *Cibicides* (Jour. Pal., Vol. 1, 1927, p. 66). Finlay (loc. cit. supra) restricted the name *Cibicides tenuimargo* (Brady) to figure 3, and re-named figure 2 *Parvicarinina altocamerata* (Heron-Allen and Earland).

Figure 6.—*Dyocibicides biserialis* Cushman and Valentine.

Challenger Sta. 166, W. coast of New Zealand. (275 fathoms)

Referred by Brady to *Truncatulina variabilis* d'Orbigny. Cushman and Valentine (Contr. Dept. Geol. Stanford Univ., Vol. 1, No. 1, 1930, p. 30) erected the genus *Dyocibicides* for similar forms, with *D. biserialis* as type. In 1931 Cushman (U.S.N.M. Bull. 104, Pt. 8, p. 126) referred *T. variabilis* of Brady, Parker and Jones (not d'Orbigny) to *D. biserialis*, and Thalmann (Eclog. geol. Helv., Vol. 25, Pt. 2, 1932, p. 309) referred this figure to that species.

Figure 7.—*Dyocibicides uniserialis* Thalmann.

Referred by Brady to *Truncatulina variabilis* d'Orbigny and by Thalmann (Eclog. geol. Helv., Vol. 26, No. 2, 1933, p. 254) to *Dyocibicides uniserialis*.

Figure 8.—*Planulina bradii* Tolmachoff.

Porcupine Sta. 21, W. of Ireland, Atlantic.

Referred by Brady to *Truncatulina wuellerstorfi* (Schwager) and by Tolmachoff (Ann. Carnegie Mus., Pittsburgh, Vol. 23, 1934, p. 333) to *Planulina bradii*. This appears to be the same as *Cibicides rugosa* Phleger and Parker (Mem. Geol. Soc. Amer., No. 46, 1951, p. 31).

Figure 9.—*Planulina wuellerstorfi* (Schwager).

Challenger Sta. 166, off W. coast of New Zealand (275 fathoms)

Referred by Brady to *Truncatulina* and by Cushman (C.C.L.F.R., Vol. 5, 1929, p. 104) to *Planulina*. Hofker (l. c., 1951) refers this species to *Cibicides* but gives no reason for dropping *Planulina*.

Figures 10, 11.—*Planulina ariminensis* d'Orbigny. (350 fathoms)

Challenger Sta. 122, S.E. of Pernambuco, Atlantic.

Referred by Brady to *Anomalina* but Cushman and others have reinstated *Planulina* d'Orbigny with *ariminensis* as the genotype.

EXPLANATION OF PLATE 94 (XCIV)

Fig. 1, X 60; Fig. 2, X 55; Fig. 3, X 90; Figs. 4, 5, X 40-45; Fig. 6, X 50;
Fig. 7, X 100; Fig. 8, X 45; Fig. 9, X 35.

Figure 1.—*Planulina foveolata* (Brady).

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Anomalina* and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 111) to *Planulina* d'Orbigny.

Figures 2, 3.—*Anomalina colligera* Chapman and Parr.

Fig. 2. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Fig. 3. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Anomalina ammonoides* (Reuss). These figures were referred to *A. colligera* by Chapman and Parr (Sci. Repts. Australasian Antarctic Exp. 1911-1914, Ser. C, Vol. 1, Pt. 2, 1937, p. 117) and to *Anomalina bradyi* by Said (C.L.F.R. Spec. Publ. 26, 1949, p. 41). They are very close to *A. flintii* Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 108), based on *Anomalina ammonoides* of Flint, non Reuss, from the West Indies. The two forms should be carefully compared.

Figures 4, 5.—*Anomalina globulosa* Chapman and Parr.

Fig. 4. Challenger Sta. 344, Ascension Island, Atlantic. (420 fathoms)

Fig. 5. Challenger Sta. 246, North Pacific. (2050 fathoms)

Referred by Brady to *Anomalina grosserugosa* (Gumbel) and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 309) to *Anomalina* sp. nov. aff. *grosserugosa* (Gumbel). Chapman and Parr (Australasian Antarctic Exped. 1911-1914, Ser. C, Vol. 1, Pt. 2, 1937, p. 117) referred Brady's figures to *Anomalina globulosa*. Bermúdez (Mem. Soc. Cub. Hist. Nat., Vol. 13, No. 4, 1939, p. 250) notes the similarity of his *A. atlantis* nov. to Brady's figures but does not state that they are the same.*

Figure 6.—*Anomalinella rostrata* (Brady).

Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Truncatulina* and by Cushman (C.C.L.F.R., Vol. 3, No. 1, 1927, p. 93) to *Anomalinella* as genotype.

Figure 7.—*Valvulineria* (?) *humilis* (Brady).

Challenger Sta. 5, S.W. of the Canaries, Atlantic. (2740 fathoms)

or Challenger Sta. 276, South Pacific. (2350 fathoms)

Referred by Brady to *Truncatulina* and by Thalmann to *Anomalina*. Chapman and Parr (Sci. Repts. Australasian Antarctic Exp. 1911-1914, Ser. C, Vol. 1, Pt. 2, 1937, p. 115) referred it to *Globorotalia*, and Phleger, Parker, and Peirson (Repts. Swedish Deep-Sea Exped. 1947-48, Vol. 7, 1954, p. 40) have placed it in *Valvulineria*. It does not appear to be a typical *Valvulineria* and Brady's types should be examined to determine the correct generic position.

Figure 8.—*Cibicides cicatricosus* (Schwager).

Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Referred by Brady to *Truncatulina akneriana* (d'Orbigny), and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 309) to *Cibicides cicatricosus* (Schwager).

Figure 9.—*Cibicides pseudoungerianus* (Cushman).

Porcupine Sta. 42, S.W. of Ireland, Atlantic (862 fathoms)

Referred by Brady to *Truncatulina ungeriana* (d'Orbigny) and by Cushman (U.S.G.S. Prof. Paper 129-E, 1922, p. 97) to *T. pseudoungeriana*. Cushman later transferred the species to *Cibicides*.

*Beckmann (Eclog. geol. Helv., Vol. 46, No. 2, (1953), 1954, p. 400) compares fig. 5 to *A. pompilioides* Galloway and Morrey var. *semicribrata* from the Oceanic formation, Barbados. Type of material of both forms is needed to determine their identity or otherwise.

EXPLANATION OF PLATE 95 (XCV)

Figs. 1, 2, 7, X 30; Fig. 3, X 35; Fig. 4, X 50; Figs. 5, 9, 10, X 60;
Fig. 6, X 40; Fig. 8, X 100; Fig. 11, X 75.

Figures 1-3.—*Cibicides praecinctus* (Karrer).

Fig. 1. Challenger Sta. 209, Philippines, Pacific. (95-100 fathoms)

Fig. 2. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Fig. 3. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Truncatulina*. This species has been placed in the genus *Eponides* but material from off Papua and the Malacca Straits which is identical with Brady's figures shows a typical *Cibicides* aperture.

Figure 4.—*Cibicides robertsonianus* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Truncatulina*, and by Cushman and others to *Cibicides*.

Figure 5.—*Cibicides bradyi* (Trauth).

Challenger Sta. 323, South Atlantic. (1900 fathoms)

Referred by Brady to *Truncatulina dutemplei* (d'Orbigny) and by Trauth (Denkschr. K. Akad. Wiss. Wien., Math.—Nat. Kl., Vol. 95, 1918, p. 235) to *Truncatulina bradyi*. Thalmann (Amer. Mid. Nat., Vol. 28, No. 2, 1942, p. 464) transferred the species to *Cibicides*. Hofker (Siboga Exped. Foraminifera Pt. III, 1951, p. 359) notes that this form is very similar to his *C. hyaline*, although his figures do not bring out this similarity.

Figure 6.—*Cibicidoides mundulus* (Brady, Parker and Jones).

Challenger Sta. 296, South Pacific. (1825 fathoms)

Referred by Brady to *Truncatulina* sp., near *T. haidingerii* (d'Orbigny). It was referred to *Cibicides mundulus* by Chapman and Parr (Australasian Antarctic Exped., 1911-1914, Ser. C, Vol. 2, Pt. 1, 1937, p. 120) which was designated the type of *Cibicidoides* Thalmann 1939 (genus proposed by Brotzen, 1936, but not valid until the genotype was designated by Thalmann (Jour. Pal., Vol. 13, 1939, p. 448). See discussion by Loeblich and Tappan, Smiths. Misc. Coll., Vol. 128, No. 5, 1955, p. 25.

Figure 7.—*Cibicides subhaidingerii* Parr.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Truncatulina haidingerii* (d'Orbigny) and by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 364) to *Cibicides subhaidingerii*.

Figure 8.—*Eponides tumidulus* (Brady).

Challenger Sta. 5, North Atlantic. (2740 fathoms)

Referred by Brady to *Truncatulina* and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 55) to *Eponides*. Cf. also *Cibicides hyaline* Hofker (l. c. supra).

Figures 9-10.—*Eponides bradyi* Earland.

Fig. 9. Challenger Sta. 64, North Atlantic. (2750 fathoms)

Fig. 10. Challenger Sta. 5, North Atlantic. (2740 fathoms)

Referred by Brady to *Truncatulina pygmaea* Hantken. Cushman (Bull. Scripps Inst. Oceanogr., Techn. Ser., Vol. 1, 1927, p. 165) refers fig. 10 to *Pulvinulinella bradyana*, but Earland (Discovery Repts., Vol. 10, Foraminifera Pt. III, 1934, p. 187) states that Brady's form is not a *Pulvinulinella* and therefore not conspecific with *bradyana*, which he regards as a distinct W. American form. He names Brady's species *Eponides bradyi*. Phleger, Parker and Peirson (Repts. Swedish Deep-Sea Exped. 1947-48, Vol. 7, Fasc. 1, 1954, p. 43) refer Brady's figures to *Epistominella* (?) *umbonifera* (Cushman), with Earland's *E. bradyi* doubtfully in synonymy. Their figures do not appear to be the same as those of Brady and indicate relationship with *Pseudoparrella* and *Epistominella*. Earland's name has therefore been retained here.

Figure 11.—*Eponides* (?) *tenera* (Brady).

Challenger Sta. 305, W. coast of Patagonia, Pacific. (120 fathoms)

Referred by Brady to *Truncatulina* and by Cushman and others to *Eponides*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 403) transfers it to *Gyroidina*. Cushman, Todd and Post (U.S.G.S. Prof. Paper 260-H, 1954, p. 359) retain it in *Eponides*, but Parker (Bull. Mus. Comp. Zool., Harvard, Vol. III, No. 10, 1954, p. 530) regards it as a *Pseudoeponides*. This genus, described by Uchio in 1951, is characterized by supplementary apertures on both the dorsal and the ventral side. Parker states that she has observed supplementary apertures on the dorsal side of some specimens of *E. tenera* but such apertures could not be found by the writer on any of the available Pacific material and the species has therefore been left tentatively in *Eponides*.

EXPLANATION OF PLATE 96 (XCVI)

Figs. 1, 8, X 70; Fig. 2, X 28; Fig. 3, X 90; Figs. 4-7, 9-14, X 100.

Figure 1.—*Discorbina rosea* (d'Orbigny).

