

AUSTRALASIAN ANTARCTIC EXPEDITION

1911-14.

UNDER THE LEADERSHIP OF SIR DOUGLAS MAWSON, O.B.E., B.E., D.Sc., F.R.S.

SCIENTIFIC REPORTS.
SERIES C.—ZOOLOGY AND BOTANY.

Edited by Professor T. Harvey Johnston,
University of Adelaide.

VOL. I PART 2.

FORAMINIFERA

BY

FREDERICK CHAPMAN, A.L.S., F.G.S., Hon. F.R.M.S., ETC.
COMMONWEALTH PALAEONTOLOGIST, 1927-1935.

AND

WALTER JAMES PARR F.R.M.S.

WITH FOUR PLATES.

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CORRIGENDA.

Mawson Report on the Foraminifera, Chapman and Parr, November, 1937.

Tables on pp. 16, 26, 36, 46, No. 82. For "*Buliminella*" *subcylindrica* read "*Robertina*" *subcylindrica*.

p. 62, No. 26. After NODOSARIA SUBSTRIATULA *Cushman* insert "pl. VII, fig. 4."

p. 71, No. 58. For "LAGENA LAEVIGATA (*Reuss*)" read "LAGENA BIANCAE (*Seguenza*)" and insert the following synonymy —

"*Fissurina laevigata* Reuss, 1849-50, p. 366, pl. I (XLVI), fig. 1; 1863, p. 338, pl. VI, figs. 84a, b.

Lagena laevigata (Reuss, non d'Orbigny) of later authors.

Fissurina biancae Seguenza, 1862, p. 57, pl. I, figs. 48-50. A. Silvestri, 1902, p. 20, figs. 29-32.

Lagena biancae (Seguenza), Heron-Allen and Earland, 1932, p. 372, pl. X, figs. 35-39."

Also Tables on pp. 14, 24, 34, 44, No. 58. For "*Lagena laevigata* (Rss.)" read "*Lagena biancae* (Seguenza)."

p. 72, No. 59, line 11. For "entosoleman" read "ectosolenian."

p. 94, line 2. For GENUS REUSSELLA *Galloway*, "1923" read "1933."

p. 125, No. 213. MILIAMMINA ARENACEA, delete third paragraph, from "associated" to "porcellanous isomorphs."

p. 128, line 7. For "Atlantic" read "Antarctic."

p. 162, line 5. For "Hauesler" read "Haeusler."

p. 185, line 15, fig. 43. For *Textularia* "*tenuissa*" read "*tenuissima*."

p. 187—Index. Between "*botelliformis*" and "*dextrospiralis*" insert list as follows:—

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FORAMINIFERA.

By FREDERICK CHAPMAN, A.L.S., F.G.S., Hon. F.R.M.S., Commonwealth Palæontologist
(1927-35), and WALTER JAMES PARR, F.R.M.S.

(With Plates VII—X.)

I.—INTRODUCTION.

For the most part the samples of soundings obtained by the Mawson Expedition have proved to contain Foraminifera. The general details of these soundings are given in a previous "Report on Sea-floor Deposits from Soundings" (Chapman, 1922), where the analyses of calcareous and siliceous constituents, together with the appearance of the fine washings, are recorded.

Some of the ground traversed by the "Aurora" (1911-1914) was also covered by the course of the "Terra Nova" (1910); and consequently the results of Heron-Allen and Earland, given in their comprehensive and valuable report of 1922 (Heron-Allen and Earland, 1922) are to some extent matched by the present series. There are, however, many notable exceptions in both reports, details of which are given in the systematic portion of this monograph.

It is gratifying to note in this report the occurrence of certain species of Foraminifera which were previously described or recorded from the "Nimrod" soundings taken by Shackleton in 1907-9 (Chapman, 1917) and which were found in the "Terra Nova" dredgings of the Scott Expedition.

An especially noteworthy feature of the results from the present work, on the Antarctic material, including as well the previously published accounts, is the difference that the majority of specific forms present from those of the Tertiary and Quaternary foraminiferal faunas of Australian and New Zealand deposits. This is mainly on account of the totally distinct conditions obtaining in the Antarctic Seas, with their deeper sea-bed and lower temperatures, for the Australian fossil deposits were invariably laid down in temperate to sub-tropical seas, and their maximum bathymetrical limits possibly did not exceed 600 fathoms.

AUTHORS' NOTE.

Some explanation is needed as to the differences between the classification here followed and that published by us in the Proceedings of the Royal Society of Victoria in 1936 (vol. XLIX, Pt. I). The present contribution was forwarded to be printed in April, 1931, but owing to delays in publication it has appeared after the Classification, which was not begun until after the date mentioned. To avoid extensive alterations in the proofs, it has been deemed inadvisable to attempt to bring the present work into line with our later ideas in regard to classification.

It is to be regretted that the delay in publication has also resulted in several of the species described by us as new having been published by other authors on Antarctic Foraminifera. In these cases the necessary alterations have been made in the text, which otherwise has been left as it was completed in 1931.—F.C. and W.J.P.

We may point out at the same time that there is a small proportion of species which is common to the Recent Antarctic shallow water deposits and to the foraminiferal sediments of Tertiary and Pleistocene areas in south-eastern Australia, as well as in those of New Zealand. This relationship, within limits, between the Antarctic and Australian microzoic faunas, is in keeping with the fact of the once greater continuity of the shore-lines of Antarctica. This lost coastal area must have closely linked up the Australian shores with enormous continental areas in higher latitudes, but which are now only represented in New Zealand and Patagonian faunas. In this way Antarctica may also have been connected with certain areas of lower latitudes in the Southern Hemisphere.

LIST OF NEW SPECIES AND VARIETIES.

- Spirillina helenae.*
Spirillina spinulosa.
Lagena pseudocatenulata.
Lagena fimbriata Brady, var. *polita.*
Lagena multicincta.
Ceratobulimina tenuis.
Sigmomorphina subulata nom. mut.
Ceratobulimina tenuis.
Cassidulina subglobosa Brady, var. *producta.*
Bulimina brevitrigona.
Bulimina buchiana d'Orb., var. *gutta.*
Virgulina davisii.
Bolivina sphenoides.
Angulogerina angulosa (Williamson), var. *asperrima.*
Ellipsolagena cucullata.
Discorbis margariteus.
Discorbis williamsoni nom. mut.
Globorotalia pseudocrassa.
Anomalina colligera.
Anomalina globulosa.
Cornuspira involvens (Reuss), var. *corticata.*
Sigmoilina edwardsi Schlumberger, var. *acuta.*
Recurvoides contortus Earland.
Reophax mawsoni.
Proteonina bulbosa.
Trochammina mawsoni.
Trochammina planoconvexa.
Techinitella hystrix.
Rhizammina horrida.
Marsipella dextrospiralis.

II.—METHOD OF CLASSIFICATION USED IN THIS REPORT.

Up to the time of the issue of Dr. H. B. Brady's fine Monograph of the Foraminifera of the "Challenger" (H. B. Brady, 1884), the classification of this group had been gradually evolving, by the general assumption that the generic forms could be more easily arranged according to the material used in the structure of the test, concomitantly with their plans of growth. These genera were then arranged by Brady in consecutive order, under families. That this arrangement was artificial, rather than biological, is very evident when we consider that certain families embraced both arenaceous and hyaline types, whilst other families had their plans of growth precisely duplicated in adjacent families. Another drawback to this classification was the association of generic types which were not understood in their original meaning, as are now seen in regard, say, to the Rotaline types.

A later classification, by Eimer and Fickert (1899) was based on form alone, the shell-structure being regarded as of only secondary importance. Although this arrangement was not satisfactory, it opened up the way to more modern classifications which have since been elaborated, particularly that of Dr. J. A. Cushman (1928).

It appears that the first natural classification, based on the phylogeny of the various types, and confirmed by the ontogeny of the individual generic types, was stressed by R. J. Schubert as far back as 1907 (Schubert, 1907). This author, unfortunately, was not able to complete his scheme of classification, owing to his death in the Great War, but it is along those lines that future work must progress. Even with later accumulated knowledge of the fossil forms there is still very much to be learned of the geological history of the various groups.

The results of some of our own detailed work amongst the fossil forms have convinced us that the perforate calcareous and the arenaceous forms were primarily developed from chitinous types. Of these two groups the former must have appeared first, the test being naturally moulded on the protoplasm. This sequence appears to be supported by known facts, since the oldest representatives of the Foraminifera are found in the form of glauconitic casts or grains, some of which still have the hyaline test adhering to them.

Galloway, in a recent work (1928, p. 224) points out, in regard to the sequence of the calcareous and arenaceous forms respectively, that "many chitinous and calcareous forms, some of the Lagenidae, Miliolidae and Rotaliidae, show a tendency to develop an agglutinated test on a chitinous or calcareous base, but no known Foraminifera has an arenaceous young stage followed by a calcareous stage in its ontogeny."

Regarding the formerly accepted group having a porcellanous type of calcareous shell structure, this is shown by morphological analysis to belong to more than one phylogenetic series. Thus Rhumbler and Cushman have already postulated, in the case of the Peneroplidae, forms like *Peneroplis*, *Spirolina* and *Marginopora* have been derived from a perforate ancestral shell. On the other hand the members of the families Milolidae and Cornuspiridae comprise those genera which are wholly imperforate, and have apparently been derived from an *Ammodiscus*-like stock. This is supported by the fact that in the embryonic stage of these forms the test is never perforate.

At present, however, our knowledge is insufficiently supported by facts such as would enable us to determine satisfactorily the position in classification of the various known genera. In the following scheme we have introduced only those families (mainly based on Cushman's latest researches) which we have met with in the Antarctic soundings, and we have attempted merely a rearrangement of these so as to fit more closely with the actual phylogeny of the Foraminifera. In formulating this rearrangement we have been helped by the results obtained from a further study of the geological occurrences of the group, and especially from those of the Palaeozoic rocks. The present notes are preliminary to a more elaborate study of the subject, which we hope to publish at a date in the near future.¹

ORDER FORAMINIFERA:

SUPER-FAMILY SPIRILLINOIDEA.

<i>Family.</i>	<i>Sub-family.</i>	<i>Genus.</i>
SPIRILLINIDAE.		<i>Spirillina.</i>
LENTICULINIDAE.	NODOSARIINAE.	<i>Lenticulina, Marginulina, Vaginulina, Dentalina, Nodosaria, Pseudoglandulina, Frondicularia, Amphicoryne.</i>
	LAGENINAE.	<i>Lagena (vel Entosolenia).</i>
POLYMORPHINIDAE.	POLYMORPHININAE.	<i>Guttulina, Pseudopolymorphina, Glandulina, Polymorphina.</i>
	RAMULININAE.	<i>Ramulina.</i>
BULIMINIDAE.	TURRILININAE.	<i>Buliminella, Robertina, Ceratobulimina.</i>
	CASSIDULININAE.	<i>Pseudobulimina, Cassidulina, Cassidulinoides, Ehrenbergina.</i>
	BULIMININAE.	<i>Bulimina.</i>
	VIRGULININAE.	<i>Virgulina, Bolivina, Rectobolivina.</i>
	REUSSELLINAE.	<i>Reussella.</i>
	UVIGERININAE.	<i>Uvigerina, Siphogenerina, Siphonodosaria, Angulogerina, Trifarina.</i>
	ELLIPSOIDININAE.	<i>Pleurostomella, Ellipsolagena.</i>
NONIONIDAE.		<i>Nonion, Elphidium.</i>
HETEROHELICIDAE.	HETEROHELICINAE.	<i>Heterohelix.</i>
	BOLIVINITINAE.	<i>Bolivinita.</i>

¹ See authors' note, p. 5.

<i>Family.</i>	<i>Sub-family.</i>	<i>Genus.</i>
ROTALIIDAE.	DISCORBINAE.	<i>Patellina, Patellinella, Discorbis, Gyroidina.</i>
	ROTALIINAE.	<i>Eponides, Rotalia.</i>
	SIPHONININAE.	<i>Epistomina.</i>
	BAGGININAE.	<i>Cancris.</i>
CHILOSTOMELLIDAE.	ALLOMORPHINELLINAE.	<i>Pullenia.</i>
	SPHAEROIDININAE.	<i>Sphaeroidina.</i>
GLOBIGERINIDAE.	GLOBIGERININAE.	<i>Globigerina, Globigerinoides.</i>
	ORBULININAE.	<i>Orbulina.</i>
	PULLENIATININAE.	<i>Pulleniatina.</i>
GLOBOROTALIIDAE.		<i>Globorotalia.</i>
CIBICIDIDAE.	ANOMALININAE.	<i>Anomalina, Planulina, Laticarinina.</i>
	CIBICIDINAE.	<i>Cibicides, Dycibicides.</i>
PLANORBULINIDAE.		<i>Acervulina.</i>

SUPER-FAMILY AMMODISCOIDEA.

AMMODISCIDAE.	AMMODISCINAE.	<i>Glomospira.</i>
	TOLYPAMMININAE.	<i>Tolypammmina, Ammolagena.</i>
SILICINIDAE.	MILIAMMININAE.	<i>Miliammmina.</i>
HYPERAMMINIDAE.	HYPERAMMININAE.	<i>Hyperammmina, Jaculella.</i>
	DENDROPHRYINAE.	<i>Saccorhiza, Dendronina.</i>
CORNUSPIRIDAE.	CORNUSPIRINAE.	<i>Cornuspira.</i>
	OPHTHALMIDIINAE.	<i>Ophthalmidium, Planispirina.</i>
MILIOLIDAE.		<i>Quinqueloculina, Sigmoidina, Tubinella, Triloculina, Pyrgo.</i>
LITUOLIDAE.	HAPLOPHRAGMIINAE.	<i>Recurvoides, Haplophragmoides, Ammobaculites, Ammomarginulina.</i>
	LITUOLINAE.	<i>Cyclammmina.</i>
PLACOPSILINIDAE.	PLACOPSILININAE.	<i>Placopsilina.</i>
REOPHACIDAE.	REOPHACINAE.	<i>Reophax.</i>
	PROTEONININAE.	<i>Proteonina.</i>
TEXTULARIIDAE.	SPIROPECTAMMININAE.	<i>Spiropectammmina.</i>
	TEXTULARIINAE.	<i>Textularia.</i>
VERNEUILINIDAE.		<i>Verneuilina, Globotextularia, Gaudryina, Clavulina.</i>
TROCHAMMINIDAE.	TROCHAMMININAE.	<i>Trochammmina.</i>
	AMMOSPHAEROIDININAE.	<i>Ammosphaeroidina, Cystammmina.</i>
NOURIIDAE.		<i>Nouria.</i>
SACCAMMINIDAE.	PSAMMOSPHAERINAE.	<i>Psammosphaera.</i>
	SACCAMMININAE.	<i>Saccammmina, Thurammmina.</i>
	PELOSININAE.	<i>Pelosina, Technitella.</i>
	WEBBINELLINAE.	<i>Iridia, Tholosina.</i>
RHIZAMMINIDAE.		<i>Marsipella, Rhizammina, Bathysiphon.</i>
ASTRORHIZIDAE.		<i>Astrorhiza, Rhabdammina.</i>

III.—TABLE OF SAMPLES CONTAINING FORAMINIFERA.

Samples.		Date.	Location.		Depth (fathoms).	Description.
Number.	Dist. Mark.		S. Lat.	F. Long.		
I	Sample A.	3/1/12	65° 52'	143° 39'	210	Dark-grey sandy ooze with some Globigerina.
II	Sample B.	6/1/12	66° 50'	146° 16'	398	Pale-grey sandy ooze.
III	No. 1 ...	20/1/12	66° 32'	140° 25½'	308	Light-coloured diatomaceous and spicular ooze.
V	No. 4 ...	23/1/12	65° 2'	132° 26'	160	Greenish-grey pebbly sand with some mud.
VII	No. 6 ...	23/1/12	65° 45'	132° 36'	230	Sand and stones.
VIII	No. 7 ...	24/1/12	65° 26'	132° 31'	170	Green mud.
IX	No. 8 ...	25/1/12	65° 17'	129° 10'	230	Mud and small stones.
X	No. 10 ...	31/1/12	66° 0'	119° 30'	330	Green mud and small rock fragments.
XI	No. 11 ...	1/2/12	64° 49'	115° 57'	930	Mud; sand and small pebbles.
XII	No. 13 ...	3/2/12	65° 39'	108° 35'	300	Brown mud and pebbles.
XIII	No. 16 ...	6/2/12	64° 31'	106° 28'	1,500	Pale-grey mud.
XIV	No. 20 ...	9/2/12	64° 34'	96° 58½'	110	Grey sandy and spicular mud with pebbles.
XV	No. 21 ...	10/2/12	64° 26'	97° 11'	120	Sand and pebbles with Foraminifera.
XVI	No. 22A...	10/2/12	64° 13'	97° 35'	870	Sand and pebbles with Foraminifera.
XVII	No. 23 ...	11/2/12	64° 46'	96° 14'	120	Pale-green mud.
XVIII	No. 24 ...	13/2/12	65° 38'	94° 28'	375	Grey mud.
XIX	No. 25 ...	13/2/12	65° 5½'	94° 25'	500	Grey mud.
XX	No. 27 ...	14/2/12	66° 22'	94° 16'	220	Mud and pebbles.
XXI	No. 28 ...	14/2/12	66° 18'	94° 15'	160	Mud and stones.
XXII	No. 29 ...	14/2/12	66° 13'	94° 15'	125	Shelly-mud and stones.
XXIII	No. 30 ...	15/2/12	66° 21'	94° 50'	182	Grey sandy mud with stones and Polyzoa.
XXIV	No. 31 ...	15/2/12	66° 19'	94° 57'	220	Pale-greenish mud and Polyzoa.
XXV	No. 1 ...	26/5/12	44° 12'	140° 19'	2,590	Globigerina ooze.
XXVI	No. 2 ...	28/5/12	47° 38'	139° 30'	2,452	Globigerina ooze.
XXVII	No. 4 ...	6/6/12	53° 45'	158° 12'	800	Diatom ooze.
XXIX	...	3/9/12	142 miles S.W. of St. Francis Id.		706	Globigerina ooze.

III.—TABLE OF SAMPLES CONTAINING FORAMINIFERA—*continued.*

Samples.		Date.	Location.		Depth (fathoms.).	Description.
Number.	Dist. Mark.		S. Lat.	E. Long.		
XXX	No. 11 ...	13/11/12	44° 20½'	147° 33'	1,475	Globigerina ooze (grey with blue tint).
XXXI	No. 12 ...	14/11/12	45° 26'	147° 26'	2,083	Globigerina ooze (cream-coloured).
XXXII	No. 13 ...	14/11/12	46° 2'	147° 30'	1,940	Globigerina ooze (grey).
XXXIII	No. 22 ...	20/11/12	51° 40'	155° 3½'	2,570	Globigerina ooze (pale ochre-yellow).
XXXIV	No. 23 ...	21/11/12	53° 8'	157° 0½'	2,460	Globigerina ooze (pale ochre-yellow).
XXXV	No. 33 ...	27/11/12	51° 51½'	164° 40'	2,430	Terrigenous mud with spicules (greenish-grey).
XXXVIII	No. 40 ...	1/12/12	49° 23½'	159° 47'	2,610	Globigerina ooze with some shells and sand (greenish-yellow).
XXXIX	No. 41 ...	4/12/12	48° 17'	151° 42'	2,700	Globigerina ooze with some terrigenous sand (ochre-yellow).
XL	No. 42 ...	5/12/12	48° 19½'	149° 19'	1,076	Globigerina ooze (cream-coloured).
XLI	No. 46 ...	6/12/12	47° 30'	147° 29'	710	Globigerina ooze (almost white).
XLII	No. 47 ...	7/12/12	47° 28½'	148° 21'	543	Shelly fragments.
XLV	No. 56 ...	11/12/12	42° 53'	148° 25½'	675	Brown terrigenous sand.
XLVI	No. 58 ...	11/12/12	42° 38½'	148° 37'	1,180	Pale-green mud with spicules.
XLVII	No. 59 ...	12/12/12	42° 38½'	148° 41½'	1,320	Green terrigenous mud with spicules.
XLVIII	No. 60 ...	12/12/12	42° 44'	148° 41'	1,300	Green terrigenous mud with spicules.
XLIX	No. 67 ...	29/12/12	47° 21½'	145° 32'	1,670	Globigerina ooze (pale cream-coloured).
L	No. 68 ...	31/12/12	49° 58½'	144° 40'	2,020	Globigerina ooze.
LI	No. 72 ...	4/1/13	56° 13'	146° 35'	1,670	Diatom and spicular ooze.
LII	No. 73 ...	5/1/13	57° 25½'	146° 33'	1,900	Diatom and spicular ooze.
LIII	No. 74 ...	5/1/13	58° 12'	146° 47'	1,900	Diatom and spicular ooze.
LIV	No. 75 ...	7/1/13	59° 59'	146° 54'	2,230	Diatom and spicular ooze.
LV	No. 76 ...	8/1/13	61° 53½'	146° 39'	2,250	Diatom and spicular ooze.
LVI	No. 77 ...	9/1/13	63° 6'	146° 41'	2,260	Diatom and spicular ooze.
LVII	No. 78 ...	9/1/13	63° 39'	146° 49'	2,150	Diatom and spicular ooze.
LIX	No. 80 ...	11/1/13	64° 52'	146° 40'	1,950	Terrigenous mud with sponge spicules and Diatoms.
LX	No. 81 ...	11/1/13	65° 20'	146° 48½'	1,650	Terrigenous mud (grey-green).
LXI	No. 83 ...	12/1/13	65° 51'	144° 19'	350	Polyzoa, pebbles, etc.
LXII	No. 84 ...	12/1/13	66° 1'	144° 19'	184	Green sandy mud with few pebbles, igneous rock.

III.—TABLE OF SAMPLES CONTAINING FORAMINIFERA.—*continued.*

Samples.		Date.	Location.		Depth (fathoms.)	Description.
Number.	Dist. Mark.		S. Lat.	E. Long.		
LXIII	No. 87 ...	12/1/13	66° 16½'	143° 28'	320	Green mud with sponge spicules.
LXV	No. 92 ...	22/11/13	49° 9'	148° 1'	2,400	Globigerina ooze (pale cream-coloured).
LXVI	No. 93 ...	23/11/13	50° 30'	148° 2'	2,470	Globigerina ooze (pale cream-coloured).
LXVII	No. 101	7/12/13	58° 19½'	155° 39'	2,000	Pebble, with Foraminifera attached.
LXVIII	No. 104	12/12/13	66° 25'	144° 50'	250	Green mud with sponge spicules and zircon.
LXIX	No. 105	12/12/13	66° 37'	144° 8½'	450	Green terrigenous mud with sponge spicules and Diatoms.
LXX	No. number.	22/12/13	66° 55'	142° 37'	354	Green Diatomaceous and spicular ooze.
LXXI	No. 106	27/12/13	66° 51'	145° 35'	288	Yellow sandy mud with sponge spicules.
LXXII	No. 107	28/12/13	66° 55½'	145° 24'	318	Grey sandy mud with sponge spicules.
LXXIII	No. 108	29/12/13	66° 49'	145° 42'	240	Whitish terrigenous mud with sponge spicules.
LXXIV	No. 110	31/12/13	66° 32'	141° 39'	157	Green terrigenous mud.
LXXV	No. 111	1/1/14	65° 43'	140° 19'	205	Sandy mud.
LXXVI	No. 114	2/1/14	65° 53'	137° 30'	230	Sandy mud.
LXXVII	No. 115	2/1/14	65° 48'	137° 32'	330	Pale-greenish terrigenous mud with Diatoms.
LXXVIII	No. 116	31/1/14	64° 53'	135° 35'	940	Greenish-grey terrigenous mud with sponge spicules.
LXXX	No. 118	4/1/14	64° 25'	132° 26'	950	Green terrigenous mud with spicules.
LXXXI	No. 119	4/1/14	64° 0'	132° 22'	1,810	Green terrigenous mud with spicules.
LXXXII	No. 120	5/1/14	64° 14'	130° 1'	1,550	Green terrigenous mud with spicules.
LXXXIII	No. 121	6/1/14	64° 34½'	127° 17'	1,700	Yellow terrigenous mud with spicules.
LXXXIV	No. 122	9/1/14	65° 28½'	120° 59'	1,400	Green terrigenous mud.
LXXXV	Pack edge	10/1/14	64° 34'	117° 1'	...	Globigerina, etc. (Tow-netting at 25 fathoms).
LXXXVI	No. 123	10/1/14	64° 35'	117° 1'	1,350	Green mud, sponge spicules, Diatoms.
LXXXVII	No. 124	11/1/14	64° 44'	113° 46'	990	Green mud, sponge spicules and Diatoms.
LXXXVIII	No. 125	12/1/14	64° 37'	109° 6'	1,530	Greenish Diatomaceous ooze.
LXXXIX	No. 126	14/1/14	63° 21'	101° 42'	710	Green mud and Diatoms.
XC	No. 127	14/1/14	63° 13½'	101° 42'	870	Green mud and Diatoms.
XCI	No. 128	15/1/14	62° 47'	99° 20'	2,250	Green mud and Diatoms.
XCII	No. 129	16/1/14	62° 58'	96° 2'	1,660	Green mud and Diatoms.

III.—TABLES OF SAMPLES CONTAINING FORAMINIFERA—*continued.*

Samples.		Date.	Location.		Depth (fathoms.).	Description.
Number.	Dist. Mark.		S. Lat.	E. Long.		
XCVIII	No. 130	17/1/14	62° 33½'	94° 34'	1,990	Green mud and Diatoms.
XCIV	No. 131	20/1/14	65° 47'	90° 16'	290	Sandy terrigenous mud.
XCIV	No. 133	20/1/14	65° 48'	91° 21'	280	Pale-green terrigenous mud and spicules.
XCVII	No. 138	26/1/14	66° 17'	94° 20'	204	Gritty terrigenous sand and spicules.
XCVIII	No. 139	27/1/14	65° 53'	95° 18'	328	Green mud and spicules.
XCIX	No. 140A	28/1/14	65° 19½'	95° 27'	204	Pale-green terrigenous sandy mud.
CI	No. 141	28/1/14	65° 7'	96° 3'	302	Green mud.
CII	No. 141A	29/1/14	65° 6'	96° 13°	325	Green mud.
CIII	No. 141B	29/1/14	65° 2½'	96° 13'	250	Green mud.
CIV	No. 142	30/1/14	65° 53'	95° 59'	370	Green sandy mud.
CV	No. 142A	30/1/14	64° 42'	96° 10'	110	Pale grey-green gritty mud.
CVI	No. 142B	30/1/14	64° 36'	96° 35'	114	Pale-green terrigenous mud and spicules.
CVII	No. 142C	30/1/14	64° 44'	97° 29'	358	Grey terrigenous mud and spicules.
CVIII	No. 144A	2/2/14	63° 47'	96° 58'	1,170	Grey mud with Diatoms and spicules.
CIX	No. 145	5/2/14	65° 45'	91° 43'	265	Green sandy mud, spicules and Diatoms.
CX	No. 145A	5/2/14	65° 46½'	91° 47'	265	Green sandy mud, spicules and Diatoms.
CXI	No. 146	7/2/14	62° 55½'	90° 28'	2,120	Diatom ooze (pale cream).
CXII	No. 147	12/2/14	54° 42½'	96° 11'	2,190	Diatom ooze (rich in Diatoms).
CXIII	No. 148	15/2/14	49° 28'	107° 39'	1,780	Globigerina and Diatom ooze (pale cream).
CXIV	No. 149	18/2/14	44° 10'	117° 20'	2,60	Globigerina ooze,
CXV	No. 150	24/2/14	35° 56'	134° 14'	1,800	Globigerina ooze.
CXVII	Tow-net	9/1/14	65° 30'	120° 40'	...	Diatoms. Tow-net operating at surface.
CXVIII	...	25/11/12	...	...	...	Stones and sand. Sample taken off Macquarie Island, between Isle Rocks and North Head. Mt. Elder 85° 2', distant 7.5 sea miles.

IV.—DISTRIBUTIONAL AND REGIONAL

SPECIES.	Samples Fathoms	Between Long. 90° and 100° E.; Lat. 60°													
		XCV.	XCV.	CIX.	CX.	XCVI.	XXII.	XCVII.	XXI.	XX.	XXIII.	XXIV.	XCVIII.	XVII.	
		290	280	265	265	56	125	204	160	220	182	220	328	375	
136. <i>Angulogerina angulosa</i> (Williamson)	v.c.	...	c.	f.	c.	c.	v.c.	...
137. <i>A. angulosa</i> , var. <i>aserrima</i> , nov.	f.	...
138. <i>Trifarina bradyi</i> Cushman
139. <i>Pleurostomella alternans</i> Schwager
140. <i>Ellipsolagena cucullata</i> , nov.	f.	...	...
141. <i>E. schlichti</i> (A. Silvestri)	c.	...
142. <i>Nonion depressulus</i> (Walker and Jacob)	v.f.	v.f.	...	...	f.	...
143. <i>N. pompilioides</i> (Fichtel and Moll)
144. <i>N. scapha</i> (Fichtel and Moll)	v.f.	...	...
145. <i>N. umbilicatus</i> (Montagu)
146. <i>Elphidium crispum</i> (Linné)	f.	...	...	...	...	...	...	...
147. <i>E. macellum</i> (Fichtel and Moll)
148. <i>E. verruculatum</i> (Brady)
149. <i>Bolivinita quadrilatera</i> (Schwager)
150. <i>Patellina corrugata</i> Williamson	f.	...	...	...	...	v.f.	...	...
151. <i>Patellinella inconspicua</i> (Brady)	f.	...	v.f.	...	...
152. <i>Discorbis bertheloti</i> (d'Orbigny)
153. <i>D. concinnus</i> (Brady)
154. <i>D. dimidiatus</i> (Jones and Parker)
155. <i>D. globularis</i> (d'Orbigny)	f.	...	v.f.	...	...	...	...	...
156. <i>D. involutus</i> (Sidebottom)	f.	v.f.	...
157. <i>D. margariteus</i> , nov. sp.	c.	...
158. <i>D. patelliformis</i> (Brady)	v.f.	...
159. <i>D. australensis</i> Heron-Allen and Earland
160. <i>D. rarescens</i> (Brady)
161. <i>D. williamsoni</i> , nom. mut.
162. <i>Heronallenia wilsoni</i> (Heron-Allen & Earland)	f.	...
163. <i>Gyroidina broeckhiana</i> (Karrer)
164. <i>G. soldanii</i> (d'Orbigny)
165. <i>Eponides bradyi</i> Earland
166. <i>E. exiguus</i> (Brady)
167. <i>E. frigidus</i> (Cushman)
168. <i>E. punctulatus</i> (d'Orbigny)
169. <i>E. umbonatus</i> (Reuss)
170. <i>Rotalia clathrata</i> Brady
171. <i>R. perlucida</i> Heron-Allen and Earland
172. <i>Epistomina elegans</i> (d'Orbigny)	f.	...	...	...	...	f.	...	...
173. <i>Cancris auricula</i> (Fichtel and Moll)
174. <i>Pullenia quinqueloba</i> (Reuss)	v.f.	...	...	v.f.	...	...
175. <i>P. sphaeroides</i> (d'Orbigny)
176. <i>Sphaeroidina bulloides</i> d'Orbigny
177. <i>Globigerina bulloides</i> d'Orbigny	f.	...	...	...	...	c.	f.	...
178. <i>G. conglomerata</i> Schwager	v.f.	...	...	...	v.f.	...
179. <i>G. dutertrei</i> d'Orbigny	c.	...	...
180. <i>G. inflata</i> d'Orbigny
181. <i>G. pachyderma</i> (Ehrenberg)	c.	...	...
182. <i>G. subcretacea</i> Chapman	f.	...	v.f.	...	c.	...	v.c.	f.	f.	c.	v.c.
183. <i>G. triloba</i> Reuss	v.f.	...
184. <i>Globigerinoides ruber</i> (d'Orbigny)
185. <i>G. sacculifer</i> (Brady)
186. <i>Orbulina universa</i> d'Orbigny
187. <i>Pulleniatina obliquiloculata</i> (Parker & Jones)
188. <i>Globorotalia hirsuta</i> (d'Orbigny)
189. <i>G. humilis</i> (Brady)
190. <i>G. pseudocrassa</i> , nov. sp.
191. <i>G. scitula</i> (Brady)
192. <i>G. truncatulinoidea</i> (d'Orbigny)
193. <i>Anomalina colligera</i> , nov. sp.
194. <i>A. glabrata</i> Cushman
195. <i>A. globulosa</i> , sp. nov.
196. <i>Planulina biconcava</i> (Jones and Parker)
197. <i>Laticarinina pauperata</i> (Parker and Jones)
198. <i>Cibicides aknerianus</i> (d'Orbigny)
199. <i>C. cutter</i> (Parker and Jones)
200. <i>C. lobatus</i> (Walker and Jacob)
201. <i>C. mundulus</i> (Brady, Parker and Jones)	c.	...	c.	...	f.	f.	c.
202. <i>C. refulgens</i> Montfort	v.f.
203. <i>C. tenuimargo</i> (Brady)	c.	...	v.c.	v.f.	f.	c.	c.
204. <i>C. ungerianus</i> (d'Orbigny)
205. <i>C. wüllerstorfi</i> (Schwager)	v.f.	...	...	v.f.	...	...	v.f.

TABLE OF FORAMINIFERA—continued.

and 70° S. (Off Queen Mary Land).																			
XIX.	XCIX.	C.	CI.	CII.	CIII.	CIV.	CV.	XVII.	CVI.	XIV.	XV.	CVII.	XVI.	CVIII.	XCH.	XCHH.	CXI.	XCI.	
500	204	252	302	325	250	370	110	120	114	110	120	358	870	1,170	1,660	1,900	2,120	2,250	
...	276.
...	V.F.	...	...	...	...	...	...	...	...	...	...	...	...	277.
c.	V.F.	...	c.	V.F.	...	V.F.	V.F.	...	...	V.C.	...	...	...	...	V.F.	V.F.	278.
r.	V.F.	f.	...	f.	...	...	...	...	...	f.	...	...	...	...	...	...	279.
...	V.F.	...	...	V.F.	...	...	...	...	...	...	...	...	...	...	...	...	280.
...	281.
c.	f.	...	c.	...	...	...	...	...	...	f.	...	...	...	...	...	V.F.	282.
...	283.
V.C.	f.	...	V.F.	...	...	...	...	...	...	...	...	...	...	284.
f.	c.	c.	f.	...	...	...	...	...	...	f.	...	...	...	...	...	285.
...	286.
r.	r.	...	c.	r.	...	...	...	...	...	...	...	...	V.F.	...	...	V.F.	287.
...	288.
...	289.
...	290.
...	291.
...	V.F.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	292.
...	293.
...	294.
...	295.
...	296.
...	297.
...	298.
...	V.F.	...	...	...	...	...	...	V.F.	...	r.	...	...	...	V.F.	299.
...	300.
...	301.
...	302.
...	303.
...	V.F.	...	...	...	...	...	304.
...	305.
...	V.F.	V.F.	...	r.	306.
...	307.
...	308.
f.	r.	r.	f.	...	...	...	...	...	...	...	...	...	r.	...	...	...	309.
...	310.
...	r.	...	c.	c.	...	V.C.	...	r.	V.F.	...	V.F.	c.	...	...	...	...	...	...	311.
...	f.	c.	f.	...	...	...	...	...	V.F.	...	...	...	...	...	...	312.
...	313.
c.	r.	f.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	314.
...	315.
c.	r.	...	r.	...	r.	...	...	f.	r.	...	...	f.	c.	...	r.	...	V.F.	f.	316.
...	317.
r.	318.
...	319.
...	f.	...	...	...	V.F.	...	...	...	...	...	...	320.
...	321.
V.F.	c.	...	...	...	...	V.F.	...	...	...	...	...	...	...	f.	322.
...	f.	323.
...	r.	...	V.F.	...	...	...	...	...	...	...	...	324.
...	325.
...	V.F.	...	...	...	...	...	...	...	...	...	...	326.
...	327.
...	328.
V.F.	V.F.	...	V.F.	...	...	r.	...	r.	V.F.	...	...	...	...	...	...	...	329.
...	V.F.	...	...	...	...	...	...	...	...	...	...	V.F.	...	...	V.C.	330.
V.F.	331.
...	332.
...	333.
...	334.
...	335.
V.F.	336.
...	337.
...	338.
V.F.	339.
c.	c.	c.	V.C.	...	...	...	...	...	...	f.	...	...	...	V.F.	r.	340.
...	341.
...	V.F.	...	r.	r.	...	r.	...	...	...	...	...	f.	...	...	V.F.	...	...	...	342.

IV.—DISTRIBUTIONAL AND REGIONAL

SPECIES.	Samples Fathoms	Between Lat. 60° and 70° S.; Long. 100° and 110° E.					Between Lat. 60° and 70° S.; Long. 110° and 120° E.				
		LXXXIX. 710	XG. 370	XIII. 1,500	LXXXVIII. 1,530	XII. 300	LXXXVII. 900	XI. 630	LXXXV. Tow net at pack edge. 1,350	LXXXVI. 1,350	X. 330
69. <i>Lagena staphyllearia</i> Schwager	
70. <i>Guttulina communis</i> (d'Orbigny)	
71. <i>G. communis</i> , forma <i>coronula</i> Jones and Chapman	
72. <i>G. fusiformis</i> (Roemer)	
73. <i>G. gibba</i> (d'Orbigny)	
74. <i>G. lactea</i> , forma <i>diffusa</i> Jones and Chapman	
75. <i>G. yabei</i> C. & O., forma <i>horrida</i> Jones and Chapman	
76. <i>Glandulina laevigata</i> (d'Orbigny)	
77. <i>Sigmomorphina concava</i> (Williamson)	
78. <i>S. subulata</i> , nom. mut.	
79. <i>S. williamsoni</i> (Terquem)	
80. <i>Ramulina globulifera</i> (Brady)	
81. <i>Buliminella elegantissima</i> (d'Orbigny)	
82. <i>B. subcylindrica</i> (Brady)	
83. <i>Robertina subteres</i> (Brady)	
84. <i>Ceratobulimina pacifica</i> Cushman and Harris	
85. <i>C. tenuis</i> , sp. nov.	
86. <i>Pseudobulimina chapmani</i> (Heron-Allen & Earland)	
87. <i>Cassidulina crassa</i> d'Orbigny	
88. <i>C. elegans</i> Sidebottom	
89. <i>C. laevigata</i> d'Orbigny	
90. <i>C. oblonga</i> Reuss	
91. <i>C. subglobosa</i> Brady	
92. <i>C. subglobosa</i> , var. <i>producta</i> , nov. var.	
93. <i>Cassidulinoides chapmani</i> Parr	
94. <i>C. parkeriana</i> (Brady)	
95. <i>Ehrenbergina bradyi</i> Cushman	
96. <i>E. glabra</i> Heron-Allen and Earland	V.F.	
97. <i>E. mestayeri</i> Cushman	
98. <i>Bulimina aculeata</i> d'Orbigny	...	V.F.	V.C.	...	V.F.	V.F.	C.	V.C.	...	V.F.	
99. <i>B. affinis</i> d'Orbigny	V.F.	
100. <i>B. brevitrigona</i> , nov. sp.	
101. <i>B. buchiana</i> d'Orbigny	
102. <i>B. buchiana</i> , var. <i>gutta</i> , nov.	
103. <i>B. elegans</i> d'Orbigny	
104. <i>B. exilis</i> Brady	
105. <i>B. inflata</i> Seguenza	
106. <i>B. rostrata</i> Brady	
107. <i>Virgulina cornuta</i> Cushman	
108. <i>V. davisi</i> , nov. sp.	
109. <i>V. punctata</i> d'Orbigny	V.F.	...	...
110. <i>V. schreibersiana</i> Czjzek	
111. <i>V. subdepressa</i> Brady	
112. <i>V. subsquamosa</i> Egger	
113. <i>Bolivina beyrichi</i> Reuss	
114. <i>B. beyrichi</i> , var. <i>alata</i> (Seguenza)	
115. <i>B. decussata</i> Brady	V.F.	...	...
116. <i>B. dilatata</i> Reuss	
117. <i>B. hantkeniana</i> Brady	
118. <i>B. limbata</i> Brady	
119. <i>B. lobata</i> Brady	
120. <i>B. punctata</i> d'Orbigny	
121. <i>B. pygmaea</i> Brady	
122. <i>B. robusta</i> Brady	
123. <i>B. seminuda</i> Cushman	
124. <i>B. sphenoides</i> , nov. sp.	
125. <i>Rectobolivina bifrons</i> (Brady)	
126. <i>Reussella spinulosa</i> (Reuss)	
127. <i>Uvigerina aculeata</i> d'Orbigny	
128. <i>U. ampullacea</i> Brady	
129. <i>U. asperula</i> Czjzek	
130. <i>U. auferiana</i> d'Orbigny	
131. <i>U. porrecta</i> Brady	
132. <i>U. pigmea</i> d'Orbigny	
133. <i>Siphogenerina columellaris</i> (Brady)	
134. <i>S. dimorpha</i> (Parker and Jones)	
135. <i>Siphonodosaria lepidula</i> (Schwager)	
136. <i>Angulogerina angulosa</i> (Williamson)	V.C.	...	...	...

IV.—DISTRIBUTION AND REGIONAL

SPECIES.	Samples Fathoms	Between Lat. 60° and 70° S.; Long. 100° and 110° E.					Between Lat. 60° and 70° S.; Long. 110° and 120° E.				
		LXXXIX.	XC.	XIII.	LXXXVIII.	XII.	LXXXVII.	XI.	LXXXV.	LXXXVI.	X.
		710	870	1,500	1,530	300	990	930	Tow net at pack edge.	1,350	330
205. <i>Cibicides wüllerstorfi</i> (Schwager)	V.F.	...	...
206. <i>Cibicidella variabilis</i> (d'Orbigny)	
207. <i>Acerulina inhaerens</i> Schultze	
208. <i>Rupertia stabilis</i> Wallich	
209. <i>Glomospira charoides</i> (Jones and Parker)	V.F.	...	...	...	...	...	...
210. <i>G. gordialis</i> (Jones and Parker)	
211. <i>Tolypammmina vagans</i> (Brady)	
212. <i>Ammolagena clavata</i> (Jones and Parker)	
213. <i>Miliammina arenacea</i> (Chapman)	C.	F.	...	...	V.F.	...	...	...	V.C.	
214. <i>Hyperammmina elongata</i> Brady	
215. <i>H. friabilis</i> Brady	V.F.	...	F.	...	...	...
216. <i>H. laevigata</i> Wright	
217. <i>H. subnodosa</i> Brady	V.F.	...	...	...	...	...	...
218. <i>Jaculella acuta</i> Brady	F.	...	...	...
219. <i>J. obtusa</i> Brady	f.	...	...	...
220. <i>Saccorhiza ramosa</i> (Brady)	
221. <i>Dendronina arborescens</i> Heron-Allen and Earland	
222. <i>Cornuspira involvens</i> (Reuss)	
223. <i>C. involvens</i> , var. <i>corticata</i> , nov.	
224. <i>Ophthalmidium inconstans</i> (Brady)	
225. <i>O. margaritifera</i> Heron-Allen and Earland	
226. <i>Planispirina bucculenta</i> (Brady)	
227. <i>P. contraria</i> (d'Orbigny)	
228. <i>P. sphaera</i> (d'Orbigny)	
229. <i>Quinqueloculina lamurckiana</i> d'Orbigny	
230. <i>Q. seminulum</i> (Linné)	
231. <i>Q. subrotunda</i> (Montagu)	
232. <i>Q. tropicalis</i> Cushman	
233. <i>Q. venusta</i> Karrer	
234. <i>Q. vulgaris</i> d'Orbigny	
235. <i>Sigmoilina edwardsi</i> Schlumberger, var. <i>acuta</i> , nov.	
236. <i>S. schlumbergeri</i> A. Silvestri	
237. <i>S. tenuis</i> (Czjzek)	
238. <i>Trilinella funalis</i> (Brady)	
239. <i>Triloculina circularis</i> Bornemann	
240. <i>T. circularis</i> , var. <i>sublineata</i> (Brady)	
241. <i>T. oblonga</i> (Montagu)	
242. <i>T. tricarinata</i> d'Orbigny	
243. <i>T. trigonula</i> (Lamarck)	
244. <i>Pyrgo anomala</i> (Schlumberger)	
245. <i>P. depressa</i> (d'Orbigny)	V.F.	...	...
246. <i>P. murrhyna</i> (Schwager)	V.F.	...	...
247. <i>P. serrata</i> (Bailey)	
248. <i>P. elongata</i> (d'Orbigny)	
249. <i>P. globulus</i> (Bornemann)	
250. <i>P. irregularis</i> (d'Orbigny)	
251. <i>P. lucernula</i> (Schwager)	
252. <i>P. tubulosa</i> (Costa)	
253. <i>P. vespertilio</i> (Schlumberger)	
254. <i>Recurvoides contortus</i> Earland	C.	...	...	...	...	C.	...	f.	
255. <i>Haplophragmoides canariensis</i> (d'Orbigny)	V.F.	V.F.	...	...	...	...	...	...
256. <i>H. canariensis</i> , var. <i>variabilis</i> (H.-A. and E.)	V.F.	...	
257. <i>H. emaciatus</i> (Brady)	V.F.	...	...	...	V.F.	...	...
258. <i>H. glomeratus</i> (Brady)	f.	V.F.	V.F.	...	...	...	f.	...	f.	
259. <i>H. ringens</i> (Brady)	
260. <i>H. silex</i> (Egger)	V.F.	...	...	...	...	...	...	...
261. <i>H. sphaeriloculus</i> Cushman	V.F.	...	...	...
262. <i>H. subglobosus</i> (Sars)	f.	C.	V.F.	C.	...	f.	f.	V.F.	f.	
263. <i>H. trullisatus</i> (Brady)	V.F.	...	V.F.	...	V.F.	...	
264. <i>Ammobaculites agglutinans</i> (d'Orbigny)	V.F.	...	V.F.	...	...	...	...	...	...
265. <i>A. americanus</i> Cushman	
266. <i>A. foliaceus</i> (Brady)	V.F.	
267. <i>A. pseudospiralis</i> (Williamson)	
268. <i>A. rostratus</i> Heron-Allen and Earland	
269. <i>Ammomarginulina ensis</i> Wiesner	
270. <i>Cyclammina acutidorsata</i> (Hantken)	
271. <i>C. orbicularis</i> Brady	F.	V.F.	...	C.	...	...	...	...	...
272. <i>C. pusilla</i> Brady	V.F.	V.F.	C.	...	f.	C.	F.	F.	

TABLE OF FORAMINIFERA—*continued.*

Between Lat. 60° and 70° S.; Long. 120° and 130° E.			Between Lat. 60° and 70° S.; Long. 130° and 140° E.												
LXXXIV.	LXXXIII.	IX.	LXXXII.	LXXXI.	LXXX.	V.	VIII.	VI.	VII.	LXXIX.	LXXVIII.	IV.	LXXVII.	LXXVI.	
1,400	1,700	230	1,550	1,810	950	160	170	150	230	945	940	239	330	230	
...	205.
...	206.
...	207.
...	208.
...	209.
...	210.
...	211.
...	...	f.	...	...	...	v.c.	...	...	...	...	...	...	v.c.	c.	212.
...	f.	...	...	...	...	...	...	...	...	...	213.
...	r.	r.	...	...	...	...	...	...	...	...	...	...	214.
...	215.
...	r.	...	v.f.	c.	...	...	...	...	...	...	...	...	...	...	216.
...	f.	...	...	...	...	...	...	...	...	...	...	217.
...	218.
...	219.
...	220.
...	221.
...	222.
...	223.
...	224.
...	225.
...	226.
...	227.
...	228.
...	229.
...	230.
...	231.
...	232.
...	233.
...	234.
...	235.
...	236.
...	237.
...	238.
...	239.
...	240.
...	241.
...	242.
...	243.
...	244.
...	245.
...	246.
...	247.
...	248.
...	249.
...	250.
...	251.
...	252.
...	253.
...	...	v.f.	f.	...	f.	r.	v.f.	...	v.f.	...	f.	...	c.	...	254.
...	...	v.f.	r.	...	f.	...	...	...	v.f.	...	...	...	...	...	255.
...	v.f.	...	...	...	...	...	256.
...	v.f.	...	v.f.	v.f.	...	...	...	...	...	...	...	...	...	v.f.	257.
...	258.
...	259.
...	260.
...	v.f.	...	...	...	...	...	...	...	...	...	...	...	...	...	261.
...	f.	...	...	...	...	...	...	...	...	...	...	...	...	...	262.
...	v.f.	...	...	...	...	...	...	...	v.f.	...	v.f.	...	r.	...	263.
...	264.
...	265.
...	266.
...	267.
...	f.	...	...	...	...	...	...	268.
...	f.	...	...	...	...	...	...	...	...	...	...	269.
...	270.
v.f.	v.f.	...	...	r.	...	...	...	...	...	...	...	...	271.
f.	v.f.	...	f.	...	...	r.	...	...	...	...	r.	...	...	...	272.

IV.—DISTRIBUTIONAL AND REGIONAL

SPECIES.	Samples Fathoms.	Between Lat. 60° and 70° S.; Long. 100° and 110° E.					Between Lat. 60° and 70° S.; Long. 110° and 120° E.				
		LXXXIX.	XO.	XIII.	LXXXVIII.	XII.	LXXXVII.	XI.	LXXXV.	LXXXVI.	X.
		710	870	1,500	1,530	300	990	930	Tow net at pack edge.	1,350	330
273. <i>Placopsilina cenomana</i> d'Orbigny	
274. <i>Reophax aduncus</i> Brady	V.F.	...	...	...	...
275. <i>R. advenus</i> Cushman	
276. <i>R. bacillaris</i> Brady	
277. <i>R. cylindricus</i> Brady	c.	...	...	...	...	...	...
278. <i>R. dentaliniformis</i> Brady	V.F.	...	V.F.	...	...	...	V.F.	
279. <i>R. distans</i> Brady	V.F.	...	...	...	...
280. <i>R. longiscatiformis</i> Chapman	
281. <i>R. mawsoni</i> , nov.	
282. <i>R. nodulosus</i> Brady	V.F.	V.F.	V.F.	...	...	...
283. <i>R. pilulifer</i> Brady	f.	
284. <i>R. scorpiurus</i> Montfort	V.F.	...	...	...	...	...	...
285. <i>R. spiculifer</i> Brady	
286. <i>Proteonina bubosa</i> , nov.	
287. <i>P. difflugiformis</i> (Brady)	V.F.	...	...	V.F.	...	...	...
288. <i>P. fusiformis</i> Williamson	
289. <i>Spiroplectammina biformis</i> (Parker and Jones)	
290. <i>Textularia tenuissima</i> Earland	V.F.	V.F.	...	...	...
291. <i>T. agglutinans</i> d'Orbigny	
292. <i>T. arenacea</i> (Heron-Allen and Earland)	
293. <i>T. conica</i> d'Orbigny, var. <i>horrida</i> Egger	
294. <i>T. heterostoma</i> Fornasini	
295. <i>T. milleti</i> Cushman	
296. <i>T. porrecta</i> Brady	
297. <i>T. pseudogramen</i> , nov.	
298. <i>T. sagittula</i> Defrance	
299. <i>Verneuilina bradyi</i> Cushman	V.F.	...	...	...	...
300. <i>V. propinqua</i> Brady	V.F.	...	...	...
301. <i>V. triquetra</i> (Münster)	
302. <i>Globotextularia anceps</i> (Brady)	
303. <i>Gaudryina baccata</i> Schwager	
304. <i>G. bradyi</i> Cushman	V.F.	...	...	c.	...	...	...
305. <i>G. chilostoma</i> (Reuss)	
306. <i>Clavulina communis</i> d'Orbigny	c.	...	V.F.	...	...	V.F.	...	
307. <i>C. obscura</i> Chaster	
308. <i>Valvulina fusca</i> (Williamson)	
309. <i>Trochammina globigeriniformis</i> (Parker and Jones)	V.F.	...	...	...	...	...	...
310. <i>T. mawsoni</i> , nov.	
311. <i>T. nana</i> (Brady)	f.	...	...	...	...	...	V.F.	
312. <i>T. planoconvexa</i> , nov.	
313. <i>Ammosphaeroidina sphaeroidiniformis</i> (Brady)	V.F.	...	
314. <i>Cystammina pauciloculata</i> (Brady)	
315. <i>Nouria polymorphinoides</i> Heron-Allen and Earland	
316. <i>Psammospaera fusca</i> Schultze	...	V.F.	c.	V.F.	...	V.F.	c.	...	...	...
317. <i>P. parva</i> Flint	
318. <i>P. rustica</i> Heron-Allen and Earland	
319. <i>Saccammina sphaerica</i> G. Sars	
320. <i>Thurammina papillata</i> Brady	V.F.	...	
321. <i>T. albicans</i> Brady	
322. <i>Pelosina cylindrica</i> Brady	
323. <i>P. rotundata</i> Brady	
324. <i>P. variabilis</i> Brady	V.F.	...	...
325. <i>Technitella hystrix</i> , nov.	
326. <i>T. melo</i> Norman	
327. <i>Iridia diaphana</i> Heron-Allen and Earland	
328. <i>Tholosina bulla</i> (Brady)	...	V.F.	...	...	...	...	...	...	...	...
329. <i>Rhizammina algaeformis</i> Brady	
330. <i>R. horrida</i> , nov.	
331. <i>R. indivisa</i> Brady	
332. <i>Marsipella cylindrica</i> Brady	
333. <i>M. dextrospiralis</i> , nov.	
334. <i>M. elongata</i> Norman	
335. <i>Bathysiphon argenteus</i> Heron-Allen and Earland	
336. <i>Astrorhiza arenaria</i> Norman	
337. <i>A. crassatina</i> Brady	
338. <i>Rhabdammina abyssorum</i> Carpenter	V.F.	...	...	...	...	...	...
339. <i>R. cornuta</i> (Brady)	
340. <i>R. discreta</i> Brady	...	V.F.	V.F.	...	f.	V.C.	c.	...	...	c.
341. <i>R. irregularis</i> Carpenter	
342. <i>R. linearis</i> Brady	f.	...	...	...	c.	

TABLE OF FORAMINIFERA—*continued.*

Between Lat. 60° and 70° S; Long. 120° and 130° E.			Between Lat. 60° and 70° S.; Long. 130° and 140° E.												
LXXXIV.	LXXXIII.	IX.	LXXXII.	LXXXI.	LXXX.	V.	VIII.	VI.	VII.	LXXIX.	LXXVIII.	IV.	LXXVII.	LXXVI.	
1,400	1,700	230	1,550	1,810	950	160	170	156	230	945	940	239	330	230	
...	273.
...	274.
...	275.
...	276.
...	V.F.	...	...	...	...	...	277.
...	...	V.F.	...	V.F.	...	...	...	...	V.F.	...	f.	...	f.	...	278.
F.	V.F.	F.	V.F.	...	...	...	V.F.	...	...	...	...	...	279.
...	V.F.	...	V.F.	...	...	...	...	...	...	...	f.	...	...	...	280.
...	281.
V.F.	C.	F.	...	...	...	...	...	f.	...	...	...	282.
...	283.
...	V.F.	...	C.	...	...	...	...	...	284.
...	V.F.	...	...	...	...	...	V.F.	...	285.
...	V.F.	...	...	...	...	...	V.F.	...	...	...	C.	V.F.	286.
...	287.
...	V.F.	...	...	...	288.
...	V.F.	...	...	...	...	...	...	...	289.
...	290.
...	291.
...	292.
...	293.
...	294.
...	295.
...	296.
...	297.
...	298.
...	V.F.	...	...	...	...	...	...	...	...	...	...	299.
...	300.
...	V.F.	...	...	...	301.
...	302.
...	303.
...	304.
...	305.
f.	306.
...	307.
...	F.	...	...	...	...	...	308.
V.F.	309.
...	...	V.F.	...	...	...	...	...	...	...	...	V.F.	...	F.	...	310.
...	311.
V.F.	312.
V.F.	313.
...	314.
...	315.
C.	V.F.	...	V.F.	V.F.	f.	...	...	...	...	...	...	...	...	...	316.
...	F.	...	...	...	...	...	...	...	...	317.
...	V.F.	F.	...	...	...	...	...	...	...	...	...	318.
...	319.
...	F.	...	320.
...	321.
...	322.
...	...	f.	...	...	...	...	...	...	...	...	...	...	...	...	323.
...	f.	...	...	...	...	...	324.
...	V.F.	...	...	...	...	...	...	...	...	...	325.
...	326.
...	327.
...	328.
...	C.	...	...	...	...	...	...	...	...	...	...	329.
...	330.
...	C.	...	...	...	...	...	...	...	...	...	...	331.
...	332.
...	333.
...	334.
...	...	V.F.	...	...	...	...	...	...	...	...	...	...	...	...	335.
...	336.
...	V.F.	...	...	...	...	...	...	...	...	...	...	...	337.
...	338.
...	339.
f.	V.F.	f.	V.F.	V.F.	V.F.	...	...	...	...	V.C.	F.	...	F.	C.	340.
...	V.F.	...	...	...	...	...	...	...	...	...	341.
V.F.	V.F.	V.F.	f.	...	...	...	V.C.	...	...	...	...	...	342.

* 3240—C

IV.—DISTRIBUTIONAL AND REGIONAL

SPECIES.	Samples	Between Lat. 60° and 70° S.; Long. 140° and 150° E.											
		LXXV.	LXXVI.	LXXVII.	LXXVIII.	LXXIX.	LXXX.	LXXXI.	LXXXII.	LXXXIII.	LXXXIV.	LXXXV.	
		Fathoms	205	308	157	354	210	320	350	184	450	250	240	258
69. <i>Lagena staphyllearia</i> Schwager
70. <i>Guttulina communis</i> (d'Orbigny)
71. <i>G. communis</i> , forma <i>coronula</i> Jones and Chapman
72. <i>G. fusiformis</i> (Roemer)
73. <i>G. gibba</i> (d'Orbigny)
74. <i>G. lactea</i> , forma <i>diffusa</i> Jones and Chapman
75. <i>G. yabei</i> C. & O., forma <i>horrida</i> Jones & Chapman
76. <i>Glandulina laevigata</i> (d'Orbigny)	f.	...	...	...	...	...	...	...
77. <i>Sigmomorphina concava</i> (Williamson)
78. <i>S. subulata</i> , nom. mut.
79. <i>S. williamsöni</i> (Terquem)
80. <i>Ramulina globulifera</i> Brady
81. <i>Buliminella elegantissima</i> (d'Orbigny)
82. <i>B. subcylindrica</i> (Brady)
83. <i>Robertina subteres</i> (Brady)
84. <i>Ceratobulimina pacifica</i> Cushman and Harris
85. <i>C. tenuis</i> , sp. nov.
86. <i>Pseudobulimina chapmani</i> (H.-A. and E.)
87. <i>Cassidulina crassa</i> d'Orbigny
88. <i>C. elegans</i> Sidebottom
89. <i>C. laevigata</i> d'Orbigny
90. <i>C. oblonga</i> Reuss	f.	...	...	...	...	...	...	...
91. <i>C. subglobosa</i> Brady	...	v.f.	...	...	...	f.	...	...	...	...	...	...	...
92. <i>C. subglobosa</i> , var. <i>producta</i> , var. nov.	...	v.f.	...	c.	...	f.	...	...	...	...	...	...	...
93. <i>Cassidulinoides chapmani</i> Parr
94. <i>C. parkeriana</i> (Brady)	v.f.	...	...	...	...	...	...	...
95. <i>Ehrenbergina bradyi</i> Cushman
96. <i>E. glabra</i> Heron-Allen and Earland	...	v.f.	...	...	...	c.	...	...	...	...	...	...	...
97. <i>E. mestayeri</i> Cushman
98. <i>Bulimina aculeata</i> d'Orbigny
99. <i>B. affinis</i> d'Orbigny
100. <i>B. brevitrigona</i> , nov. sp.
101. <i>B. buchiana</i> d'Orbigny
102. <i>B. buchiana</i> , var. <i>gutta</i> , nov.
103. <i>B. elegans</i> d'Orbigny
104. <i>B. exilis</i> Brady
105. <i>B. inflata</i> Seguenza
106. <i>B. rostrata</i> Brady
107. <i>Virgulina cornuta</i> Cushman
108. <i>V. davisii</i> , nov. sp.
109. <i>V. punctata</i> d'Orbigny
110. <i>V. schreibersiana</i> Czjzek
111. <i>V. subdepressa</i> Brady
112. <i>V. subsquamosa</i> Egger	c.	...	...	...	...	...	...	...	...	...
113. <i>Bolivina beyrichi</i> Reuss
114. <i>B. beyrichi</i> , var. <i>alata</i> (Seguenza)
115. <i>B. decussata</i> Brady
116. <i>B. dilatata</i> Reuss
117. <i>B. hantkeniana</i> Brady
118. <i>B. limbata</i> Brady
119. <i>B. lobata</i> Brady
120. <i>B. punctata</i> d'Orbigny
121. <i>B. pygmaea</i> Brady
122. <i>B. robusta</i> Brady
123. <i>B. seminuda</i> Cushman
124. <i>B. sphenoides</i> , nov. sp.
125. <i>Rectobolivina bifrons</i> (Brady)
126. <i>Reussella spinulosa</i> (Reuss)
127. <i>Uvigerina aculeata</i> d'Orbigny
128. <i>U. ampullacea</i> Brady
129. <i>U. asperula</i> Czjzek
130. <i>U. auberiana</i> d'Orbigny
131. <i>U. porrecta</i> Brady
132. <i>U. pygmaea</i> d'Orbigny
133. <i>Siphogenerina columellaris</i> (Brady)
134. <i>S. dimorpha</i> (Parker and Jones)
135. <i>Siphonodosaria lepidula</i> (Schwager)
136. <i>Angulogerina angulosa</i> (Williamson)	...	f.	...	f.	...	c.	...	v.f.	v.f.	...	...	...	...

TABLE OF FORAMINIFERA—*continued.*

Between Lat. 60° and 70° S.; Long. 140° and 150° E.								Between Antarctica and Australia.								
LXXII.	II.	LX.	LIX.	LVIII.	LVII.	LVI.	LV.	CXII.	CXIII.	CXIV.	CXV.	LIV.	LIII.	LII.	LI.	
318	398	1,650	1,950	2,100	2,150	2,260	2,250	2,100	1,780	2,600	1,800	2,230	1,900	1,900	1,670	
...	137.
...	138.
...	139.
...	140.
...	141.
...	v.f.	c.	...	...	...	...	...	142.
...	v.f.	...	...	...	...	...	143.
...	f.	...	...	...	...	...	144.
...	145.
...	146.
...	147.
...	148.
...	149.
...	150.
...	151.
...	152.
...	153.
...	154.
...	155.
...	156.
...	157.
...	158.
...	159.
...	160.
...	161.
...	162.
...	163.
...	v.f.	v.f.	...	v.f.	...	...	164.
...	v.c.	...	...	c.	...	...	165.
...	...	f.	...	...	...	...	...	...	...	c.	...	...	c.	f.	...	166.
...	167.
...	168.
...	v.f.	f.	...	v.f.	v.f.	...	169.
...	170.
...	...	v.f.	...	...	...	...	f.	...	...	c.	f.	...	...	f.	...	171.
...	172.
...	v.f.	...	173.
...	174.
...	175.
...	176.
...	v.c.	v.c.	c.	...	...	v.f.	v.f.	...	177.
...	178.
...	c.	...	...	v.c.	...	v.c.	179.
...	c.	f.	...	...	...	...	v.f.	v.c.	c.	v.c.	v.c.	...	f.	...	...	180.
...	v.c.	f.	c.	...	...	...	...	...	181.
...	c.	...	...	...	...	...	...	182.
...	v.f.	...	...	...	...	183.
...	184.
...	v.c.	c.	...	...	...	f.	185.
...	c.	...	...	...	...	186.
...	c.	...	...	...	...	187.
...	188.
...	189.
...	f.	c.	c.	...	...	...	...	190.
...	v.c.	v.c.	v.c.	...	...	...	...	...	191.
...	v.f.	...	...	192.
...	193.
...	194.
...	195.
...	196.
...	197.
...	v.f.	...	...	...	...	...	198.
...	f.	...	...	...	...	...	199.
...	c.	...	...	...	...	200.
...	201.
...	202.
...	c.	...	...	...	...	...	203.
...	v.f.	v.f.	...	204.

FORAMINIFERA—CHAPMAN AND PARR.

TABLE OF FORAMINIFERA—continued.

Between Antarctica and Australia.																	
L	LXV.	XL.	XLII.	XLIII.	XLIX.	XLIII.	XXVI.	XXXII.	XXXI.	XXX.	XXV.	XLIV.	XLV.	XLVI.	XLVII.	XLVIII.	
2,020	2,400	1,076	710	543	1,070	840	2,452	1,940	2,083	1,475	2,590	1,100	675	1180	1,320	1,300	
...	V.F.	...	...	...	...	...	...	69.
...	70.
...	f.	...	71.
...	72.
...	V.F.	...	...	...	...	...	...	...	...	73.
...	V.F.	74.
...	75.
...	76.
...	77.
...	78.
...	V.F.	...	...	79.
...	80.
...	f.	81.
...	V.F.	...	...	...	...	f.	...	82.
...	f.	...	83.
...	V.F.	...	84.
...	85.
...	V.F.	...	...	...	86.
...	87.
...	f.	...	...	88.
...	f.	...	...	89.
...	V.F.	...	...	...	...	...	V.F.	...	...	...	f.	...	...	V.F.	f.	c.	90.
...	V.F.	...	...	...	...	...	...	...	...	...	91.
...	f.	...	...	92.
...	f.	...	93.
...	V.F.	f.	...	...	94.
...	V.F.	...	95.
...	V.F.	...	...	...	...	...	...	...	...	...	V.F.	...	...	...	...	...	96.
...	f.	...	...	97.
...	...	F.	...	...	...	...	...	...	...	c.	...	...	V.F.	c.	V.C.	c.	98.
...	f.	...	...	...	...	...	...	99.
...	V.F.	...	...	...	...	...	...	100.
...	101.
...	f.	...	102.
...	103.
...	V.F.	...	...	...	...	...	...	...	...	...	...	...	...	...	104.
...	V.F.	...	...	...	...	...	...	...	...	V.F.	...	...	...	V.F.	c.	V.F.	105.
...	106.
...	V.F.	...	...	...	...	...	107.
...	108.
...	V.F.	109.
...	110.
...	f.	...	...	...	V.F.	c.	111.
...	c.	c.	112.
...	V.F.	V.F.	...	113.
...	V.F.	f.	V.C.	114.
...	115.
...	c.	V.F.	116.
...	V.F.	...	117.
...	f.	...	118.
...	V.F.	...	119.
...	f.	...	...	...	...	f.	f.	120.
...	c.	...	121.
...	V.F.	122.
...	f.	123.
...	f.	...	...	...	...	...	...	124.
...	V.F.	125.
...	f.	...	V.F.	...	...	...	...	...	126.
...	f.	f.	V.F.	...	...	...	...	...	...	127.
...	128.
...	129.
...	V.F.	130.
...	V.F.	...	...	...	...	...	...	131.
...	V.F.	f.	...	...	...	f.	V.F.	132.
...	V.F.	...	133.
...	V.F.	134.
...	135.
...	V.F.	V.F.	...	...	...	...	...	...	...	...	f.	f.	V.C.	c.	136.

V.—SYSTEMATIC DESCRIPTION OF SPECIES.

ORDER FORAMINIFERA.

SUPER-FAMILY SPIRILLINOIDEA.

FAMILY SPIRILLINIDAE.

Genus SPIRILLINA *Ehrenberg*, 1843.1. SPIRILLINA DECORATA *Brady*.

Spirillina decorata H. B. Brady, 1884, p. 633, Pl. LXXXV, figs. 22-25. Heron-Allen and Earland, 1922, p. 197.

Observations.—Typical specimens were found, as well as the intermediate forms between this species and *S. tuberculata*, previously noted by Heron-Allen and Earland from the Antarctic dredgings by the "Terra Nova."

The largest specimen we have seen is from Sample XXII and measures 1.22 mm. in diameter. This came from a depth of 122 fathoms. Another specimen, from Sample XLVIII (1,300 fathoms), is only half the size.

Occurrence.—XXII, common; XLVIII, rare.

2. SPIRILLINA DENTICULOGANULATA *Chapman*.

Spirillina denticulogranulata Chapman, 1909 (1), p. 133, Pl. X, figs. 6 a-c; 1909 (2), p. 354, Pl. XVII, figs. 3 a, b.

Observations.—This species was described from shore-sand at Torquay, near Geelong, Victoria; it has since been recorded by one of us (F.C.) from off the Snares, S. of New Zealand, at 60 fathoms.

This species is not confined to any particular depth; in the present samples its bathymetrical range extends from 182 to 1,180 fathoms. The geological history of this species commences in Lower Miocene times, in Victoria.

Occurrence.—XXIII, rare; XLVI, rare.

3. SPIRILLINA HELENÆ sp. nov. Plate VII, fig. 1 a, b.

Description.—Test thin, compressed, circular, consisting of eight whorls, with a minute inflated proloculum. The spiral tube is circular in section, with the sutural line distinct. Surface ornamented with minute beads. Diameter of test, 0.26 mm.

Observations.—Although this species is quite distinct, it shows a relationship to *S. margaritifera* Williamson in type of ornament, but differs from that species in having the prominences very minute and more numerous, whilst the test in the present species is much thinner, with more numerous coils. The great depth of 2,610 fathoms; from which this specimen was dredged, is perhaps hardly to be matched by any other species of *Spirillina*; the deepest water record of Brady being from 1,425 fathoms, and the species *S. limbata*.

This species is named in appreciation of the assistance given by Mrs. Helen M. Chapman, the wife of the senior author, during the progress of the present work.

Occurrence.—XXXVIII, very rare.

4. SPIRILLINA INAEQUALIS *Brady*.

Spirillina inaequalis H. B. Brady, 1879, p. 278, Pl. VIII, fig. 25; 1884, p. 631, Pl. LXXXV, figs. 8-11.

Observations.—Brady's records of this species are confined to shallow water; in the warmer parts of the Pacific, whilst those of Heron-Allen and Earland came from the vicinity of North Cape, New Zealand; from depths of 100 to 70 fathoms.