Shore sand, Cuba.

Referred by Brady to *Truncatulina rosea* (d'Orbigny) and by Cushman and others to *Rotalia*. Bandy (Jour. Pal., Vol. 18, 1944, p. 372) placed it in *Rotorbinella*, but Hornibrook and Vella (The Micropal., N. Y., Vol. 8, No. 1, 1954, p. 26) have given reasons for the retention of the name *Discorbina* Parker and Jones with *Rotorbinella* in synonymy. Hofker (Spolia Zool. Mus. Hauniensis, Vol. 15, 1956, p. 76) has recently figured "*Parrella rosea* (d'Orbigny)" from off Santa Cruz Is., West Indies. He states that specimens received from Bermúdez as *Rotorbinella rosea* (d'Orbigny) show a straight, nearly umbilical aperture, whereas his material shows the aperture of *Parrella*. Material from shore sand of Cuba (near topotype for d'Orbigny's species), Tampico beach and Barbados has been examined and all shows the straight, nearly umbilical aperture as indicated by Brady's figure. It is therefore concluded that Hofker's species, if truly a *Parrella*, is not d'Orbigny's *rosea*, but a new species.

Figure 2.—*Cibicides margaritiferus* (Brady).

Challenger Sta. 209, Philippines, Pacific. (95-100 fathoms)

Referred by Brady to *Truncatulina* and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 309) to *Rotalia*. Specimens identical with Brady's figure from Sta. 209 and from off New Guinea show a typical *Cibicides* aperture and the species has therefore been placed in that genus.

Figure 3.—*Osangularia bengalensis* (Schwager).

Challenger Sta. 191A, Ki Islands, Pacific. (580 fathoms)

Referred by Brady to *Truncatulina culter* (Parker and Jones) but Chapman and Parr (Australasian Antarctic Exped. 1911-1914, Ser. C, Vol. 1, Pt. 2, 1937, p. 119) have pointed out that Brady's form from the Pacific is *Anomalina bengalensis* Schwager. Finlay (Trans. Roy. Soc. N.Z., Vol. 68, 1939, p. 523) erected the genus *Parrella* with *A. bengalensis* Schwager as genotype, but since *Parrella* had been used by Ginsburg in 1938, *Osangularia* Brotzen 1940 must be used for this species (see Thalmann and Graham, Contr. Cush. Found. Foram. Res., Vol. 3, Pt. 1, 1952, p. 31).

Figure 4.—*Siphoninella soluta* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Truncatulina* and by Cushman (C.C.L.F.R., Vol. 3, Pt. 1, 1927, p. 77) to *Siphoninella* as the genotype.

Figures 5-7.—*Siphonina tubulosa* Cushman.

Fig. 5. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Figs. 6, 7. Challenger Sta. 174A, off Fiji, Pacific. (255 fathoms)

Referred by Brady to *Truncatulina reticulata* (Czjzek) and by Cushman (Carnegie Inst. Washington, Publ. 342, 1924, p. 40) to *Siphonina tubulosa*.

Figure 8.—*Siphonina bradyana* Cushman.

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Truncatulina reticulata* (Czjzek) and by Cushman (U.S.N.M. Proc., Vol. 72, Art. 20, 1927, p. 11) to *Siphonina bradyana*.

Figures 9-14.—*Siphoninoides echinata* (Brady).

Fig. 9. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Figs. 10, 13, 14. Challenger Sta. 260A, off Honolulu, Pacific. (40 fathoms)

Figs. 11, 12. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Truncatulina* and by Cushman (C.C.L.F.R., Vol. 3, No. 1, 1927, p. 77) to *Siphoninoides*, as the genotype.

EXPLANATION OF PLATE 97 (XCVII)

Fig. 1, X 40; Figs. 2, 12-14, X 50; Figs. 3-6, X 35-45; Fig. 7, X 45;
Figs. 8-10, X 15-17; Fig. 11, X 18.

Figures 1, 2.—*Paromalina coronata* (Parker and Jones).

Fig. 1. Challenger Sta. 145, Prince Edward Island, S. Pacific. (50-150 fathoms)

Fig. 2. Challenger Sta. VIII, off the Canaries, Atlantic. (620 fathoms)

Referred to *Anomalina* by Brady but transferred to *Paromalina* as genotype by Loeblich and Tappan in 1957 (U.S.N.M., Bull. 215, p. 230).

Figures 3-6.—*Anomalina semipunctata* (Bailey).*

Fig. 3. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Figs. 4, 6. Challenger Sta. 164A, off Sydney, N.S.W., Australia. (410 fathoms)

Fig. 5. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Anomalina polymorpha* Costa and by Cushman (U.S.N.M., Bull. 104, Pt. 8, 1931, p. 106) to *A. semipunctata* (Bailey) (*Rotalina* 1851), with *polymorpha* Costa in synonymy.

Figure 7.—*Anomalina vermiculata* (d'Orbigny).

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *A. polymorpha* Costa (?) and by Thalmann (Eclog. geol. Helv., Vol. 26, No. 2, 1933, p. 254) to *A. vermiculata* (d'Orbigny).

Figures 8-14.—*Carpenteria proteiformis* Goës.

Figs. 8, 10-12, 14. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 9. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 13. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

*NOTE: Hofker (Siboga Exped., Foraminifera Pt. II, 1930, p. 127) suggests that *Anomalina polymorpha* Costa (i.e. *A. semipunctata* (Bailey)) is the microspheric form of *Carpenteria utricularis* (Carter). Although the similarity of young specimens of *Carpenteria* to *Anomalina* has been noted by several authors it does not seem probable that *A. semipunctata* is a *Carpenteria* and it has therefore been retained here in *Anomalina*.

EXPLANATION OF PLATE 98 (XCVIII)

Figs. 1-12, X 40; Figs. 13, 15, 16, X 35; Figs. 14, 17, X 30-40.

Figures 1-12.—*Rupertia stabilis* Wallich.

Porcupine Sta. 57, Faroe Channel, N. Atlantic. (632 fathoms; cold area)

Figures 13, 15, 16.—*Carpenteria monticularis* Carter (?), young specimens.

Challenger Sta. 344, Ascension Island, Atlantic. (420 fathoms)

Figures 14, 17.—*Carpenteria balaniformis* Gray (?), young specimens.

Challenger Sta. 344, Ascension Island, Atlantic. (420 fathoms)

EXPLANATION OF PLATE 99 (XCIX)

Figs. 1-5, X 12; Figs. 6, 7, X 15.

Figures 1-5.—*Carpenteria monticularis* Carter.

Figs. 2, 3, 5. Challenger Sta. 201, Philippines, Pacific. (102 fathoms)

Figures 6, 7.—*Carpenteria utricularis* (Carter).

Challenger Sta. 216A, Admiralty Islands, Pacific. (16-25 fathoms)

NOTE: Hofker (Siboga Exped., Foraminifera Pt. II, 1930, p. 126) places *C. monticularis* in the synonymy of *C. utricularis*, and refers to these figures. Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 310) also refers figs. 1-7 to *C. utricularis* (Carter). Since there appear to be valid reasons for separating the two forms that procedure has been followed here.

EXPLANATION OF PLATE 100 (C)

Figs. 1-4, X 15; Figs. 5-8, X 20; Fig. 9, X 50.

Figures 1-4.—*Carpenteria utricularis* Carter.

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Figures 5-9.—*Miniacina miniaceae* (Pallas).

Fig. 5. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Figs. 6, 7. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 8. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 9. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Polytrema* and by Galloway (Manual of Foraminifera, 1933, p. 305) to *Miniacina*, nom. nov. for *Polytrema* of authors, not of Risso, 1826, which is a bryozoan. *M. miniaceae* was designated the genotype by Galloway.

EXPLANATION OF PLATE 101 (CI)

Figs. 1, 7, 12, X 40; Figs. 2-6, 8-11, X 30.

Figure 1.—*Miniacina miniacea* (Pallas).

Referred by Brady to *Polytrema*. As noted earlier Galloway proposed the name *Miniacina* for *Polytrema* of authors, not of Risso 1826.

Figures 2, 3.—*Miniacina alba* (Carter).

Referred by Brady to *Polytrema miniacea* var. *alba* Carter and to *Polytrema album* and later (Eclog. geol. Helv., Vol. 26, No. 2, 1933, p. 254) to *Miniacina alba* (Carter) by Thalmann.

Figures 4-7.—*Baculogypsina sphaerulata* (Parker and Jones).

Figs. 4-6. Challenger Sta. 173A, off Fiji, Pacific. (12 fathoms)

Fig. 7. Wednesday Island, Pacific.

Referred by Brady to *Tinoporus baculatus* (Montfort?) Carpenter. Sacco (Bull. Soc. Belge Géol. Pal. Hydr., Vol. 7, 1893, p. 206) has pointed out that *Tinoporus baculatus* of Carpenter and Brady has nothing in common with the *baculatus* of Montfort, which he regards as a variety of *Calcarina spengleri* (L.). He identified the *baculatus* of Carpenter and Brady as *Orbitolina sphaerulata* Parker and Jones and erected a new genus, *Baculogypsina*, with *sphaerulata* as genotype.

Figure 8.—*Sphaerogypsina globulus* (Reuss).

Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *Gypsina globulus* (Reuss) and by Galloway (Manual of Foraminifera, 1933, p. 309) to *Sphaerogypsina* as genotype.

Figures 9-12.—*Gypsina vesicularis* (Parker and Jones).

Figs. 9-11. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 12. Wednesday Island, Pacific.

EXPLANATION OF PLATE 102 (CII)

Figs. 1-6, X 30-40; Figs. 7-12, X 60; Figs. 13, 14, X 50; Figs. 15-18, X 40.

Figures 1-6.—*Acervulina inhaerens* Schultze.

Figs. 1, 5, 6. Dog's Bay, Connemara, Ireland.

Fig. 2. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 3. Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Fig. 4. Challenger Sta. 187, off Papua, Pacific. (6 fathoms)

Referred by Brady to *Gypsina* but originally described as *Acervulina*, which was subsequently used by Fornasini, Cushman, Galloway and others.

Figures 7, 8?, 12?—*Tretomphalus planus* Cushman.

Fig. 7. Pacific Ocean, surface.

Fig. 8. Challenger Sta. 260A, Honolulu reefs, Pacific. (40 fathoms)

Fig. 12. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Cymbalopora* (*Tretomphalus*) *bulloides* (d'Orbigny) and by Cushman (C.C.L.F.R., Vol. 10, Pt. 4, 1934, p. 94) to *Tretomphalus planus* Cushman (*T. bulloides* (d'Orbigny) var. *plana* Cushman 1924, no reference to Brady).

Figure 9.—*Tretomphalus millettii* (Heron-Allen and Earland).

Challenger Sta. 260A, Honolulu reefs, Pacific. (40 fathoms)

Referred by Brady to *Cymbalopora* (*Tretomphalus*) *bulloides* (d'Orbigny) and by Heron-Allen and Earland (Trans. Zool. Soc. London, Vol. 20, 1915, p. 690) to *Cymbalopora millettii*. Transferred to *Tretomphalus* by Cushman (Carnegie Inst. Washington, Publ. 342, 1924, p. 36).

Figures 10, 11.—*Tretomphalus atlanticus* Cushman.

Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Cymbalopora* (*Tretomphalus*) *bulloides* (d'Orbigny) and by Cushman (C.C.L.F.R., Vol. 10, Pt. 4, 1934, p. 86) to *Tretomphalus atlanticus*.

Figure 13.—*Cymbaloporella squamosa* (d'Orbigny).

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Referred by Brady to *Cymbalopora poeyi* (d'Orbigny) and by Cushman (U.S.N.M., Bull. 104, Pt. 8, 1931, p. 83) to *Cymbaloporella squamosa* (d'Orbigny), with *poeyi* d'Orbigny in synonymy.

Figure 14.—*Cymbaloporella bradyi* (Cushman).

Figs. 14a-c. Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Fig. 14d. Challenger Sta. 217A, Papua. (37 fathoms)

Referred by Brady to *Cymbalopora poeyi* (d'Orbigny) var. and by Cushman (U.S.N.M., Bull. 71, Pt. 5, 1915, p. 25) to *Cymbalopora poeyi* var. *bradyi*. Cushman later (Carnegie Inst. Washington, Publ. 342, 1924, p. 34) raised this to specific rank as *Cymbalopora bradyi* and Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 310) transferred it to *Cymbaloporella*.

Figures 15-18.—*Cymbaloporella tabellaeformis* (Brady).

Figs. 15, 18. Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Fig. 16. Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Fig. 17. Challenger Sta. 209, Philippines, Pacific. (95-100 fathoms).

Referred by Brady to *Cymbalopora* and by Cushman (C.C.L.F.R., Vol. 3, Pt. 1, 1927, p. 81) to *Cymbaloporella*, as the genotype.

EXPLANATION OF PLATE 103 (CIII)

Figs. 1-10, X 35; Figs. 11-14, X 40.

Figures 1, 2.—*Globorotalia menardii* (d'Orbigny).

Fig. 1. Challenger Sta. 224, North Pacific. (1850 fathoms)

Referred by Brady to *Pulvinulina* and by Cushman (Bull. Scripps Inst. Oceanogr., Tech. Ser., Vol. 1, No. 10, 1927, p. 175) to *Globorotalia*.

Figure 3.—*Globorotalia menardii* var. *fimbriata* (Brady).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Pulvinulina* and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 94) to *Globorotalia*.

Figures 4-6.—*Globorotalia tumida* (Brady).

Fig. 4. Challenger Sta. 224, North Pacific. (1850 fathoms)

Fig. 5. Challenger Sta. 276, N. of Tahiti, Pacific. (2350 fathoms)

Referred by Brady to *Pulvinulina* and by Cushman (C.C.L.F.R., Vol. 3, No. 1, 1927, p. 91) to *Globorotalia*, as genotype.

Figure 7.—*Globorotalia scitula* (Brady).

Challenger Sta. 302, W. coast of Patagonia, E. Pacific. (1450 fathoms)

Referred by Brady to *Pulvinulina patagonica* (d'Orbigny) and by Cushman (Bull. Scripps Inst. Oceanogr., Tech. Ser., Vol. 1, No. 10, p. 175) to *Globorotalia scitula* (Brady 1882).

Figures 8-10.—*Globorotalia hirsuta* (d'Orbigny).

Fig. 8. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Fig. 9. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Referred by Brady to *Pulvinulina canariensis* (d'Orbigny) and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 99) to *Globorotalia hirsuta* (d'Orbigny).

Figures 11, 12.—*Globorotalia punctulata* (d'Orbigny).

Fig. 11. Challenger Sta. 5, North Atlantic. (2740 fathoms)

Referred by Brady to *Pulvinulina crassa* (d'Orbigny). These figures have been the source of endless confusion and contradictions. Galloway and Wissler (J. Pal., Vol. 1, 1927, p. 41) referred both figs. to *Globigerina crassaformis* (Pleistocene, California); White (Jour. Pal., Vol. 2, 1928, Pt. 3, p. 191) referred fig. 11 to *Globigerina angulata*, and fig. 12 to *G. crassaformis* Galloway and Wissler; Cushman and Stewart (Trans. San Diego Soc. Nat. Hist., Vol. 6, No. 2, 1930, p. 77) referred both figures to *Globorotalia crassula*, ignoring earlier changes; Chapman and Parr (Australasian Antarctic Exp. 1911-1914, Sci. Repts., Ser. C, Vol. 1, 1937, p. 115) referred fig. 12 (not 11) to *Globorotalia pseudocrassa*, stating that the type of *G. crassula* was fig. 11, and they regard the figures as representing two species; Cushman and Bermudez (C.C.L.F.R., Vol. 25, Pt. 2, 1949, p. 43) referred both figs. to *Globorotalia (Turborotalia) oceanica*, again without reference to earlier designations. Recently Phleger, Parker and Peirson (Swedish Deep-Sea Exped., 1947-48, Repts. Vol. 7, fasc. 1, 1953, p. 20) have reviewed the whole question of these two figures in detail and reached the conclusion that both figures represent variations of *Globorotalia punctulata* (d'Orbigny). The question was also studied in less detail by Phleger and Parker (Geol. Soc. Amer., Mem. 46, 1951, p. 36) who reached the conclusion that Brady's fig. 11 was *Globorotalia punctulata*.

Figures 13, 14.—*Epistominella exigua* (Brady).

Fig. 13. Challenger Sta. 332, South Atlantic. (2200 fathoms)

Fig. 14. Challenger Sta. 160, Southern Ocean. (2600 fathoms)

Referred by Brady to *Pulvinulina* and by Cushman, Hofker, Parr and others to *Pulvinulinella*. Transferred to *Pseudoparrella* Cushman and ten Dam 1948 by Phleger and Parker (Geol. Soc. Amer., Mem. 46, Pt. 2, 1951, p. 28). It has also been placed in *Eponides*, but was transferred to *Epistominella* Husezima and Maruhasi by F. L. Parker in 1954 (Mus. Comp. Zool., Harvard, Bull., Vol. 111, No. 10, p. 533).

EXPLANATION OF PLATE 104 (CIV)

Figs. 1, 2, 12-14, X 40; Figs. 3-11, X 25; Figs. 15, 16, X 80; Fig. 17, X 16; Figs. 18, 19, X 30.

Figures 1, 2.—*Globorotalia truncatulinoides* (d'Orbigny).

Fig. 1. Challenger Sta. 335, South Atlantic. (1425 fathoms)

Referred by Brady to *Pulvinulina micheliniana* (d'Orbigny), originally from the Cretaceous of France. Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 97) to *Globorotalia truncatulinoides* (d'Orbigny) a Recent species from the Canaries.

Figures 3-11.—*Laticarinina halophora* (Stache).

Figs. 4, 6, 11. Challenger Sta. 120, off Pernambuco, Atlantic. (675 fathoms)

Figs. 5, 10. Challenger Sta. 335, South Atlantic. (1425 fathoms)

Figs. 7-9. Challenger Sta. 146, Southern Ocean. (1375 fathoms)

Referred by Brady to *Pulvinulina pauperata* Parker and Jones which was designated the genotype of *Laticarinina* Galloway and Wissler 1928. Finlay (Trans. Roy. Soc. New Zealand, Vol. 69, 1940, pp. 467-468) studied topotype material from Stache's Whaingaroa beds and found abundant "*L. pauperata*" which matched Brady's figures exactly and also Stache's figures of *Robulina halophora* Stache 1864. He therefore concluded that *pauperata* and also "*Robulina corona-lunae* Stache" are to be regarded as synonyms of *Laticarinina halophora* (Stache).

Figures 12-16.—*Favocassidulina favus* (Brady).

Figs. 12, 14, 15. Challenger Sta. 300, N. of Juan Fernandez, E. Pacific. (1375 fathoms)

Figs. 13, 16. Challenger Sta. 283, South Pacific. (2075 fathoms)

Referred by Brady to *Pulvinulina* and by Cushman (C.C.L.F.R., Vol. 2, 1926, p. 70) to *Cassidulina*. Loeblich and Tappan have erected *Favocassidulina* with *favus* as genotype (U.S.N.M., Bull. 215, 1957, p. 230).

Figure 17.—*Eponides punctulatus* (d'Orbigny).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Pulvinulina* and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 48) to *Eponides*.

Figure 18.—"*Eponides repandus* (Fichtel and Moll)".

Challenger Sta. 354A, Vigo Bay, Spain, Atlantic. (11 fathoms)

Referred by Brady to *Pulvinulina* and by Montfort (Conch. Syst., Vol. 1, 1808, p. 127) to *Eponides* as type. There is doubt as to what the genus *Eponides* really is as Montfort and Fichtel and Moll's figures represent a totally different form from that now regarded as *Eponides repandus* (Fichtel and Moll). It seems probable that new generic and specific names are required for the present form. The question has been discussed recently by Redmond (The Micropal., N.Y., Vol. 3, No. 4, 1949, pp. 19-21) and Hofker (The Micropal., N.Y., Vol. 4, No. 1, pp. 15-16). Redmond (Jour. Pal., Vol. 27, No. 5, 1953, p. 726) refers to this species as "*Eponides repandus*" (Brady, not Fichtel and Moll). Asano and Uchio (in Stach, Illus. Cat. Jap. Tert. Smaller Foram., Tokyo, Pt. 14, 1951, p. 18) placed forms with large, scattered, rounded openings in the apertural face, but otherwise identical with "*E. repandus*" auct., in *Poroeponides cribrorepandus*. Cushman (U.S.N.M., Bull. 104, Pt. 8, 1931, p. 50) mentioned the frequent occurrence of such openings in "*E. repandus*," and the writer has observed them in many specimens from diverse localities. It is therefore probable that *repandus* auct. non Fichtel and Moll, should be placed in *Poroeponides*. It is also probable, however, that the species is that described as *Rotalina caribaea* by d'Orbigny (Hist. Phys., Pol. et Nat. de l'Ile de Cuba, Foram., 1839, p. 74, pl. 5, figs. 1-3), from the West Indies. Specimens of *cribrorepandus* should be compared with d'Orbigny's type if it is available to determine if these two are identical.

Figure 19.—"*Eponides repandus* (F. & M.)" var. *concamerata* (Williamson).

Porcupine Sta. AA, off Loch Scavaig, Scotland, Atlantic. (45-60 fathoms)

Referred by Brady to *Pulvinulina repanda* var. *concamerata* (Montagu). Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 51) implies doubt regarding Montagu's species and refers the variety to Williamson 1858. Montagu did not figure his *Serpula concamerata* and its identity is problematical.

EXPLANATION OF PLATE 105 (CV)

Figs. 1, 4-7, X 35; Figs. 2, 8, 9, X 50; Fig. 3, X 40.

Figure 1.—*Mississippina concentrica* (Parker and Jones).

Off the Shetlands, N. Atlantic. (70-90 fathoms)

Referred by Brady to *Pulvinulina*. Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, Pt. 6, 1950, p. 360) places this form in *Stomatorbina* Dorreen and this procedure is followed by Phleger and Parker, 1951. Uchio (Trans. Proc. Pal. Soc. Japan, n.s., No. 7, 1952, pp. 195-200) has discussed the genera *Stomatorbina* and *Mississippina* and concludes that *concentrica* (P. & J.) is a true *Mississippina* and that *Stomatorbina* may prove to be a synonym of that genus, though this depends upon the generic value of apertural characters.