In our series typical examples of *S. inaequalis* were found in two samples from off the S.E. coast of Tasmania, at the exceptional depths of 1,180 and 1,300 fathoms; whilst the species was also met with in the Antarctic in dredgings from off Queen Mary Land at 220 fathoms.

Occurrence.—XXIV, very rare; XLVII, rare; XLVIII, frequent.

5. SPIRILLINA LIMBATA *Brady*.

Spirillina limbata H. B. Brady, 1879, p. 278, Pl. VIII, fig. 26; 1884, p. 632, Pl. LXXXV, figs. 18-21.

Observations.—According to Brady, this species is widely distributed. He records it from six stations in the South Pacific. Our specimens from Sample XXII differ from those figured by Brady in being megalospheric. It should be noted that the examples figured by Brady in the "Challenger" Report were from the Atlantic, fig. 18 off Prince Edward Island, and figs. 19 and 20 off Pernambuco. The present examples were dredged off Queen Mary Land, at depths of 125 and 328 fathoms.

S. limbata occurs in fossil deposits in Victoria in beds as old as the Oligocene.

Occurrence.—XXII, very common; XCVIII, frequent.

6. SPIRILLINA MARGARITIFERA *Williamson*.

Spirillina margaritifera Williamson, 1858, p. 93, Pl. VII, fig. 204. Heron-Allen and Earland, 1922, p. 197.

Observations.—There are two specimens from off the east coast of Tasmania, 1,180 fathoms, which are nearer to this species than any other known form of *Spirillina*. Williamson described this species from a single specimen from off the British Isles. Heron-Allen and Earland recorded very fine examples off New Zealand.

Occurrence.—XLVI, rare.

7. SPIRILLINA SPINULOSA, sp. nov. Plate VII, fig. 2.

Description.—Test thin, roundly elliptical, consisting of about four and a half coils; tube somewhat depressed, suture line well marked; the surface and peripheral edge decorated with delicate spinous processes, there being about twenty-four spines on the outer periphery.

Measurements.—0.45 mm. in longer diameter; 0.37 mm. in shorter diameter.

Observations.—This species was frequent in Sample XXII, from off Queen Mary Land, 125 fathoms. The only described species which resembles this is *S. spinigera* Chapman, from beach sands and lagoon at Funafuti in the South Pacific. That species differs, however, in having a plano-convex test, circular in outline and with spines of very regular shape and position.

S. spinulosa also shows some resemblance to a fossil species, *S. pectinimarginata*, from the Lower Miocene of Victoria.

Occurrence.—XXII, frequent.

8. SPIRILLINA VIVIPARA *Ehrenberg*.

Spirillina vivipara Ehrenberg, 1843, p. 442, Pl. III, fig. 41. Brady, 1884, p. 630, Pl. LXXXV, figs. 1-5. Cushman, 1924 (1), p. 30, Pl. IX, figs. 1, 2.

Observations.—The few specimens found are typical; they were from depths of 930 and 1,076 fathoms. This species is of cosmopolitan occurrence. It has been previously recorded by Heron-Allen and Earland from several Antarctic stations of the "Terra Nova." As a fossil it occurs in the Balcombian, Lower Miocene of Victoria.

Occurrence.—XI, very rare; XLVI, rare.

FAMILY LENTICULINIDAE.

Genus LENTICULINA Lamarck, 1804.

9. LENTICULINA ALBATROSSI (Cushman). Plate VII, fig. 3.

Marginulina lituus Parker and Jones, 1865 (*non* d'Orbigny, 1826), p. 343, Pl. XIII, figs. 14 a, b.

Cristellaria obtusata Reuss, var. *subalata* Brady, 1884, p. 536, Pl. LXVI, figs. 24, 25. Chapman, 1895, p. 33. Flint, 1899, p. 315, Pl. LXI, fig. 3. Cushman, 1923, p. 119, Pl. XXX, fig. 5; Pl. XXXI, figs. 2, 3.

Cristellaria albatrossi Cushman, 1923, p. 120, Pl. XIX, figs. 4, 5.

Observations.—We regard Brady's var. *subalata* as being specifically distinct from Reuss's *Cristellaria obtusata*, from the Oligocene of Germany. As Reuss had previously described another species as *Cristellaria subalata* (Reuss, 1854, p. 68, Pl. XXV, fig. 13), we felt inclined to give it a new name, but, on reference to Cushman's work on the Lagenidæ of the North Atlantic, we find that he has described what appears to be an identical form under the name of *Cristellaria albatrossi*. At the same time Cushman recorded the occurrence of Brady's varietal form on a previous page, which from Cushman's figures appears to be the same as his *C. albatrossi*, although the former is stated by him to "differ in the clear limbate sutures and in the wing developed at the base of the test, which is clear, fairly thick, and yet shows no lines of growth."

Most of the records of this species occur in the North Atlantic from depths of 23 to 2,369 fathoms. Brady's type-figures were from "Challenger" Station 23, off Sombrero Island, West Indies, 390 fathoms. The typical form also occurs in the Indian Ocean.

Occurrence.—CIII, rare.

10. LENTICULINA CREPIDULA (Fichtel and Moll).

Nautilus crepidulus Fichtel and Moll, 1798, p. 107, Pl. XIX, figs. g-i.

Cristellaria crepidula (F. and M.) Brady, 1884, p. 542, Pl. LXVII, figs. 17, 19, 20; Pl. LXVIII, figs. 1, 2.

Observations.—A fine specimen from Sample XI (930 fathoms), which is close to Fichtel and Moll's type-figure, except that it is slightly keeled.

Occurrence.—XI, very rare; XXXIX, very rare; XLVII, very rare.

11. LENTICULINA CULTRATA (*Montfort.*)

Robulus cultratus Montfort, 1808, p. 214, 54e genre.

Robulina cultrata (Montfort); d'Orbigny, 1846, p. 96; Pl. IV, figs. 10-13.

Observations.—Several species have been recorded under this species name, but our specimens are typical, although small. They are from the exceptional depths of 1,990 and 1,800 fathoms.

Occurrence.—XCIII, very rare; CXV, very rare.

12. LENTICULINA GIBBA (*d'Orbigny.*)

Cristellaria gibba d'Orbigny, 1839 (1), p. 63, Pl. VII, figs. 20, 21. Chapman, 1917 (1), p. 44, Pl. V, fig. 8.

Observations.—This species has been previously recorded from upthrust deposits on the slopes of Mt. Erebus. The present specimens are very typical and come from all depths. This form also occurred in the "Terra Nova" soundings.

Occurrence.—XXI, very rare; XXII, common; XXIII, very rare; XXIV, very rare; XXXII, very rare; XLVII, rare; XLVIII, rare; XCI, very rare; XCVIII, rare; CXIV, rare.

13. LENTICULINA ORBICULARIS (*d'Orbigny.*)

Robulina orbicularis d'Orbigny, 1826, p. 288, Pl. XV, figs. 8, 9.

Cristellaria orbicularis (d'Orbigny), Brady, 1884, p. 549, Pl. LXIX, fig. 17.

Observations.—One small, but otherwise typical, specimen, from a depth of 1,180 fathoms. In the "Terra Nova" dredgings this species was confined to those taken in the New Zealand area. Brady recorded it from five stations in the South Pacific from depths of from 38 to 450 fathoms.

Occurrence.—XLVI, very rare.

14. LENTICULINA PEREGRINA (*Schwager.*)

Cristellaria peregrina Schwager, 1866, p. 245, Pl. VII, fig. 89.

Cristellaria variabilis Brady (*non* Reuss), 1884, p. 541, Pl. LXVIII, figs. 11-16. Heron-Allen and Earland, 1922, p. 177.

Cristellaria peregrina Schwager, Cushman, 1923, p. 113, Pl. XXX, figs. 3, 4.

Observations.—A few typical specimens from Sample XXII, 125 fathoms. This species has usually been recorded as *C. variabilis* Reuss, from which it has been shown to be distinct by Cushman. The type specimens of *L. peregrina* were from the Pliocene of Kar Nicobar, in the Andaman Islands. It has also been found by one of us (W.J.P.) in dredgings from off Gabo Island, Bass Strait.

Occurrence.—XXII, frequent.

15. LENTICULINA RENIFORMIS (*d'Orbigny*).

Cristellaria reniformis d'Orb., 1846, p. 88, Pl. III, figs. 39, 40. Brady, 1884, p. 539, Pl. LXX, figs. 3a, b. Chapman, 1909 (2), p. 344.

Observations.—One fairly typical specimen of this species the types of which were from the Miocene of Baden, near Vienna. There are several records of this species from the South Pacific, from off Great Barrier Island, New Zealand, and from 10 miles north of Enderby Island, New Zealand, 85 fathoms (Chapman), and from several "Challenger" stations.

Occurrence.—XXIV, very rare.

16. LENTICULINA ROTULATA (*Lamarck*).

Lenticulites rotulata Lamarck, 1804, p. 188, No. 3; 1806, Pl. LXII, fig. 11.

Cristellaria rotulata (Lamarck), Brady, 1884, p. 547, Pl. LXIX, figs. 13a, b. Heron-Allen and Earland, 1922, p. 179.

Lenticulina rotulata (Lamarck), Cushman, 1927 (2), p. 142, Pl. XXVIII, fig. 7a, b.

Observations.—There is one example agreeing with Cushman's figure of the type specimen in DeFrance's collection. Judging by the records this specimen is very widely distributed in the living condition, but some of these records are at least doubtful.

Occurrence.—XXIV, very rare.

Genus MARGINULINA *d'Orbigny*, 1826.

17. MARGINULINA GLABRA *d'Orbigny*.

Marginulina glabra, d'Orbigny, 1826, p. 259, No. 6, Modèle No. 55. Heron-Allen and Earland, 1922, p. 176.

Observations.—One fine example from Sample CVIII; the other examples are somewhat compressed and are not typical.

Heron-Allen and Earland recorded this species from five "Terra Nova" stations.

Occurrence.—XIX, very rare; LXXXVII, very rare; CVIII, very rare.

Genus DENTALINA *d'Orbigny*, 1826.

18. DENTALINA CONSOBRINA *d'Orbigny*.

Dentalina consobrina d'Orbigny, 1846, p. 46, Pl. II, figs. 1-3.

Nodosaria consobrina (d'Orbigny), Brady, 1884, p. 501, Pl. LXII, figs. 23, 24. Heron-Allen and Earland, 1922, p. 170.

Observations.—One specimen is close to d'Orbigny's fig. 1. The only record of this species from the "Terra Nova" dredgings was from off the coast of New Zealand. It has also been recorded by one of us (F.C.) from off Great Barrier Island, and Enderby Island, both in the New Zealand area.

Occurrence.—XLVIII, very rare.

19. DENTALINA GUTTIFERA d'Orbigny.

Dentalina guttifer d'Orbigny, 1846, p. 49, Pl. II, figs. 11-13.

Nodosaria (Dentalina) guttifer (d'Orb.), Parker and Jones, 1865, p. 343, Pl. XIII, fig. 11.

Nodosaria pyrula Brady, 1884 (*non* d'Orb., 1846), p. 497, Pl. LXII, figs. 10-12 (and later authors).

Observations.—One typical specimen. The species usually recorded as *Nodosaria pyrula* is quite distinct from the Soldanian figure to which d'Orbigny gave this name, and appears to be the attenuated form of *Dentalina soluta* Reuss, described from the Vienna Basin Tertiaries by d'Orbigny as *D. guttifer*.

Occurrence.—XLVII, very rare.

20. DENTALINA INORNATA d'Orbigny.

Dentalina communis d'Orbigny, 1840 (*non* d'Orbigny, 1826), p. 13, Pl. I, fig. 4.

Dentalina inornata d'Orbigny, 1846, p. 44, Pl. I, figs. 50, 51.

Dentalina roemeri Neugeboren, 1856, p. 82, Pl. II, figs. 13-17.

Nodosaria communis Brady, 1884 (*non* *Nodosaria (Dentalina) communis* d'Orb., 1826), p. 504, Pl. LXII, figs. 19-22.

Observations.—There are several specimens, agreeing with the type-figures of this species, which, by the way, was described from the Miocene of the Vienna Basin. A comparison of the Soldanian figure on which d'Orbigny based his *Dentalina communis* of 1826 (*Ann. Mag. Nat. Hist.*, ser. 4, vol. VIII, 1871, Pl. IX, fig. 46) with the figure of his *D. communis* of 1840, from the chalk of France will show that two distinct species are there represented. The original *D. communis* has an elongate test, with oval chambers and straight sutures. The aperture is much produced. Brady mentions the differences between the two figures of this species, and states (*op. cit.* p. 499) "the direction of the septa whether straight or oblique affords distinctive characters of some service, and under these circumstances the term *Nodosaria communis* may properly be employed in a restricted sense for the variety with oblique sutures." It now becomes necessary to give another name to *D. communis*, 1840. As d'Orbigny in his work on the Foraminifera of the Vienna Basin described a species *Dentalina inornata*, which appears to be inseparable from his *D. communis* of the Chalk, this specific name has been adopted.

Occurrence.—LXV, very rare; XCI, very rare; XCVIII, rare.

21. DENTALINA MUCRONATA *Neugeboren*.

Dentalina mucronata Neugeboren, 1856, p. 83, Pl. III, figs. 8-11.

Nodosaria mucronata (Neug.), Cushman, 1913, p. 56, Pl. XXV, fig. 2; Pl. XXVII, figs. 5-7 (*non* Plate XXIV, fig. 3; Pl. XXXV, fig. 6).

Observations.—Rare, but typical. The types of this species came from the Miocene of Transylvania. It has also been recorded from the Upper Eocene in New Zealand (F.C.).

Occurrence.—CXIV; frequent.

22. DENTALINA PAUPERATA *d'Orbigny*.

Dentalina pauperata d'Orbigny, 1846, p. 46, Pl. I, figs. 57, 58.

Nodosaria pauperata (d'Orb.), Brady, 1884, p. 500; woodcuts, figs. 14a-c. Heron-Allen and Earland, 1922, p. 170.

Observations.—The solitary specimen found agrees with the type figure of this species. Heron-Allen and Earland recorded *D. pauperata* as frequent in the New Zealand area.

Occurrence.—XI; very rare.

Genus NODOSARIA *Lamarck*, 1812.23. NODOSARIA CALOMORPHA *Reuss*.

Nodosaria calomorpha Reuss, 1866, p. 129, Pl. I, figs. 15-19. Brady, 1884, p. 497, Pl. LXI, figs. 23-27. Heron-Allen and Earland, 1922, p. 168.

Observations.—One small specimen with four chambers. The types of this species come from the Oligocene of Pietzpuhl, in North Germany. According to Brady it is widely distributed and Heron-Allen and Earland had it from seven "Terra Nova" stations.

Occurrence.—XLVII, very rare.

24. NODOSARIA RAPHANISTRUM (*Linn.*).

Nautilus raphanistrum Linné, 1758, p. 710; 1788, p. 3372.

Nodosaria raphanistrum (Linné), Jones, Parker and Brady, 1866, p. 50, Pl. I, figs. 6-8. Sidebottom, 1918, p. 135, Pl. IV, fig. 12-13. Heron-Allen and Earland, p. 171.

Observations.—One small specimen. Heron-Allen and Earland recorded this species from four "Terra Nova" stations, with the note, that, with one exception,

their specimens were very rare and very small. Sidebottom also had it from off the coast of New South Wales at 465 fathoms. Its geological history dates from the Lias. In the Australian and New Zealand Tertiary deposits it is a well-known form.

Occurrence.—XCVIII, very rare.

25. NODOSARIA SCALARIS (*Batsch*).

Nautilus (Orthoceras) scalaris Batsch, 1791, p. 2, Pl. II, fig. 4a, b.

Nodosaria longicauda d'Orb., 1826, p. 254, No. 28.

Nodosaria scalaris (Batsch); Cushman, 1913, p. 58, Pl. XXIV, fig. 7.

Observations.—Small thin-shelled specimens occur here, from deep water (1,180-1,350 fathoms). The only records of Heron-Allen and Earland were from the New Zealand area, from which the specimens figured by Brady as var. *separans* in the "Challenger" Report, were obtained (1884, p. 510, Pl. LXIV, figs. 16-19).

As a fossil it dates from the Upper Eocene of Europe and is also known from beds of similar age in New Zealand.

Occurrence.—XLVI, very rare; XLVII, very rare; XLVIII, rare.

26. NODOSARIA SUBSTRIATULA *Cushman*.

Nodosaria subcanaliculata, var., Brady, 1884, Pl. VII, fig. 4 (*non Dentalina subcanaliculata* Neugeboren), p. 512, Pl. LXIV, figs. 23, 24.

Nodosaria substriatula Cushman, 1917, Proc. U.S. Nat. Mus., vol. LI, p. 655; 1921, p. 204, Pl. XXXVI, figs. 8; 9; Pl. LII, figs. 7-9.

Observations.—A single chamber, undoubtedly belonging to this species, occurs here. The type specimens were from the Philippines, from depths down to 422 fathoms. The example recorded by Brady was from 420 fathoms, off Tahiti. According to Cushman the species is apparently rather widely distributed in the Indo-Pacific region, although it is a delicate one and easily broken. Our example is from a depth of 675 fathoms.

Occurrence.—XLV, very rare.

Genus PSEUDOGLANDULINA *Cushman*, 1929.

27. PSEUDOGLANDULINA ROTUNDATA (*Reuss*).

Glandulina rotundata, Reuss, 1850, p. 366, Pl. XLVI, fig. 2.

Nodosaria (Glandulina) rotundata (Reuss), Brady, 1884, p. 491, Pl. LXI, figs. 17-19.
Chapman 1917 (1), p. 32, Pl. III, figs. 20a, b.

Observations.—Typical specimens. There are several records of this species from the Antarctic. Heron-Allen and Earland had it from four "Terra Nova" stations and one of us (F.C.) has recorded it from upthrust muds on the slopes of Mt. Erebus and also from soundings of moderate depths in the Ross Sea. The types of the species were from the Miocene of the Vienna Basin.

Occurrence.—XXII, frequent; XXIV, rare.

Genus AMPHICORYNE *Schlumberger*, 1881.

28. AMPHICORYNE FALX (*Jones and Parker*).

Marginulina falx Jones and Parker, 1860, p. 302, No. 28.

Amphicoryne falx (Jones and Parker), Brady, 1884, p. 556, Pl. LXV, fig. 7-9.

Observations.—One small faintly striated specimen from each station. Jones and Parker described this species from the Mediterranean and noted that it is always found with *Nodosaria scalaris* (Batsch). In the present dredgings they are similarly associated.

Occurrence.—XLVII, very rare; XLVIII, very rare.

Genus VAGINULINA *d'Orbigny*, 1826.

29. VAGINULINA LEGUMEN (*Linn.*).

Nautilus legumen Linn., 1758, p. 711, No. 248; 1767, p. 1164, No. 288.

Vaginulina legumen (Linn.); Brady, 1884, p. 530, Pl. LXVI, figs. 13-15.

Observations.—One broken example, resembling Brady's fig. 15 but not quite typical when compared with Plancus's and Gaultieri's figures.

Occurrence.—XIX, very rare.

Genus FRONDICULARIA *Defrance*, 1824.

30. FRONDICULARIA ADVENA *Cushman*.

Frondicularia advena Cushman, 1923, p. 141, Pl. XX, fig. 1, 2.

F. inaequalis Chapman and Parr (*non* Costa), 1926, p. 385, Pl. XX, fig. 50.

Observations.—One specimen. This species was described by Cushman from the North Atlantic, with the remark that it is also well distributed throughout the Pacific.

F. advena was originally regarded by us as being conspecific with *F. inaequalis*, but after examining additional material, we agree with Dr. Cushman that it is quite distinct from that species. Our record was from the Balcombian deposits of Port Phillip. Heron-Allen and Earland have also recorded what is undoubtedly the same form from the Lower Miocene of Batesford, near Geelong, Victoria.

Occurrence.—XLVIII, very rare.

Genus *LAGENA* Walker and Jacob, 1798.

(*Lagenae sensu stricto*.)

31. *LAGENA ACUTA* (Reuss). Plate VII, fig. 5.

Fissurina acuta Reuss, 1858, p. 434; 1863, p. 340, Pl. VII, figs. 90, 91.

Lagena acuta (Reuss), Cushman, 1913, p. 6, Pl. XXXVIII, fig. 6. Heron-Allen and Earland, 1922, p. 154.

Observations.—The specimens here met with are more sharply margined than those of Reuss. The species was first described from the Oligocene of Germany. It was recorded as rare, but extensively distributed in the "Terra Nova" dredgings.

Occurrence.—XI, very rare; XLVIII, rare; LII, very rare; XCIII, rare.

32. *LAGENA ACUTICOSTA* Reuss.

Lagena acuticosta Reuss, 1862, p. 305, Pl. I, fig. 4; 1863, p. 331, Pl. V, fig. 63.

Egger, 1893, p. 329, Pl. X, figs. 80-84; Cushman, 1923, p. 5, Pl. I, figs. 1-3.

Observations.—Many typical examples are found here. This species was recorded from sixteen "Terra Nova" stations. Egger noted it from off Kerguelen, Mauritius, and Western Australia, while it occurred in the "Challenger" dredgings from off New Zealand, and around the Subantarctic Islands of New Zealand (F.C.).

Occurrence.—XXII, very rare; XXXIII, very rare; XL, very rare; XLVII, very rare; CXV, very rare.

33. *LAGENA ALVEOLATA* var. *SUBSTRIATA* Brady.

Lagena alveolata Brady, var. *substriata* Brady, 1881, p. 61; 1884, p. 488, Pl. LX, fig. 34. Cushman, 1913, p. 34, Pl. XVIII, fig. 5. Heron-Allen and Earland, 1922, p. 167.

Observations.—Quite typical specimens of this deep water form occur here. The record from Station XCII is for this species from the exceptionally shallow depth of 870 fathoms.

Occurrence.—LXXXI, very rare; XC, very rare; XCII, frequent; CXIV, very rare.

34. LAGENA PSEUDOCATENULATA, sp. nov. Plate VII, fig. 6.

Lagena catenulata Reuss (non *Entosolenia squamosa* var. *catenulata* Williamson), 1863, p. 332, Pl. VI, fig. 75, 76. Heron-Allen and Earland, 1922, p. 152, Pl. V, figs. 16-18.

Observations.—Since Williamson's *Entosolenia squamosa*, var. *catenulata*, as already pointed out by Heron-Allen and Earland, is the same as *Oolina melo* of d'Orbigny, the name *catenulata* must lapse. According to the accepted rules of nomenclature (Article 31), "the specific name which rests upon an error of identification can not be retained for the misdetermined species even if the species in question are afterwards placed in different genera," and consequently Reuss's *catenulata* is not available. We therefore re-name this species as *pseudocatenulata*, and agree with Heron-Allen and Earland in his matter of distinctness of species.

Occurrence.—XXII, frequent; XLVIII, rare; XCI, very rare; CXIV, very rare.

35. LAGENA CLATHRATA Brady.

Lagena clathrata Brady, 1884, p. 485, Pl. LX, fig. 4.

Lagena orbignyana (Seg.), var. *clathrata* Brady, Chapman, 1909 (2), p. 338, Pl. XV, fig. 11.

Lagena clathrata Brady, Heron-Allen and Earland, 1922, p. 165.

Observations.—Fine typical examples occur here. Brady recorded this species from two "Challenger" stations, off the Ki Islands, 580 fathoms, and off Aru Island, 800 fathoms. Heron-Allen and Earland (*op. cit.*) note that this is one of the most characteristic New Zealand Foraminifera. One of us (F.C.) has also recorded it from off the Subantarctic Islands of New Zealand, 85 fathoms, and as a fossil from the Miocene of Batesford, Victoria.

Occurrence.—XXXII, very rare; XLVI, very rare; XLVII, rare.

36. LAGENA DISTOMA Parker and Jones. Plate VII, fig. 7.

Lagena distoma Parker and Jones MS in Brady, 1864, p. 467, Pl. XLVIII, fig. 6. Brady, 1884, p. 461, Pl. LVIII, figs. 11-15. Heron-Allen and Earland, 1922, p. 235.

Observations.—One specimen occurred, which is figured. It is broader than usual, and is spirally twisted. Heron-Allen and Earland recorded one typical example of this species from the "Terra Nova" dredgings.

Occurrence.—XXXIII, very rare.

37. *LAGENA EXSCULPTA* Brady.

Lagena exsculpta Brady, 1881, p. 61; 1884, p. 467, Pl. LVIII, fig. 1; Pl. LXI, fig. 5.
Cushman, 1913, p. 28, Pl. XIII, fig. 5; Heron-Allen and Earland, 1922, p. 149.

Observations.—Specimens of both the compressed and rounded forms figured by Brady occur here. According to Nuttall the compressed form was from "Challenger" Station 168, north-east of New Zealand. Brady's records of this species were from the North Pacific, South Pacific, south of Australia, the Antarctic Ice-barrier, and the South Atlantic. It occurred also in deep water stations of the "Terra Nova."

Occurrence.—XI, very rare; XXII, very rare.

38. *LAGENA FEILDENIANA* Brady.

Lagena feildeniana Brady, 1878, p. 434, Pl. XX, fig. 4; 1884, p. 469, Pl. LVIII, figs. 38, 39.

Observations.—Occasional specimens of this rare form. Amongst other localities Brady recorded this from the Southern Ocean, west of Prince Edward Island, 1,570 fathoms; off Sydney, 410 fathoms; off Tahiti, 620 fathoms. Sidebottom also recorded it from off the coast of New South Wales.

Occurrence.—XVII, very rare; LXXXII, very rare; XCI, very rare.

39. *LAGENA FIMBRIATA* Brady, var. *POLITA*, var. nov. Plate VII, fig. 8.

Observations.—This new varietal form is moderately common at the stations at which it occurred. It is distinguished from the type-species by its polished surface, and practically entire absence of the fimbriated and tubulated base.

In his description of *L. fimbriata*, Brady describes it as being ento- and ectosolenian. All of our specimens are ectosolenian.

Occurrence.—XXIX, rare; XLVI, very rare; XLVII, rare; XLVIII, very rare; XCII, very rare.

40. *LAGENA FORMOSA* Schwager.

Lagena formosa Schwager, 1866, p. 206, Pl. IV, figs. 19a-d; Pl. VII, fig. 1.
Cushman, 1913, p. 41, Pl. XI, figs. 6-8.

Observations.—Two typical examples, one broken, of this beautiful deep-water species. The type of *L. formosa* were from the Pliocene of Kar Nicobar. It has been recorded by Sidebottom from off the coast of New South Wales and by Heron-Allen and Earland from two "Terra Nova" Stations in the Antarctic. Our examples were from depths of 2,250 and 2,600 fathoms.

Occurrence.—XCI, very rare; CXIV, very rare.

41. *LAGENA FOVEOLATA* Reuss.

Lagena foveolata Reuss, 1863, p. 332, Pl. V, fig. 65. Millett, 1901, p. 11, Pl. I, fig. 15.
Sidebottom, 1912, p. 395, Pl. XVI, fig. 15. Heron-Allen and Earland, 1922,
p. 150.

Observations.—One beautiful specimen from Sample XLVII, of the form figured by Sidebottom from off the coast of New South Wales. This is slenderer than the type form from the Oligocene of Pietzpuhl, Germany.

Occurrence.—XLVII, very rare.

42. *LAGENA GRACILIS* Williamson.

Lagena gracilis Williamson, 1848, p. 13, Pl. I, figs. 3, 4. Cushman, 1923, p. 22,
Pl. IV, figs. 3, 4.

Observations.—Typical examples occur. This species was recorded by Heron-Allen and Earland from fourteen "Terra Nova" stations.

Occurrence.—XXIV, rare; LXVI, very rare; LXXXI, very rare; XCI, very rare;
XCVIII, very rare; CVIII, very rare; CXIV, very rare.

43. *LAGENA GRACILLIMA* (Seguenza).

Amphorina gracillima Seguenza, 1862 (2), p. 51, Pl. I, fig. 37.

Lagena gracillima (Seguenza) Brady, 1884, p. 456, Pl. LVI, figs. 21, 22, 24-26, 28,
19 (?), 20 (?), 23 (?), 27 (?). Heron-Allen and Earland, 1922, p. 144.

Observations.—One very typical example from Sample XLVI, 1,180 fathoms. This species was described from the Miocene of Sicily.

Occurrence.—XLVI, very rare.

44. *LAGENA HISPIDA* Reuss.

Lagena hispida Reuss, 1858, p. 43; 1863, p. 335, Pl. VI, figs. 77-79. Brady, 1884,
p. 459, Pl. LVII, figs. 1-4; Pl. LIX, figs. 2, 5.

Observations.—Typical examples are rare. Heron-Allen and Earland recorded this species from twelve "Terra Nova" stations and noted that their specimens were subject to considerable variation.

Occurrence.—XL, very rare; CXIV, frequent.

45. LAGENA LAEVIS (*Montagu*).

Vermiculum laeve Montagu, 1803, p. 524.

Lagena vulgaris Williamson, 1858, p. 3, Pl. I, fig. 5, 5a.

Observations.—Fairly typical specimens. Several species appear to have been recorded by various authors under this name: None of the specimens figured by Brady in the "Challenger" Report could be regarded as typical. Heron-Allen and Earland note that the specimens assigned by them to this species, from the "Terra Nova" dredgings, exhibit an enormous range of variation, the deep water specimens having a very long neck while others are very delicately spinous and approach *L. hispida* Reuss.

L. laevis has been found fossil in the Balcombian deposits of Balcombe Bay, Victoria.

Occurrences.—XI, very rare; XXXIII, very rare; XCI, very rare; XCII, very rare; XCIII, very rare.

46. LAGENA MULTICINCTA, sp. nov. Plate VII, fig. 9.

Description.—Test compressed pyriform, the central part inflated, and its surface marked by very fine striæ. The margin is tricarinate, the central keel being sharper and more salient than the two laterals. The marginal area is finely concentrically lineate. The aperture is compressed, situated at the extremity of a short flattened neck; the tube is visible in this extended portion, but apparently does not pass inwards. The inflated faces of the test are also distinctly keeled, the carination being prolonged at the base to meet the outer margin of the test.

Dimensions.—Length, 0.46 mm.; greatest width, 0.32 mm.

Observations.—The nearest form to that now described appears to be one figured by Sidebottom (1913, p. 196, Pl. XVII, fig. 15) as a variety of *Lagena orbignyana* (Seg.). This form differs, however, in having a dehiscence of the central keel on the body of the test.

Occurrence.—XLVII, very rare.

47. LAGENA PLUMIGERA *Brady*.

Lagena plumigera Brady, 1881, p. 62; 1884, p. 465, Pl. LVIII, figs. 25; 27. Millett, 1901, p. 490, Pl. VIII, fig. 8. Heron-Allen and Earland, 1922, p. 147.

Observations.—Very rare. The specimens are from a depth of 2,570 fathoms. The species has been recorded from both Atlantic and Pacific Oceans. It is essentially of deep water habitat. It was found in the "Terra Nova" dredgings.

Occurrence.—XXXIII, very rare.

48. *LAGENA SEMINIFORMIS* Schwager.

Lagena seminiformis Schwager, 1866, p. 208, Pl. V, fig. 21. Brady, 1884, p. 478, Pl. LIX, figs. 28-30. Heron-Allen and Earland, 1922, p. 158.

Observations.—One small but typical specimen occurred in Sample CXIV, from 2,600 fathoms. The species was originally described from the Upper Pliocene of Kar Nicobar, and it has since been recorded in the Recent condition from the Atlantic and Pacific Oceans, from very deep water. One of us (F.C.) has also identified it in dredgings from the Arabian Sea. The only shallow-water record appears to be that of Heron-Allen and Earland from 7 miles east of North Cape, New Zealand, 70 fathoms; they note the occurrence of one rather weak specimen.

Occurrence.—CXIV, very rare.

49. *LAGENA STRIATA* (d'Orb.).

Oolina striata d'Orb., 1839 (3), p. 21, Pl. V, fig. 12.

Lagena striata (d'Orb.) Brady, 1884, p. 460, Pl. LVII, figs. 19, 22, 24, 28, 29, 30.

Observations.—Our examples agree with Brady's figure 30, from "Challenger" Station 346 in the South Atlantic. This has a spinous base. The same form was recorded by Heron-Allen and Earland from Station 17 of the "Terra Nova" dredgings.

Occurrence.—XLVII, common.

50. *LAGENA SULCATA* (Walker and Jacob).

Serpula (*Lagena*) *sulcata* Walker and Jacob, 1798, p. 634, Pl. XIV, fig. 5.

Lagena sulcata (W. and J.) Brady, 1884, p. 462, Pl. LVII, figs. 23, 26, 33, 34. Chapman, 1909 (2), p. 333, Pl. XV, fig. 4. Cushman, 1923, p. 57, Pl. XI, fig. 1.

Observations.—This species and its slight variations, as noted by Heron-Allen and Earland from the "Terra Nova" Antarctic samples, are well represented here. The species has been recorded one of us (F.C.) from the Subantarctic Islands and Great Barrier Island, off New Zealand. Its geological history in New Zealand dates from the Eocene (Weka Pass).

Occurrences.—XXII, very common; LXXV, rare; XCVIII, very rare.

51. *LAGENA SULCATA* (Walker and Jacob), var. *INTERRUPTA* Williamson.

Lagena vulgaris, var. *interrupta* Williamson, 1858, p. 7, Pl. I, fig. 11.

Observations.—This variety differs from the specific form in the broken lines of sulcation on the test. Heron-Allen and Earland record it from two stations in the Antarctic ("Terra Nova") Expedition.

Occurrence.—XLVII, very rare.

[ENTOSOLENIAN SECTION.]

52. LAGENA APICULATA (*Reuss*).

Oolina apiculata Reuss, 1851 (1), p. 22, Pl. I, fig. 1.

Lagena apiculata (Reuss) Reuss, 1863, p. 319, Pl. I, figs. 4-8, 10, 11. Chapman, 1917 (2), p. 66, Pl. IV, fig. 26.

Observations.—This species here varies in its amount of inflation, some being pyriform, others subglobular, but covered by Reuss's original figures. One of our examples shows a stellate aperture, and although the inner tube cannot be distinguished because of the thick test, it seems to be similar to a form figured by Reuss under this name (Reuss, 1863, Pl. I, fig. 5), which shows a test with stellate aperture and entosolenian tube. This rayed aperture would suggest affinity with the true *Lagenae*, and so helps to break down the partition between the supposed ecto- and entosolenian groups.

Occurrence.—XV, very rare; XXIV, very rare; XLVII, very rare; CXIV, rare.

53. LAGENA AURICULATA *Brady*.

Lagena auriculata Brady, 1881, p. 61; 1884, p. 487, Pl. LX, figs. 29-33. Heron-Allen and Earland, 1922, p. 166, Pl. VI, fig. 26.

Observations.—Brady described this species as being ento- or ectosolenian. Our example is distinctly entosolenian. It occurred in a sounding to the east of Tasmania; the "Terra Nova" occurrence was from off New Zealand.

Occurrence.—XLVII, very rare.

54. LAGENA BOTELLIFORMIS *Brady*.

Lagena botelliformis Brady, 1881, p. 60; 1884, p. 454, Pl. LVI, fig. 6. Heron-Allen and Earland, 1922, p. 143.

Observations.—Very good examples occur here. The specimen figured by Brady was from shallow water off the Cape de Verde Islands, and he also records the species from the South Atlantic, 2,350 fathoms, and from south of Juan Fernandez, 1,450 fathoms. In the "Terra Nova" soundings it was widely distributed, especially in the deep-water stations.

Occurrence.—CVIII, very rare; CXIV, rare.

55. LAGENA COSTATA (*Williamson*).

Entosolenia costata Williamson, 1858, p. 9, Pl. I, fig. 18.

Lagena costata (Williamson) Reuss, 1863, p. 329, Pl. IV, fig. 54. Heron-Allen and Earland, 1922, p. 147. Cushman, 1923, p. 12, Pl. I, fig. 16; Pl. II, figs. 1, 2; Pl. III, fig. 8.

Observations.—This species occurred at only one station. It is common around the British Isles. In the "Terra Nova" soundings it was widely distributed.

Occurrence.—XXII, frequent.

56. LAGENA GLOBOSA (*Montagu*).

Vermiculum globosum Montagu, 1803, p. 523.

Entosolenia globosa (Montagu) Williamson, 1858, p. 8, Pl. I, figs. 15, 16.

Lagena globosa (Montagu) Brady, 1884, p. 452, Pl. LVI, figs. 1-3. Chapman, 1917 (2), p. 66, Pl. IV, fig. 25. Heron-Allen and Earland, 1922, p. 142.

Observations.—Typical specimens of this widely distributed species occurs here. The delicate, transparent test shows the tenuous inner tube to perfection.

Occurrence.—XXII, very rare; XXIV, very rare; XXXII, very rare; XLIX, very rare.

57. LAGENA HEXAGONA (*Williamson*).

Entosolenia squamosa, var. *hexagona* Williamson, 1848, p. 20, Pl. II, fig. 23; 1858, p. 13, Pl. I, fig. 32.

Lagena hexagona (Williamson) Brady, 1884, p. 472, Pl. LVIII, figs. 32, 33. Heron-Allen and Earland, 1922, p. 152.

Observations.—Typical examples were found in three soundings. Williamson described this species from off the Shetland Islands. It is widely distributed in the living conditions. *Lagena hexagona* is met with in the fossil condition in the Miocene of Victoria (Torquay and Dartmoor).

Occurrence.—XXII, very rare; XLVII, rare; XLVIII, rare.

58. LAGENA LAEVIGATA (*Reuss*).

Fissurina laevigata Reuss, 1850, p. 366, Pl. XLVI, fig. 1; 1863, p. 338, Pl. VI, fig. 84a, b.

Lagena laevigata (Reuss) Heron-Allen and Earland, 1922, p. 153.

Observations.—This is a well distributed recent species. It has also been found fossil from beds as old as the Cretaceous (I. of Rügen) and has occurred in the Upper Miocene of New Zealand. In the "Terra Nova" dredgings it occurred at almost every station, but was not recorded from those of the "Nimrod" (Shackleton Expedition).

Occurrence.—XI, very rare; XIX, very rare; XXII, very rare; XXIV, common; XLVI, very rare; LXV, very rare; XCI, very rare; XCIII, rare; CXIV, very rare.

59. LAGENA LAGENOIDES (*Williamson*).

Entosolenia marginata Walker and Boys, var. *lagenoides* Williamson, 1858, p. 11, Pl. I, figs. 25, 26.

Lagena lagenoides (Williamson) Brady, 1884, p. 479, Pl. LX, figs. 6, 8, 9, 12. Heron-Allen and Earland, 1922, p. 158.

Observations.—There are three typical examples from deep water off the coast of Tasmania. This species is one of the few forms of which there may be a doubt as to a relationship with the typical ectosolenian Lagenae, since it has both the prolonged neck and an introverted tube; another similar instance is in the common form *Lagena orbignyana* (Seguenza). As to whether this inner tube facilitates the protection of protoplasmic threads at the orifice as compared with an entosolenian form, it is difficult to adduce any evidence, but the facts seem to point in that direction.

Occurrence.—XLVII, very rare; XLVIII, very rare.

60. LAGENA LAGENOIDES (*Williamson*), var. TENUISTRIATA *Brady*.

Lagena tubulifera var. *tenuistriata* Brady, 1881, p. 61.

Lagena lagenoides var. *tenuistriata* Brady, 1884, p. 479, Pl. LX, figs. 11, 15, 16. Heron-Allen and Earland, 1922, p. 158.

Observations.—There is one small example of this variety of *Lagena lagenoides*. In the "Terra Nova" dredgings, it occurred at four stations, at one of which it passed imperceptibly into the typical form.

Occurrence.—LXV, very rare.

61. LAGENA LUCIDA (*Williamson*).

Entosolenia marginata (Walker and Boys), var. *lucida* Williamson, 1858, p. 10, Pl. I, figs. 22, 23.

Lagena lucida (Williamson) Reuss, 1863, p. 324, Pl. II, figs. 25, 26. Heron-Allen and Earland, 1922, p. 154.

Observations.—There is one typical specimen from Sample XLVII, dredged east of Tasmania from 1,320 fathoms. This species is common on the coast of the British Isles.

Occurrence.—XLVII, very rare.

62. LAGENA MARGINATA (*Walker and Boys*).

Serpula (Lagena) marginata Walker and Boys, 1784, p. 2, Pl. I, fig. 7.

Lagena marginata (Walker and Boys) Brady, 1884, p. 476, Pl. LIX, figs. 21-23.

Cushman, 1913, p. 37, Pl. XXII, figs. 1-7. Heron-Allen and Earland, 1922, p. 156.

Observations.—The present examples are of the compressed typical form, and they are well distributed in the Antarctic and Tasmanian areas.

Occurrence.—XIX, very rare; XXI, very rare; XXII, common; XXIV, frequent; XXX, very rare; XLV, rare; XLVII, very rare; XLVIII, rare; LIII, very rare; LXXIV, common; LXXXI, very rare; XCVIII, common; CXIV, common.

63. LAGENA MARGINATA, *var. CATENULOSA Chapman*.

Lagena marginata (Walker and Boys), *var. catenulosa* Chapman, 1895, p. 28, Pl. I, fig. 5. Sidebottom, 1912, p. 407, Pl. XVIII, fig. 6. Chapman and Parr, 1926, p. 376, Pl. XVII, fig. 13.

Observations.—The above variety is represented by a distorted specimen. The original specimen came from the Arabian Sea, and it has since occurred off the east coast of Australia (Sidebottom), and as a fossil in the Balcombian (Lower Miocene) of Altona Bay, Victoria (Chapman and Parr).

Occurrence.—XLVII, very rare.

64. LAGENA MARGINATA, *var. FISSA Heron-Allen and Earland*.

Lagena marginata (Walker and Boys), *var. fissa* Heron-Allen and Earland, 1922, p. 157, Pl. V, figs. 24, 25.

Observations.—This interesting variety of *Lagena marginata* having a split basal keel was described by Heron-Allen and Earland from two stations in the Antarctic. It is here found in one "Aurora" sample, in 328 fathoms, off the Shackleton Shelf.

Occurrence.—XCVIII, frequent.

65. LAGENA ORBIGNYANA (*Seguenza*).

Entosolenia marginata Williamson (*pars*), (*non Serpula (Lagena) marginata*, W. and B.), 1858, p. 9, Pl. I, figs. 19, 20.

Fissurina orbignyana Seguenza, 1862(2), p. 66, Pl. II, figs. 25, 26.

Lagena orbignyana (Seguenza) Cushman, 1923, p. 39. Heron-Allen and Earland, 1922, p. 161.

Observations.—Typical specimens are found in the "Aurora" dredgings from the Antarctic and from stations off Tasmania. The "Terra Nova" specimens were universally distributed.

Occurrence.—XXX, very rare; XL, very rare; XLI, very rare; XLVIII, very rare; LXV, very rare; LXXXII, very rare; XCI, rare.

66. LAGENA QUADRATA (*Williamson*).

Entosolenia marginata (Walker and Boys), var. *quadrata* Williamson, 1858, p. 11, Pl. I, figs. 27, 28.

Lagena quadrata (Williamson) Brady, 1884, p. 475, Pl. LIX, figs. 3, 16. Chapman, 1909 (2), p. 339. Heron-Allen and Earland, 1922, p. 155. Chapman and Parr, 1926, p. 377, Pl. XVII, fig. 16.

Observations.—Two of the "Aurora" soundings containing this species were obtained off the Shackleton Shelf, the third from east of Tasmania. The "Terra Nova" examples came from the New Zealand area. It was also found by one of us (F.C.) from the Subantarctic Islands of New Zealand.

Occurrence.—XXI, very rare; XXIV, rare; XLVI, very rare.

67. LAGENA MARGINATA, var. SEMIMARGINATA *Reuss*.

Lagena marginata (Walker and Boys), var. *semimarginata* Reuss, 1870, p. 468. Schlicht, 1870, p. 11, Pl. IV, figs. 4-6, 10-12. Brady, 1884, p. 477, Pl. LIX, figs. 17-19. Chapman, 1909 (2), p. 337. Heron-Allen and Earland, 1922, p. 157.

Observations.—Examples of this form were met with in two soundings, one from south of Tasmania, 2,700 fathoms, and the other from off Adelie Land, from moderately shallow water. This variety was earlier recorded by one of us (F.C.) as not uncommon, from the Subantarctic Islands of New Zealand. The specimens originally described by Reuss were from the Oligocene of Germany.

Occurrence.—XXXIX, very rare; LXXIV, very rare.

68. LAGENA SQUAMOSO-SULCATA *Heron-Allen and Earland*.

Lagena melo (intermediate var.) Brady, Parker and Jones, 1888, p. 237, Pl. XLIV, fig. 25.

Lagena squamoso-sulcata Heron-Allen and Earland, 1922, p. 151, Pl. V, figs. 15, 19.

Observations.—This species combines the characters of *Lagena squamosa* (Montagu) and *Lagena costata* (Williamson). It was described from the Antarctic dredgings of the "Terra Nova" and was confined to that area. The present examples were all obtained off the Shackleton Shelf.

Occurrence.—XXII, frequent; XXIV, frequent; XCVIII, very rare.

69. LAGENA STAPHYLLEARIA (*Schwager*).

Fissurina staphyllearia Schwager, 1866, p. 209, Pl. V, fig. 24.

Lagena staphyllearia (Schwager) Brady, 1884, p. 474, Pl. LIX, figs. 8-11. Pearcey, 1914, p. 1019. Heron-Allen and Earland, 1922, p. 154.

Observations.—The examples occurring here are typical but very rare. It is fairly widely distributed, as a recent species; the original type came from the Pliocene of Kar Nicobar.

Occurrence.—XXX, very rare; XXXV, very rare.

FAMILY POLYMORPHINIDAE.

SUB-FAMILY POLYMORPHININAE.

Genus GUTTULINA *d'Orbigny*, 1826.

70. GUTTULINA COMMUNIS (*d'Orb.*).

Polymorphina (Guttulina) communis *d'Orb.*, 1826, p. 266, Pl. XII, figs. 1-4, Modèle No. 62.

Guttulina communis (*d'Orb.*) *d'Orb.*, 1846, p. 224, Pl. XIII, figs. 6-8.

Polymorphina communis *d'Orb.*, Brady, 1884, p. 568, Pl. LXXII, fig. 19.

Observations.—One rather large example of this species was found in Sample LXXXI. This was from the unusual depth of 1,810 fathoms. The "Terra Nova" records of this species were all from moderately shallow water, off the coast of New Zealand.

Occurrence.—LXXXI, very rare.

71. GUTTULINA COMMUNIS (*d'Orb.*), forma CORONULA *Jones and Chapman*.

Observations.—There are two examples of *Guttulina lactea* exhibiting the type of fistulosity described by Jones and Chapman as var. *coronula* (1896, p. 501) which at the time had not been recognised in this species. In this form, the exogenous shell growth is confined to the oral extremity of the shell.

Occurrence.—XLVII, rare.

72. GUTTULINA FUSIFORMIS (*Roemer*).

Polymorphina fusiformis *Roemer*, 1838, p. 386, Pl. III, fig. 37.

P. angusta Brady (*non Egger*), 1884, p. 563, Pl. LXXI, figs. 17-19; Pl. LXXII, fig. 4. Chapman and Parr, 1926, p. 392, Pl. XXI, fig. 75.

Pyrulina fusiformis (*Roemer*), Cushman and Ozawa, 1930, p. 54, Pl. XIII, figs. 3-8.

Observations.—Specimens of this form are similar to that figured by us from the Balcombian (L. Miocene) of Victoria. As *Polymorphina angusta* it was recorded by Heron-Allen and Earland from six "Terra Nova" stations.

Occurrence.—XXXIX, very rare; CXIV, very rare.

73. GUTTULINA GIBBA (*d'Orbigny*).

Globulina gibba d'Orbigny, 1826, p. 266, No. 20; Modèle No. 63.

Polymorphina gibba (d'Orbigny) Brady, Parker and Jones, 1870, p. 216, Pl. XXXIX, figs. 2a-d.

Observations.—There are several examples of this well-known species, but none of them is fistulose, unlike those recorded by Heron-Allen and Earland from the "Terra Nova" dredgings.

Occurrence.—XXXII, very rare; XCIII, frequent; CXIV, very rare.

74. GUTTULINA LACTEA, forma DIFFUSA *Jones and Chapman*.

Polymorphia lactea (Walker and Jacob); var. *diffusa* Jones and Chapman, 1896, pp. 505, 511; text-fig. No. 27.

Observations.—This form of *Guttulina lactea* was previously recorded from the Mediterranean.

Occurrence.—XLVIII, very rare.

75. GUTTULINA YABEI *Cushman and Ozawa*, forma HORRIDA *Jones and Chapman*.

Polymorphina oblonga Brady (*non d'Orbigny*), 1884, Pl. LXXIII, figs. 2, 3. Chapman, 1917 (2), p. 67, Pl. IV, fig. 31; 1926, p. 68, Pl. XIV, fig. 2.

Guttulina yabei Cushman and Ozawa, 1929, p. 68, Pl. XIII, fig. 2; Pl. XIV, fig. 6; 1930, p. 30, Pl. IV, figs. 6, 7.

Observations.—This species is a common Tertiary fossil in New Zealand (Oligocene of Kakanui). The type-specimen was described from the Upper Pliocene of Sawane, Island of Sadō, Japan, by Cushman and Ozawa. It is a well-distributed species off the Australian coast, and it has also occurred in dredgings from the Ross Sea, Antarctic.

Most of the references to *P. oblonga* from the Pacific region belong to the above species.

Occurrence.—CXV, very rare.

Genus GLANDULINA *d'Orbigny*, 1826.76. GLANDULINA LAEVIGATA (*d'Orbigny*).

Nodosaria (Glandulina) laevigata d'Orbigny, 1826, p. 252, No. 1, Pl. X, figs. 1-3. Brady, 1884, pp. 490, 493, Pl. LXI, figs. 20-22.

Polymorphina vitrea (Bornemann), var. *glandulinoides* Fornasini, 1901, p. 66, woodcut fig. 18.

Polymorphina glandulinoides Fornasini, Chapman and Parr, 1926, p. 392, Pl. XXI, fig. 76.

Observations.—Typical specimens. The species has been recorded by one of us (F.C.) from upthrust muds on the slopes of Mt. Erebus and in soundings in the Ross Sea. It also occurred at seven "Terra Nova" stations. In the Australian and New Zealand Tertiary deposits it is a common form. Fornasini's *Polymorphina vitrea*, var. *glandulinoides* has been recently shown by Cushman and Ozawa to be the microspheric form of *Glandulina laevigata*.

Occurrence.—I, rare; XIV, very rare; XV, very rare; XXI, frequent; XXII, rare; XXIV, frequent; XCVIII, very rare; CXV, very rare.

Genus SIGMOMORPHINA Cushman and Ozawa, 1928.

77. SIGMOMORPHINA CONCAVA (Williamson).

Polymorphina lactea Walker and Jacob, var. *concaua* Williamson, 1858, p. 72, Pl. VI, figs. 151, 152.

P. concaua Williamson, Brady, Parker and Jones, 1870, p. 236, Pl. XL, figs. 22a, b.
Jones and others, 1896, p. 264, Pl. V (1895), fig. 22.

Sigmomorphina concaua (Williamson), Cushman and Ozawa, 1930, p. 139, Pl. XXXVIII, figs. 5-7.

Observations.—One typical example of this interesting shallow-water form was found. Williamson's types were from the English coast. There are several records of its occurrence in the Pliocene of Europe, while it has also been met with in the Lower beds (of Balcombian age) at Muddy Creek, near Hamilton, Victoria.

Occurrence.—XXVII, very rare.

78. SIGMOMORPHINA SUBULATA, *nom. mut.* Plate VII, figs. 10a, b.

Polymorphina inflata Pearcey (non *P. inflata* Zittel, vel *Sigmomorphina pearceyi* Cushman and Ozawa), 1914, p. 1023, Pl. II, figs. 14-16.

Description.—Test elongate, compressed, awl-shaped, broadest in the upper half and tapering towards the base; chambers oblong, more or less inflated, the last chamber large and more inflated than the others. Chambers arranged in a clock-wise sigmoidal series, each succeeding chamber farther from the base. Sutures depressed. Wall smooth, thin, and translucent. Aperture terminal, radiate and sometimes with a short entosolenian tube extending into the cavity of the last-formed chamber.

Dimensions.—Length, 0.76 mm.; width, 0.43 mm.

Observations.—This species is closely related to *S. pearceyi* Cushman and Ozawa, described from off the Tortugas and recorded also from another station from the North Atlantic, as well as from the Eocene of Italy. Those authors had only three specimens in all, and further material may show that these are not one and the same species.

The present species agrees with Pearcey's figured specimen, which he has described as *P. inflata*, a name already preoccupied, and which differs from *Sigmomorphina pearceyi* in having a much compressed test.

Occurrence.—XXII, common.

79. SIGMOMORPHINA WILLIAMSONI (*Terquem*).

Polymorphina lactea (W. and J.), var. *oblonga* Williamson (*non P. (Globulina) oblonga* Roemer), 1858, p. 71, Pl. VI, figs. 149, 149a.

Polymorphina williamsoni Terquem, 1878, p. 37.

Sigmomorphina williamsoni (Terq.), Cushman, 1930, p. 36, Pl. VI, fig. 4.

Observations.—This interesting species, which has been generally referred to under the name of *Polymorphina lactea*, var. *oblonga*, is morphologically separable from typical *Polymorphinae* by the compressed and elongated chambers, which are arranged counter clockwise and sigmoidally.

Williamson's specimens were from the British coast, and those of Terquem from the Island of Rhodes in Pliocene strata.

The species was recorded by Heron-Allen and Earland from the "Terra Nova" dredgings.

Occurrence.—XLVII, very rare.

Genus RAMULINA *Rupert Jones*, 1875.

80. RAMULINA GLOBULIFERA *Brady*.

Ramulina globulifera Brady, 1879, p. 272, Pl. VIII, figs. 32, 33; 1884, p. 587, Pl. LXXVI, figs. 22-28. Jones and Chapman, 1897, p. 340, text-figs. 5-22.

Observations.—One example from a depth of 675 fathoms.

The species is usually found in water of comparatively moderate depth. Brady recorded it from six "Challenger" stations in the South Pacific, and it was also found in the "Terra Nova" dredgings.

Ramulina globulifera has been recorded by us as a fossil from the Balcombian beds of the Port Phillip area, in Victoria.

Occurrence.—XLV, very rare.

FAMILY BULIMINIDAE.

SUB-FAMILY TURRILININAE.

Genus BULIMINELLA Cushman, 1911.

81. BULIMINELLA ELEGANTISSIMA (*d'Orbigny*).

Bulimina elegantissima d'Orbigny, 1839 (3), p. 51, Pl. VII, figs. 13, 14.

Buliminella elegantissima (d'Orb.) Cushman, 1911, p. 89.

Bulimina elegantissima d'Orb., Heron-Allen and Earland, 1922, p. 129.

Buliminella elegantissima (d'Orb.) Cushman and Kellett, 1929, p. 6, Pl. III, figs. 1-3.

Observations.—Our examples agree with those recently figured from off the west coast of America by Cushman and Kellett.

Occurrence.—IX, rare; XIX, very rare; XXI, frequent; XXIV, rare; XCVIII, very rare.

Genus ROBERTINA *d'Orbigny*, 1846.82. ROBERTINA SUBCYLINDRICA (*Brady*).

Bulimina subcylindrica Brady, 1881, p. 56; 1884, p. 404, Pl. L, figs. 16a, b.

Buliminella subcylindrica (Brady) Cushman, 1922, p. 112, Pl. XX, fig. 5.

Observations.—This rare species occurred in two samples, both from off the coast of Tasmania, from depths of 1,180 and 1,300 fathoms. Brady's records were from three "Challenger" stations in the Atlantic, and three in the South Pacific—Torres Strait, 155 fathoms; off Tahiti, 620 fathoms; and off the west coast of Patagonia, 175 fathoms.

Occurrence.—XLVII, rare; XLVIII, rare.

83. ROBERTINA SUBTERES (*Brady*).

Bulimina subteres Brady, 1881, p. 55; 1884, p. 403, Pl. L, figs. 17, 18. Chapman, 1909 (2), p. 330, Pl. XIV, fig. 10. Heron-Allen and Earland, 1922, p. 130.

Robertina subteres (Brady), Wiesner, 1931, p. 124, Pl. XX, fig. 238.

Observations.—The examples are typical. This species is widely distributed in the living condition. It occurs as a fossil in the Lower Miocene (Balcombian) of Victoria.

Occurrence.—XXII, frequent; XXIX, very rare; XXX, very rare; XLVII, frequent.

Genus CERATOBULIMINA Toulou, 1920.

84. CERATOBULIMINA PACIFICA Cushman and Harris.

Bulimina contraria Brady (non *Rotalina contraria* Reuss), 1884, Pl. LIV, figs. 18a-c.

Ceratobulimina pacifica Cushman and Harris, 1927, p. 176, Pl. XXIX, figs. 9a-c.

Observations.—There are two examples of this recently described species, the types of which were from off the Philippines, 494 fathoms. The specimen from off the Ki Islands, figured by Brady as *Bulimina contraria* (Reuss), is undoubtedly identical with the present species. It is interesting to note that this genus did not occur in the Antarctic dredgings examined by us, and recorded. The two species here are from the east of Tasmania, 1,320 fathoms.

Occurrence.—XLVII, rare.

85. CERATOBULIMINA TENUIS, sp. nov. Plate VII, figs. 11a, b.

Description.—Test thin, hyaline; consisting of a series of seven more or less elongated chambers arranged on a marginuline plan on the superior face, the earlier forming a partial coil around the proloculum, and gradually lengthening, and posed obliquely to the end of the test. Inferior face with the inrolled edges of the successive chambers forming a median groove at the summit of which at the base of the last-formed chamber is situated the elongated bulimine aperture. The widest part of the test equals about one-third of the length.

Dimensions.—Length, 0.3 mm.; width, 0.136 mm.

Observations.—This delicate little species is probably the most elongate form of the genus *Ceratobulimina*. A related but shorter and stouter species has been described from the Batesford Limestone (L. Miocene) of Victoria by Heron-Allen and Earland under the name of *Bulimina convoluta*, var. *dehiscens* (Heron-Allen and Earland, 1924, p. 143, Pl. VIII, figs. 26-28).

Occurrence.—XLVII, very rare.

SUB-FAMILY CASSIDULININÆ.

Genus PSEUDOBULIMINA Earland, 1934.

86. PSEUDOBULIMINA CHAPMANI (Heron-Allen and Earland).

Bulimina seminuda Chapman (non Terquem), 1917 (1), p. 29, Pl. II, figs. 9a, b.

Bulimina chapmani Heron-Allen and Earland, 1922, p. 130, Pl. IV, figs. 18-20.

Robertina chapmani (Heron-Allen and Earland) Wiesner, 1931, p. 124, Pl. XX, fig. 239.

Pseudobulimina chapmani (Heron-Allen and Earland) Earland, 1934, p. 134, Pl. VI, figs. 11-14.

Observations.—Heron-Allen and Earland correctly separate this species as distinct from *Bulimina seminuda* Terquem, to which it was originally referred. One of the very distinguishing characters is the remarkably flat septal face. In further illustration of this species the authors mentioned appear to have selected a varietal form with a peculiarly inflated apical spiral for their figure 18. This appears to be an abnormal specimen as nothing approaching it has been met with in the abundant material from the "Aurora" dredgings. The records are all from off the Ice Barrier.

Occurrence.—XXI, common; XXII, common; XXIII, very rare; XXIV, frequent; XCVIII, rare.

Genus CASSIDULINA *d'Orbigny*, 1826.

87. CASSIDULINA CRASSA *d'Orbigny*.

Cassidulina crassa *d'Orbigny*, 1839 (3), p. 56, Pl. VII, figs. 18–20. Cushman, 1911, p. 97, text-figs. 151a–c. Heron-Allen and Earland, 1922, p. 138.

Observations.—This species is, strangely, rare in the "Aurora" dredgings; in those of the "Terra Nova" it was almost universally distributed, increasing in size and abundance to the south. *D'Orbigny's* types came from the Falkland Islands and off Cape Horn.

Occurrence.—XXI, very rare; XXIV, rare; XLV, very rare.

88. CASSIDULINA ELEGANS *Sidebottom*.

Cassidulina elegans *Sidebottom*, 1910, p. 106, Pl. IV, figs. 1a–c.

Observations.—There are four fine examples of this beautiful species. *Sidebottom's* types were from lat. 19° 4' S.; long. 179° 43' E., 1,050 fathoms, in the South Pacific. Our examples are from two stations, east of Tasmania, from depths of 1,180 and 1,320 fathoms.

Occurrence.—XLVI, rare; XLVII, rare.

89. CASSIDULINA LAEVIGATA *d'Orbigny*.

Cassidulina laevigata *d'Orbigny*, 1826, p. 282, No. 1, Pl. XV, figs. 4, 5. Brady, 1884, p. 428, Pl. LIV, figs. 1–3. Pearcey, 1914, p. 1015. Heron-Allen and Earland, 1922, p. 137.

Observations.—This species did not occur in the Antarctic soundings of the "Aurora," our only examples being from off the east coast of Tasmania, 1,320 fathoms. Heron-Allen and Earland record it as generally distributed, but never very abundant in the "Terra Nova" dredgings. *Cassidulina laevigata* is known as a fossil in the older Tertiary of Victoria.

Occurrence.—XLVII, frequent.

90. *CASSIDULINA OBLONGA* Reuss.

Cassidulina oblonga Reuss, 1850, p. 376, Pl. XLVIII, figs. 5, 6. Chapman, 1917 (1), p. 30, Pl. II, figs. 12a; b. Cushman, 1925, p. 55, Pl. IX, figs. 19-22. Heron-Allen and Earland, 1922, p. 138.

Observations.—As compared with *Cassidulina crassa*, this species is much more common in the "Aurora" dredgings. The geological history of *Cassidulina oblonga* appears to begin in the Oligocene of Victoria. Reuss' original material was from the Miocene of the Vienna Basin. It is remarkable that the examples of this species from the Antarctic are much larger and finer in every way than those at hand from the type locality.

Occurrence.—I, frequent; VIII, very rare; IX, very common; XIV, very common; XV, common; XVI, frequent; XX, very rare; XXI, frequent; XXII, frequent; XXV, rare; XXVI, very rare; XXXVIII, very rare; XXXIX, frequent; XLVI, very rare; XLVII, frequent; XLVIII, common; LXXIV, very rare; LXXV, common; LXXXIII, very rare.

91. *CASSIDULINA SUBGLOBOSA* Brady.

Cassidulina subglobosa Brady, 1881, p. 60; 1884, p. 430, Pl. LIV, figs. 17a-c. Pearcey, 1914, p. 1015. Chapman, 1917 (1), p. 31, Pl. II, fig. 14. Heron-Allen and Earland, 1922, p. 138.

Observations.—This species has been recorded previously by the senior author from upthrust muds on the shores of, and from soundings in, the Ross Sea. The type locality of *Cassidulina subglobosa* was not designated by Brady, but the example figured by him was from "Challenger" Station 120, off Pernambuco, Brazil (Nuttall). The species is one of the commoner forms in the Tertiary of Victoria.

Occurrence.—I, frequent; V, very rare; IX, very common; XI, very rare; XIV, common; XV, very rare; XX, frequent; XXII, rare; XXIII, rare; XXIV, rare; XXVI, very rare; XXIX, very rare; L, very rare; LXXIV, common; LXXV, very rare; XCVIII, frequent; CIV, rare; CVI, very rare; CXIV, rare.

92. *CASSIDULINA SUBGLOBOSA* Brady, *var. PRODUCTA*, *var. nov.* Plate VIII, fig. 12.

Description.—This variety differs from the type species in having the later part of the test produced into a bluntly rounded apex, thus giving a pyriform aspect to the shell.

Dimensions.—Length, 0.48 mm.; width, 0.35 mm.

Observations.—Since this modification of *Cassidulina subglobosa* is constant in character, we have no hesitation in giving it a varietal name.

It is also noteworthy that the var. *producta* occurs in Victoria in the Miocene of Torquay. In the Pliocene of Kar Nicobar there occurs a form at first sight comparable with the above variety, viz., "*Sphaeroidina*" (*C.*) *murrhyna* (Schwager C.; 1866, Pl. VII, fig. 97) but the latter has fewer chambers, and the oral face flatter with a more slit-like aperture. *Cassidulina murrhyna* was recorded by the senior author from dredgings off Tasmania (Chapman, 1915, p. 20) but on referring to the specimens they are now seen to belong to the above variety of *Cassidulina subglobosa*.

Occurrence.—XLVI, frequent.

GENUS CASSIDULINOIDES *Cushman*, 1927.

93. CASSIDULINOIDES CHAPMANI *Parr*.

Cassidulina parkeriana Heron-Allen and Earland (*non* Brady), 1924, p. 146.

Cassidulinoides chapmani Parr, 1931, p. 99, text-figs. a-c; 1932, p. 231, Pl. XXII, figs. 36, 37.

Observations.—This species has recently been described from Victorian shore sands and the Tertiary of Victoria. It was previously recorded (as *Cassidulina parkeriana*) by Heron-Allen and Earland from the Lower Miocene of Batesford, Victoria. The present specimens are from dredgings off the east coast of Tasmania, 1,320 fathoms.

Occurrence.—XLVII, rare.

94. CASSIDULINOIDES PARKERIANA (*Brady*).

Cassidulina parkeriana Brady, 1881, p. 59; 1884, p. 432, Pl. LIV, figs. 11-16. Chapman, 1909 (1), p. 128, Pl. IX, fig. 7; 1917 (2), p. 30, Pl. II, fig. 13. Pearcey, 1914, p. 1016. Heron-Allen and Earland, 1922, p. 139.

Observations.—The examples are usually like fig. 14 of the "Challenger" Report, as were those recorded by the senior author from the upthrust muds on the shores of the Ross Sea, and Heron-Allen and Earland from the Antarctic dredgings of the "Terra Nova." The finest specimens met with by us are from Sample CVI. The specimens from the Miocene of Batesford, Victoria, recorded under this name by Heron-Allen and Earland (1924, p. 146) have been renamed *Cassidulinoides chapmani* (q.v.) by the junior author (W.J.P.).

Occurrence.—Sample I, very rare; XIV, frequent; XVI, rare; XXI, common; XXIII, rare; XXIV, rare; XLV, very rare; XLVI, rare; XCVIII, very rare; CVI, very rare.

Genus *EHRENBERGINA* Reuss, 1850.

95. *EHRENBERGINA BRADYI* Cushman.

Ehrenbergina serrata Brady, *pars* (*non Ehrenbergina serrata* Reuss), 1884, Pl. LV, figs. 2, 3.

Ehrenbergina bradyi Cushman, 1922, p. 134, Pl. XXVI, fig. 5; 1927 (5), p. 5, Pl. II, figs. 1a-c.

Observations.—This species appears to be confined to the Pacific and Southern Oceans, and is a common form on the coast of New South Wales. It is easily distinguished from Reuss' form in having a median duplex carina on the inner concave side.

Occurrence.—XLVII, very rare; CXIV, very rare.

96. *EHRENBERGINA GLABRA* Heron-Allen and Earland.

Ehrenbergina serrata Chapman (*non* Reuss), 1917 (1), p. 31, Pl. II, figs. 16, 17.

Ehrenbergina hystrix Brady, var. *glabra* Heron-Allen and Earland, 1922, p. 140, Pl. V, figs. 1-6, 11. Cushman, 1927 (5), p. 4, Pl. I, figs. 7, 8.

Observations.—The above form is characteristic of the Antarctic Foraminiferal fauna, and is the most abundant of the genus. We have raised this variety of Heron-Allen and Earland's to specific rank, for it is distinct in itself and seems to bear no relationship to *Ehrenbergina hystrix*. It may be regarded as a southern form of *Ehrenbergina serrata*, to which species the senior author referred the specimens from the Shackleton Expedition.

Occurrence.—I, common; IX, common; X, very rare; XIV, common; XV, very rare; XIX, frequent; XXI, common; XXII, common; XXIII, common; XXIV, common; XXXIII, very rare; XXXVIII, very rare; LXXV, very rare; XCVIII, very common; CIII, common.

97. *EHRENBERGINA MESTAYERI* Cushman.

Ehrenbergina serrata Chapman (*non Ehrenbergina serrata* Reuss), 1907, p. 33, Pl. IV, figs. 85-87; 1909 (2), p. 332, Pl. XV, fig. 2. Cushman, 1919, p. 607.

Ehrenbergina mestayeri Cushman, 1922 (2), p. 135; 1927 (5), p. 4, Pl. I, fig. 9.

Observations.—We agree with Dr. Cushman in regarding this form as being quite distinct from *Ehrenbergina serrata* Reuss. The raised flattened area in the centre of the ventral side is a distinctive feature. Cushman's types came from off the Poor Knights Islands. The species also occurs off the Snares, south of New Zealand, 60 fathoms, and as a fossil, in the Tertiary of New Zealand and Australia.

Occurrence.—XXV, very rare; XLVI, rare; LXV, very rare.

SUB-FAMILY BULIMININAE.

Genus BULIMINA *d'Orbigny*, 1826.98. BULIMINA ACULEATA *d'Orbigny*.

Bulimina aculeata *d'Orbigny*, 1826, p. 269, No. 7. Brady, 1884, p. 406, Pl. LI, figs. 7-9. Heron-Allen and Earland, 1922, p. 128.

Observations.—This species is of common occurrence, in deep-water dredgings, and is well-known from almost every recent deposit of that character.

Occurrence.—X, very rare; XI, very common; XII, very rare; XVI, rare; XXIX, very rare; XXX, common; XL, rare; XLV, very rare; XLVI, common; XLVII, very common; XLVIII, common; LXXXVII, common; LXXXVIII, very rare; LXXXIX, very rare; XC, very common.

99. BULIMINA AFFINIS *d'Orbigny*.

Bulimina affinis *d'Orbigny*, 1839 (1), p. 105, Pl. II, figs. 25, 26. Brady, 1884, p. 400, Pl. L, figs. 14a, b. Heron-Allen and Earland, 1922, p. 128. Cushman, 1922 (2), p. 103, Pl. XX, fig. 6.

Observations.—There are two typical examples. *D'Orbigny* described *Bulimina affinis* from a single specimen from shore sands of Cuba. The oldest record of this species appears to be that of the senior author from the Neocomian (Bargate Beds) of Surrey, England.

Occurrence.—X, very rare; XXX, rare.