Figure 2.—*Eponides umbonatus* (Reuss).

Challenger Sta. 308, W. coast of Patagonia, E. Pacific. (175 fathoms)

Referred by Brady to *Pulvinulina* and by Cole (Bull. Amer. Pal., Vol. 14, No. 53, 1928, p. 215 (15)) to *Eponides*. Galloway and Morrey have referred this species to *Rotalia* and Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 403) has placed *umbonatus* in *Gyroidina*, and as noted earlier it is probable that most forms referred to *Eponides* require a new generic name. Hofker suggests that the forms referred to *umbonatus* probably comprise more than one species. Uchio (Assoc. Petr. Techn., Tokyo, Jour., Vol. 15, No. 4, 1950) included *Eponides umbonatus* (Reuss) in his new genus *Pseudoeponides*, characterized by supplementary dorsal and ventral apertures. As such supplementary apertures cannot be found in any of the Recent material available referred to *E. umbonatus* it has been retained here in the problematic genus "*Eponides*" (auct., non Montfort).

Figures 3-6.—*Hoglundina elegans* (d'Orbigny).

Fig. 3. Porcupine Sta.?, North Atlantic.

Fig. 4. Challenger Sta. 135, Tristan d'Acunha, Atlantic. (100-150 fathoms)

Fig. 5. Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Pulvinulina* and by Martinotti (Boll. R. Ufficio geol. Ital., Vol. 51, 1926, p. 3) to *Epistomina*. Brotzen (Sver. Geol. Unders., Vol. 42, No. 2, 1948, p. 92) differentiated Tertiary and Recent forms previously assigned to *Epistomina* from the Jurassic forms, and referred them to *Hoglundina* gen. nov., with *E. elegans* as genotype. Galloway and Wissler (Jour. Pal., Vol. 1, 1927, p. 60) referred fig. 3 to *E. bradyi*, and figs. 4-6 to *E. flintii*, but this has not been accepted by later authors and Cushman (U.S.N.M. Bull. 104, Pt. 8, p. 66) referred these species to the synonymy of *E. elegans* (d'Orbigny).

Figure 7.—"Eponides (?) "*procera* (Brady).

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Pulvinulina* and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 310) to *Discorbis*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 396) places this species in *Alabamina*, and states that it shows the apertural characters of that genus. These were not observed in specimens examined and it is doubted that this is a true *Alabamina*.

Figures 8, 9.—*Buccella frigida* (Cushman).

Fig. 8. Challenger Sta. 313, Magellan Strait, Antarctic. (55 fathoms)

Fig. 9. N. Polar Exped., 1875-76, Cape Frazier, Lat. 79° 45' N.

Referred by Brady to *Pulvinulina karsteni* (Reuss) and by Cushman (Results of the Hudson Bay Exped., 1920, I—The Foraminifera, Contr. Canadian Biol. (1921), No. 9, p. 12) to *Pulvinulina frigida*, with reference to *P. karsteni* Brady 1864, non Reuss, but not to the Challenger Report. Transferred to *Eponides* by Cushman in 1931 and to *Buccella* by Anderson (Jour. Washington Acad. Sci., Vol. 42, No. 5, 1952, p. 144). Heron-Allen and Earland (Discovery Repts., Vol. 4, Foraminifera Pt. 1, 1932, p. 431) noted great variation in Antarctic material and included *frigida* in the synonymy of *karsteni*, retaining the name given by Reuss.

EXPLANATION OF PLATE 106 (CVI)

Fig. 1, X 35; Figs. 2, 3, X 35-40; Figs. 4, 5, X 40; Figs. 6, 7, X 40-50;
Fig. 8, X 50; Fig. 9, X 30.

Figure 1.—*Eponides berthelotianus* (d'Orbigny).

Challenger Sta. 189, S. of New Guinea, Pacific. (25-29 fathoms)

Referred by Brady to *Pulvinulina* and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 310) to *Eponides*.

Figures 2, 3.—*Poroeponides lateralis* (Terquem).

Fig. 2. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 3. Challenger Sta. 186, Wednesday Island, Pacific. (7-8 fathoms)

Referred by Brady to *Pulvinulina* and by Cushman (C.L.F.R., Spec. Publ. No. 12, 1944, p. 34) to *Poroeponides*, as genotype.

Figures 4, 5.—*Cancris oblongus* (Williamson)?

Fig. 4. Challenger Sta. 142, off S. Africa (Atlantic). (150 fathoms)

Fig. 5. Challenger Sta. 24, West Indies. (390 fathoms)

Brady referred fig. 4 to *Pulvinulina oblonga* (Williamson) and fig. 5 to *Pulvinulina auricula* (Fichtel and Moll). Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 72) included *oblonga* in the synonymy of *auricula* (Fichtel and Moll) but later, with Ruth Todd (C.C.L.F.R., Vol. 18, Pt. 4, 1942, pp. 74, 80) separated them. In the later work there is no reference to these figures of Brady but *C. sagra* is figured from Challenger Sta. 24, West Indies. There is a possibility that these figures (figs. 4, 5) represent two species rather than extremes in variability of *C. oblongus* but types should be examined to determine satisfactorily the forms figured.

Figure 6.—*Cancris indicus* (Cushman).

Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Pulvinulina hauerii* (d'Orbigny) and by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 332) to *P. indica*. Cushman and Todd (C.C.L.F.R., Vol. 18, Pt. 4, 1942, p. 91) transferred this form to *Cancris*.

Figure 7.—*Baggina philippinensis* (Cushman).

Challenger Sta. 192, Ki Islands, Pacific. (129 fathoms)

Referred by Brady to *Pulvinulina hauerii* (d'Orbigny) and by Cushman (U.S.N.M., Bull. 100, Vol. 4, 1921, p. 331) to *P. philippinensis*. Subsequently referred to *Valvulineria* (Thalmann 1932), *Cancris* (Thalmann 1942) and *Baggina* (LeRoy, Colo. Sch. Mines Quart., Vol. 36, No. 1, 1941, p. 84).

Figure 8.—*Lamarckina scabra* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Pulvinulina oblonga* var. *scabra*, and by Cushman (U.S.N.M., Bull. 104, Pt. 8, 1931, p. 35) to *Lamarckina scabra* (Brady).

Figure 9.—*Streblus gaimardii* (d'Orbigny).

Challenger Sta. 188, S. of New Guinea, Pacific. (28 fathoms)

Referred by Brady to *Rotalia papillosa* and by Fornasini (Mem. R. Ac. Sci. Ist. Bologna, Ser. VI, Vol. 3, 1906, pp. 67, 70) to *R. gaimardii* (d'Orbigny) (*Turbinulina* 1826). Thalmann (Eclog. geol. Helv., Vol. 27, No. 2, 1934, p. 430) has pointed out that the name *Rotalia papillosa* is preoccupied, having been used by d'Orbigny in 1826. Although the name *gaimardii* is a nomen nudum as of 1826 it was validated by Fornasini in 1906 (see above) and becomes the first available name for the present species. Placed in *Streblus* by Ishizaki (Taiwan Tigaku Kizi, Vol. 11, Appendix, 1940, p. 131).

EXPLANATION OF PLATE 107 (CVII)

Fig. 1, X 30; Figs. 2-5, 8, 9, X 50; Figs. 6, 7, X 40.

Figure 1.—*Streblus gaimardii* (d'Orbigny) var. *compressiuscula* (Brady).

Referred by Brady to *Rotalia papillosa* Brady var. *compressiuscula*. As noted under *Streblus gaimardii* on Plate CVI, fig. 9, the name *R. papillosa* Brady (non d'Orbigny 1826) should be replaced by *R. gaimardii* (d'Orbigny) and this form was placed in *Streblus* by Ishizaki in 1940.

Figure 2.—*Streblus beccarii* (Linnaeus) var. *koeboeensis* (LeRoy).

Challenger Sta. 187A, Booby Island, Torres Strait, Pacific. (8 fathoms)

Referred by Brady to *Rotalia beccarii* (Linnaeus). Frizzell and Keen (Jour. Pal., Vol. 23, No. 1, 1949, p. 106) have pointed out that Brunnich cited *Nautilus beccarii* L. and *Nautilus spirula* L. for his genus *Ammonia* in 1771, the name being regarded as probably valid by Winckworth 1945. This name has not as yet been validated by the International Committee on Zoological Nomenclature and Bermúdez and other authors have retained *Streblus* Fischer 1817 for *Nautilus beccarii* and congeneric forms. *Hammonium* of Fichtel and Moll 1798 has also been used for *N. beccarii* but the validity of this also appears to be questionable. Until the matter has been ruled upon by the Committee the name *Streblus* is adopted here. Brady's figure 2, although larger than the variety proposed by LeRoy (Natuurk. Tijdschr. Nederl.—Indie, Vol. 99, Pt. 6, 1939, p. 255) is regarded as the same form. LeRoy does not refer to Brady's figure.

Figure 3.—*Streblus* cf. *catesbyanus* (d'Orbigny).

No locality given for this figure.

Referred by Brady to *Rotalia beccarii* (Linnaeus). Brady's figures closely resemble those of *Rosalina catesbyana* d'Orbigny from Cuba, which was referred to *Streblus* by Bermúdez (Bol. de Geol., Min. de Minas, Caracas, Vol. 2, No. 4, 1952, p. 72) although he does not refer to Brady's figures.

Figure 4.—*Gyroidina broeckhiana* (Karrer).

Challenger Sta. 191A, Ki Islands, New Guinea, Pacific. (580 fathoms)

Referred by Brady to *Rotalia* and by Chapman and Parr (Australasian Antarctic Exped., 1911-1914, Sc. Rep. Ser. C, Vol. 1, No. 2, 1937, p. 106) to *Gyroidina*.

Figure 5.—*Streblus batavus* Hofker?

Porcupine Sta. 18, West of Ireland, Atlantic. (183 fathoms)

Referred by Brady to "*Rotalia orbicularis* (d'Orbigny)? (a passage-form between *R. beccarii* and *R. orbicularis*." Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 501, etc.) referred North Sea material of "*Rotalia beccarii* auct." to *Streblus batavus*. Brady's figures are close to some specimens found off Scotland which appear to fit into the *S. batavus* series.

Figures 6, 7.—*Gyroidina neosoldanii* Brotzen.

Fig. 6. Challenger Sta. 302, South Pacific. (1450 fathoms)

Fig. 7. Challenger Sta. 246, North Pacific. (2050 fathoms)

Referred by Brady to *Rotalia soldanii* (d'Orbigny) and by Brotzen (Sver. Geol. Unders. Avh., Stockholm, Ser. C, No. 396, p. 158) to *Gyroidina neosoldanii*.

Figure 8.—*Notorotalia clathrata* (Brady).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred to *Rotalia* by Brady and to *Notorotalia* by Finlay (Trans. Roy. Soc. New Zealand, Vol. 68, 1939, p. 517). The species was emended by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 374).

Figure 9.—*Notorotalia patagonica* Parr.

Challenger Sta. 305, W. coast of Patagonia, E. Pacific. (120 fathoms)

Referred by Brady to *Rotalia clathrata* and by Parr (l. c. supra, 1950, p. 375) to *Notorotalia patagonica*.