100. BULIMINA BREVITRIGONA *sp. nov.* Plate VIII, fig. 13.

Description.—Test conical; short and broadly trigonal; consisting of a trifacial series of moderately inflated chambers, the last of which are comparatively large and well-inflated; sutures well impressed, aperture a curved slit between the sutures of the last three chambers, the edges of which are delicately toothed. Aboral end somewhat acute. Test hyaline, finely tubulate and polished on the surface.

Dimensions.—Length, 0.7 mm.; width, 0.67 mm.

Observations.—This species is practically isomorphous with *Vermulina bradyi* Cushman, which has a finely arenaceous test.

Occurrence.—XXII, very rare.

101. *BULIMINA BUCHIANA d'Orbigny.*

Bulimina buchiana d'Orbigny, 1846, p. 186, Pl. XI, figs. 15-18. Brady, 1884, p. 407, Pl. LI, figs. 18, 19. Chapman, 1909 (1), p. 127, Pl. IX, fig. 6. Heron-Allen and Earland, 1922, p. 129.

Observations.—Occasional examples occur. They resemble those figured by Brady but have weaker costae. Judging by d'Orbigny's type figures and topotype material from the Vienna Basin, Brady's figures of *Bulimina buchiana* are not typical, the true form of this species being intermediate in character between *B. inflata* Seguenza and Brady's figures of *B. buchiana*. Its geological history appears to begin in the Eocene (Bavaria, Biarritz and Nigeria). The only record in the Australian region is from the Miocene (Janjukian) of the Sorrento Bore, at 1,160 feet (Chapman and Crespin).

Occurrence.—XIV, very rare; XXX, very rare; XLVI, rare.

102. *BULIMINA BUCHIANA d'Orbigny, var. GUTTA var. nov.* Plate VIII, fig. 14.

Description.—Test elongate, ovate, slightly curved, wider at oral end, pointed aborally; sides gently convex. Surface ornamented with about ten fine sharp costae, persistent to the penultimate chamber; aperture bulimine, situated in a slight concavity.

Dimensions.—Length, 0.4 mm.; greatest width, 0.19 mm.

Observations.—This variety has a more slender habit of growth than the specific form. Its narrow and slightly curved test makes it easily distinguishable from typical examples of *Bulimina buchiana*. *Bulimina rostrata*, at first sight suggestive of the above variety, differs in the dominant costae, obliterating the suture lines, as well as in the aciculate aboral end.

Occurrence.—XLVII, frequent.

103. *BULIMINA ELEGANS d'Orbigny.*

Bulimina elegans d'Orbigny, 1826, p. 270, No. 10; Modèle No. 9. Brady, 1884, p. 398, Pl. L, figs. 1-4. Heron-Allen and Earland, 1922, p. 127.

Observations.—This species has been recorded in the recent condition off the islands of the South Pacific, from New Zealand, and from the Antarctic. As a fossil it has been recorded by one of us (F.C.) from the Tertiary of the Mallee Bores.

Occurrence.—XI, frequent.

104. BULIMINA EXILIS *Brady*.

Bulimina elegans, var. *exilis* Brady, 1884, p. 399, Pl. L, figs. 5, 6. Heron-Allen and Earland, 1922, p. 127. Cushman, 1922 (2), p. 106, Pl. XVII, figs. 7-12; Pl. XIX, figs. 2, 3.

Observations.—This widely distributed form has been recorded from off New Zealand by Heron-Allen and Earland, but not from the Antarctic. The specimens found are quite typical.

Occurrence.—XXXVIII, very rare; XXXIX, very rare; XLI, very rare; XCVIII, frequent; CXIV, frequent.

105. BULIMINA INFLATA *Seguenza*.

Bulimina inflata Seguenza, 1862, p. 109, Pl. I, fig. 10. Brady, 1884, p. 406, Pl. LI, figs. 10-13. Heron-Allen and Earland, 1922, p. 128.

Observations.—This usually deep-water form is here confined to samples from east and south of Tasmania.

The "Terra Nova" records of this species are from New Zealand waters.

Records of fossil examples include those of Reuss from the Oligocene of Germany, and of Schwager and Seguenza from the Neogene of Kar Nicobar and of Southern Italy.

Occurrence.—XXX, very rare; XLVI, very rare; XLVII, common; XLVIII, very rare

106. BULIMINA ROSTRATA *Brady*.

Bulimina rostrata Brady, 1884, p. 408, Pl. LI, figs. 14, 15. Cushman, 1911, p. 87, figs. 140a, b (in text). Heron-Allen and Earland, 1922, p. 129.

Observations.—Dr. H. B. Brady places *Bulimina truncana* Hantken (Brady, *loc. cit.*) in the synonymy of his species but omits to refer to it as not of Gumbel. Hantken's reference is to a form identical with Brady's *Bulimina rostrata*, but not then named, and therefore Brady's species stands.

This species did not occur in the Antarctic dredgings of the "Terra Nova." Our example came from a dredging lat. 49° 9' S., long. 148° 1' E., at a depth of 2,400 fathoms.

Occurrence.—LXV, very rare.

SUB-FAMILY VIRGULININAE.

Genus VIRGULINA d'Orbigny, 1826.

107. VIRGULINA CORNUTA Cushman.

Virgulina cornuta Cushman, 1913, p. 637, Pl. LXXX, fig. 1; 1921, p. 170, Pl. XXXII, figs. 3-6.

Observations.—One typical example was found, but has unfortunately been mislaid. This species was described from the China Sea, near Southern Luzon, 422 fathoms. It is readily distinguishable from the other species of *Virgulina* by its peculiar hornlike shape, the much-inflated later chambers and the tapering, curved, early portion.

Occurrence.—After examining and identifying this species the original and only specimen was unfortunately mislaid, together with the number of the station.

108. VIRGULINA DAVISI, sp. nov. Plate VIII, fig. 15.

Virgulina schreibersiana Brady (non Czjzek), 1884, p. 414, Pl. LII, figs. 1 and 3 (non 2).

Description.—Test narrow, attenuate; surface polished; segments few, spirally alternate; aborally often apiculate. Aperture widely open and bulimine.

Length of Brady's example (Pl. LII, fig. 1), 0.43 mm.; greatest width, 0.085 mm.

Observations.—*Virgulina schreibersiana*, to which Brady referred the above form, is a larger species, somewhat depressed and elongately ovate. Brady's specimens of this new species came from the South Pacific. Our specimens come from the colder waters of the Antarctic, whilst the specimens of the present series, which we refer to *V. schreibersiana*, came from the Tasmanian area. This species is named in honour of Captain J. King Davis, R.N.R., the Commander of the "Aurora." The species most closely related to *V. davis* appears to be *Virgulina longissima* (Costa), figured by Costa (1856, Pl. XIII, figs. 22, 23) as *Polymorphina longissima*, from the Tertiary of Italy. The latter species has more chambers, is longer and has a narrower aperture.

Occurrence.—XI, very rare; XXV, very rare.

109. VIRGULINA PUNCTATA d'Orbigny.

Virgulina punctata d'Orbigny, 1839 (1), p. 139, Pl. I, figs. 35, 36. (Cushman, 1922 (1), p. 31, Pl. III, fig. 9.

Observations.—There occurs one very typical example of this rarely-recorded species, which appears to be a slender form of the later-described *Virgulina schreibersiana* Czjzek. D'Orbigny described it from the West Indies, and the only other records, those of Cushman, are from the same region.

Occurrence.—V, very rare.

110. *VIRGULINA SCHREIBERSIANA* Czjzek.

Virgulina schreibersiana Czjzek, 1848, p. 147, Pl. XIII, figs. 18-21.

Observations.—There are fairly typical examples in one sounding. The species figured under this name by Brady is different from Czjzek's species, toponotype examples of which we have from the Miocene of the Vienna Basin, and has been renamed *V. davisi* by us. Very characteristic specimens of *V. schreibersiana* occur in the Lower Miocene of Batesford, Victoria, and on the South Australian coast.

Occurrence.—XLVIII, rare.

111. *VIRGULINA SUBDEPRESSA* Brady.

Virgulina subdepressa Brady, 1884, p. 416, Pl. LII, figs. 14-17. Cushman, 1911, p. 93, text-fig. 147. Heron-Allen and Earland, 1922, p. 131.

Observations.—The "Challenger" records are chiefly from the stations in the South Pacific, south-west of Juan Fernandez, 1,825 fathoms, and from two in the South Atlantic, in mid-ocean, at 2,200 fathoms and 2,350 fathoms. Cushman has recorded *Virgulina subdepressa* from four stations in the North Pacific.

The "Terra Nova" records of this species were from two stations at each of which it was very rare, viz., off New Zealand and off South Victoria Land. The present examples are from dredgings in the Tasmanian region at about the same latitude.

As a fossil this species occurs in various Tertiary deposits, and the earliest record appears to be from the Lower Cretaceous (Bargate Beds of Surrey, England) by the senior author.

Occurrence.—XXV, rare; XLVII, very rare; CXIV, very rare.

112. *VIRGULINA SUBSQUAMOSA* Egger.

Virgulina subsquamosa Egger, 1857, p. 295, Pl. VIII, figs. 19-21. Brady, 1884, p. 415, Pl. LII, figs. 7-11. Egger, 1893, p. 291, Pl. VIII, figs. 89, 90, 109. Heron-Allen and Earland, 1922, p. 131.

Observations.—This variable species is well represented here. The specimens generally agree with Brady's fig. 11.

The original type-specimen came from the Miocene of Ortenburg, Bavaria.

Occurrence.—XLVII, common; XLVIII, common; LXXIV, common; XCI, very rare; XCVIII, very rare.

Genus BOLIVINA *d'Orbigny*, 1839.113. BOLIVINA BEYRICHI *Reuss*.

Bolivina beyrichi Reuss, 1851 (2), p. 83, Pl. VI, fig. 51. Brady, 1884, p. 422, Pl. LIII, fig. 1. Heron-Allen and Earland, 1922, p. 134.

Observations.—There is only one example from each sample, although the variety *alata* is of frequent occurrence in both soundings. According to Brady, the two forms are usually found together. Reuss described *Bolivina beyrichi* from the Oligocene beds of Germany.

Occurrence.—XLVI, very rare; XLVII, very rare.

114. BOLIVINA BEYRICHI *Reuss*, var. ALATA (*Seguenza*).

Vulvulina alata Seguenza, 1862 (1), p. 115, Pl. II, figs. 5, 5a.

Bolivina beyrichi, var. *alata* (Seg.) Brady, 1884, p. 422, Pl. LIII, figs. 2-4. Heron-Allen and Earland, 1922, p. 134.

Observations.—Typical specimens of this variety are fairly abundant here. All the stations where they occur are to the east of Tasmania in deep water. The "Terra Nova" examples were found in the New Zealand area. Previous localities for this variety are from the Pacific, at depths ranging from 50-800 fathoms.

Seguenza's original examples came from the Pleistocene of Catania, Sicily.

Occurrence.—XLV, very rare; XLVI, frequent; XLVII, very common; XLVIII, common.

115. BOLIVINA DECUSSATA *Brady*.

Bolivina decussata Brady, 1881, p. 58; 1884, p. 423, Pl. LIII, figs. 12, 13. Heron-Allen and Earland, 1922, p. 134.

Observations.—"Challenger" examples of the above were recorded at two stations in the South Pacific. The species occurred here in a terrigenous sounding at 930 fathoms, between Queen Mary Land and Adelie Land.

A single example was recorded by Heron-Allen and Earland from the "Terra Nova" dredgings.

Occurrence.—XI, very rare.

116. *BOLIVINA DILATATA* Reuss.

Bolivina dilatata Reuss, 1850, p. 381, Pl. XLVIII, fig. 15. Brady, 1884, p. 418, Pl. LII, figs. 20, 21. Heron Allen and Earland, 1922, p. 134.

Observations.—This species is here confined to the deep-water dredgings off the east coast of Tasmania. It is also a common form in the L. Miocene of Batesford, Victoria.

Occurrence.—XLVII, common; XLVIII, very rare.

117. *BOLIVINA HANTKENIANA* Brady.

Bolivina hantkeniana Brady, 1881, p. 58; 1884, p. 424, Pl. LIII, figs. 16–18. Millett, 1900, p. 546, Pl. IV, fig. 9. Cushman, 1911, p. 42, text-fig. 68.

Observations.—A single example was found in Sample XLVII, dredged off the east coast of Tasmania from 1,320 fathoms. This species is confined to the Indo-Pacific region, and is usually found in warmer shallower water than that from which it is now recorded.

Bolivina hantkeniana was not met with by Heron-Allen and Earland in the "Terra Nova" dredgings.

Occurrence.—XLVII, very rare.

118. *BOLIVINA LIMBATA* Brady.

Bolivina limbata Brady, 1881, p. 57; 1884, p. 419, Pl. LIII, figs. 26–28. Chapman, 1907, p. 32, Pl. IV, fig. 83. Heron-Allen and Earland, 1922, p. 137.

Observations.—Examples are fairly common in a deep-water dredging from off the east coast of Tasmania. The only "Terra Nova" record was from a single station off the coast of New Zealand, 70 fathoms. This species has an Indo-Pacific distribution, in the living condition. Its geological history begins in the Upper Eocene of New Zealand, and it is a common form in the Miocene of Victoria.

Occurrence.—XLVI, frequent.

119. *BOLIVINA LOBATA* Brady.

Bolivina lobata Brady, 1881, p. 58; 1884, p. 425, Pl. LIII, figs. 22, 23. Heron-Allen and Earland, 1922, p. 134.

Observations.—Like the preceding species, *Bolivina lobata* is here recorded from a single deep-water station off the east coast of Tasmania. Heron-Allen and Earland noted its occurrence in four "Terra Nova" soundings, all off the coast of New Zealand. The "Challenger" records were confined to moderately shallow water near Papua. As a fossil, *Bolivina lobata* occurs in the Tertiary of Victoria.

Occurrence.—XLVII, very rare.

120. *BOLIVINA PUNCTATA* d'Orbigny. Plate VIII, fig. 16.

Bolivina punctata d'Orbigny, 1839 (3), p. 63, Pl. VIII, figs. 10-12. Chapman, 1907, p. 32, Pl. IV, fig. 80. Heron-Allen and Earland, 1922, p. 132.

Observations.—All of the present specimens were dredged from the Tasmanian region with the exception of those from Sample CXIV, which is from the mid-Southern Ocean. Specimens from Sample XXX are exceptionally delicate and transparent and show the internal sinuous tube (see fig. 16).

The "Terra Nova" specimens were more widely distributed. *Bolivina punctata* is a cosmopolitan form, and in fossil deposits is found as far back as the Lower Miocene (Balcombian) of Victoria and the Upper Eocene of New Zealand.

Occurrence.—XXX, frequent; XLVII, rare; XLVIII, frequent; CXIV, very rare.

121. *BOLIVINA PYGMAEA* Brady.

Bolivina pygmaea Brady, 1881, p. 57; 1884, p. 421, Pl. LIII, figs. 5, 6.

Bolivina difformis Heron-Allen and Earland (*non Textularia variabilis*, var. *difformis* Williamson), 1922, p. 135.

Observations.—Our specimens agree with Brady's figures of the species. Williamson's var. *difformis* of *Bolivina variabilis*, although somewhat similar in its lateral aspect, is distinct in edge view and oral characters. Probably the "Terra Nova" specimens are similar to ours, for Heron-Allen and Earland include Brady's specific name in the synonymy.

The present examples were dredged off Tasmania. The "Challenger" specimens of *Bolivina pygmaea* were almost confined to the Atlantic, with one exception, in the Southern Ocean. The "Terra Nova" records were made from the New Zealand area.

Occurrence.—XLVII, common.

122. *BOLIVINA ROBUSTA* Brady.

Bolivina robusta Brady, 1881, p. 57; 1884, p. 421, Pl. LIII, figs. 7-9. Heron-Allen and Earland, 1922, p. 136.

Observations.—The solitary specimen found here in Tasmanian waters is typical in form, although the surface is ornamented with some exogenous beading. A single specimen was found in the Antarctic from the "Terra Nova" soundings. It is a well-known species in the Southern Hemisphere, where it is most characteristic, but is also distributed as far north as Bergen, Norway. *Bolivina robusta* is also found fossil in the Lower Miocene of Australia and the Miocene of New Zealand.

Occurrence.—XLVIII, very rare.

123. *BOLIVINA SEMINUDA* Cushman. Plate VIII, fig. 17.

Bolivina seminuda Cushman, 1911, p. 34, text-fig. 55; 1927 (3), p. 157, Pl. III, fig. 6.

Observations.—Both megalospheric and microspheric forms of this species occur here. The original examples were from the Bering Sea. According to Cushman it is common on the Pacific coast of North America, and occurs as a fossil in the Pliocene of California. The species was absent from the "Terra Nova" dredgings.

Occurrence.—XXIX, very rare; XLVIII, frequent.

124. *BOLIVINA SPHENOIDES*, *sp. nov.* Plate VIII, fig. 18.

Description.—Test hyaline, perforations distinct, broadly conical and narrowly wedge-shaped in edge view. Chambers narrow, about 7 or 8 on each side. Surface flat, with roughened and almost pustulate sutures. Edges of test serrate from projecting ends of segments. Aperture a narrow slit on face of last chamber.

Length, 0.36 mm.; greatest width, 0.2 mm.; greatest thickness, 0.057 mm.

Observations.—This species partakes of some of the characters of *Bolivina lobata* Brady but the test is not distinctly segmented. From *Bolivina robusta* Brady, it differs in the perfectly plane surfaces and conspicuous sutures.

Occurrence.—XXX, rare.

Genus RECTOBOLIVINA Cushman, 1927.125. *RECTOBOLIVINA BIFRONS* (Brady).

Sagrina bifrons, Brady, 1881, p. 64; 1884, p. 582, Pl. LXXV, figs. 18-20. Heron-Allen and Earland, 1922, p. 186.

Rectobolivina bifrons (Brady), Cushman, 1927 (1), p. 68, Pl. XIV, fig. 11.

Observations.—Typical examples occur in two deep water dredgings off the east coast of Tasmania. The species was originally described by Brady from a "Challenger" dredging on the *Hyalonema* ground, south-east of Japan, from 345 fathoms. Although this is the only "Challenger" record of *Rectobolivina bifrons* it is common in material at hand from "Challenger" Station 185, off Raine Island, Torres Strait, 155 fathoms. It is known also from off the Philippines and near Funafuti.

The examples of this species recorded in the "Terra Nova" Report (*op. cit.*) were fossils, dredged off the coast of New Zealand.

Occurrence.—XLVII, very rare; XLVIII, very rare.

SUB-FAMILY REUSSELLINAE.

Genus REUSSELLA Galloway, 1923.

126. REUSSELLA SPINULOSA (Reuss).

Verneuilina spinulosa Reuss, 1850, p. 374, Pl. XLVII, fig. 12.*Reussia spinulosa* (Reuss) Schwager, 1877, p. 26, Pl. fig. 66.*Verneuilina spinulosa* Reuss, Brady, 1884, p. 384, Pl. XLVII, figs. 1-3. Heron-Allen and Earland, 1922, p. 124.

Observations.—There is one fine example from Sample XXV, dredged south-west of Tasmania, from a depth of 2,590 fathoms. *Reussella spinulosa* has a cosmopolitan distribution as a living form. The type specimens were from the Miocene of the Vienna Basin, and the species occurs in beds of similar age in Australia.

Occurrence.—XXV, very rare.

SUB-FAMILY UVIGERININAE.

Genus UVIGERINA d'Orbigny, 1826.

127. UVIGERINA ACULEATA d'Orbigny.

Uvigerina aculeata d'Orbigny, 1846, p. 191, Pl. XI, figs. 27, 28. Brady, 1884, p. 578, Pl. LXXV, figs. 1, 2. Heron-Allen and Earland, 1922, p. 184.

Observations.—This species occurred in the "Terra Nova" dredgings; off New Zealand it reaches an enormous size. In the present series it did not occur farther south than 50° lat.; at three stations south of Tasmania and one in the Southern Ocean, at 1,475 to 2,600 fathoms.

Occurrence.—XXX, very rare; XXXI, rare; XXXII, rare; CXIV, very rare.

128. UVIGERINA AMPULLACEA Brady.

Uvigerina asperula Czjzek, var. *ampullacea* Brady, 1884, p. 579, Pl. LXXV, figs. 10, 11. Heron-Allen and Earland, 1922, p. 184.

Observations.—The present samples were from the east of Tasmania in deep water. The "Terra Nova" examples came from three stations off New Zealand, and from Rio de Janeiro.

Occurrence.—XLVII, rare; XLVIII, rare.

129. *UVIGERINA ASPERULA* Czjzek.

Uvigerina asperula Czjzek, 1848, p. 146; Pl. XIII, figs. 14, 15. Heron-Allen and Earland, 1922, p. 184.

Observations.—Judging by the material that we have from the Miocene of the Vienna Basin, this appears to be merely a variety of *Uvigerina pigmea*, d'Orb. in which the costae are replaced by lines of short prickles. The most typical examples were from Sample LXV. (See Brady, 1884, Pl. LXXV, fig. 8.)

Occurrence.—XXXIX, rare; XL, very rare; LXV, common; XCII, very rare; XCVIII, common; CXIV, very common.

130. *UVIGERINA AUBERIANA* d'Orbigny.

Uvigerina auberiana d'Orbigny, 1839 (1), p. 106, Pl. II, figs. 23, 24. Heron-Allen and Earland, 1922, p. 184. Cushman, 1923, p. 163, Pl. XLII, figs. 3, 4.

Observations.—The only example found agrees with d'Orbigny's type-figures of this species. Heron-Allen and Earland also record a single specimen from off New Zealand. The species is typically a West Indian one, and occurs as a fossil in the Miocene of Trinidad.

Occurrence.—XLVIII, very rare.

131. *UVIGERINA PORRECTA* Brady.

Uvigerina porrecta Brady, 1879, p. 60, Pl. VIII, figs. 15, 16; 1884, p. 577, Pl. LXXIV, figs. 21-23.

Observations.—According to Brady, this is a coral-reef species, his records of its occurrence being from off Bermuda, 435 fathoms, and from six "Challenger" stations in the Indo-Pacific, from depths ranging from shallow water to 1,850 fathoms.

Occurrence.—XXX, very rare.

132. *UVIGERINA PIGMEA* d'Orbigny. Plate VIII, fig. 19.

Uvigerina pigmea d'Orbigny, 1826, p. 269, Pl. XII, figs. 8, 9, Modèle No. 67.

Uvigerina pygmaea (d'Orb.) Brady, 1884, p. 575, Pl. LXXIV, figs. 11-14. Chapman, 1917 (2), p. 68, Pl. IV, fig. 32. Heron-Allen and Earland, 1922, p. 183.

Observations.—This species was previously recorded by one of us (F.C.) from the Shackleton dredgings in the Ross Sea, and off Great Barrier Island, New Zealand. Heron-Allen and Earland obtained it from "Terra Nova" samples, in the New Zealand area and in the Antarctic. It is a cosmopolitan form, being found also as far north as

Franz Josef Land. Fossil specimens occur in the Upper Eocene of New Zealand. Some of the specimens are of the elongate hispid and costate form occurring with typical examples, and which is closely related to the variety which Brady has identified as *Uvigerina brunnensis*.

Occurrence.—XXV, frequent; XXIX, common; XXX, very rare; XXXII, rare; XXXVIII, frequent; XLVI, rare; XLVII, rare; XLVIII, very rare; XLIX, rare; CXIV, frequent; CXV, common.

Genus SIPHOGENERINA Schlumberger, 1883.

133. SIPHOGENERINA COLUMELLARIS (*Brady*).

Sagrina columellaris Brady, 1881, p. 64; 1884, p. 581, Pl. LXXV, figs. 15-17.

Siphogenerina (Sagrina) columellaris (Brady) Egger, 1893, p. 316, Pl. IX, figs. 28, 31, 33.

Sagrina columellaris Brady, Heron-Allen and Earland, 1922, p. 185.

Siphogenerina columellaris (Brady) Cushman, 1926, p. 11, Pl. II, figs. 4, 11; Pl. III, figs. 1-4; Pl. IV, figs. 5, 6; Pl. V, figs. 9-11.

Observations.—This species here occurs in a sounding from the east of Tasmania. It is the most widely distributed species of the genus, and is most frequent in the Pacific. It is not uncommon on the Victorian coast. The "Terra Nova" records were from off New Zealand.

Occurrence.—XLVII, very rare.

134. SIPHOGENERINA DIMORPHA (*Parker and Jones*).

Uvigerina (Sagrina) dimorpha Parker and Jones, 1865, p. 420, Pl. XVIII, fig. 18.

Sagrina dimorpha (Parker and Jones) Brady, 1884, p. 582, Pl. LXXVI, figs. 1-3. Heron-Allen and Earland, 1922, p. 186.

Observations.—The specimen found here is without the sutural crenellations figured by Brady, who, however, states that this feature may not always be present. *S. dimorpha* ranges from Norwegian seas to the Southern Ocean. The present occurrence is from a sounding off the east coast of Tasmania at 1,300 fathoms, apparently a record for great depth. The "Terra Nova" examples came from the New Zealand area in waters of moderate depth.

Occurrence.—XLVIII, very rare.

Genus SIPHONODOSARIA A. *Silvestri* 1924.

135. SIPHONODOSARIA LEPIDULA (*Schwager*).

Nodosaria lepidula Schwager, 1866, p. 210, Pl. V, figs. 27, 28. Cushman, 1921, p. 203; Pl. XXXVI, fig. 6.

Observations.—The present examples, from 675 fathoms, east of Tasmania, are quite comparable with Cushman's specimens found in the Pacific Ocean, off the east coast of Mindanao, at 494 fathoms.

Occurrence.—XLV, rare.

Genus ANGULOGERINA *Cushman* 1927.

136. ANGULOGERINA ANGULOSA (*Williamson*).

Uvigerina angulosa Williamson, 1858, p. 67, Pl. V, fig. 140. Chapman, 1917 (1), p. 32, Pl. III, fig. 22. Heron-Allen and Earland, 1922, p. 183. Cushman, 1923, p. 170, Pl. XLI, figs. 17-20.

Observations.—This well-distributed species also occurred in the "Terra Nova" gatherings and in the Shackleton collection from the side of Mt. Erebus. In the present samples, *Angulogerina angulosa* shows a large amount of variation, both as regards the torsion of the test and the costation, some specimens being practically smooth, and at first sight resembling *Trifarina*.

Occurrence.—I, common; II, very rare; V, very common; VII, common; VIII, very rare; IX, very common; XI, very common; XV, very rare; XVI, common; XVII, very rare; XIX, very rare; XX, frequent; XXI, common; XXII, very common; XXIII, common; XXIV, common; XLI, very rare; XLII, very rare; XLV, frequent; XLVI, frequent; XLVII, very common; XLVIII, common; LXI, very rare; LXII, very rare; LXXIV, frequent; LXXV, frequent; XCVIII, very common; CVI, rare.

137. ANGULOGERINA ANGULOSA (*Williamson*), var. ASPERRIMA *nov.* Plate VIII, fig. 20.

Description.—Test elongate and trihedral as in the type species, but with the surface generally covered with spinous prickles. The trihedral character in some is not clearly shown through the length of the shell, since in these specimens the later chambers are distinctly inflated, approaching the shape of a true *uvigerine*. Dimensions as in the type species.

Occurrence.—XCVIII, frequent.

Genus TRIFARINA Cushman 1923.

138. TRIFARINA BRADYI Cushman.

Rhabdogonium tricarinatum Brady (non *Vaginulina tricarinata* d'Orb.); 1884, p. 525, Pl. LXVII, figs. 1-3. Heron-Allen and Earland, 1922, p. 175.

Trifarina bradyi Cushman, 1923, p. 99, Pl. XXII, figs. 3-9. Chapman and Parr, 1926, p. 386, Pl. XX, fig. 52.

Observations.—The only example is from Sample XLVII, dredged off the east coast of Tasmania, from 1,320 fathoms.

The "Terra Nova" records were from three stations off New Zealand. As a fossil, *Trifarina bradyi* has been recorded by us from the L. Miocene (Balcombian) of Victoria.

Occurrence.—XLVII, very rare.

FAMILY ELLIPSOIDINIDAE.

Genus PLEUROSOMELLA Reuss 1860.

139. PLEUROSOMELLA ALTERNANS Schwager.

Pleuromella alternans Schwager, 1866, p. 238, Pl. VI, figs. 79, 80. Brady, 1884, p. 412, Pl. LI, figs. 22, 23.

Observations.—The examples recorded from the samples below have the typical spatulate depression of the oral region. These "Aurora" records are from off the Ice Barrier in 930 fathoms, and from the west of Tasmania in 2,590 fathoms. Fossil examples are known from beds as old as the Cretaceous.

Occurrence.—XI, rare; XXV, very rare.

Genus ELLIPSOLAGENA A. Silvestri 1923.

140. ELLIPSOLAGENA CUCULLATA, *sp. nov.* Plate VIII, figs. 21a, b.

Description.—Test long ovate, compressed; greatest width in the lower third; bluntly pointed orally, with the aperture depressed and excavated on one side, surmounted by a hooded projection. Aboral extremity bluntly rounded. Periphery gently curved. Faces depressed convex. Surface shining.

Length, 0.4 mm.; greatest width, 0.2 mm.; thickness *circ.*, 0.12 mm.

Observations.—This distinct species was found in only one locality off the Shackleton Shelf in 220 fathoms.

The so-called *Lagena apiculata* of Brady (non Reuss) figured in the "Challenger" Reports (1884, Pl. LVI, figs. 17, 18) belong to this genus. They differ from the above form in having an apiculate aboral end, whereas ours are more broadly rounded. The genotype of *Ellipsolagena*, *E. ventricosa* Silvestri, is a much broader form.

Occurrence.—XXIV, frequent.

141. ELLIPSOLAGENA SCHLICHTI (*A. Silvestri*).

Fissurina schlichti A. Silvestri, 1902, p. 143, text-figs. 9-11.

Lagena schlichti (A. Silvestri) Chapman, 1909 (2), p. 337, Pl. XV, figs. 7a, b; 1917 (2), p. 66, Pl. IV, fig. 27. Heron-Allen and Earland, 1922, p. 156.

Observations.—Previous southern records are those of the senior author from around the Subantarctic Islands of New Zealand, at depths of 50-85 fathoms, and from three soundings in the Ross Sea, from depths of 121-171 fathoms; and of Heron-Allen and Earland, from eight "Terra Nova" stations. Silvestri's types were from the Tertiary of Italy.

Occurrence.—XLVII, very rare; XCVIII, common.

FAMILY NONIONIDAE.

Genus NONION Montfort 1808.142. NONION DEPRESSULUS (*Walker and Jacob*).

Nautilus depressulus Walker and Jacob, 1798, p. 641, Pl. XIV, fig. 33.

Nonionina depressula (Walker and Jacob) Brady, 1884, p. 725, Pl. CIX, figs. 6, 7. Chapman, 1917 (2), p. 70, Pl. V, fig. 41.

Observations.—There are many typical examples of this widely distributed species. Others have strongly inflated chambers, and the umbilicus is beaded. This is the commonest species of the genus in Antarctic dredgings.

Occurrence.—XI, very rare; XIX, rare; XX, very rare; XXI, very rare; XXX, very rare; XXXII, rare; XXXVIII, very rare; XLI, rare; LXV, very rare; XCVIII, frequent; CXIII, very rare; CXIV, common.

143. NONION POMPILIOIDES (*Fichtel and Moll*).

Nautilus pompilioides Fichtel and Moll, 1798, p. 31, Pl. II, figs. a-c.

Nonionina pompilioides (F. and M.) Brady, 1884, p. 727, Pl. CIX; figs. 10, 11.

Observations.—The examples are rare but typical.

The Recent records of this species are usually from shallow water and the present records are no exception to the rule. *Nonion pompilioides* was recorded by Heron-Allen and Earland from six "Terra Nova" stations. It also occurs as a fossil in the Miocene of Victoria.

Occurrence.—XXX, very rare; XXXI, rare; XLIX, very rare; LXV, rare; CXIV, very rare.

144. NONION SCAPHA (*Fichtel and Moll*).

Nautilus scapha Fichtel and Moll, 1798, p. 105, Pl. XIX, figs. *d-f*.

Nonionina scapha (F. and M.) Brady, 1884, p. 730, Pl. CIX, figs. 14, 15 (*non* 16).

Observations.—There are two small specimens, one typical, and the other linking the typical form with that figured by Brady (*op. cit.*, Pl. CIX, fig. 16) and named var. *bradii* by one of us (F.C., 1917 (2), p. 71, Pl. V, fig. 42).

Occurrence.—XXIV, very rare; XLVII, very rare.

145. NONION UMBILICATULUS (*Montagu*).

Nautilus umbilicatulus Montagu, 1803, p. 191; Suppl., p. 78, Pl. XVIII, fig. 1.

Nonionina umbilicatula (Montagu) Brady, 1884, p. 726, Pl. CIX, figs. 8, 9.

Observations.—This frequently recorded species was described from the coast of Great Britain. The present examples from depths of from 1,180 to 2,600 fathoms are, except for being smaller and more thin-shelled than usual, otherwise quite typical. This species has been recorded by one of us (F.C.) as very common from 20 miles north of Auckland Island, 85 fathoms. It is also found fossil in the Tertiary of Victoria and elsewhere.

Occurrence.—XXXI, very rare; XXXIV, very rare; XLVI, very rare; XLVII, rare; XLVIII, common; LXXV, rare; LXXXII, very rare; CXIV, rare.

Genus ELPHIDIUM *Montfort*, 1808.146. ELPHIDIUM CRISPUM (*Linné*).

Nautilus crispum Linné, 1767, p. 1162; 1788, p. 3370.

Elphidium crispum (Linné) Cushman and Leavitt, 1929, p. 20, Pl. IV, figs. 3, 4.

Observations.—Typical examples of this well-known species were found in Sample XXII, 125 fathoms. The species was described from the Adriatic Sea. A thin complanate form of *Elphidium crispum* was recorded by one of us (F.C.) from the Ross Sea, 353 fathoms, and is also known from the Subantarctic Islands of New Zealand and off Kerguelen Island.

Occurrence.—XXII, rare.

147. *ELPHIDIUM MACELLUM* (Fichtel and Moll).

Nautilus macellus Fichtel and Moll, 1798, p. 66, Pl. X, figs. e-k.

Elphidium macellum (F. and M.) Cushman and Leavitt, 1929, p. 18, Pl. IV, figs. 1, 2.

Observations.—Fichtel and Moll figured two forms of this species as vars. α and β . Cushman and Leavitt have selected var. β as the genotype and make no reference to var. α . If any preference were given, the selection would be in favour of form but in our opinion the two forms are inseparable, the microspheric and megalospheric conditions possibly being represented by forms α and β respectively.

Occurrence.—XLVII, very rare; XLVIII, very rare.

148. *ELPHIDIUM VERRICULATUM* (Brady).

Polystomella verriculata Brady, 1881, p. 66; 1884, p. 738, Pl. CX, figs. 12a, b.
Chapman, 1909:(1), p. 142, Pl. X, fig. 10.

Observations.—The previous records of this species are from off East Moncoeur Island, Bass Strait, and in Curtis Strait, Queensland (Brady); Malay Archipelago, Sagami Bay, Japan (Millett); and shore sand, Beaumaris, Victoria (Chapman). As these are all shallow water occurrences, the present records from 1,320 and 1,300 fathoms are exceptional. These dredgings were from the east of Tasmania.

Occurrence.—XLVII, rare; XLVIII, very rare.

FAMILY HETEROHELICIDAE.

SUB-FAMILY BOLIVINITINAE.

Genus *BOLIVINITA* Cushman 1927.149. *BOLIVINITA QUADRILATERA* (Schwager).

Textularia quadrilatera Schwager, 1866, p. 253, Pl. VII, fig. 103. Brady, 1884, p. 358, Pl. XLII, figs. 8-12. Millett, 1899, p. 559, Pl. VII, fig. 3.

Bolivina obsoleta Heron-Allen and Earland (*non Textularia obsoleta* Eley), 1922, p. 136.

Observations.—There are here two examples, one a particularly fine specimen. This species was described by Schwager from the Pliocene of Kar Nicobar. The Recent records are usually from deep water, in the Atlantic and Pacific Oceans.

Textularia obsoleta Eley (now *Bolivinita eleyi* Cushman) of the Cretaceous, although often linked with the above, is distinguished by having a narrower test, broader aborally, and with the margins undulate.

Occurrence.—XLVI, rare.

FAMILY ROTALIIDAE.

SUB-FAMILY PATELLININAE.

Genus PATELLINA *Williamson* 1858.150. PATELLINA CORRUGATA *Williamson*.

Patellina corrugata Williamson, 1858, p. 46, Pl. III, figs. 86-89. Heron-Allen and Earland, 1922, p. 198, Pl. VII, fig. 5. Parr and Collins, 1930, p. 90, Pl. IV, figs. 1-5.

Observations.—Dr. Cushman has suggested (1924, p. 133) that probably *Patellina corrugata* is not represented in the Pacific, but after having compared our specimens with material from the British coast, we are satisfied that they are quite typical of this species.

Occurrence.—XXII, frequent; XXIII, rare; XXIV, very rare; LXV, very rare.

Genus PATELLINELLA *Cushman* 1928.151. PATELLINELLA INCONSPICUA (*Brady*).

Textularia inconspicua Brady, 1884, p. 357, Pl. XLII, figs. 6a-c. Heron-Allen and Earland, 1922, p. 116.

Patellinella inconspicua (Brady) Cushman, 1928, p. 5, Pl. I, figs. 8a-c. Parr and Collins, 1930, p. 92, Pl. IV, fig. 7.

Observations.—With one exception, the records of this species are all from the Indo-Pacific, the greatest depth being 345 fathoms, from south of Japan. The present perfectly typical examples are from the exceptional depth of 1,320 fathoms, east of Tasmania.

Occurrence.—XLVII, rare.

Genus DISCORBIS *Lamarck* 1804.152. DISCORBIS BERTHELOTI (*d'Orbigny*).

Rosalina bertheloti d'Orbigny, 1839 (2), p. 135, Pl. I, figs. 28-30.

Discorbis bertheloti (d'Orbigny) Cushman, 1915, p. 20, Pl. VII, fig. 3; text-figs. 23a-c.

Observations.—This species occurred at the two stations east of Tasmania, at depths of 1,320 and 1,300 fathoms. It is interesting to note that the only "Terra Nova" records of *Discorbis bertheloti* were confined to the New Zealand area, while Brady also notes that the most southerly record of the "Challenger" was at the south-eastern corner of Australia.

Occurrence.—XLVII, common; XLVIII, frequent.

153. DISCORBIS CONCINNA (*Brady*).

Discorbina concinna Brady, 1884, p. 646, Pl. XC, fig. 7, 8.

Discorbis concinna (Brady) Cushman, 1915, p. 16, Pl. V, fig. 3, text-fig. 17.

Observations.—This seems to be an exceptional occurrence of a tropical form in temperate waters, that is to say, from the east of Tasmania.

Occurrence.—XLVII, rare.

154. DISCORBIS DIMIDIATUS (*Jones and Parker*).

Discorbina dimidiata Jones and Parker (in Carpenter), 1862, p. 201, fig. XXXIIB (in text); Parker and Jones, 1865, pp. 385, 422, Pl. XIX, figs. 9a-c. Chapman, 1909 (1), p. 136, Pl. X, figs. 8a, b. Heron-Allen and Earland, 1915, p. 698.

Observations.—There are two small thin-shelled examples of this species. The only other records are those given above. *Discorbis dimidiatus* is a common species in Australian shore sands, but has usually been recorded as *Discorbis vesicularis* Lamarck, a species described from the Middle Eocene (Calcaire Grossier) of the Paris Basin, which is a distinct, although closely allied form.

Occurrence.—XXI, very rare; XLVII, rare; XLVIII, rare.

155. DISCORBIS GLOBULARIS (*d'Orbigny*).

Rosalina globularis d'Orbigny, 1826, p. 271, Pl. XIII, figs. 1-4; Modèle No. 69.

Discorbis globularis (d'Orbigny) Heron-Allen and Earland, 1915, p. 694, Pl. LI, figs. 36-39.

Observations.—Most of the specimens are thin-shelled and poorly developed. The species is widely distributed, and is usually common in the shallower zones of temperate and sub-tropical seas. In Australian fossil deposits, *Discorbis globularis* first appears in the Balcombian deposits (L. Miocene) of Port Phillip.

Occurrence.—XI, very rare; XXII, rare; XXIV, rare; LXXXV, very rare; XCVIII, very rare.

156. DISCORBIS INVOLUTUS (*Sidebottom*).

Discorbina involuta Sidebottom, 1918, p. 255, Pl. VI, figs. 15-17.

Observations.—There is one example of this peculiar species, which was described by Sidebottom from off the coast of New South Wales, 465 fathoms. It is related to *D. disparilis* (H.-A. and E.) but differs from that species in having the chambers subdivided by subsidiary septa. *D. involutus* is not uncommon in shallow-water dredgings from off the east and south-east of Australia, and has also been identified by one of us (W.J.P.) in shore sand from Point Lonsdale, Victoria.

Occurrence.—XLVII, very rare.

157. *DISCORBIS MARGARITEUS*, *sp. nov.* Plate VIII, figs. 22a-c.

Description.—Test trochoid subcircular, somewhat inflated, consisting of about $3\frac{1}{2}$ whorls, inner whorls with comparatively small and inflated chambers, the central part of the test having a beaded character, last whorl consisting of five chambers rapidly increasing in size with the sutures slightly curved and reflexed; inferior aspect showing one coil, with the chambers well inflated, aperture a crescent-shaped slit, turned towards the inferior face; shell-texture conspicuously perforate; colour of test white, in some specimens the early chambers stained a pale amber brown.

Dimensions.—Diameter, 0.24 mm.; height, 0.15 mm.

Remarks.—The remarkably small chambers of the earlier series would separate this species from others of the *D. dimidiatus* type, while the thin-shelled shining wall and angular outline of the test will serve to distinguish it from *D. globularis*.

Occurrence.—XCVIII, common.

158. *DISCORBIS PATELLIFORMIS* (*Brady*).

Discorbina patelliformis Brady, 1884, p. 647, Pl. LXXXVIII, figs. 3a-c; Pl. LXXXIX, figs. 1a-c. Heron-Allen and Earland, 1915, p. 703, Pl. III, fig. 32.

Observations.—There is one typical specimen. This is the first record of this species from the Antarctic. Heron-Allen and Earland had it from off New Zealand, and one of us (F.C.) has recorded it from the Subantarctic Islands of New Zealand.

The species is common in the Indo-Pacific and has also been recorded by Brady and Sidebottom from the Mediterranean. It is found fossil in the Tertiary of Victoria.

Occurrence.—XCVIII, very rare.

159. *DISCORBIS AUSTRALENSIS* *Heron-Allen and Earland*.

Discorbina pileolus Brady (*non Valvulina pileolus* d'Orb.), 1884, p. 649, Pl. LXXXIX, figs. 2-4. Chapman, 1926, p. 76, Pl. XV, fig. 7.

Discorbis australensis Heron-Allen and Earland, 1932, p. 416.

Observations.—The only examples of this species are from Sample XLV, east of Tasmania, 675 fathoms. *D. australensis* has an Indo-Pacific distribution and is common in Victorian shore sands.

The Indo-Pacific species recorded by Brady under the name of *Discorbina pileolus* (d'Orb.) has been recently found by Heron-Allen and Earland to be distinct from that form, with eight chambers to a whorl, as compared with four or five in d'Orbigny's species which also differs in other characters.

Occurrence.—XLV, very rare.

160. *DISCORBIS RARESCENS* (*Brady*).

Discorbina rarescens Brady, 1884, p. 651, Pl. XC, figs. 2, 3. Chapman, 1926, p. 76, Pl. XV, fig. 8.

Observations.—The records of this species are confined to shallow water in the Indo-Pacific. In the "Terra-Nova" dredgings it occurred off the coast of New Zealand. In the "Aurora" dredgings it was common in Sample XLVII, from east of Tasmania, 1,320 fathoms. It is of great interest to note the occurrence, in the sample, of many species which are elsewhere confined to shallow water, and here reach their most southerly limits.

Occurrence.—XLVII, common.

161. *DISCORBIS WILLIAMSONI*, *nom. mut.* Chapman and Parr MS. (in Parr, 1932).
Plate VIII, fig. 23.

Rotalina nitida Williamson, 1858 (*non Rotalina nitida* Reuss, 1844), p. 54, Pl. IV, figs. 106-108. Terquem, 1875, p. 26, Pl. II, figs. 9a-c.

Discorbina nitida (Williamson) Sidebottom, 1908, p. 13, Pl. IV, fig. 6. Heron-Allen and Earland, 1913 (2), p. 121; 1922, p. 199.

Discorbis williamsoni Chapman and Parr, M.S. (in Parr, 1932), p. 226, Pl. XXI, fig. 25.

Description.—"Shell trochoid; depressed; very smooth; with from two to three convolutions; each convolution containing about six smooth, depressed, trapezoidal segments of somewhat variable proportions of length and breadth in different specimens; the ultimate one with a convex antero-peripheral border, giving a slightly lobulated outline to the thin margin of the shell. Septal lines slightly depressed superiorly; often appearing to be double; those of the inferior being then seen through the transparent shell. Inferiorly the segments are slightly concave; triangular; reaching nearly to the umbilicus, and having often a peculiar constriction near the umbilical border, which appears as a small obtuse mamilla, projecting into the umbilicus. Texture exquisitely hyaline and transparent; in some specimens very finely foraminated. Young specimens either colourless or of a bluish tint. Matured ones often exhibiting a pale ferruginous hue near the umbilical region, especially visible on the upper or convex side, and caused by the brown animal matter contained within the colourless shell. In some instances the inferior umbilicus is occupied by a distinct and prominent umbo."

Observations.—The above is Williamson's description of the species named by him *Rotalina nitida*. Heron-Allen and Earland (1913, p. 121) note that Williamson has figured two forms under this name. Our example is the typical *Discorbis nitidus* represented by Williamson's figures 106 and 107, and later by Sidebottom. It seems to have been overlooked by authors that Reuss had also described earlier, in 1844, another *Rotalina nitida*, and thus Williamson's name must lapse. Most of the records

of this species are from around the British Isles, but it has also been recorded from the Mediterranean (Sidebottom), and off the coast of New Zealand (Heron-Allen and Earland). The species occurs frequently in Sample XLVII, from east of Tasmania, 1,320 fathoms.

Occurrence.—XLVII, frequent.

Genus *HERONALLENIA* Chapman and Parr 1931.

162. *HERONALLENIA WILSONI* (Heron-Allen and Earland).

Discorbina wilsoni Heron-Allen and Earland, 1922, p. 206, Pl. VII, figs. 17-19; 1924, p. 172.

Heronallenia wilsoni (H.-A. and E.) Chapman and Parr, 1931, p. 236, Pl. IX, figs. 7, 8.

Observations.—This species was described from the Antarctic, and has since been recorded as a fossil from the Miocene of Batesford, Victoria. Although these are the only records of the species, it occurs in Victorian and South Australian shore sands, and as a fossil throughout the range of the Victorian Tertiary deposits.

Occurrence.—XCVIII, frequent.

Genus *GYROIDINA* d'Orbigny 1826.

163. *GYROIDINA BROECKHIANA* (Karrer).

Rotalia broeckhiana Karrer, 1878, p. 98, Pl. V, fig. 26. Brady, 1884, p. 705, Pl. CVII, figs. 4a-c.

Observations.—One good example of this rare species is recorded. Karrer's types were from the Tertiary of the Philippines. The species figured under this name by Dr. Cushman in his work on the Foraminifera of the Philippine and adjacent Seas (1921, p. 346, Pl. LXXII, fig. 1) is apparently *Eponides umbonatus* (Reuss) or a closely related form.

Occurrence.—XXVI, very rare.

164. *GYROIDINA SOLDANII* (d'Orbigny).

Rotalia (Gyroidina) soldanii d'Orbigny, 1826, p. 278, No. 5; Modèle No. 36.

Rotalia soldanii d'Orbigny, Chapman, 1926, p. 86, Pl. V, figs. 23a-c, 24a-c.

Observations.—This species is widely distributed in the living condition, its home according to Brady being deep sea oozes. There are numerous records of its occurrence in the Tertiary of Europe and Australia.

Occurrence.—XI, very rare; XVI, very rare; XXIX, rare; XXXIII, frequent; XXXIV, very rare; XLVI, rare; XLVII, very rare; XLIX, frequent; LIII, very rare; LXV, frequent; LXXXVII, very rare; XCII, common; CXIV, very rare; CXV, very rare.

SUB-FAMILY ROTALIINAE.

Genus *Eponides* Montfort 1808.165. *Eponides bradyi* EARLAND.

Truncatulina pygmaea Brady (non Hantken), 1884, p. 666, Pl. XCV, figs. 9, 10, and later authors.

Eponides bradyi Earland, 1934, p. 187, Pl. VIII, figs. 36-38.

Observations.—A comparison of Brady's figures with the type figure of von Hantken will show that the two forms represented by those authors are generically distinct. Hantken's species is a *Cibicides*, while that of Brady belongs to the genus *Eponides*. With reference to *Pulvinulinella bradyana* Cushman (1927 (3), p. 165, pl. V, figs. 11-13) it is difficult to see how this can be correlated with Brady's figure 10, an apertural view of which is not given. According to Nuttall, Brady's figures 9 and 10 represent specimens from the North Atlantic, and without doubt relate to the same species. The aperture of figure 9 is characteristic of *Eponides*, and is quite unlike that of *Pulvinulinella*. According to Brady, the species is confined to very deep water, and is widely distributed. It is very common in many of the dredgings of the "Aurora."

Occurrence.—XXV, very rare; XXXIII, frequent; XXXIV, common; XXXV, very rare; XXXVIII, rare; XXXIX, very rare; XL, very rare; XLI, rare; XLII, very rare; XLVIII, rare; XLIX, very rare; LIII, common; LXV, rare; LXVI, very rare; LXXXI, common; LXXXII, very rare; XC, very rare; XCI, very common; XCII, very common; XCIII, very common; CXIV, very common.

166. *Eponides exiguus* (Brady).

Pulvinulina exigua Brady, 1884, p. 696, Pl. CIII, figs. 13, 14. Cushman, 1915, p. 60, Pl. XXIII, fig. 5. Heron-Allen and Earland, 1922, p. 217.

Observations.—The examples of this species are common and very typical. According to Heron-Allen and Earland, it was common and universally distributed in the "Terra Nova" dredgings. *E. exiguus* has been recorded by one of us (F.C.) as a fossil from the Miocene of New Zealand.

Occurrence.—XI, common; XXV, very rare; XXVI, very rare; XXVII, very rare; XXIX, very rare; XXX, rare; XXXI, very rare; XXXII, frequent; XXXIV, very rare; XXXV, rare; XXXVIII, rare; XXXIX, very rare; LII, frequent; LIII, common; LX, frequent; LXV, common; LXVI, very rare; LXXXII, very rare; LXXXVII, very rare; LXXXVIII, rare; XC, rare; XCI, rare; XCII, rare; XCIII, very rare; CXIV, common.

167. EPONIDES FRIGIDUS (*Cushman*).

Pulvinulina karsteni H. B. Brady (*non* Reuss), 1864, p. 470; 1884, p. 698, Pl. CV, figs. 8, 9.

Pulvinulina frigida Cushman, 1922 (3), p. 144.

Observations.—Only one fine example of the recent form, which differs from the Cretaceous species of Reuss, occurs here. *E. frigidus* is a typically cold-water species, and practically confined to shallow water in high latitudes. The present specimen is from Globigerina ooze at 2,460 fathoms.

Occurrence.—XXXIV, very rare.

168. EPONIDES PUNCTULATUS (*d'Orbigny*).

Rotalia punctulata d'Orbigny, 1826, p. 273, No. 25; Modèle No. 12.

Pulvinulina punctulata (d'Orbigny) Heron-Allen and Earland, 1913 (2); p. 134, Pl. IV, figs. 20, 21; 1922, p. 214.

Observations.—Only one small example was met with. It was also rare in the "Terra Nova" dredgings and was there confined to the New Zealand area.

Occurrence.—LXV, very rare.

169. EPONIDES UMBONATUS (*Reuss*).

Rotalina umbonata Reuss, 1851 (2), p. 75, Pl. V, fig. 35.

Truncatulina tenera Brady, 1884, p. 665, Pl. XCV, figs. 11a-c (and later authors).

Pulvinulina umbonata (Reuss) Brady, 1884, p. 695, Pl. CV, figs. 2a-c.

Eponides umbonata (Reuss) Cushman, 1929 (2), p. 98, Pl. XIV, figs. 8a-c.

Observations.—The specimens agree exactly with those recently figured by Dr. Cushman from Reuss's type locality.

Occurrence.—XXV, rare; XXVI, very rare; XXIX, very rare; XXXI, very rare; XXXII, rare; XXXIX, very rare; XLVI, very rare; XLVII, rare; XLIX, frequent; LII, very rare; LIII, very rare; LXV, rare; LXXXII, very rare; XC, very rare; CXIV, very rare; CXV, rare.

Genus ROTALIA, Lamarck 1804.170. ROTALIA CLATHRATA *Brady*.

Rotalia clathrata Brady, 1884, p. 709, Pl. CVII, figs. 8; 9. Chapman, 1926, p. 85, Pl. XVII, fig. 5.

Observations.—This species is particularly common around New Zealand, from whence it was recorded by Heron-Allen and Earland, and by one of us (F.C.). It is also abundant in the Tertiary of New Zealand.

Occurrence.—XIV, rare.

171. *ROTALIA PERLUCIDA* Heron-Allen and Earland.

Rotalia perlucida Heron-Allen and Earland, 1913 (2), p. 139, Pl. XIII, figs. 7-9; 1922, p. 219. Parr, 1932, p. 231, Pl. XXII, figs. 35a-c.

Observations.—The examples are very typical. *Rotalia perlucida* was described from shallow water off the west coast of Ireland. It has since been recorded from off Portuguese East Africa, the west coast of Scotland, and three "Terra Nova" stations off New Zealand, and in the Antarctic. It is apparently a weak form of *Rotalia beccarii*.

Occurrence.—XXII, rare; XXIV, frequent.

SUB-FAMILY SIPHONININAE.

Genus *EPISTOMINA* Terquem 1883.

172. *EPISTOMINA ELEGANS* (d'Orbigny).

Rotalia (Turbinulina) elegans d'Orbigny, 1826, p. 276, No. 54.

Rotalia partschiana d'Orbigny, 1846, p. 153, Pl. VII, figs. 28-30; Pl. VIII, figs. 1-3.

Epistomina elegans (d'Orbigny) Cushman, 1927 (4), p. 182, Pls. XXXI, XXXII.

Observations.—Many excellent specimens. In Sample L, the deep water form, sometimes recorded as *Pulvinulina partschiana*, was met with. In Sample LXXXII there was a strongly keeled variety. The species has a long geological history. In Australia and New Zealand it is a common Tertiary fossil.

Occurrence.—XVI, very rare; XXIX, common; XLVI, common; XLVII, common; XLVIII, very rare; L, rare; LII, rare; LV, rare; LX, very rare; LXV, rare; LXXXII, rare; LXXXIX, very rare; CXIV, common; CXV, frequent.

SUB-FAMILY BAGGININAE.

Genus *CANCRIS* Montfort 1808.

173. *CANCRIS AURICULA* (Fichtel and Moll).

Nautilus auricula Fichtel and Moll, 1798, p. 108, var. α , Pl. XX, figs. a-c; var. β , Pl. XX, figs. d-f.

Observations.—There is one typical example of Fichtel and Moll's variety α from Sample XLVII, from east of Tasmania, 1,320 fathoms. The only "Terra Nova" record of the species was from 7 miles east of North Cape, New Zealand. The species is a common fossil in the Lower Miocene of Victoria.

Occurrence.—XLVII, rare.

FAMILY CHILOSTOMELLIDAE.

SUB-FAMILY ALLOMORPHINELLINAE.

Genus PULLENIA Parker and Jones 1862.

174. PULLENIA QUINQUELOBA (Reuss).

Nonionina quinqueloba Reuss, 1851 (2), p. 47, Pl. V, fig. 31 *a, b*.*Pullenia quinqueloba* (Reuss) Brady, 1884, p. 617, Pl. LXXXIV, figs. 14, 15.
Chapman, 1917 (1), p. 45, Pl. V, fig. 9; 1917 (2), p. 69. Heron-Allen and Earland, 1922, p. 193.

Observations.—This species was recorded by one of us (F.C.) from the elevated deposits on the shores of the Ross Sea and from the marine muds in the same area. It is also abundant round New Zealand, and is generally distributed in the Southern Ocean. It is abundant in northern seas.

Occurrence.—I, very rare; VII, very rare; XI, very rare; XXI, very rare; XXIV, very rare; XLI, very rare; XLVII, very rare; LII, very rare; LXXV, very rare; XCII, very rare.

175. PULLENIA SPHAEROIDES (d'Orb.).

Nonionina sphaeroides d'Orbigny, 1826, p. 293, No. 1. Modèle No. 43.*Pullenia sphaeroides* (d'Orbigny) Brady, 1884, p. 615, Pl. LXXXIV, figs. 12, 13.
Heron-Allen and Earland, 1922, p. 194.

Observations.—The "Terra Nova" specimens were found to be best developed round the New Zealand area. The "Aurora" gatherings off the Ice Barrier yielded a fair series of typical specimens.

Occurrence.—XXIX, rare; XLVII, very rare; LXV, very rare; LXXXI, very rare; LXXXVIII, very rare; XCI, rare; XCII, frequent.

SUB-FAMILY SPHAEROIDININAE.

Genus SPHAEROIDINA d'Orbigny 1826.

176. SPHAEROIDINA BULLOIDES (d'Orb.).

Sphaeroidina bulloides d'Orbigny, 1826, p. 267, No. 1; Modèle No. 65. Brady, 1884, p. 620, Pl. LXXXIV, figs. 1-7. Heron-Allen and Earland, 1922, p. 194.

Observations.—The present examples of *Sphaeroidina bulloides* occurred mainly round Tasmania. Those from Sample XLVI, east of Tasmania, were thin-shelled and small.

Occurrence.—XXVI, common; XXVII, very rare; XXIX, frequent; XXXIX, rare; XLI, common; XLV, very rare; XLVI, rare; XLVII, very rare.

FAMILY GLOBIGERINIDAE.

SUB-FAMILY GLOBIGERININAE.

Genus GLOBIGERINA d'Orbigny 1826.

177. GLOBIGERINA BULLOIDES d'Orbigny.

Globigerina bulloides d'Orbigny, 1826, p. 277, No. 1; Modèles Nos. 17 and 76.
Fornasini, 1899, p. 579, Pl. II, figs. 1, 3-8; Pl. IV, fig. 2.(?).

Observations.—This species occurs in abundance in all of the deeper water samples.

Occurrence.—XVI, rare; XXII, frequent; XXIV, common; XXV, very common; XXVI, common; XXXII, common; XXXIII, common; XXXIV, common; XXXV, common; XXXVIII, common; XXXIX, very common; XL, common; XLI, very common; XLII, common; XLV, frequent; XLVI, common; XLVII, common; XLVIII, common; XLIX, common; LII, very rare; LIII, very rare; LXI, very rare; LXV, very common; LXVI, common; LXXXV, frequent; LXXXVII, very rare; XCI, very rare; XCVIII, rare; CXIII, very common; CXIV, very common; CXV, common.

178. GLOBIGERINA CONGLOMERATA Schwager.

Globigerina conglomerata Schwager, 1866, p. 255, Pl. VII, fig. 113.

Globigerina dutertrei Brady (non d'Orbigny), 1884, p. 601, Pl. LXXXI, figs. 1a-c.

Globigerina dubia Brady (non Egger), 1884, p. 595, Pl. LXXIX, figs. 17a-c.

Globigerina eggeri Rhumbler, 1900, p. 19 (of separate copy), text-figs. 20a-c (p. 20).

Globigerina conglomerata (Schwager) Cushman, 1927 (3), p. 172.

Observations.—Dr. Cushman has noted that this is the dominant species of the genus in the Eastern Pacific. It has usually been recorded as *Globigerina dutertrei* d'Orbigny or *G. dubia* Egger, following Brady's figures in the "Challenger" Report, but these relate to Schwager's species from the Pliocene of Kar Nicobar. Schwager's figure is of a juvenile specimen. Egger's species, from the Miocene of Germany, is a very different form.

Messrs. Heron-Allen and Earland have described *Globigerina dubia* var. *eggeri* from the "Terra Nova" dredgings (1922, p. 188, Pl. VII, figs. 6-8). Since the varietal and specific names are coequal in nomenclature, this will require a new name, for Rhumbler had already used the same name for another species, which is here recorded as being identical with the earlier described *Globigerina conglomerata* Schwager.

Occurrence.—XI, very rare; XXI, very rare; XXV, very rare; XXX, frequent; XL, very rare; XLII, very rare; XLVII, very rare; XCVIII, very rare.

179. *GLOBIGERINA DUTERTREI d'Orbigny.*

Globigerina dutertrei d'Orbigny, 1839 (1), p. 84, Pl. IV, figs. 19-21. Cushman, 1922 (1), p. 36, Pl. V, figs. 8, 9.

Observations.—Most of the specimens are typical, but in some samples it is difficult to draw the line separating this species from *Globigerina pachyderma*. The type locality of this species was the coast of Cuba.

Occurrence.—IX, very common; XVI, frequent; XIX, frequent; XXIV, common; XXXIV, frequent; XXXV, rare; XXXVIII, frequent; XXXIX, common; XL, frequent; XLI, common; XLII, rare; XLV, frequent; XLVI, rare; XLVII, rare; L, very rare; LI, very common; LIII, very common; LXI, very rare; LXV, very rare; LXXXV, very rare; CIII, very rare; CVIII, very common; CXV, common.

180. *GLOBIGERINA INFLATA d'Orbigny.*

Globigerina inflata d'Orbigny, 1839 (2), p. 134, Pl. II, figs. 7-9. Brady, 1884, p. 601, Pl. LXXIX, figs. 8-10.

Observations.—The examples are all very typical. As a fossil this species has been recorded from the Miocene of New Zealand (F.C.) and from the Eocene of Mexico (Cole).

Occurrence.—XXVI, common; XXVII, very rare; XXIX, very common; XXX, very common; XXXI, common; XXXII, common; XXXIII, common; XXXIV, frequent; XXXV, very common; XXXVIII, frequent; XXXIX, very rare; XLI, frequent; XLV, common; XLVI, common; XLVII, common; XLVIII, frequent; XLIX, frequent; LXV, common; LXVI, common; CXIII, common; CXIV, very common; CXV, very common.

181. *GLOBIGERINA PACHYDERMA (Ehrenberg).*

Aristerospira pachyderma Ehrenberg, 1873, p. 386, Pl. I, fig. 4.

Globigerina pachyderma (Ehr.) Brady, 1884, p. 600, Pl. CXIV, figs. 19, 20. Heron-Allen and Earland, 1922, p. 190.

Observations.—Typical examples occur in almost every sample. They agree with material at hand from off the Farøe Islands.

Occurrence.—I, common; II, common; V, common; VII, very common; IX, very common; X, very common; XI, very common; XII, common; XIII, rare; XIV, common; XV, rare; XVI, very common; XIX, common; XX, frequent; XXI, very common; XXII, common; XXIII, frequent; XXIV, common; XXVII, frequent; XXIX, very common; XXX, rare; XXXI, common; XXXIII, common; XXXIV, common; XXXV, rare; XXXVIII, frequent; XXXIX, common; XL, very rare;

XLII, very rare; XLVI, rare; XLIX, rare; LIII, frequent; LIV, common; LV, very rare; LX, frequent; LXI, very rare; LXIV, very common; LXV, very rare; LXVI, common; LXXV, common; LXXXI, common; LXXXII, very common; LXXXVI, rare; LXXXVII, very common; LXXXVIII, common; LXXXIX, common; XC, very common; XCI, very common; XCII, very common; XCIII, very common; XCV, rare; XCVIII, very common; XCIX, rare; CIII, common; CVII, frequent; CX, very rare; CXII, very common; CXIV, rare; CXV, common.

182. *GLOBIGERINA SUBCRETACEA* Chapman.

Globigerina cretacea ? Brady, 1884, p. 596, Pl. LXXXII, fig. 10.

Globigerina subcretacea Chapman, 1902, p. 410, Pl. XXXVI, figs. 16a, b; 1924, p. 17.

Observations.—This species is allied to the previously recorded *Globigerina conglomerata* Schwager, but is proportionately thinner and more outspread. It was described from off Funafuti and has been recorded from dredgings off the coast of South Africa.

Occurrence.—XXV, very rare; XXXII, common; XXXIII, very rare; XLVI, common; XCVIII, very rare.

183. *GLOBIGERINA TRILOBA* Reuss.

Globigerina triloba Reuss, 1850, p. 374, Pl. XLVII, fig. 11.

Globigerina bulloides d'Orbigny, var. *triloba* Reuss, Brady 1884, p. 595, Pl. LXXIX, figs. 1, 2; Pl. LXXXI, figs. 2, 3.

Observations.—This species was associated with *G. bulloides* wherever it occurred. The specimens are typical and agree with topotype material at hand, from the Vienna Basin.

Occurrence.—XXV, frequent; XXVI, common; XXVII, very rare; XXXII, rare; XXXVIII, frequent; XXXIX, very rare; XL, frequent; XLI, very rare; XLV, very rare; XLVII, frequent; XLVIII, rare; XLIX, frequent; LXV, frequent; CXIV, common.

Genus *GLOBIGERINOIDES* Cushman 1927.

184. *GLOBIGERINOIDES RUBER* (d'Orbigny).

Globigerina rubra d'Orbigny, 1839 (1), p. 82, Pl. IV, figs. 12-14. Brady, 1884, p. 602, Pl. LXXIX, figs. 11-16. Cushman, 1924 (2), p. 15, Pl. III, figs. 4-7.

Observations.—The few examples met with are colourless, but otherwise typical. Brady notes that the home of this species is in the tropics, nevertheless it spreads northwards nearly to lat. 49° N. and southwards to lat. 36° S. Our most southerly record is from Sample XLVI, east of Tasmania. With the exception of one good specimen

from off Barne Glacier, McMurdo Sound, 200 fathoms, the "Terra Nova" records were from New Zealand waters.

Occurrence.—XLVI, very rare; CXV, very rare.

185. GLOBIGERINOIDES SACCULIFER (*Brady*).

Globigerina helicina Carpenter (*non d'Orbigny*), 1862, Pl. XII, fig. 11.

Globigerina sacculifera Brady, 1877, p. 535; 1884, p. 604, Pl. LXXX, figs. 11-17; Pl. LXXXII, fig. 4.

Observations.—One typical example was found in Sample XLVI from east of Tasmania. The geographical distribution of this species covers an area extending from about 40° N. to 35° S. of the equator. The only "Terra Nova" records were from off the coast of New Zealand.

Occurrence.—XLVI, very rare.

Genus ORBULINA *d'Orbigny* 1826.

186. ORBULINA UNIVERSA *d'Orbigny*.

Orbulina universa *d'Orbigny*, 1839 (1), p. 3, Pl. I, fig. 1; Brady, 1884, p. 608; Pl. LXXVIII; Pl. LXXXI, figs. 8-26; Pl. LXXXII, figs. 1-3. Rhumbler, 1900, pp. 27-29 (separate copy), text-figs. 28a-c, 29, 30.

Observations.—This species has proved to be much more abundant in our material than in the "Terra Nova" dredgings examined by Messrs. Heron-Allen and Earland. Examples vary considerably in size, and thickness of shell wall.

Occurrence.—XXIX, very common; XXX, very common; XXXI, common; XXXII, common; XXXIX, common; XL, common; XLII, very rare; XLV, common; XLVI, very common; XLVII, common; XLVIII, common; XLIX, very rare; LI, rare (small); LXV, frequent; LXXXII, very rare; XCI, very rare; CVIII, very rare; CXIV, very common; CXV, common.

SUB-FAMILY PULLENIATININAE.

Genus PULLENIATINA *Cushman* 1927.

187. PULLENIATINA OBLIQUILOCULATA (*Parker and Jones*).

Pullenia obliquiloculata Parker and Jones, 1865, pp. 368, 421, Pl. XIX, fig. 4. Brady, 1884, p. 618, Pl. LXXXIV, figs. 16-20.

Observations.—Typical examples of this species were common in Sample LXV only, from lat. 49° 9' S., long. 148° 1' E., our most southerly record. In the "Terra Nova" dredgings *Pulleniatina obliquiloculata* was generally distributed in the New Zealand area, and was also recorded from as far south as lat. 64° 33' 4" S.

Occurrence.—XXV, common; XXXIX, very rare; XLVI, very rare; LXV, common.

FAMILY GLOBOROTALIIDAE.

Genus GLOBOROTALIA *Cushman* 1927.188. GLOBOROTALIA HIRSUTA (*d'Orbigny*). Plate IX, fig. 24.

Rotalina hirsuta d'Orbigny, 1839 (2), p. 131, Pl. I, figs. 37-39.

Globorotalia hirsuta (d'Orb.) *Cushman*, 1931, p. 99, Pl. XVII, figs. 6a-c.

Observations.—These specimens exactly resemble *Cushman's* figures of this species, which was originally obtained from the Canaries by d'Orbigny. It has recently been recorded by *Cushman* from a number of Stations in the North Atlantic. *G. hirsuta* probably has a much wider distribution than would appear from its few records, as it has almost certainly been recorded by many authors, including H. B. Brady, under the name of *Pulvinulina canariensis*, which, however, according to the type figure has a limbate margin, such as is seen in the *G. menardii* group.

Occurrence.—XXIX, frequent; XXX, frequent; XXXII, frequent; XXXIX, very rare; XL, common; XLI, common; XLVI, frequent; XLVII, common; XLVIII, common; CXV, common.

189. GLOBOROTALIA HUMILIS (*Brady*).

Truncatulina humilis *Brady*, 1884, p. 665, Pl. XCIV, figs. 7a-c.

Observations.—This minute and rare species is allied to *Globorotalia scitula* (*Brady*), which also occurs in some of the "Aurora" dredgings. Our specimens are typical and show the silvery appearance characteristic of the genus.