EXPLANATION OF PLATE 108 (CVIII)

Figs. 1-4, X 50; Figs. 5, 7, X 30-35; Figs. 6-9, X 30.

Figure 1.—*Streblus gaimardii* (d'Orbigny) var. *compressiuscula* (Brady) juv.

Challenger Sta. 186, Wednesday Island, Pacific. (7-8 fathoms)

Referred by Brady to *R. papillosa* Brady var. *compressiuscula*—see note to Pl. CVI, fig. 9, and Pl. CVII, fig. 1.

Figure 2.—*Calcarina venusta* (Brady).

Challenger Sta. 187A, Booby Island, Torres Strait, Pacific. (8 fathoms)

Referred to *Rotalia* by Brady and to *Parrella* by Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 333).

As Thalmann and Graham have pointed out, *Parrella* Finlay 1939 is preoccupied by Ginsburg 1938, this genus becoming *Osangularia* Brotzen 1940. Finlay, however (Trans. Roy. Soc. New Zealand, Vol. 68, 1939, p. 524), has placed *venusta* in *Calcarina*, and is followed here.

Figures 3, ?4.—*Calcarina calcar* d'Orbigny.

Fig. 3. Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Fig. 4. Challenger Sta. 187, off New Guinea, Pacific. (6 fathoms)

Referred by Brady to *Rotalia* and by d'Orbigny to *Calcarina*. According to Finlay (l. c. supra, 1939, pp. 524-526) who discusses *Calcarina* in some detail, *calcar* is the genotype by tautonymy. Brady referred fig. 4 to *Rotalia calcar*, young specimen, or possibly a young *R. dentata* Parker and Jones.

Figures 5-7.—*Tinoporus spengleri* (Gmelin).

Figs. 5-7. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Figs. 5 and 7 referred by Brady to *Calcarina spengleri* (L.) and fig. 6 to *Calcarina defranciai* d'Orbigny. Cushman, Todd and Post (U.S.G.S., Prof. Paper 260-H, 1954, p. 363) refer these figures to *Calcarina spengleri* (Gmelin), and regard fig. 6 as that species and not *C. defranciai* of d'Orbigny. Finlay (l. c. supra, 1929, p. 525) has given reasons for the retention of *Tinoporus* Montfort, with *Tinoporus baculatus* Montfort as genotype. (For full discussion see Finlay.)

Figures 8, 9.—*Tinoporus hispidus* (Brady).

Loo Choo Islands, N. Pacific, washed from algae.

Referred by Brady to *Calcarina* and by Finlay (l. c. supra, 1939, p. 526) to *Tinoporus*.

EXPLANATION OF PLATE 109 (CIX)

Figs. 1, 2, 20, 21, X 50; Figs. 3, 4, 6, 7, 10, 11, 14-19, 22, 23, X 75;
Fig. 5, X 60; Figs. 8, 9, 12, 13, X 70.

Figures 1, 2.—*Astrononion fijiense* Cushman and Edwards.

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *Nonionina asterizans* (Fichtel and Moll) and by Cushman and Edwards (C.C.L.F.R., Vol. 13, Pt. 1, 1937, p. 35) to *Astrononion fijiense*.

Figures 3, 4.—*Astrononion stelligerum* (d'Orbigny).

Fig. 3. Porcupine Sta. 67-68, E. of Shetlands, N. Atlantic. (64-75 fathoms)

Referred by Brady to *Nonionina stelligera* d'Orbigny and by Cushman and Edwards (l. c. supra, 1937, p. 31) to *Astrononion stelligerum* (d'Orbigny).

Figure 5.—*Astrononion tumidum* Cushman and Edwards.

Challenger Sta. 344, Ascension Island, Atlantic. (420 fathoms)

Referred by Brady to *Nonionina stelligera* d'Orbigny and by Cushman and Edwards (l. c. supra, 1939, p. 33) to *Astrononion tumidum*.

Figures 6, 7.—*Nonion depressulum* (Walker and Jacob)?

Challenger Sta. 163C, off Sydney, Australia. (6 fathoms)

Referred by Brady to *Nonionina*. Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 3) stated "Brady's *Challenger* figures do not at all fit this form (i.e. *Nonion depressulum*), but seem nearer to *N. umbilicatum*." *N. umbilicatum* is a highly problematical species and Brady's figures agree fairly well with the figure and discussion of *N. depressulum* given by Macfadyen (Geol. Mag., Vol. 77, 1940, pp. 279-281). Brady's determination has therefore been retained pro tem.

Figures 8, 9.—*Gavelinonion barleeianum* (Williamson).

Fig. 8. Challenger Sta. 24, West Indies. (390 fathoms)

Fig. 9. Challenger Sta. 276, off Tahiti, Pacific. (2350 fathoms)

Referred by Brady to *Nonionina umbilicatulula* (Montagu), though *umbilicatulula* should be referred to Walker and Jacob 1798 rather than to Montagu 1803. Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 2) has pointed out that *umbilicatum* is virtually indeterminate from the original figures and description, and was referred by Williamson to *Polystomella* and by Parker and Jones to *Truncatulina*. The West Indian form figured by Brady is the same as that found off the British Isles (from material studied), and is regarded as *barleeianum* (Williamson). Cushman (l. c. supra, 1930, p. 11) says of *barleeianum* "recorded from about the British Isles as *Nonionina umbilicatulula*" and refers the species to *Nonion*. Hofker (Spolia Zool. Mus. Hauniensis, Copenhagen, Vol. 15, 1956, pp. 116, 118) retains the specific name *umbilicatulula*, but notes that this form differs from true *Nonion* in possessing thick walls, double septal walls and coarse pores and should be referred to *Gavelinonion* Hofker 1951. He does not refer to Brady but from material examined and his description is thought to be dealing with the present species, though his figures show considerable differences. Figure 9 appears somewhat different from the Atlantic form of *barleeianum* and may represent a deep water variant or a subspecies.*

Figures 10, 11.—*Nonion* (?) *pompilioides* (Fichtel and Moll).

Fig. 10. Porcupine Sta. 20, W. of Ireland, E. Atlantic. (1443 fathoms)

Referred by Brady to *Nonionina*. This is probably also a *Gavelinonion*.

Figures 12, 13.—*Nonion* cf. *asterizans* (Fichtel and Moll).

Challenger Sta. 354A, Vigo Bay, E. Atlantic. (11 fathoms)

Referred by Brady to *Nonionina boueana* d'Orbigny. Cushman (U.S.G.S., Prof. Paper 191, 1939, p. 12) records *boueianum* only from the Miocene and Pliocene of Europe. Brady's figures seem to be closest to Cushman's figures of *Nonion asterizans* (Fichtel and Moll).

Figures 14, 15.—*Nonion scaphum* (Fichtel and Moll).

Challenger Sta. 306, W. coast of Patagonia, E. Pacific. (345 fathoms)

Referred by Brady to *Nonionina* and by Cushman to *Nonion*. (A *Nonionella*?)

Figure 16.—*Nonionella bradii* (Chapman).

Challenger Sta. 217A, off Papua, Pacific. (37 fathoms)

Referred by Brady to *Nonionina scapha* (Fichtel and Moll) and by Chapman (Brit. Antarctic Exped. 1907-1909, Sci. Invest. Repts., Geol., Vol. 2, Pt. 3, 1917, p. 71) to *Nonionina scapha* var. *bradii*. It is regarded as *Nonionella*, and unrelated to *N. scaphum*.

Figures 17-19.—*Nonionella turgida* (Williamson).

Figs. 17, 18. Porcupine Sta. 67-68, E. of Shetland, E. Atlantic. (64-75 fathoms)

Fig. 19. Challenger Sta. 167, W. coast of New Zealand. (150 fathoms)

Referred by Brady to *Nonionina* and by Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, p. 15) to *Nonionella*. *N. turgida* occurs typically in the North Atlantic and it is possible that fig. 19 represents a different species but Parr has noted that the New Zealand fauna has many species in common with that of the British Isles.

Figures 20, 21.—*Elphidium orbiculare* (Brady).

Porcupine Sta. 57, Faroe Channel (cold area), N. Atlantic. (632 fathoms)

*Galloway and Heminway (N.Y. Acad. Sci., Sci. Surv. Porto Rico, Vol. 3, Pt. 4, 1941, p. 357) referred these figures to *Nonion nicobarensis* Cushman. Possibly figure 9 is that species but figure 8 is regarded as *barleeianum*. Boltovskoy (Micropaleontology, Vol. 4, No. 2, 1958, pp. 193-198 and personal communication) regards most forms of this type as *Nonion affine* (Reuss) but does not refer to these figures.

EXPLANATION OF PLATE 109 (CIX), CONTINUED

Referred by Brady to *Nonionina*, and by Cushman (l. c. supra, 1930, p. 12) to *Nonion*. Loeblich and Tappan (Smith. Misc. Coll., Vol. 121, No. 7, 1953, p. 102) have transferred the species to *Elphidium* on the wall structure, nature of the aperture and indications of retral processes in some specimens.

Figure 22a.—*Elphidiononion poeyanum* (d'Orbigny).

Challenger Sta. 24, West Indies. (390 fathoms)

Referred by Brady to *Polystomella striatopunctata* (Fichtel & Moll). Galloway and Wissler (Jour. Pal., Vol. 1, 1927, p. 83) referred figs. 22a and b to *Themeon decipiens* nov., later changed to *T. granulosus* since *decipiens* was preoccupied by Costa. Asano (Jour. Geol. Soc. Japan, Vol. 35, 1938, p. 586) compared both figures with *Elphidium subgranulosum*, but since Brady included *poeyanum* in synonymy with his *striatopunctata*, and typical *poeyanum* occurs in material from Challenger Sta. 24, figure 22a is regarded as this species. Hofker (Archiv. Neerl. Zool., Leiden, Vol. 8, 1951, p. 356) has proposed the genus *Elphidiononion* based on the canal system, with *E. poeyanum* (d'Orbigny) as genotype. Ellis and Messina (Catalogue of Foraminifera, Suppl. for 1953, No. 1) suggest that the genus is inadequately characterized and may be invalid.

Figure 22b.—*Elphidium* cf. *kerquelenense* Parr?

Challenger Sta. 315A, Falkland Islands, S. Atlantic. (6 fathoms)

Referred by Brady to *Polystomella striatopunctata* (Fichtel and Moll). Parr (B.A.N.Z. Antarctic Res. Exp. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 373) suggested that Brady's Kerguelen records of *E. striatopunctata* were *E. kerquelenense* but did not refer to this figure. Heron-Allen and Earland (Discovery Repts., Vol. 4, 1932, p. 439) identified Falkland material of this type as *Elphidium incertum* (Williamson) and it is possible that they were correct. (See below—fig. 23.)

Figure 23.—*Elphidium incertum* (Williamson)?