Brady remarked that this is an extremely obscure organism characterised chiefly by its thick, rounded contour and minute dimensions. The "Challenger" records were from three stations in the North Atlantic, between lat. 24° and 40° N., at depths from 1,000 to 2,750 fathoms; and at two in the South Pacific, between lat. 13° and 40° S.

Occurrence.—XXIX, very rare; XCIII, frequent.

190: GLOBOROTALIA PSEUDOCRASSA, *sp. nov.* Plate IX, figs. 25a, b.

Pulvinulina crassa *Brady pars* (*non Rotalina crassa* d'Orbigny), 1884, p. 694, Pl. CIII, fig. 12 (*non* fig. 11).

Description.—Test subconical, superior face flat with limbate periphery, inferior face convexly rounded and umbilicated; peripheral margin roundly angulated, lobulate. Chambers comparatively few, about four in the last whorl. Sutures curved and depressed. Surface granulate to feebly spinose. Aperture an arched opening, wider at the umbilical region.

Dimensions.—Diameter, 0.48 mm.; height, 0.243 mm.

Observations.—The present species has usually been recorded under the name of *Pulvinulina crassa* (d'Orb.). D'Orbigny's *Rotalina crassa* (d'Orb., 1840, p. 32, Pl. III, figs. 7, 8) is from the chalk of Meudon, France, and is very distinct from the recent form,

and with very little doubt belongs to another genus, probably *Rotalia*. His figure represents a species with a rounded, not lobulated margin; the sutures are not depressed, and the last chamber is much larger than the earlier ones, and it has a broad septal face.

Brady has figured two distinct species under the one name of *Pulvinulina crassa*, on Plate CIII of the "Challenger" Report. Our examples agree with his figure 12. This form is common off the coast of New South Wales. Both forms have been re-named *G. crassula* by Cushman and R. E. Stewart (1930, p. 77, Pt. VII, figs. 1a-c), but have taken fig. 11 as their type, which we consider to be distinct from Brady's fig. 12.

Occurrence.—XLI, rare; XLVI, very rare; LXV, frequent; LXXXII, very rare.

191. GLOBOROTALIA SCITULA Brady.

Pulvinulina scitula Brady, 1882, p. 716.

Pulvinulina patagonica Brady (*non Rotalina patagonica* d'Orbigny), 1884, p. 693, Pl. C III, figs. 7a-c. Heron-Allen and Earland, 1922, p. 215.

Pulvinulina patagonica (d'Orb.), var. *scitula* Brady, Heron-Allen and Earland, 1922, p. 215.

Globorotalia scitula (Brady) Cushman, 1927 (3), p. 175.

Observations.—This is a common species in the "Aurora" dredgings. Dr. Cushman in his work on the recent Foraminifera from the west coast of America (*op. cit.*) has shown that this form is quite distinct from d'Orbigny's *Rotalina patagonica*. Brady described *Globorotalia scitula* from off the Farøe Islands. In the "Challenger" dredgings, it was recorded from 41 stations, from the Atlantic, Pacific and Southern Oceans.

Occurrence.—XL, common; XLI, very rare; XLV, rare; XLVI, very rare; XLVII, common; XLIX, common; LXV, rare; CXIII, rare; CXIX, common; CXV, common.

192. GLOBOROTALIA TRUNCATULINOIDES (d'Orbigny).

Rotalina truncatulinoides d'Orbigny, 1839 (2), p. 132, Pl. II, figs. 25-27.

Pulvinulina micheliniana Brady (*non Rotalina micheliniana* d'Orbigny), 1884, p. 694, Pl. CIV, figs. 1, 2. Cushman, 1915, p. 59, Pl. XXIII, fig. 4; text-fig. 57.

Observations.—Typical examples of this pelagic species are usually common.

Occurrence.—XXVI, frequent; XXIX, common; XXX, very common; XXXI, common; XXXII, very common; XXXIII, common; XXXIV, frequent; XXXV, very rare; XXXVIII, common; XXXIX, common; XL, very common; XLI, very common; XLV, rare; XLVI, common; XLVII, very common; XLVIII, common; XLIX, very common; LXV, very common; LXVI, rare; LXXIV, frequent; CXIII, very common; CXIV, very common; CXV, very common.

FAMILY CIBICIDIDAE.

Genus ANOMALINA d'Orbigny 1826.

193. ANOMALINA COLLIGERA, *sp. nov.* Plate IX, fig. 26.

Anomalina ammonoides Brady (*non Rosalina ammonoides* Reuss, 1844), 1884, p. 672,
Pl. XCIV, figs. 2, 3.

Description.—Test consisting of about three coils, all of which are visible on the superior face; two only are visible on the inferior face. Test somewhat compressed, with the edge subacute to rounded; chambers numerous, arcuate, with the sutures more or less limbate; shell rather coarsely perforate, especially on the inferior face. The aperture is placed almost symmetrically in the median line.

Observations.—This species has hitherto been confused with Reuss's *Rosalina ammonoides* described from the Chalk of Bohemia, and a common species in the Cretaceous of Europe. Reuss's form is a true *Cibicides*, and is perfectly distinct from the form figured under the name of *Anomalina ammonoides* (Reuss) by Brady. The specimens figured by Brady were from off Fiji and Papua.

Occurrence.—XLVI, rare; LIII, very rare.

194. ANOMALINA GLABRATA Cushman.

Anomalina glabrata Cushman, 1924 (1), p. 39, Pl. XII, figs. 5-7.

Observations.—There are three typical examples of this species which Dr. Cushman described from shallow water off Samoa. It has since been recorded by one of us (W.J.P.) from the Lower Miocene of Victoria.

Occurrence.—XV, very rare; XI, very rare; XLV, very rare.

195. ANOMALINA GLOBULOSA, *sp. nov.* Plate IX; fig. 27.

Anomalina grosserugosa Brady (*non Truncatulina grosserugosa* Gümbel), 1884, p. 673,
Pl. XCIV, figs. 4, 5.

Description.—Test consisting of about two and a half coils, all of which are visible on the superior face, with only the last-formed coil showing on the inferior face; about seven chambers in last coil which are strongly inflated; periphery rounded; sutures deeply impressed; superior face more or less flattened, inferior face depressed in the umbilical region, otherwise strongly convex. Surface of test deeply pitted. Diameter of test is about two and a half times the thickness. Aperture crescentic, and placed almost symmetrically in the median line.

Dimensions.—Diameter, 0.6 to 1 mm.; thickness, 0.25 to 0.4 mm.

Observations.—Although Brady recorded *Anomalina grosserugosa* (Gümbel) from the "Challenger" dredgings, his figures show his species to be distinct from Gümbel's from the Nummulitic limestone of Kressenberg, Bavaria. The type figure of *Anomalina grosserugosa* shows it to be a more elongated helicoid shell, whilst only the last-formed coil is visible on both faces of the test.

Brady's records are from four stations in the North Atlantic, three in the South Atlantic, two in the South Pacific, and two in the North Pacific; the depths ranging between 345 and 2,050 fathoms. The species also occurs on the coasts of New South Wales and Victoria, in shallow water.

Occurrence.—XXIX, rare; XLV, frequent.

Genus *PLANULINA* d'Orbigny 1826.

196. *PLANULINA BICONCAVA* (Jones and Parker).

Discorbina biconcava Jones and Parker, in Carpenter and others, 1862, p. 201, text fig. XXXII. G. Brady, 1884, p. 653, Pl. XCI, figs. 2a-c. (non fig. 3).

Observations.—Typical examples were found in Sample XLVII, from east of Tasmania, 1,320 fathoms. This species is common in shallow water on the Victorian coast, and also occurs in the Victorian Tertiary. The "Terra Nova" records were from off New Zealand, but Heron-Allen and Earland note that their specimens are very rare and far from typical.

Occurrence.—XLVII, rare.

Genus *LATICARININA* Galloway and Wissler, 1927.

197. *LATICARININA PAUPERATA* (Parker and Jones). Plate IX, fig. 28.

Pulvinulina repanda (Fichtel and Moll), var. *menardii* (d'Orb.), sub-var. *pauperata* Parker and Jones, 1865, p. 395, Pl. XVI, figs. 50, 51a, b.

Pulvinulina pauperata Parker and Jones, Brady, 1884, p. 696, Pl. CIV, figs. 3-11.

Observations.—Very fine examples were common in Sample XCII. One is here figured. This species is widely distributed in the living condition. As a fossil it has been recorded by one of us (F.C.) from the Upper Cretaceous and Upper Eocene of New Zealand, and the Miocene of Barbados, in the West Indies. Nuttall has also recorded it from the Miocene of Trinidad.

Occurrence.—XLVII, very rare; XLVIII, very rare; XCII, very common.

Genus CIBICIDES, Montfort 1808.

198. CIBICIDES AKNERIANUS (*d'Orbigny*).

Rosalina akneriana d'Orbigny, 1846, p. 156, Pl. VIII, figs. 13-15.

Truncatulina akneriana (d'Orbigny) Brady, 1884, p. 663, Pl. XCIV, figs. 8a-c.

Observations.—The specimens resemble d'Orbigny's figures rather than those of Brady. The species was described from the Miocene of the Vienna Basin.

Occurrence.—XXV, rare; XXIX, very rare; XXX, very rare; XXXI, very rare; XXXV, very rare; XXXIX, very rare; CXIV, very rare.

199. CIBICIDES CULTER (*Parker and Jones*).

Planorbulina culter Parker and Jones, 1865, p. 421, Pl. XIX, figs. 1a, b. Chapman, 1895, p. 41.

Observations.—There are several examples of the typical form described by Parker and Jones from the tropical Atlantic. The species figured by Brady under this name from off the Ki Islands is quite distinct, with an aperture of a very different type, and appears to be identical with Schwager's *Anomalina bengalensis*. Dr. Cushman has placed Brady's form in his genus *Pulvinulinella* on account of its apertural characters, but in our opinion its relationships are with *Cibicides*. Further research may prove that a new genus should be created for its reception, but in the meantime, it may be known as *Cibicides bengalensis* (Schwager). Schwager's type material was from the Pliocene of Kar Nicobar.

Occurrence.—XXIX, very rare; XLVI, very rare; XLVII, rare.

200. CIBICIDES LOBATULUS (*Walker and Jacob*).

Nautilus lobatulus Walker and Jacob, 1798, p. 642, Pl. XIV, fig. 36.

Truncatulina lobatula (Walker and Jacob) Brady, 1884, p. 660, Pl. XCII, fig. 10; Pl. XCIII, figs. 1, 4, 5; Pl. CXV, figs. 4, 5.

Observations.—As is usual, there is a considerable amount of variation in the examples.

Occurrence.—I, frequent; IX, frequent; X, rare; XIV, common; XXI, common; XXII, common; XXIII, frequent; XXIV, frequent; XXV, very rare; XXIX, rare; XXXI, very rare; XXXIII, frequent; XXXIV, frequent; XLI, very rare; XLV, frequent; XLVII, rare; XLVIII, rare; XCI, rare; XCII, very rare; XCVIII, common; CIII, very rare; CIV, very rare; CXIV, rare; CXVII, rare.

201. *CIBICIDES MUNDULUS* (*Brady, Parker and Jones*).

Truncatulina sp. intermediate form near *Truncatulina haidingeri* (d'Orb.). Brady, 1884, Pl. XCV, figs. 6a-c.

Truncatulina mundula Brady, Parker, and Jones, 1888, p. 228, Pl. XLV, fig. 25.
Cushman, 1915, p. 41, Pl. XIII, fig. 4, text-figs. 45a-c.

Observations.—This species is rarely recorded. It is one of the group of thick-walled, biconvex species of *Cibicides*, distinguishable by the excessive sutural limbation on the superior face. The examples from Sample XLIX are very typical. Those figured on plate XCV of the "Challenger" Report were from the South Pacific. The species has also been recorded from the Abrolhos Bank, off the coast of Brazil (Brady, Parker, and Jones), off the Hawaiian Islands (Bagg), and from the western tropical Pacific (Goës). The recorded depths are, from 104 to 1,218 fathoms.

Occurrence.—VIII, very rare; XXIX, rare; XXXI, very rare; XXXIII, very rare; XXXIX, very rare; XLI, rare; XLVII, very rare; XLIX, rare; LXV, rare; XCVIII, very rare; CXV, common.

202. *CIBICIDES REFULGENS* *Montfort*.

Cibicides refulgens Montfort, 1808, p. 122, 31me genre.

Truncatulina refulgens (Montfort), Cushman, 1915, p. 30, Pl. XII, fig. 2; text-figs. 33a-c.

Observations.—The specimens are usually more depressed than in the typical form of the species. In sample XXI it is common, and most of the examples are very typical, but there are also aberrant specimens approaching *Cibicides lobatulus* in contour.

The keeled type figured in the "Challenger" Report is absent from the "Aurora" dredgings. *Cibicides refulgens* has been previously recorded by one of us (F.C.) from the upthrust muds (Pleistocene) of the Ross Sea area.

Occurrence.—Sample I, frequent; VII, very rare; IX, very common; XI, very rare; XIII, very rare; XIV, frequent; XVI, very rare; XIX, very rare; XX, very rare; XXI, very common; XXII, common; XXIII, frequent; XXIV, common; XXV, common; LXXV, rare; XCVIII, common; CIII, very rare.

203. *CIBICIDES TENUIMARGO* (*Brady*).

Truncatulina tenuimargo Brady, 1884, p. 662, Pl. XCIII, figs. 2, 3. Sidebottom, 1918, p. 257, Pl. VI, figs. 20, 21.

Truncatulina tenuimargo, var. *altocamerata* Heron-Allen and Earland, 1922, p. 209, Pl. VII, figs. 24-27.

Truncatulina tenuimargo Brady, Chapman, 1926, p. 78, Pl. XVI, fig. 1.

Observations.—Examples of this species occurred in three samples of this collection. That from Sample LXXXII was small, and thin-shelled and from a depth of 1,550 fathoms. All agree with Brady's fig. 2, which we consider represents the megalospheric stage of the species; his fig. 3 being the microspheric stage. Messrs. Heron-Allen and Earland have given a new varietal name to Brady's fig. 2 as var. *altocamerata*. In the first place a new varietal name can hardly be given to this form since the earlier one figured would naturally be considered as typical according to priority, and secondly, the idea of the two stages being present as we believe would render the use of a varietal name unnecessary. It is worthy of note that Sidebottom recorded both forms in the proportion of fourteen to four, from a sounding off the coast of New South Wales. Other records of this species show it to be common in the South Pacific, and Brady notes that it occurred in a "Challenger" dredging in the South Atlantic, north of Falkland Islands, 1,035 fathoms.

In the fossil condition, it (the megalospheric stage) has been recorded from the Upper Eocene of New Zealand (F.C.) and one of us (W.J.P.) has found it to be common in beds of Middle Tertiary age, near Auckland, New Zealand.

Occurrence.—XLV, very rare; XLVII, very rare; LXXXII, very rare.

204. CIBICIDES UNGERIANUS (*d'Orbigny*).

Rotalina ungeriana d'Orbigny, 1846, p. 157, Pl. VIII, figs. 16-18.

Truncatulina ungeriana (d'Orbigny), Brady, 1884, p. 664, Pl. XCIV, fig. 9a-c.

Observations.—Most of the examples are small and not very typical. Some, however, are in fairly close agreement with specimens at hand from the Vienna Basin. There are numerous records of this species as a fossil and in the living condition, but many of them are at least doubtful. The type-figures of *Cibicides ungerianus* show it to have a sharp-edged plano-convex test, with the superior face flattened and the central portion granulate. Brady stated (*op. cit.*, p. 664), that the "Challenger" figure was not a good illustration of the species, the specimen being relatively thicker and more stoutly built than the typical form. Had the variants on the typical form shown a general resemblance to one another we should have been inclined to separate them under a new name.

Occurrence.—XXII, very rare; XXIII, very rare; XXV, very rare; XXIX, very rare; XXX, frequent; XXXII, very rare; XXXVIII, rare; XLII, very rare; LII, very rare; LIII, very rare; LXV, common; XCIII, very rare; CXIV, common.

205. CIBICIDES WÜLLERSTORFI (*Schwager*).

Anomalina wüllerstorfi Schwager, 1866, p. 258, Pl. VII, figs. 105, 107.

Truncatulina wüllerstorfi (Schwager), Brady, 1884, p. 662, Pl. XCIII, figs. 8, 9.

Planulina wüllerstorfi (Schwager) Cushman, 1929 (3), p. 102, Pl. XV, figs. 1, 2.

Observations.—Examples of the type figured by Brady (*loc. cit.*), from off the west coast of New Zealand, are common. The types of this species were from the Pliocene of Kar Nicobar. Other records as a fossil are from the Eocene and Miocene of New Zealand (Chapman) and the Miocene of Trinidad (Nuttall).

Occurrence.—XI, very rare; XXIX, very common; XXX, rare; XXXI, very rare; XXXII, very rare; XXXIII, very rare; XL, rare; XLI, common; XLII, very rare; XLVI, common; XLVII, rare; XLVIII, common; L, very rare; XCVIII, very rare; CXIV, rare; CXV, frequent.

Genus CIBICIDELLA *Cushman* 1927.

206. CIBICIDELLA VARIABILIS (*d'Orbigny*).

Truncatulina variabilis d'Orbigny, 1826, p. 279, No. 8; 1839 (2), p. 135, Pl. II, fig. 29.

Brady, 1884, p. 661, Pl. XCIII, figs. 6, 7. Sidebottom, 1909, p. 2, Pl. I, figs. 5, 6; Pl. II, figs. 1-3; text-fig. p.3.

Observations.—Our examples agree with d'Orbigny's and Brady's figures of this species. This form is common in the Tertiary of Victoria. According to Sidebottom, *C. variabilis* in the Mediterranean Sea occurs in two forms, one a small, rather feebly outspread and complanate variety, and the other, very large, coarsely perforated and often showing a number of heavily lipped orifices. Our specimens are apparently of the first-mentioned variety, which is clearly a wild growing form of *Cibicides lobatulus* and usually occurs with it. The shape of the shell is probably determined by the nature of the object to which it is attached.

Occurrence.—XLVI, very rare; XLVII, rare; XLVIII, very rare.

FAMILY PLANORBULINIDAE.

Genus ACERVULINA *Schultze* 1854.

207. ACERVULINA INHAERENS *Schultze*.

Acervulina inhaerens Schultze, 1854, p. 68, Pl. VI, fig. 12.

Gypsina inhaerens (Schultze) Brady, 1884, p. 718, Pl. CII, figs. 1-6.

Observations.—There is one small example. The only "Terra Nova" records of this species were from off New Zealand. It is abundant on the Victorian coast.

Occurrence.—XLI, very rare.

FAMILY RUPERTIIDAE.

Genus RUPERTIA Wallich 1877.

208. RUPERTIA STABILIS Wallich.

Rupertia stabilis Wallich, 1877, p. 502, Pl. XX, figs. 1-13. Brady, 1884, p. 680, Pl. XCVIII, figs. 1-12. Egger, 1893, p. 439, Pl. XXI, figs. 8, 9.

Observations.—There is one fine example here of this interesting species. According to Brady, its home is in the North Atlantic, and he also records poor examples from off the Cape of Good Hope, 150 fathoms; north of the Falkland Islands, 1,035 fathoms; and in the South Pacific, near Juan Fernandez, 1,375 fathoms. The only southern record of this species by Egger was from off the coast of Western Australia, 82 metres.

Occurrence.—XLII, very rare.

SUPER-FAMILY AMMODISCOIDEA.

FAMILY AMMODISCIDAE.

SUB-FAMILY AMMODISCINAE.

Genus GLOMOSPIRA Rzehak 1888.209. GLOMOSPIRA CHAROIDES (*Jones and Parker*).

Trochammina squamata, var. *charoides* Jones and Parker, 1860, p. 304.

Ammodiscus charoides (Jones and Parker), Brady, 1884, p. 334, Pl. XXXVIII, figs. 10-16.

Glomospira charoides (Jones and Parker), Cushman, 1918, p. 100, Pl. XXXVI, figs. 10-15.

Observations.—The present example was found in Sample XIII. This species has a distribution similar to that of *Glomospira gordialis*. In the "Terra Nova" soundings, it was confined to the Antarctic, almost exclusively to the deepest water stations. Our specimen is from off Knox Land, in the Antarctic, 1,500 fathoms.

Occurrence.—XIII, very rare.

210. GLOMOSPIRA GORDIALIS (*Jones and Parker*).

Trochammina squamata, var. *gordialis* Jones and Parker, 1860, p. 304. Parker and Jones, 1865, p. 408, Pl. XV, fig. 32.

Ammodiscus gordialis (Jones and Parker), Brady, 1884, p. 333, Pl. XXXVIII, figs. 7-9.

Glomospira gordialis (Jones and Parker) Cushman, 1918, p. 99, Pl. XXXVI, figs. 7-9.

Observations.—There is one typical example here. This species is very widely distributed, but is never common. In the "Terra Nova" dredgings it was recorded from seventeen stations.

Occurrence.—CIV, very rare.

SUB-FAMILY TOLYPAMMININAE.

Genus TOLYPAMMINA *Rhumbler* 1895.211. TOLYPAMMINA VAGANS (*Brady*).

Hyperammina vagans Brady, 1879, p. 33, Pl. III, fig. 5; 1884, p. 260, Pl. XXIV, figs. 1-9.

Tolypammina vagans (Brady), Cushman, 1910, p. 67, text-figs. 84, 85.

Girvanella vagans (Brady), Cushman, 1918, p. 91, Pl. XXXV, figs. 4, 5; Pl. XXXVI, fig. 1.

Observations.—There is one typical example here attached to a test of *Reophax distans*. Judging by the available records the species is most widely distributed. It is common on a species of *Jaculella* dredged by the late Mr. James Gabriel off Eden, New South Wales.

Occurrence.—CVII, very rare.

Genus AMMOLAGENA *Eimer and Fickert* 1899.212. AMMOLAGENA CLAVATA (*Jones and Parker*).

Trochammina irregularis, var. *clavata* Jones and Parker, 1860, p. 304.

Webbina clavata (Jones and Parker), Brady, 1884, p. 349, Pl. XLI, figs. 12-16.

Ammolagena clavata (Jones and Parker), Cushman, 1918, p. 89, Pl. XXXIV, figs. 2-5; Pl. XXXV, figs. 1-3.

Observations.—There are here two typical examples, that from Sample LXVII being attached to a pebble. The species, like many others in this family, is widely distributed in the living condition. It was sparingly represented at several "Terra Nova" stations.

Occurrence.—XVI, very rare; LXVII, very rare.

FAMILY SILICINIDAE.

SUB-FAMILY MILIAMMININAE.

Genus MILIAMMINA *Heron-Allen and Earland* 1930.213. MILIAMMINA ARENACEA (*Chapman*).

Miliolina oblonga (Montagu), var. *arenacea* Chapman, 1917 (2), p. 59, Pl. I, fig. 7.
Heron-Allen and Earland, 1922, p. 66.

Miliammmina oblonga Heron-Allen and Earland, 1930 (*pars*), p. 41, Pl. I, fig. 6 (? figs. 1-5, 22, 23).

Observations.—The test of this species is composed of excessively fine sand, with a siliceous cement. In commenting upon this structure Messrs. Heron-Allen and Earland stated, in a letter to "Nature," September 20th, 1930, that "The fact remains

that in the absence of chemical tests they were regarded by him (Chapman) and by ourselves and others afterwards, as *Miliolina oblonga*." If, however, the Report by Chapman on Sea-floor Deposits from Soundings (Austral. Ant. Exped., 1911-14, Ser. A, vol. II, 1922, p. 6), Sample III, Description, be consulted, one may read "Occasional arenaceous isomorphs of porcellanous Foraminifera (*Miliolina*) upon which strong HCl has no effect." When the earlier report and description (1917) were written, less importance was paid by rhizopodists to differences in shell-wall structure, and even to-day it is rather open to question whether describers of new species are not going too far in setting their own limits to morphological variation.

The appended distributional record shows a remarkable abundance of specimens in the samples examined. The form, in its broad interpretation, appears to be confined to the Antarctic from lat. 49°, and the original specimens were dredged from the Ross Sea. Other examples, under distinct names, were recorded by Heron-Allen and Earland (*loc. supra cit.*, 1930, p. 42) from Kerguelen Island and off South Georgia, and elsewhere in the Antarctic.

Associated with these forms from the Antarctic, in the present dredgings, are found porcellanous types, thus agreeing with the similar occurrence noted by Heron-Allen and Earland. The general form of the test resembles that of *Triloculina oblonga*, although some of the specimens are shorter and broader, and, further, show the quinqueloculine plan of growth as in *Q. venusta*. Their protean characters seem to be due to the effects of variable conditions. Since the two forms occur together in the one dredging, linked by insensible variations, it is impossible to regard them as distinct genera, as in porcellanous isomorphs.

Occurrence.—II, very common; III, common; V, very common; IX, frequent; X, very common; XII, very rare; XIV, very rare; XVII, very common; XVIII, very common; XIX, very common; XX, frequent; XXVII, very rare; XXXVIII, very rare; XXXIX, frequent; LXII, very rare; LXIII, very common; LXVIII, very common; LXIX, very common; LXX, very rare; LXXI, common; LXXII, very common; LXXIII, very rare; LXXIV, common; LXXVI, common; LXXVII, very common; LXXXIX, common; XC, rare; XCIV, very common; XCVII, very common; CI, common; CII, common; CIII, common; CIV, very common; CV, very rare; CIV, frequent; CVII, very rare; CIX, very common; CX, rare; CXIII, very rare.

FAMILY HYPERAMMINIDAE.

SUB-FAMILY HYPERAMMININAE.

Genus HYPERAMMINA *H. B. Brady* 1878.

214. HYPERAMMINA ELONGATA *H. B. Brady*. Plate IX, figs. 29, 30.

Hyperammina elongata Brady, 1878, p. 443, Pl. XX, figs. 2a, b; 1884, p. 257, Pl. XXIII, figs. 4, 7-8. Chapman, 1917 (2), p. 61, Pl. II, fig. 13. Heron-Allen and Earland, 1922, p. 87, Pl. I, fig. 21.

Observations.—Although not a common form here, the examples show the extreme kinds of test structure,—fine and spicular and coarsely arenaceous.

Hyperammima elongata has been previously recorded from Antarctic gatherings, from the Ross Sea, by the senior author; whilst Heron-Allen and Earland have obtained it in various soundings made by the "Terra Nova." Their description of the variations in test structure is very complete (*loc. supra cit.*).

Occurrence.—XXIX, very rare; XXXI, very rare; LVI, rare; LX, frequent; LXIX, very rare; LXXIV, very rare; LXXX, frequent; CVII, very rare.

215. *HYPERAMMINA FRIABILIS* H. B. *Brady.*

Hyperammima friabilis Brady, 1884, p. 258, Pl. XXIII, figs. 1-3, 5, 6. Cushman, 1910, p. 62, text-fig. 76.

Observations.—It is curious to note the absence of the above species from the "Terra Nova" collection. Here it is a well-recognised form, in deep and shallow water alike. Cushman records the survival of the tests of this species in the stomachs of holothurians from near the Galapagos Islands, at a depth of 1,329 fathoms.

Occurrence.—LX, rare; LXXXI, rare; LXXXII, rare; LXXXVII, rare; LXXXVIII, very rare; XCII, rare; XCV, very rare; CII, frequent; CIV, very rare; CVI, very rare.

216. *HYPERAMMINA LAEVIGATA* J. *Wright.*

Hyperammima elongata Brady (*pars*), 1884, p. 257, Pl. XXIII, figs. 9, 10. (*non* 4, 7, 8).

Hyperammima elongata, var. *laevigata* Wright, 1891, p. 466, Pl. XX, fig. 1. Cushman, 1910, p. 61, text-fig. 75.

Hyperammima laevigata Wright, Cushman, 1918, p. 77, Pl. XXIX, figs. 5, 6.

Observations.—This species has been confused with *Hyperammima elongata*, but is quite distinct. It is not uncommon off the coast of New South Wales.

Occurrence.—LIX, rare.

217. *HYPERAMMINA SUBNODOSA* H. B. *Brady.*

Hyperammima subnodosa Brady, 1884, p. 259, Pl. XXIII, figs. 11-14. Egger, 1893, p. 255, Pl. IV, fig. 32. Cushman, 1910, p. 63. Pearcey, 1914, p. 1004. Cushman, 1918, p. 76, Pl. XXIX, figs. 7, 8.

Observations.—Tests not common, and usually broken. This is a cold water form, occurring in shallow water in high latitudes, but in warmer areas frequenting deep water where the temperatures are correspondingly low.

Occurrence.—LXXXI, common; LXXXII, very rare; LXXXIII, rare; LXXXVIII, very rare.

Genus *JACULELLA* *H. B. Brady* 1879.

218. *JACULELLA ACUTA* *Brady*.

Jaculella acuta Brady, 1879, p. 35, Pl. III, figs. 12, 13; 1884, p. 255, Pl. XXII, figs. 14-18. Cushman, 1910, p. 70, text-figs. 90, 91. Heron-Allen and Earland, 1922, p. 85, Pl. I, figs. 19, 20.

Observations.—The "Aurora" specimens agree with those found by Heron-Allen and Earland, in that they depart from the more usually elongate-conical form and become shorter and broader.

Occurrence.—LXXXI, frequent; LXXXVII, rare.

219. *JACULELLA OBTUSA* *H. B. Brady*.

Jaculella obtusa Brady, 1882, p. 714; 1884, p. 256, Pl. XXII, figs. 19-22. Goës, 1894, p. 20, Pl. IV, figs. 87-89; Pl. V, figs. 90, 91.

? *Jaculella obtusa* Brady, Chapman, 1907, p. 24, Pl. III, fig. 49.

Jaculella obtusa Brady, Heron-Allen and Earland, 1922, p. 86.

Observations.—This species is represented almost certainly by a fossil form of L. Miocene age in Victoria. Another fossil species has lately been described by the senior author, as *J. neumerellensis* from Miocene beds in East Gippsland, and differs only in the slightly fusiform test. The Recent specimens here recorded are typical. Heron-Allen and Earland note it from three stations of the "Terra Nova" Expedition.

Occurrence.—LXXXVII, frequent.

SUB-FAMILY DENDROPHRYINAE.

Genus *SACCORHIZA* *Eimer and Fickert* 1899.

220. *SACCORHIZA RAMOSA* (*H. B. Brady*).

Hyperammima ramosa Brady, 1879, p. 33, Pl. III, figs. 14, 15.

Saccorhiza ramosa (Brady) Cushman, 1910, p. 65, text-fig. 81.

Hyperammima ramosa Brady, Heron-Allen and Earland, 1922, p. 86, Pl. I, fig. 13.

Observations.—The tests are coarsely constructed of sand-grains, sponge spicules. Foraminifera (*Haplophragmoides*) and valves of ostracoda.

Occurrence.—XLII, rare; XLVI, rare; LX, frequent.

Genus DENDRONINA Heron-Allen and Earland 1922.

221. *DENDRONINA ARBORESCENS Heron-Allen and Earland*. Plate IX, fig. 31.

Dendronina arborescens Heron-Allen and Earland, 1922, p. 78, Pl. II, figs. 10-12, 14-18.

Observations.—This extremely interesting species has been fully dealt with by Heron-Allen and Earland. Two typical specimens of the branching portion were met with here, in dredgings in the Atlantic, viz., off Queen Mary Land and in the D'Urville Sea. Other fragmentary specimens have been seen which may belong to either this or *Dendronina limosa*, but the material is insufficient for determination.

Occurrence.—XIX, very rare; LXI, very rare.

FAMILY CORNUSPIRIDAE.

SUB-FAMILY CORNUSPIRINAE.

Genus CORNUSPIRA Schultze 1854.

222. *CORNUSPIRA INVOLVENS (Reuss)*.

Operculina involvens Reuss, 1850, p. 370, Pl. XLVI, fig. 20.

Cornuspira involvens (Reuss), Brady, 1884, p. 200, Pl. XI, figs. 1-3. Heron-Allen and Earland, 1922, p. 74. Chapman, 1926, p. 27, Pl. III, figs. 1-2.

Observations.—The specimens from Samples XXII and XXIV, dredged off Queen Mary Land, are very large and finely developed. The deepest water in which they were here found is 2,083 fathoms, which constitutes a record. Reuss' types were from the Miocene of the Vienna Basin. The species is a common fossil in the Tertiary of Australia.

Occurrence.—XXII, very common; XXIII, rare; XXIV, common; XLVIII, very rare; XCVIII, very rare.

223. *CORNUSPIRA INVOLVENS, var. CORTICATA nov.* Plate IX, fig. 32.

Description.—Test large, whorls irregular, especially in the later turns, in the microspheric form numbering thirteen or more; inner whorls thin and closely coiled, outer whorls increasing rapidly in diameter, compressed and elliptical in section, concentrically striated and constricted at intervals, giving a pseudo-septate appearance. Surface of test covered by a thin rusty coating, of the nature of dried protoplasm, to which fine sand is generally adherent.

Diameter up to 5.5 mm. Diameter of peripheral whorl in large specimens, 0.7 mm.

Observations.—This variety was found at only one station, off Queen Mary Land, 125 fathoms, associated with the specific form.

The somewhat irregular contour and redundant growth of this species recalls Heron-Allen and Earland's *C. diffusa* (Journ. Roy. Micr. Soc., 1913, pp. 272-276, Pl. XII), but in the present form the redundancy is restricted to tumidity and constriction of the tube, and there is no foliation or depression of the test. The brown cortical layer is a distinct feature of this species.

Occurrence.—XXII, common.

SUB-FAMILY OPHTHALMIDIINAE.

Genus OPHTHALMIDIUM *Zwingli and Kubler* 1870.

224. OPHTHALMIDIUM INCONSTANS (*Brady*).

Hauerina inconstans Brady, 1879, p. 54.

Ophthalmidium inconstans (Brady) Brady, 1884, p. 189, Pl. XII, figs. 5, 7, 8. Brady, Parker, and Jones, 1888, p. 216, Pl. XL, figs. 12, 13.

Observations.—One example of this species was observed in Sample XLVII, from east of Tasmania, 1,320 fathoms. Brady states that the distribution of the species is world-wide and records it from depths of 100 to 2,300 fathoms. It did not occur in the "Terra Nova" dredgings.

Occurrence.—XLVII, very rare.

225. OPHTHALMIDIUM MARGARITIFERUM *Heron-Allen and Earland*.

Ophthalmidium margaritifera Heron-Allen and Earland, 1922, p. 72, Pl. I, figs. 9-12.

Observations.—There is one example, from 45° 26' S, 147° 26' E., 2,083 fathoms. This species was described from off the coast of New Zealand. According to Heron-Allen and Earland, it is allied to *Ophthalmidium tumidulum*, from which it differs in having the later chambers occupying more than half the circumference.

Occurrence.—XXXI, very rare.

Genus PLANISPIRINA *Sequenza* 1880.

226. PLANISPIRINA BUCCULENTA (*Brady*).

Miliolina bucculenta Brady, 1884, p. 170, Pl. CXIV, figs. 3a, b.

Planispirina bucculenta (Brady) Schlumberger, 1892, p. 194, Pl. VIII, figs. 6, 7; woodcuts 2-4. Chapman, 1909 (2), p. 324, Pl. XIV, fig. 2; 1917 (1), p. 42, Pl. V, fig. 4.