Challenger Sta. 46, North Atlantic. (1350 fathoms)

Referred by Brady to *Polystomella striatopunctata* (Fichtel and Moll), but this figure was reproduced by Cushman (U.S.N.M. Bull. 104, Pt. 7, 1930, pl. 7, fig. 5) as *Elphidium incertum* (Williamson), with no reference to Brady in the text. Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 311) referred Brady's fig. 23 to *E. angulatum* (Egger), a very different form from the Miocene of Germany. Heron-Allen and Earland (Discovery Repts., Vol. 4, 1932, p. 439, pl. 16, figs. 22-23) have figured a very similar Falkland Islands form as *E. excavatum* (Terquem) with the remark "Under this name Terquem separated the very common northern type which Williamson had earlier figured admirably under the erroneous designation *P. umbilicatulula* Walker (and Boys) . . . On the British Coasts, the species reaches its maximum development . . . under estuarine conditions." Both Williamson and Cushman show a different form from *excavatum* as figured by Heron-Allen and Earland, though Terquem's figures show considerable variation. More recently Loeblich and Tappan (Smith. Misc. Coll. Vol. 121, No. 7, 1953, pp. 100-102) have given a full discussion of *E. incertum*, unfortunately without figures, and indicate the confusion concerning its identify. Hofker (Spolia Zool. Mus. Hauniensis, Vol. 15, 1956, pl. 21, figs. 1-3) has shown yet a different form as *Elphidiononion incertum* (Williamson). From similarities of Brady's figure to the figures of Macfadyen 1932, and Phleger 1952 (see Loeblich and Tappan, l. c.) and the description of Williamson, it has been referred tentatively to *E. incertum*.

EXPLANATION OF PLATE 110 (CX)

Fig. 1, X 75; Figs. 2-4, 13-15, X 30; Fig. 5, X 100; Figs. 6, 7, X 40; Figs. 8, 9, 11, X 45-60;
Fig. 10, X 60; Fig. 12, X 65; Figs. 16, 17, X 30-40.

Figure 1.—*Elphidium advena* (Cushman).

Fig. 1a. Challenger Sta. 187A, Booby Island, Torres Strait, Pacific. (8 fathoms)

Fig. 1b. Challenger Sta. 189, S. of Papua, Pacific. (25-29 fathoms)

Referred by Brady to *Polystomella subnodosa* (Münster) and by Cushman (Carnegie Inst. Washington, Publ. 311, 1922, p. 56) to *P. advena*. Cushman also reported this species from Samoa and in 1930 (U.S.N.M. Bull. 104, Pt. 7, p. 25) transferred it to *Elphidium*.

Figures 2-5.—*Elphidiella arctica* (Parker and Jones).

Fig. 2. N. Polar Exped. 1875-76, Smith Sound.

Fig. 3. Porcupine Sta. 57, Faroe Channel (cold area), N. Atlantic. (632 fathoms)

Figs. 4, 5. N. Polar Exped. 1875-76, off Cape Frazer.

Referred by Brady to *Polystomella* and placed in *Elphidiella*, as genotype, by Cushman (C.C.L.F.R., Vol. 12, Pt. 4, 1936, p. 89). In 1939 Cushman referred specifically to these figures of Brady.

Figures 6, 7.—*Elphidium crispum* (Linnaeus).

Challenger Sta. 186, Wednesday Island, Pacific. (7-8 fathoms)

Referred by Brady to *Polystomella* and by Cushman and Grant (Trans. San Diego Soc. Nat. Hist., Vol. 5, No. 6, 1927, p. 73) to *Elphidium*.

Figures 8, 11.—*Elphidium macellum* (Fichtel and Moll).

Fig. 8. Challenger Sta. 163C, off Sydney, Australia. (6 fathoms)

Fig. 11. Challenger Sta. 142A, off South Africa. (15-20 fathoms)

Referred by Brady to *Polystomella*. Hofker (Siboga Exped., Foraminifera Pt. I, 1927, p. 55) referred *P.*

EXPLANATION OF PLATE 110 (CX), CONTINUED

macella to the synonymy of *P. crispa*, as a trimorphous form, with reference to Brady's figures 6-9, 11. Thalmann followed this in part, referring figs. 8 and 11 to *Elphidium crispum*. This course has not been followed by later authors (Heron-Allen, Earland, Cushman, etc.) and Cushman's views have been accepted here. (See Cushman and Leavitt, C.C.L.F.R., Vol. 5, 1929, pp. 18-20.)

Figure 9.—*Elphidium lessonii* (d'Orbigny).

Challenger Sta. 315A, Falkland Islands, S. Atlantic. (6 fathoms)

Referred by Brady to *Polystomella macella* (F. & M.) and by Heron-Allen and Earland (Discovery Repts., Vol. 4, Foraminifera Pt. I, 1932, p. 440) to *Elphidium lessonii* (d'Orbigny), originally recorded from Patagonia and the Falklands.

Figure 10.—*Elphidium macellum* var. *aculeata* (Silvestri).

Challenger Sta. 315A, Falkland Islands, S. Atlantic. (6 fathoms)

Referred by Brady to *Polystomella*, young specimen, probably *P. macella*, and by Silvestri (Atti Rend. Acc. Sci. Lett. Arti Acireale, Vol. 10 (1898-1900), 1901, p. 45) to *P. macella* var. *aculeata*. This is a homonym of *Polystomella aculeata* d'Orbigny 1846 and requires a new name. Thalmann, 1932, refers this figure in error to *Elphidium aculeatum* (d'Orbigny).

Figure 12.—*Parrellina verriculatus* (Brady).

Challenger Sta. 162, Bass Strait, Pacific. (38-40 fathoms)

Referred by Brady to *Polystomella* and by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 374) to *Elphidioides* Parr. This is a homonym of *Elphidioides* Cushman 1945, and has been renamed *Parrellina* by Thalmann (Eclog. geol. Helv., Vol. 43 (1950) 1951, No. 2, p. 224).

Figures 13-15.—*Parrellina imperatrix* (Brady).

Figs. 13, 14. Storm Bay, Tasmania.

Fig. 15. Challenger Sta. 163B, off Sydney, Australia. (2-10 fathoms)

Referred by Brady to *Polystomella* and by Parr (l. c., 1950) to *Elphidioides*. As noted above this is a homonym and has been renamed *Parrellina* Thalmann 1951.

Figures 16, 17.—*Elphidium craticulatum* (Fichtel and Moll).

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms).

Referred by Brady to *Polystomella* and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 311) to *Elphidium*.

EXPLANATION OF PLATE 111 (CXI)

Figs. 1-7, X 30; Fig. 8, X 35.

Figures 1, 3.—*Amphistegina quoyii* d'Orbigny?

Figs. 1, 3c. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Figs. 3a, 3b. Challenger Sta. 173A, off Fiji, Pacific. (12 fathoms)

Referred by Brady to *A. lessonii* d'Orbigny and by Said (C.L.F.R. Spec. Publ. No. 26, 1949, p. 39) to *A. radiata* (Fichtel and Moll). Cushman and others have followed Brady. Chapman recorded *A. radiata* from the Arabian Sea, whence Fichtel and Moll originally described this species and *Nautilus venosus*, but makes no reference to Brady's figures under this species, referring figs. 1-7 to *A. lessonii* in accord with Brady. Chapman's figures agree fairly well with the original ones of *A. radiata* and differ from Brady's. Confusion has arisen regarding *A. quoyii* and *A. lessonii* since d'Orbigny in his text (Ann. Sci. Nat., Vol. 7, 1826, p. 304) referred to his pl. 17, figs. 1-4 under this species, and on the plate explanation referred these figures to *A. quoyii*. The question has been discussed by M. Lys (C. R. Somm. Soc. geol. France, 1948, pp. 64-66) and M. Lys concludes that the figs. 1-4 on pl. 17 (d'Orbigny, 1826, Ann. Sci. Nat. Vol. 7) are *A. quoyii*, a many chambered species, and that *A. lessonii* is represented by the model No. 98, which is more inflated and shows much fewer chambers (see below). The form represented by Brady may prove to be *A. radiata* (Fichtel and Moll) but in this case *A. quoyii* is regarded as a synonym. Material from Karachi and elsewhere in the Indian Ocean appears to be distinct from the Pacific species, here referred to *A. quoyii*.*

Figures 2, 4, 7.—*Amphistegina gibbosa* d'Orbigny.

Fig. 2. Challenger Sta. 33, off Bermuda, Atlantic. (435 fathoms)

Fig. 4, 7. Challenger Sta. 352, Cape Verde Islands, Atlantic. (11 fathoms)

*NOTE: The Recent species of *Amphistegina* have been greatly confused in literature, and need careful study with adequate thin sections of toptype material, also a restudy of the types where possible. Fornasini (loc. cit. supra, 1903) published a note on d'Orbigny's species but reached the conclusion that *A. lessonii* is the only valid Recent species, with *A. quoyii*, *A. vulgaris* as synonyms and *A. trilobata*, *A. bilobata*, *A. madagascariensis* and *A. gibba* as variants. He does not clarify d'Orbigny's error in referring his 1826 figures to both *A. lessonii* and *A. quoyii*, and gives a figure of *A. lessonii* for *A. madagascariensis*. M. Lys (see earlier) has given a good discussion of *A. lessonii* but did not reach any definite conclusion with respect to its relationship to *A. radiatus* and *A. venosa*, being in doubt as to whether these are camerinids or belong to *Amphistegina*. Forms close to *A. quoyii*, *A. lessonii* and *A. gibbosa* have been separated in Recent sample material but it has not been possible as yet to study examples from the Arabian Sea in order to verify to some extent the identity of the species proposed from there by Fichtel and Moll. There appears to be a possibility that the common many-chambered form from the Indian Ocean and Indo-Pacific figured by d'Orbigny as *A. quoyii* may prove to be the same as *A. radiata* (Fichtel and Moll), and that the fewer-chambered, more globose form described by d'Orbigny as *A. lessonii* is *A. venosa* (Fichtel and Moll), probably with *A. madagascariensis* d'Orbigny in synonymy. These Pacific forms require more study, as noted earlier. It is believed, however, that the common West Indian, Caribbean species is distinct from these and should be referred to *A. gibbosa* d'Orbigny.

EXPLANATION OF PLATE 111 (XCI), CONTINUED

Referred by Brady to *A. lessonii*, and followed by Cushman and others. D'Orbigny proposed *A. gibba* for an Antillean species in 1826 (Ann. Sci. Nat., Vol. 7, p. 305) but this is a nomen nudum, not validated till 1903 by Fornasini (Rend. Sess. R. Acc. Sci. Ist. Bologna, N.S., Vol. 7, p. 144, pl. ii, fig. 4), who regards it as indistinguishable from *A. lessonii* except as a variant, and compares it with Brady's fig. 7. However in 1839 (Foraminifères de l'Île de Cuba, p. 120, pl. 8, figs. 1-3) d'Orbigny described and figured *A. gibbosa* from Cuba which is regarded as the same species and which agrees well with the present figures of Brady and with Recent material from the eastern Gulf of Mexico and Caribbean region generally. It has rather fewer chambers than *A. quoyii*, is much more irregular, varying from depressed lenticular to asymmetrically inflated, is sharply carinate as a rule, and is less globose, with more chambers, than typical *A. lessonii*.

Figures 5, 6.—*Amphistegina lessonii* d'Orbigny.

Fig. 5. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 6. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

D'Orbigny described *A. lessonii* from Ile de France (Mauritius) and the model and later figures (Guerin-Meneville, Iconog. du Règne Animal, Vol. 2, 1843, pl. 3, fig. 11, 11a, 11b; Fornasini, Rend. R. Acc. Sci. Ist. Bologna, N.S., Vol. 7, 1903, pl. ii, figs. 1, 1a, 1b.) show a carinate, somewhat irregular, globose form, with comparatively few (7-8) chambers. This is very close indeed to the above figures of Brady and to material examined from the Indo-Pacific. It appears to be quite distinct from any West Indian material. Said (1949, loc. cit. supra) refers Brady's fig. 5 to *A. radiata* var. *venosa* (Fichtel and Moll), which could prove correct, but actual specimens should be examined, sectioned and thoroughly checked. Cushman, Chapman and Parr, and Yabe and Hanzawa have referred *venosa* (Fichtel and Moll) to *Camerina* (*Nummulites*) but the original figures appear to represent an *Amphistegina*.

Figure 8.—*Cycloclypeus carpenteri* Brady.

Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)

Referred by Brady to *C. guembelianus* Brady but regarded by Chapman (Jour. Linn. Soc. Zool., Vol. 28, 1900, p. 22) and others as the megalospheric form of *C. carpenteri*.

EXPLANATION OF PLATE 112 (CXII)

Figs. 1, 2, X 50; Figs. 3-10, 14, 15, X 12; Figs. 11-13, X 18; Fig. 16, X 15; Figs. 17-20, X 25.

Figures 1, 2.—*Hyalinea balthica* (Schroeter).

Porcupine Sta. 11, W. of Ireland, E. Atlantic. (1630 fathoms)

Referred by Brady to *Operculina ammonoides* (Gronovius), and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 108) to *Anomalina balthica* (Schroeter). Earland and Parr have both placed the species in *Operculina* since Hofker demonstrated it to possess a canal system. Later, Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 508) made it the genotype of *Hyalinea*. Bermúdez (Bol. de Geol., Caracas, Vol. 2, No. 4, 1952, p. 74) regarded this as too close to *Hyalinia* Agassiz and proposed the new name *Hofkerinella*. Loeblich and Tappan (personal communication) have pointed out that such similarity of spelling does not constitute homonymy according to the rules of nomenclature, and the name *Hyalinea* is therefore retained here.

Figures 3-9, 11-13.—*Operculina ammonoides* (Gronovius)?

Figs. 3, 6-8. Challenger Sta. 195A, off Amboyna, Pacific. (15-20 fathoms)

Figs. 4, 12, 13. Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Fig. 5. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Fig. 9. Challenger Sta. 186, Flinder's Passage, Pacific. (7-8 fathoms)

Fig. 11. China Sea, dredged.

Figs. 3, 4, 5, and 8 referred by Brady to *O. complanata* (Defrance), figs. 6, 7, 9, and 10 to *O. complanata* var. *granulosa* Leymerie, and figs. 11-13 to *Nummulites cumingii* (Carpenter). For forms similar to those in figures 3-9 Chapman and Parr (Proc. R. Soc. Victoria, N.S., Vol. 50, No. 1, 1938, p. 290, pl. 17) have used the name *O. ammonoides* (Gronovius), with *O. gaimardi* d'Orbigny and *Assilina discoidalis* d'Orbigny in synonymy; for forms similar to figs. 11-13 they use *Operculinella venosa* (Fichtel and Moll), with *cumingii* (Carpenter) in synonymy. Hanzawa, in his revision of "*Nummulites*" *cumingii* (Jap. Jour. Geol. Geogr. Vol. 16, Nos. 3-4, 1939, pp. 225-232, pls. 15, 16) gives a similar synonymy to that of Chapman and Parr, but includes their *Operculinella venosa* with *Operculina ammonoides* (Gronovius), and separates *cumingii* as a true *Operculinella*. Although neither Chapman and Parr nor Hanzawa refer to Brady's figures it seems clear that figs. 11-13 are *O. ammonoides* (Gronovius). The writer believes that *O. gaimardi* d'Orbigny should be regarded as distinct (see below) but that *O. discoidalis* (d'Orbigny) is correctly placed under *ammonoides*. Brady's figures 3-9 may perhaps represent forms of *O. ammonoides* but these should be examined, since they appear to be rather more compressed and thinner than any forms of *ammonoides* figured, and also the spiral coiling tends to be more open. They could be variants of the species following.

Figure 10.—*Operculina gaimardi* d'Orbigny?

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Referred by Brady to *O. complanata* var. *granulosa* Leymerie. Chapman and Parr (l. c. supra) figure a similar form as *O. bartschi* Cushman but a comparison with Fornasini's reproduction of d'Orbigny's drawing of *gaimardi* shows the two forms to be extremely similar, though d'Orbigny's drawing shows granules on the sutures

EXPLANATION OF PLATE 112 (CXII), CONTINUED

and rather fewer chambers than Brady's specimen. In any case it seems erroneous to place *gaimardi* in synonymy with *ammonoides*, and Pacific material shows extreme variation in these open-coiled, flat thin forms, the series clearly including the form figured by d'Orbigny as *gaimardi* and the various specimens figured by Cushman as *O. bartschi* and varieties. It is possible that figs. 6 and 8 and possibly others could be grouped in this series but Brady's specimens should be studied before any definite conclusion can be reached.

Figures 14-16.—*Heterostegina depressa* d'Orbigny.

Fig. 14. Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

Fig. 15. Challenger Sta. 260A, off Honolulu, Pacific. (40 fathoms)

Fig. 16. Challenger Sta. 172, Friendly Islands, Pacific. (18 fathoms)

Hofker (Siboga Exped., Foraminifera Pt. I, 1927, p. 70) has placed *H. depressa* in the synonymy of *H. suborbicularis* d'Orbigny, and also includes *H. curva* Moebius and *H. antillarum* d'Orbigny under the same heading. *H. suborbicularis* d'Orbigny 1826 was a nomen nudum and only validated in 1903 by Fornasini. Fornasini (Boll. Soc. Geol. Ital., Vol. 22, fasc. 3, 1903, p. 396) has shown that the Planches inédites of d'Orbigny contained three figures labelled *suborbicularis*, two of which he regards as *H. depressa* d'Orbigny 1826, and the third very like *H. curva* Moebius 1880 (see below). It is therefore believed that Hofker, Cushman and others are in error in making use of the name *suborbicularis*.

Figures 17, 18.—*Heterostegina* sp., juv.

Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)

Brady referred these specimens to *H. depressa* d'Orbigny and Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 311) to *H. costata* d'Orbigny, an Austrian Miocene species. It seems probable that Brady was correct but his material should be re-examined.

Figures 19, 20.—*Heterostegina* cf. *curva* Moebius.

Challenger Sta. 260A, off Honolulu reefs, Pacific. (40 fathoms)

Fornasini (l. c. supra, 1903, p. 396) compares these figures to one of the three unpublished drawings of d'Orbigny labelled *H. suborbicularis* d'Orbigny 1826. As noted above *suborbicularis* was a nomen nudum and is probably a synonym of *C. curva* Moebius, thus supporting Brady's identification of these forms.

EXPLANATION OF PLATE 113 (CXIII)

Figs. 1, 13, 15, X 50; Figs. 2, 20, 21, X 60; Figs. 3-5, 8, X 75; Figs. 6, 9, 14, X 100; Figs. 7, 10, X 80; Figs. 11, 12, X 35; Fig. 16, X 45; Fig. 17, X 30; Fig. 18, X 5; Fig. 19, X 20.

Figure 1.—*Textularia conica* d'Orbigny, short variety.

Challenger Sta. 205A, off Hong Kong, Pacific. (7 fathoms)

Figure 2.—*Siphotextularia crispata* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Textularia* and by Cushman, Todd and Post (U.S.G.S. Prof. Paper 260-H, 1954, p. 330) to *Siphotextularia*.

Figures 3-5.—*Gaudryina* (*Siphogaudryina*) *transversaria* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Textularia* and by Said (C.L.F.R., Spec. Publ. 26, 1949, p. 8) to *Gaudryina* (*Siphogaudryina*).

Figure 6.—*Pseudobulimina* sp. nov.?

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Bulimina convoluta* Williamson. Cushman (1922) transferred *convoluta* to *Buliminella* and Glaessner (Stud. Micropal., Moscow, Vol. 1, Pt. 3, 1937, p. 23) placed it in *Pseudobulimina* Earland. Makiyama and Hakagawa (Jour. Geol. Soc. Japan, Vol. 48, 1941, pp. 241, 243) referred *convoluta* to *Geminospira*, and cited Brady's figures. Cushman and Parker (U.S.G.S. Prof. Paper 210-D, 1947, p. 77), apparently in ignorance of the genus *Geminospira* retained *convoluta* in *Pseudobulimina*, but remarked that "the figures given by Brady . . . are probably not of a species identical with that of Williamson and perhaps do not belong to *Pseudobulimina*." Loeblich and Tappan (personal communication) state that they have examined types and regard *Pseudobulimina* and *Geminospira* as synonymous.

Figure 7.—*Loxostoma strigosum* (Brady).

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Bolivina lobata* var. *strigosa*, and by Cushman (C.L.F.R., Spec. Publ. No. 9, 1937, p. 189) to *Loxostoma strigosum* (Brady).

Figure 8.—*Cassidulina pacifica* Cushman.

Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)

Referred by Brady to *Cassidulina calabra* (Seguenza) and by Cushman (C.C.L.F.R. Vol. 1, Pt. 3, 1925, p. 24) to *C. pacifica*.

Figure 9.—*Orthoplecta clavata* Brady.

Challenger Sta. 219A, Admiralty Islands, Pacific. (17 fathoms)

For a recent discussion of this form see Loeblich and Tappan (Smiths. Misc. Coll., Vol. 128, No. 5, 1955, pp. 24-25).

EXPLANATION OF PLATE 113 (CXIII), CONTINUED

- Figure 10.**—*Ehrenbergina pupa* (d'Orbigny).
Challenger Sta. 305, W. coast of Patagonia, E. Pacific. (120 fathoms)
- Figure 11.**—*Saracenaria latifrons* (Brady).
Challenger Sta. 166, W. coast of New Zealand, Pacific. (275 fathoms)
Referred by Brady to *Cristellaria* and by Thalmann (1932) to *Saracenaria*.
- Figure 12.**—*Planularia magnifica* Thalmann.
Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)
Referred by Brady to *Cristellaria dentata* Karrer, and by Thalmann (Eclog. geol. Helv., Vol. 26, No. 2, 1933, p. 255) to *Planularia magnifica*.
- Figure 13.**—*Amphicoryna* sp. nov., Thalmann.
Challenger Sta. 174C, off Fiji, Pacific. (210 fathoms)
Referred by Brady to *Amphicoryne* sp.?, and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, p. 311) to *Amphicoryne* sp. nov. As noted for Plate LXIII, Thalmann (1951) has shown that Schlumberger's genus should be written *Amphicoryna*.
- Figure 14.**—*Schubertia limbata* (Brady).
Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
Referred by Brady to *Sagrina* and by Cushman (C.L.F.R. Spec. Publ. No. 9, 1937, p. 207) to *Schubertia*.
- Figure 15.**—*Articulina scrobiculata* (Brady).
Shore sand, Tamatavé, Madagascar.
Referred by Brady to *Miliolina* and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 312) to *Articulina*. This species is not mentioned by Cushman in his review of the genus *Articulina* and its species (C.L.F.R. Spec. Publ. No. 10, 1944); this may have been an oversight or possibly he did not regard this form as belonging to that genus.
- Figure 16.**—“*Quinqueloculina pygmaea* Reuss”.
Challenger Sta. 218A, Admiralty Islands, Pacific. (16-25 fathoms)
Referred by Brady to *Miliolina* and by Thalmann to *Quinqueloculina*, as originally classified by Reuss. Brady's figures are very different from that of Reuss and, moreover, seem closer to *Massilina* than to *Quinqueloculina*. The material requires further study.
- Figure 17.**—*Quinqueloculina* sp. nov.?
Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
Referred by Brady to *Miliolina ferussacii* (d'Orbigny). Brady, as may be seen from the synonymy given in his text, allowed a great deal of variation in his concept of this species. Some of his forms were probably correctly determined as *ferussacii* but it is believed that the present figure represents a new species, differing greatly from *Q. ferussacii* d'Orbigny, and with no counterpart in the literature examined.
- Figures 18, 19.**—*Cornuspiroides striolatus* (Brady).
Knight Errant Sta. 8, Faroe Channel, N. Atlantic. (540 fathoms; cold area)
Referred by Brady to *Cornuspira* and by Cushman (C.C.L.F.R., Vol. 4, 1928, p. 3) to *Cornuspiroides* as genotype.
- Figure 20.**—*Cornuspira crassisepta* Brady.
Knight Errant Sta. 7, Faroe Channel, N. Atlantic. (530 fathoms; warm area)
- Figure 21.**—*Cornuspira lacunosa* Brady.
Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
Referred by Wiesner (Deutsche Südpolar Exped. 1901-1903, Foram., Vol. 20, 1931, p. 101) to *Cornuspiroides* but returned here to *Cornuspira* since the figure does not show the characteristic generic features for *Cornuspiroides*.

EXPLANATION OF PLATE 114 (CXIV)

- Figs. 1, 12, X 60; Figs. 2, 10, 11, X 100; Figs. 3-7, X 20; Figs. 8, 17, 18, X 70; Fig. 9, X 120;
Fig. 13, X 15; Fig. 14, X 18; Figs. 15, 16, X 10; Figs. 19, 20, X 50; Fig. 21,
no magnification, given.
- Figure 1.**—*Triloculina terquemiana* (Brady).
Shore-sand, Tamatavé, Madagascar, Indian Ocean.
Referred by Brady to *Miliolina* and by Cushman (U.S.N.M. Bull. 71, Pt. 6, 1917, p. 72) to *Triloculina*.
- Figure 2.**—*Triloculina bertheliniana* (Brady).
Shore-sand, Tamatavé, Madagascar, Indian Ocean.
Referred by Brady to *Miliolina* and by Cushman (U.S.N.M. Bull. 100, Vol. 4, 1921, p. 457) to *Triloculina*.
- Figure 3.**—*Planispirinoides bucculentus* (Brady).
Porcupine Sta. 57, Faroe Channel, N. Atlantic. (632 fathoms; cold area)
Referred by Brady to *Miliolina* and by Parr (B.A.N.Z. Antarctic Res. Exped., 1929-1931, Ser. B, Vol. 5, Pt. 6, 1950, p. 287) to *Planispirinoides*, as genotype. Wiesner (Deutsche Südpolar Exped. 1901-1903, Vol. 20, Foram., 1931, p. 107) places *bucculenta* Brady in the synonymy of *Miliolinella subrotunda* var. *trigonina* (Wiesner 1923), ignoring Brady's priority, and on the following page retains the name *bucculenta* in *Miliolinella*

EXPLANATION OF PLATE 114 (CXIV), CONTINUED

- bucculenta* var. *placentiformis* (Brady). Parr is followed here and should be referred to for an excellent account of the species in question.
- Figures 4-7.**—*Planispirina communis* Seguenza.
 Figs. 4, 5, 7. Lightning Sta., off Faroe, N. Atlantic. (170 fathoms)
 Fig. 6. Porcupine Sta., Faroe Islands, N. Atlantic. (170 fathoms)
- Figure 8.**—*Fissurina laevigata* Reuss.
 Challenger Sta. (?).
 Silvestri (Mem. Pont. Acc. Rom. Nuovi Lincei, Vol. 19, 1902, p. 22) refers this figure to *Fissurina marginata* (Walker and Boys) var. but Buchner (1940) retains it in *F. laevigata* and is followed here. It was referred to *Lagena* by Brady.
- Figure 9.**—*Lagena* (?) *spiralis* Brady.
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Matthes (Palaeontogr., Vol. 90, Abt. A, 1939, p. 63) makes this a variety of *striatopunctata* Parker and Jones, which is an *Oolina*. Since Brady states that his specimens were ectosolenian they are retained tentatively in *Lagena*, as a valid species.
- Figure 10.**—*Fissurina formosa* (Schwager) var. *brevis* (Brady).
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Lagena*.
- Figure 11.**—*Fissurina* (?) *quadrangularis* (Brady).
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Lagena* and tentatively placed here in *Fissurina*. The types should be examined to determine the presence or absence of an internal tube.
- Figure 12.**—*Fronicularia compta* Brady var. *villosa* Heron-Allen and Earland.
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *F. archiaciana* d'Orbigny and by Heron-Allen and Earland (Jour. Roy. Micr. Soc., 1924, p. 157) to *F. compta* var. *villosa*.
- Figure 13.**—*Vaginulina legumen* (L.) var. *arquata* Brady.
 Challenger Sta. 24, West Indies. (390 fathoms)
 This is very close to the form figured by Cushman (U.S.N.M. Bull. 104, Pt. 4, 1923, pl. 38, fig. 1) as a senescent specimen of *V. spinigera* Brady. It may be a valid species but a series should be examined to check if it is related to *V. spinigera*.
- Figure 14.**—*Marginulinopsis* sp. nov.
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Cristellaria wetherelli* (R. Jones), an English Eocene species. It is regarded as a *Marginulinopsis* and is probably new.
- Figures 15, 16.**—*Planularia magnifica* Thalmann var. *falciformis* Thalmann.
 Knight Errant Sta. 7, Faroe Channel, N. Atlantic. (530 fathoms)
 Referred by Brady to *Cristellaria compressa* d'Orbigny and by Thalmann (Eclog. geol. Helv., Vol. 30, No. 2, 1937, p. 342) as *Planularia magnifica* Thalmann var. *falciformis*.
- Figure 17.**—*Lenticulina altifrons* Parr.
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Cristellaria acutauricularis* (Fichtel and Moll) and by Parr (B.A.N.Z. Antarctic Res. Exped. 1929-1931, Ser. B, Vol. 5, No. 6, 1950, p. 323) to *Lenticulina altifrons*.
- Figure 18.**—*Rectuwigerina nicoli* Mathews.
 Challenger Sta. 142, off South Africa. (150 fathoms)
 Referred by Brady to *Sagrina nodosa* Parker and Jones and by Mathews (Jour. Pal., Vol. 19, No. 6, 1945, p. 593) to *Rectuwigerina nicoli*.
- Figures 19, 20.**—*Globigerina pachyderma* (Ehrenberg).
 "Knight Errant Sta. 18, Faroe Channel", N. Atlantic. (Sta. 8 Knight Errant, 540 fathoms?)
 This was referred to *Globigerinoides* by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 312) but this practice has not been followed by later authors.
- Figure 21.**—*Globotruncana linnaeana* (d'Orbigny).
 Copied from d'Orbigny's figures.
 Referred by Brady to *Globigerina* and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 90) to *Globotruncana*. This species was described by d'Orbigny in 1839 from the shore sands of Cuba (as *Rosalina*) and is regarded by Cushman as a reworked Cretaceous form.

EXPLANATION OF PLATE 115 (CXV)

- Figs. 1, 2, 4, 5, X 30; Fig. 3, X 14; Figs. 6, 8, X 50; Fig. 7, X 25; Fig. 9, X 60.
- Figure 1.**—*Eponides schreibersi* (d'Orbigny).
 Challenger Sta. 185, Torres Strait, Pacific. (155 fathoms)
 Referred by Brady to *Pulvinulina* and by Thalmann (Eclog. geol. Helv., Vol. 25, No. 2, 1932, p. 312) to *Eponides*.

EXPLANATION OF PLATE 115 (CXV), CONTINUED

Figure 2.—*Cyclocibicides vermiculatus* (d'Orbigny)

Cagliari, Sardinia, Mediterranean. (Shallow water).

Referred by Brady to *Pulvinulina* and by Cushman (C.C.L.F.R., Vol. 3, No. 1, 1927, p. 93) to *Cyclocibicides*, as genotype. (*Planorbulina* of d'Orbigny).

Figure 3.—*Planopulvinulina dispansa* (Brady).

Off Madeira, Atlantic, dredged.

Referred by Brady to *Pulvinulina* and by Schubert (Pal. Zeitschr., Vol. 3, 1920, p. 153) to *Planopulvinulina*; designated the genotype of *Planopulvinulina* by Cushman, 1928.

Figures 4, 5.—*Cibicides lobatulus* (Walker and Jacob).

Challenger Sta. 78, S.E. of the Azores, Atlantic. (1000 fathoms)

Referred by Brady to *Truncatulina* and by Cushman (U.S.N.M. Bull. 104, Pt. 8, 1931, p. 119) to *Cibicides*. These figures show specimens enclosed in sand.

Figure 6.—*Gyroidina orbicularis* d'Orbigny.

Challenger Sta. 142, off South Africa. (150 fathoms)

Referred by Brady to *Rotalia* but originally placed in *Gyroidina* by d'Orbigny and currently referred to that genus.

Figure 7.—*Streblus schroeterianus* (Parker and Jones).

China Sea, dredged.

Referred by Brady to *Rotalia* and by Ishizaki (Taiwan Tigaku Kizi, Appendix to Vol. X-XI, 1940, p. 131) to *Streblus* Fischer.

Figure 8.—*Asterorotalia trispinosa* (Thalmann).

Straits of Banca, E. Indies, Pacific.

Referred by Brady to *Rotalia pulchella* (d'Orbigny 1839). Thalmann (Eclog. geol. Helv., Vol. 26, No. 2, p. 248) has pointed out that since *Rotalina* (*Calcarina pulchella* d'Orbigny 1839 is a *Rotalia*, it becomes a homonym of *Rotalia pulchella* d'Orbigny 1826. He furthermore regards Brady's Indo-Pacific species as distinct from d'Orbigny's Cuban forms, and has named the former *R. trispinosa*, and the latter *R. cubana*. Hofker (Siboga Exped., Foraminifera Pt. III, 1951, p. 505) erected the genus *Asterorotalia* and named as genotype *Asterorotalia pulchella* (d'Orbigny). This he notes is the form named *trispinosa* by Thalmann, but states that he was unable to follow Thalmann's reasoning and therefore retained d'Orbigny's name.

Figure 9.—*Nonion boueanum* (d'Orbigny) var. *armata* (Brady).

Shore-sand, Tamatavé, E. coast of Madagascar.

Referred to *Nonionina* by Brady.