Observations.—In Sample XXII, this species was exceptionally common. The only "Challenger" records were from the North Atlantic. Schlumberger recorded it from off the Azores. In the northern hemisphere it is a deep-water species, but in southern areas it is found in shallower water. It has been recorded by one of us (F.C.)

from upthrust muds on the slopes of Mt. Erebus (of Pleistocene age), and off the Subantarctic Islands of New Zealand, and was also met with in the "Terra Nova" dredgings. It also occurs in Victorian shallow-water dredgings.

Occurrence.—XXI, very rare; XXII, very common; XXIV, common; XLVII, very rare; XCVII, very rare; XCVIII, very rare.

227. *PLANISPIRINA CONTRARIA* (*d'Orbigny*).

Biloculina contraria d'Orbigny, 1846, p. 266, Pl. XVI, figs. 4-6. Brady, 1864, p. 466, Pl. XLVIII, fig. 2.

Planispirina contraria (d'Orbigny); Brady, 1884, p. 195, Pl. XI, figs. 10, 11; text-fig. 5a.

Observations.—This is one typical example. d'Orbigny described the species from the Miocene of the Vienna Basin. In the "Challenger" dredgings, it occurred at three stations in the South Pacific.

Occurrence.—CXV, very rare.

228. *PLANISPIRINA SPHAERA* (*d'Orbigny*).

Biloculina sphaera d'Orbigny 1839 (3), p. 66, Pl. VIII, figs. 13-16. Brady, 1884, p. 141, Pl. II, figs. 4a, b.

Planispirina sphaera (d'Orb.), Schlumberger, 1891, p. 577, woodcuts, 45, 46. Chapman, 1917 (2), p. 59, Pl. I, fig. 8. Cushman, 1917, p. 37, Pl. XIX, fig. 1.

Observations.—This species occurred in only one sample. The examples are more compressed than that figured previously by one of us (F.C.) from the Ross Sea. In the "Terra Nova" dredgings, the species was recorded from three stations, the Antarctic specimens unlike those in the "Aurora" soundings, being characterised by extremely labyrinthic apertures.

Occurrence.—XXII, frequent.

FAMILY MILIOLIDAE.

Genus QUINQUELOCULINA *d'Orbigny* 1826.

229. *QUINQUELOCULINA LAMARCKIANA* *d'Orbigny*.

Quinqueloculina lamarckiana d'Orbigny, 1839 (1), p. 189, Pl. XI, figs. 14-15.

Quinqueloculina auberiana d'Orb., 1839 (1), p. 193, Pl. XII, figs. 1-3.

Miliolina cuvieriana Brady (*non Quinqueloculina cuvieriana* d'Orbigny), 1884, p. 162, Pl. V, figs. 12a-c.

Quinqueloculina cuvieriana d'Orb., Cushman, 1922 (1), p. 64.

Observations.—There are three small examples of this species, the types of which were from the West Indies. It is a common form in shallow water in temperate and tropical areas of the Indo-Pacific region.

Occurrence.—XLV, rare.

230. QUINQUELOCULINA SEMINULUM (*Linn.*).

Serpula seminulum Linné, 1767, p. 1624, No. 791; 1788, p. 3739, No. 2.

Miliolina seminulum (Linné), Brady, 1884, p. 157, Pl. V, figs. 6a-c. Chapman, 1909 (2), p. 319. Heron-Allen and Earland, 1922, p. 67.

Quinqueloculina seminula (Linné) Cushman, 1929 (1), p. 59, Pl. IX, figs. 16-18.

Observations.—Examples of this species are never common here, but except in point of size agree with those recently figured by Dr. Cushman from Rimini. The "Terra Nova" specimens were recorded as not very abundant.

Occurrence.—XXIV, rare; XLVI, rare; XLVII, rare; XLVIII, very rare; CXV, very rare.

231. QUINQUELOCULINA SUBROTUNDA (*Montagu*).

Vermiculum subrotundum Montagu, 1803, p. 521.

Miliolina subrotunda (Montagu), Brady, 1884, p. 168, Pl. V, figs. 10, 11.

Observations.—There is one diminutive specimen probably referable to this species. The "Terra Nova" records were from four stations, three of which are off the New Zealand coast.

Occurrence.—XCVIII, very rare.

232. QUINQUELOCULINA TROPICALIS *Cushman*.

Miliolina gracilis Brady (*non Triloculina gracilis* d'Orbigny), 1884, p. 160, Pl. V, figs. 3a-c.

Quinqueloculina tropicalis Cushman, 1924 (1), p. 63, Pl. XXIII, figs. 9, 10.

Observations.—Two examples of this neat little species occur here. The type locality was Samoa. Our specimens show a very thin shell-wall with finely granulated surface, which at first glance might be taken for arenaceous structure.

Occurrence.—XLVII, rare.

233. QUINQUELOCULINA VENUSTA *Karrer*.

Quinqueloculina venusta Karrer, 1868, p. 147, Pl. II, fig. 6.

Miliolina venusta (Karrer) Brady, 1884, p. 162, Pl. V, figs. 5-7. Chapman, 1907, p. 20, Pl. II, fig. 38. Heron-Allen and Earland, 1922, p. 68.

Observations.—There are several examples of this deep-water species. Those from Samples XIV and XXV are of a slender, elongate type, while the others are typical. The "Terra Nova" specimens occurred to the south of New Zealand. Karrer described the

species from the Miocene of Kosteĵ in Hungary, and it has also been recorded in the fossil condition from the Gingin Chalk, of Cretaceous age, from Western Australia, and also from the Lower Miocene of Victoria (F.C.).

Occurrence.—XIV, very rare; XXV, rare; XL, very rare; XLVI, rare; LXV, very rare.

234. *QUINQUELOCULINA VULGARIS d'Orbigny.*

Quinqueloculina vulgaris d'Orbigny, 1826, p. 302, No. 33. Schlumberger, 1893, p. 207, text-figs. 13, 14; Pl. II, figs. 65, 66. Fornasini, 1902, p. 23, text-fig. 13.

Miliolina vulgaris (d'Orbigny) Chapman, 1907, p. 18, Pl. II, fig. 32. *Idem*; 1917 (2), p. 58, Pl. I, fig. 4.

Observations.—The examples referred to this species are usually of the type figured by Schlumberger from the Gulf of Marseilles. It is an abundant fossil in the L. Miocene of Victoria, and there are many records of its occurrence in the living condition in the Pacific. The Antarctic specimens occur principally in the Ross Sea.

Occurrence.—XXIX, very rare; XLVI, frequent; XLVII, rare; LXV, very rare.

Genus SIGMOILINA Schlumberger 1887.

235. *SIGMOILINA EDWARDSI (Schlumberger), var. ACUTA nov.* Plate IX, fig. 33.

Description.—Test small, resembling *S. edwardsi* in general form and character of aperture, but with the periphery compressed and acute.

Length, 0.7 mm.; diameter, 0.46 mm.

Observations.—This neat variant of *Sigmoilina edwardsi* (Schlumberger 1887, p. 483, text-fig. 8; Pl. VII, figs. 15–18) is represented here by a few specimens. The specific form does not occur in these soundings, although recorded by Heron-Allen and Earland from "Terra Nova" dredgings.

Occurrence.—XLVI, rare; XLVIII, very rare; XLIX, very rare.

236. *SIGMOILINA SCHLUMBERGERI A. Silvestri.*

Planispirina celata Brady (*non Spiroloculina celata* Costa), 1884, p. 197, Pl. VIII, figs. 1–4.

Sigmoilina schlumbergeri A. Silvestri, 1904, p. 267.

Observations.—Heron-Allen and Earland record both *Sigmoilina celata* and *S. schlumbergeri* in the "Terra Nova" dredgings from off New Zealand. In the present samples only the neat, elongated form, *Sigmoilina schlumbergeri* occurs. The examples are all from deep-water stations.

Occurrence.—XXX, common; XLVI, rare; XLVII, rare; XLVIII, very rare; XLIX, very rare; CXV, very rare.

237. SIGMOILINA TENUIS (Czjzek).

Quinqueloculina tenuis Czjzek, 1848, p. 149, Pl. XIII, figs. 31-34.

Spiroloculina tenuis (Czjzek) Brady, 1884, p. 152, Pl. X, figs. 7-11.

Sigmoilina tenuis (Czjzek) Cushman, 1927 (3), p. 139.

Observations.—The only examples of this species were from Sample XLVII, dredged from a depth of 1,320 fathoms east of Tasmania. They agree with material at hand from the Miocene of Baden, Austria, from whence the species was described. According to Brady, it inhabits all the great ocean basins, but is especially abundant in the South Pacific.

Occurrence.—XLVII, rare.

Genus TUBINELLA Rhumbler 1906.

238. TUBINELLA FUNALIS (Brady).

Articulina funalis Brady, 1884, p. 185, Pl. XIII, figs. 6-11. Egger, 1893, p. 242, Pl. III, fig. 1. Chapman, 1907, p. 22, Pl. II, fig. 44. Cushman, 1924 (1), p. 54, Pl. XIX, figs. 7, 8.

Observations.—There are a few specimens in a fragmentary condition in these dredgings. One of these, showing the initial part of the test, occurred in Davis Sea, near the iceberg depicted on the chart. In the "Terra Nova" soundings this species was remarkably abundant at some of the Antarctic stations near the coastline. Brady's records were from off Kerguelen Island, 120 and 20-50 fathoms; off Prince Edward Island, near the Crozets, 50-150 fathoms; and in Humboldt Bay, on the north coast of Papua, 37 fathoms. It thus occurs in cold and tropical areas alike.

The only fossil record is that of one of us (F.C.) from the L. Miocene of Victoria.

Occurrence.—XXII, very rare; XXIV, very rare; CVIII, very rare.

Genus TRILOCULINA d'Orbigny 1826.

239. TRILOCULINA CIRCULARIS Bornemann.

Triloculina circularis Bornemann, 1855, p. 349, Pl. XIX, fig. 4.

Miliolina circularis (Born.) Sherborn and Chapman, 1886, p. 742, Pl. XIV, figs. 2a, b.

Chapman, 1907, p. 17, Pl. II, fig. 27; 1917 (1), p. 42, Pl. V, fig. 3.

Triloculina circularis Born. Cushman, 1921, p. 462, Pl. XCII, figs. 1, 2.

Miliolina circularis (Born.) Heron-Allen and Earland, 1922, p. 64.

Observations.—The specimens are variable in size but typical. This species has been recorded both from the "Nimrod" and the "Discovery" collections.

Occurrence.—XXIII, common; XXIV, common; XLVI, rare; XLVII, rare; XLVIII, very rare.

240. *TRILOCULINA CIRCULARIS* Bornemann, var. *SUBLINEATA* (Brady).

Miliolina circularis (Born.), var. *sublineata* Brady, 1884, p. 169, Pl. IV, fig. 7. Egger, 1893, p. 237, Pl. II, figs. 78, 79. Chapman, 1909 (2), p. 319, Pl. XIII figs. 5-7. Heron-Allen and Earland, 1915, p. 558, Pl. XLI, figs. 9-11; 1922, p. 64.

Observations.—This variety, originally described from a tropical area, namely Admiralty Islands off New Guinea, is here dredged from extreme conditions, in juxtaposition to an iceberg off Queen Mary Land. It has previously been recorded by the senior author from the Subantarctic Islands of New Zealand, and by Heron-Allen and Earland in the Kerimba Archipelago and Station 27 of the "Terra Nova" Expedition.

Occurrence.—XXIII, very rare.

241. *TRILOCULINA OBLONGA* (Montagu).

Vermiculum oblongum Montagu 1803, p. 552, Pl. XIV, fig. 9.

Miliolina oblonga (Montagu) Goës, 1894, p. 110, Pl. XX, figs. 850-850f.

Observations.—In the Antarctic soundings this species was rare. It was not found in any of the samples from which *Miliammina arenacea* was recorded; thus its distinctness from *M. arenacea*, which was earlier regarded by one of us as a variety of the above, is further emphasised by this fact. The specimens are usually of the narrow type figured by Williamson, from the British Isles. Although it is cosmopolitan in its distribution, it should also be noted that this is a bipolar form.

Occurrence.—XXII, rare; XXIV, very rare; XXXI, very rare; XL, very rare; XLVIII, frequent; XCVIII, very rare; CXIV, frequent.

242. *TRILOCULINA TRICARINATA* d'Orbigny.

Triloculina tricarinata d'Orbigny, 1826, p. 299, No. 7, Modèle No. 94.

Miliolina tricarinata (d'Orbigny) Brady, 1884, p. 165, Pl. III, figs. 17a, b. Chapman, 1909 (2), p. 320; 1917 (1), p. 29, Pl. II, fig. 7a, b; 1917 (2), p. 59. Heron-Allen and Earland, 1922, p. 66.

Observations.—Only small specimens were met with in the Shackleton soundings in the Ross Sea, and the species also occurred in the elevated deposits in the same area. Both short and long forms occur quite close to the ice, off Queen Mary Land.

Occurrence.—XXII, common; XXIII, very rare; XXIV, common; XXX, rare; XLVI, very rare; XLVII, common; XLVIII, rare.

243. TRILÖCULINA TRIGONULA (*Lamarck*).

Miliolites trigonula Lamarck, 1804, p. 351, No. 3:

Miliolina trigonula (Lam.) Chapman, 1907, p. 18, Pl. II, fig. 30.

Triloculina trigonula (Lam.) Cushman, 1917, p. 65, Pl. XXV, fig. 3.

Observations.—As in the case of the preceding species, the specimens from Antarctic waters are small, and even rare.

Occurrence.—XXXII, very rare; XCVIII, very rare.

Genus PYRGO *DeFrance* 1824.244. PYRGO ANOMALA (*Schlumberger*).

Biloculina anomala Schlumberger 1891, p. 569, Pl. XI, figs. 84–86; Pl. XII, fig. 101; text-figs. 32–34. Chapman, 1906, p. 80. Cushman, 1917, p. 79, Pl. XXXII, fig. 1; 1919, p. 639.

Observations.—This species was described by Schlumberger from dredgings from the Mediterranean at a depth of 555 metres. Pacific records are from off the Hawaiian Islands and off the Poor Knight's Islands, New Zealand (Cushman), and from off Great Barrier Island, New Zealand, 110 fathoms (Chapman).

Occurrence.—XIV, very rare; XXIII, common.

245. PYRGO DEPRESSA (*d'Orbigny*).

Biloculina depressa d'Orbigny, 1826, p. 298, No. 7; Modèle No. 91. Chapman, 1915, p. 5; 1917 (1), p. 27, Pl. I, figs. 1*a*, *b*; 2, 3. Cushman, 1917, p. 74, Pl. XXVIII, figs. 1, 2. Heron-Allen and Earland, 1922, p. 62.

Observations.—This is perhaps the most abundant and widely distributed species of this genus. The largest specimens were found off Queen Mary Land (No. XXIV) and off the east coast of Tasmania (No. XLVII). In Sample XLVII one of the specimens is faintly striate.

Occurrence.—XI, very rare; XIV, very rare; XXI, very rare; XXII, rare; XXIII, very rare; XXIV, frequent; XXV, frequent; XXXII, very rare; XXXVIII, very rare; XLVI, very rare; XLVII, very common; XLVIII, common; XLIX, very rare; XCVIII, rare; CVIII, very rare; CXIV, common; CXV, rare.

246. PYRGO MURRHYNIA (*Schwäger*).

Biloculina murrhyna Schwager, 1866, p. 203, Pl. IV, figs. 15*a*, *b*. Cushman, 1917, p. 75, Pl. XXVIII, fig. 3; Pl. XXIX, fig. 1.

Biloculina depressa d'Orb., var. *murrhyna* Schwager, Heron-Allen and Earland, 1922, p. 62.

Observations.—The present distribution and relative abundance agree with that found on the Scott Expedition, being rare and small in the Antarctic area. Its best development occurred between the Antarctic and the Australian continent, in 1,800 fathoms (No. CXIV). In Sample XXII there is one specimen with a raised margin to the penultimate chamber, thus approaching *Pyrgo laevis* DeFrance.

Occurrence.—XI, very rare; XXIX, frequent; XLVI, very rare; XLVII, common; XLVIII, rare; CXIV, very common; CXV, very rare.

247. PYRGO SERRATA (*Bailey*).

Biloculina serrata L. W. Bailey, 1861, p. 350, Pl. VIII, fig. E.

Biloculina depressa d'Orb., var. *serrata* H. B. Brady, 1884, p. 146, Pl. II, fig. 3.

Biloculina serrata Bailey, Cushman, 1917, p. 75, Pl. XXIX, fig. 2.

Biloculina depressa d'Orb., var. *serrata* Bailey, Heron-Allen and Earland, 1922, p. 63.

Observations.—These occurrences are all outside the Antarctic area. The examples are well developed, one being of exceptional size.

Occurrence.—XXIX, very rare; XXX, very rare; XLV, very rare; XLVII, frequent.

248. PYRGO ELONGATA (*d'Orbigny*).

Biloculina elongata d'Orbigny, 1826, p. 298, No. 4. Schlumberger, 1891, p. 571, Pl. XI, figs. 87, 88; Pl. XII, fig. 89; text-figs. 35, 36. Chapman, 1907, p. 15, Pl. I, fig. 14; 1909 (2), p. 317; 1917 (1), p. 28, Pl. II, fig. 6. Cushman, 1917, p. 78, Pl. XXXI, fig. 1. Heron-Allen and Earland, 1922, p. 62.

Observations.—Some large examples occur in No. XXIV, off Queen Mary Land. The series is fairly numerous and typical.

Occurrence.—XXI, very rare; XXII, rare; XXIV, common; XLVIII, very rare; CXIV, frequent.

249. PYRGO GLOBULUS (*Bornemann*).

Biloculina globulus Bornemann, 1855, p. 349, Pl. XIX, fig. 3. Schlumberger, 1891, p. 575, Pl. XII, figs. 97-100; woodcuts, figs. 42-44. Chapman, 1907, p. 15, Pl. I, figs. 17, 18.

Observations.—Typical examples were found in Sample XXII. The types of this species were from the German Oligocene, and it is also known from the Lower Miocene in Victoria. Schlumberger's record, in the recent condition, was from off the Azores, 4,060 metres.

Occurrence.—XXII, frequent.

250. PYRGO IRREGULARIS (*d'Orbigny*).

Biloculina irregularis d'Orbigny, 1839 (3), p. 67, Pl. VIII, figs. 22-24. Brady, 1884, p. 140, Pl. I, figs. 17, 18. Chapman, 1907, p. 15, Pl. I, figs. 5, 6. Cushman, 1921, p. 479, Pl. XCV, figs. 1a, b.

Observations.—This species is fairly widely distributed and typical in the present series.

Occurrence.—XXI, rare; XXII, frequent; XXIV, rare; XLV, very rare; XLVI, rare; XLVIII, rare; XCVIII, rare.

251. PYRGO LUCERNULA (*Schwager*).

Biloculina lucernula Schwager, 1866, p. 202, Pl. IV, figs. 14a-c, 17a-b. Schlumberger, 1891, p. 572, Pl. XII, figs. 90-96; text-figs. 37-41. Chapman, 1909 (2), p. 315. Cushman, 1917, p. 79, Pl. XXXII, fig. 2; 1921, p. 475, Pl. XCVII, figs. 2a-c; Pl. XCVIII, figs. 1a-c.

Observations.—Many records from the time of the "Challenger" Report were noted under Costa's species name *Biloculina tubulosa*, which, by the way, is another form often showing a triloculine arrangement of the chambers.

Occurrence.—XXX, very rare; XXXIX, very rare; XLI, rare; XLVIII, very rare.

252. PYRGO TUBULOSA (*Costa*).

Biloculina tubulosa Costa, 1856, p. 309, Pl. XXIV, fig. 7. Brady, 1884, p. 147, Pl. III, figs. 6a-c. Chapman, 1895, p. 7, Pl. I, figs. 1 and 7.

Observations.—There are here two specimens of the biloculine form of this species. This probably represents the megalospheric stage, the microspheric stage being shown in Costa's type-figure and that of Brady in the "Challenger" Report.

Occurrence.—XLVI, very rare; XCVIII, very rare.

253. PYRGO VESPERTILIO (*Schlumberger*).

Biloculina ringens, Brady (*non Miliolites ringens* Lamarck), 1884, p. 142, Pl. II, fig. 8.

Biloculina vespertilio Schlumberger, 1891, p. 561, Pl. X, figs. 74-76; woodcuts, 20-22. Chapman, 1909 (2), p. 315, Pl. XIII, figs. 4a, b. Cushman, 1917, p. 77, Pl. XXX, fig. 1.

Observations.—This species was founded on one of Brady's "Challenger" specimens of *Biloculina ringens*. It is larger, sub-elongate and more inflated than in *Biloculina ringens*, *sensu stricto*. It has been recorded (*loc. supra cit.*) from the Subantarctic Islands of New Zealand, and Schlumberger describes it from the Gulf of Gascony. Cushman's specimens were found off the coast of Japan, in 258 fathoms.

Occurrence.—XXV, very rare.

FAMILY LITUOLIDAE.

SUB-FAMILY HAPLOPHRAGMIINAE.

Genus RECURVOIDES *Earland* 1934.

254. RECURVOIDES CONTORTUS *Earland*. Plate IX, figs. 34a, b.

Recurvoides contortus Earland, 1934, p. 91, Pl. X, figs. 7-19.

Description.—Test irregularly coiled, subglobose, asymmetrical; somewhat depressed at the centre but not umbilicate, partially involute, one and a half whorls being visible, with about five or six chambers to one turn; sutures not deeply impressed; periphery well rounded; aperture slit-like, inclined to one side; wall composed of sand grains with a fair amount of cement; test usually of an orange to pale yellow tint, sometimes white. In some examples, the asymmetry is so pronounced that the test is of a decided oblong form. Longest diameter of a well-grown specimen, 1 mm.; smaller specimens 0.75 mm.; ratio of longer to shorter diameter is about 4 to 3, and the thickness is equal to half the smaller diameter.

Observations.—As already shown by Earland, this species bears some resemblance to *Haplophragmoides scitulus*. In the "Aurora" soundings it did not occur north of lat. 64° south. It is commonest at depths of from 150-300 fathoms, but has been found as deep as 1,550 fathoms.

Occurrence.—II, common; III, very rare; V, rare; VII, very rare; VIII, very rare; IX, very rare; X, frequent; XI, common; XIII, common; XVIII, common; XIX, very common; XX, very rare; LXXVII, common; LXXVIII, frequent; LXXX, frequent; LXXXII, frequent; XCV, very rare; CIII, frequent; CIV, very rare; CVII, frequent; CXI, very rare.

*Genus HAPLOPHRAGMOIDES Cushman 1910.*255. *HAPLOPHRAGMOIDES CANARIENSIS (d'Orbigny).*

Nonionina canariensis d'Orbigny, 1839 (2), p. 128, Pl. II, figs. 33, 34.

Haplophragmium canariense (d'Orb.) Brady, 1884, p. 310, Pl. XXXV, figs. 1-5.

Haplophragmoides canariensis (d'Orb.) Cushman, 1910, p. 101, text-fig. 149; 1920, p. 38, Pl. VIII, fig. 1.

Haplophragmium canariense (d'Orb.) Chapman, 1917 (2), p. 63, Pl. III, fig. 20.

Observations.—There are many typical examples. In Sample LXXX, specimens show a tendency to pass into *Haplophragmoides sphaeriloculus* Cushman, a species characterised by fewer, much-inflated chambers. In the "Terra Nova" dredgings, this species was almost universally distributed, and very variable.

Occurrence.—IX, very rare; XIII, very rare; XIV, frequent; XIX, common; LVI, very rare; LX, very rare; LXIX, very rare; LXXX, frequent; LXXXII, rare; XC, very rare; XCI, very rare; XCIV, rare; XCVIII, very rare; CI, frequent; CII, very rare; CVII, frequent.

256. *HAPLOPHRAGMOIDES CANARIENSIS (d'Orbigny), var. VARIABILIS*

(*Heron-Allen and Earland*). Plate IX, fig. 35.

Haplophragmium canariense, var. variabilis Heron-Allen and Earland, 1916, p. 41, Pl. VI, figs. 1-3; 1922, p. 100.

Observations.—The occurrence of this form on the English coast was first mentioned by Brady in the "Challenger" Report (p. 311). It subsequently was named by Heron-Allen and Earland in their paper on Foraminifera from shallow water off the coast of Cornwall. It is also known from off the west coast of Scotland. The only other records of its occurrence are from the "Terra Nova" dredgings, where it was confined to the southern areas in the Antarctic circle. Although this gives a peculiar distribution, there can be no doubt that Heron-Allen and Earland's identification was correct, as very typical examples of this form have occurred in the "Aurora" dredgings. One is figured.

Occurrence.—VII, very rare; LXXXVI, very rare; CI, frequent; CII, very rare.

257. *HAPLOPHRAGMOIDES EMACIATUM (Brady).*

Haplophragmium emaciatum Brady, 1884, p. 305, Pl. XXXIII, figs. 26-28.

Haplophragmoides emaciatum (Brady), Cushman, 1910, p. 102, text-figs. 150-152; 1920, p. 40, Pl. VIII, fig. 4; text-figs. 1-3.

Haplophragmium emaciatum Brady, Heron-Allen and Earland, 1922, p. 98.

Observations.—The examples are usually small and coarsely constructed, but otherwise typical. This species was recorded from two "Terra Nova" stations.

Occurrence.—II, frequent; III, rare; XI, very rare; XIII, very rare; XVIII, very rare; XXXV, common; XLVII, very rare; LIX, rare; LX, very rare; LXXI, very rare; LXXVI, very rare; LXXXI, very rare; LXXXII, very rare; LXXXIII, very rare.

258. HAPLOPHRAGMOIDES GLOMERATUS (*Brady*).

Lituola glomerata Brady, 1878, p. 433, Pl. XX, figs. 1a-c.

Haplophragmium glomeratum (Brady) Brady, 1884, p. 309, Pl. XXXIV, figs. 15-18.

Haplophragmoides glomeratum (Brady) Cushman, 1910, p. 104, text-figs. 158-161.

Pearcey, 1914, p. 1008; Cushman, 1920, p. 47, Pl. IX, fig. 6.

Observations.—There are many exceptionally fine specimens. In the "Terra Nova" soundings, this species was confined to the deeper water between New Zealand and the Antarctic coast-line. Our records are all from south of lat. 63° S., from depths of 265 to 1,810 fathoms. The best examples are from Sample LXXXI, 1,810 fathoms. Brady's original records were from the Arctic Ocean.

Occurrence.—X, rare; XI, frequent; XIII, very rare; LX, common; LXXXI, very rare; LXXXIX, frequent; XC, very rare; CI, rare; CIX, very rare.

259. HAPLOPHRAGMOIDES RINGENS (*Brady*).

Trochammina ringens Brady, 1879, p. 57, Pl. V, figs. 12a, b; 1884, p. 343, Pl. XL, figs. 17-18.

Haplophragmoides ringens (Brady) Cushman, 1910, p. 107, text-fig. 166; 1920, p. 49, Pl. IX, fig. 2.

Trochammina ringens Brady, Heron-Allen and Earland, 1922, p. 114.

Observations.—There is one good example here of this easily recognised species. According to Cushman, it has a wide distribution, but it is almost confined to deep cold waters, and is usually rare. The only "Terra Nova" record was from off North Cape, New Zealand, 70 fathoms.

Occurrence.—XXII, very rare.

260. HAPLOPHRAGMOIDES SILEX (*Egger*). Plate X, fig. 36.

Haplophragmium silex Egger, 1899, p. 137, Pl. I, figs. 17, 36, 37.

Observations.—One typical specimen occurs here, and is figured. The original examples of Dr. Egger came from the Chalk marl of the Higher Bavarian Alps. The present occurrence is singularly interesting, for it is the first time that this Cretaceous species has been recorded living.

Occurrence.—XC, very rare.

261. HAPLOPHRAGMOIDES SPHAERILOCULUS *Cushman*.

Haplophragmoides sphaeriloculum Cushman, 1910, p. 107, text-fig. 165.

Haplophragmium sphaeriloculum (Cushman) Sidebottom, 1918, p. 15, Pl. II, figs. 15, 16. Heron-Allen and Earland, 1922, p. 101.

Observations.—Typical examples occur here. This species was originally described from off Japan. Sidebottom's record was from off the coast of New South Wales, and Heron-Allen and Earland had it from four "Terra Nova" stations. It can be distinguished from the related *Haplophragmoides canariensis* by the globose character of the few (usually five) visible chambers and the smooth wall.

Occurrence.—LXV, very rare; LXXI, very rare; LXXXII, rare; LXXXIII, very rare; LXXXIV, very rare; LXXXVII, very rare; XCI, very rare.

262. HAPLOPHRAGMOIDES SUBGLOBOSUS (*G. O. Sars*).

Lituola subglobosa M. Sars, 1869, p. 250 (*nomen nudum*). G. O. Sars, 1872, p. 253.

Haplophragmium subglobosum Brady, 1881 (1), p. 100; 1881 (2), p. 406.

Haplophragmium latidorsatum Brady (*non Nonionina latidorsata* Bornemann), 1884, p. 307, Pl. XXXIV, figs. 7, 8, 10, 14 (?) (*non* fig. 9).

Haplophragmoides subglobosum (G. O. Sars), Cushman, 1910, p. 105, text-figs. 162–164; 1920, p. 45, Pl. VIII, fig. 5.

Observations.—This species is, generally speaking, a deep-water form of cosmopolitan distribution, but in high latitudes is found at lesser depths. It has previously been recorded (as *Haplophragmium latidorsatum*) from the Antarctic, by Heron-Allen and Earland from the "Terra Nova" dredgings, and by one of us (F.C.) from the Ross Sea.

Occurrence.—X, frequent; XI, frequent; XIII, very rare; XXXI, very rare; XXXII, very rare; XXXV, very rare; XXXIX, very rare; XLI, very rare; XLVII, very rare; LX, frequent; LXXVII, rare; LXXX, rare; LXXXI, common; LXXXII, frequent; LXXXIII, frequent; LXXXIV, frequent; LXXXVI, very rare; LXXXVII, frequent; LXXXVIII, common; LXXXIX, frequent; XC, common; XCII, very rare; XCIII, frequent; CXV, rare.

263. HAPLOPHRAGMOIDES TRULLISSATUS (*Brady*).

Trochammina trullissata Brady, 1879, p. 56, Pl. V, figs. 10a, b, 11; 1884, p. 342, Pl. XL, figs. 14–16 (*non* fig. 13).

Haplophragmoides trullissata (Brady) Cushman, 1910, p. 100, text-figs. 148a, b. Pearcey, 1914, p. 1008. Cushman, 1920, p. 43, Pl. IX, fig. 5.

Observations.—Occasional specimens occur here. This species is very widely distributed, but is never common at any locality. The "Terra Nova" had it from nine stations. Our best examples are from Sample CII.

Occurrence.—VII, very rare; XIX, frequent; XLVII, very rare; LXXVIII, very rare; LXXXIII, very rare; LXXXIV, very rare; LXXXVI, very rare; LXXXVII, very rare; LXXXVIII, very rare; CII, rare; CIII, rare; CIV, very rare.

Genus AMMOBACULITES *Cushman* 1910.

264. AMMOBACULITES AGGLUTINANS (*d'Orbigny*). Plate X, fig. 37.

Spirolina agglutinans *d'Orbigny*, 1846, p. 137, Pl. VII, figs. 10-12.

Haplophragmium agglutinans (*d'Orbigny*) *Brady*, 1884, p. 301, Pl. XXXII, figs. 19, 20, 24-26.

Ammobaculites agglutinans (*d'Orb.*) *Cushman*, 1920, p. 60, Pl. XII, fig. 3.

Haplophragmium agglutinans (*d'Orb.*) *Heron-Allen and Earland*, 1922, p. 97.

Observations.—This species occurs but rarely in the "Aurora" soundings, and none of the specimens is as regularly formed as that figured by *d'Orbigny*. A fine example from Sample LXXXIX is figured. In the living condition, this species is widely distributed, the best examples being found in deep water. It was originally described from the Vienna Basin Tertiaries.

Occurrence.—XIII, very rare; LXXXI, very rare; LXXXIII, rare; LXXXIX, very rare.

265. AMMOBACULITES AMERICANUS *Cushman*.

Haplophragmium fontinense *Brady* (*non Terquem*) 1884, p. 305, Pl. XXXIV, figs. 1-4.

Ammobaculites americanus *Cushman*, 1910, p. 117, text-figs. 184, 185. *Pearcey*, 1914, p. 1010. *Cushman*, 1920, p. 64, Pl. XII, figs. 6, 7.

Haplophragmium fontinense *Heron-Allen and Earland* (*non Terquem*), 1922, p. 98.

Observations.—There is one typical example from lat. 64° 44' S.; long. 97° 29' E. off Queen Mary Land, close to Mawson's second base, 358 fathoms. This species appears to be confined to the Pacific and South Atlantic, its range extending to the Southern Ocean. A somewhat similar form has been recorded by the senior author from the Rhaetic of Wedmore Somerset, under the name of *Haplophragmium agglutinans* (*d'Orbigny*).

Occurrence.—CVII, very rare.

266. AMMOBACULITES FOLIACEUS (*Brady*).

Haplophragmium foliaceum Brady, 1881, p. 50; 1884, p. 304, Pl. XXXIII, figs. 20–25.

Ammobaculites foliaceus (Brady) Cushman, 1910, p. 116, text-figs. 177–179; 1920, p. 64, Pl. XIII, figs. 1, 2.

Observations.—The only example, a typical one, is from Sample LXXXIII, dredged off Wilke's Land, from a depth of 1,700 fathoms. The species was recorded from four "Terra Nova" dredgings. It is also known from the Atlantic and Pacific Oceans. With the exception of one by Cushman, the records are all from deep water.

Occurrence.—LXXXIII, very rare.

267. AMMOBACULITES PSEUDOSPIRALIS (*Williamson*). Plate X, fig. 39.

Protonina pseudospiralis Williamson, 1858, p. 2, Pl. I, figs. 2, 3.

Haplophragmium pseudospirale (Williamson) Brady, 1884, p. 302, Pl. XXXIII, figs. 1–4.

Ammobaculites pseudospirale (Williamson) Cushman, 1920, p. 62, Pl. XII, fig. 4.

Observations.—One typical specimen, which is figured. This species was described from off Skye. It is common in comparatively shallow water off the coast of Northern Europe. Millett recorded it from the Malay Archipelago and it was met with by Heron-Allen and Earland in the "Terra Nova" dredgings.

Occurrence.—CIII, very rare.

268. AMMOBACULITES ROSTRATUS *Heron-Allen and Earland*.

Ammobaculites rostratus Heron-Allen and Earland, 1929, p. 328, Pl. II, figs. 14–17.

Observations.—This newly described species is represented by several typical specimens. The original type-specimens were from near South Georgia, from depths of 230–270 metres. Our examples are from 160 fathoms.

Occurrence.—V. frequent.

Genus AMMOMARGINULINA *Wiesner* 1931.269. AMMOMARGINULINA ENSIS *Wiesner*. Plate X, fig. 38.

Ammomarginulina ensis Wiesner, 1931, p. 97, Pl. XII, fig. 147. Earland, 1933, p. 82, Pl. III, figs. 1–4.

Description.—Test minute, thin, gently inflated in the central coiled portion, which is involute and consists of about twelve chambers; test rapidly becoming rectilinear, then consisting of broad low chambers, numbering four or five, their width

exceeding that of the coiled portion, that is to say, the latter portion of the test broadens slightly; sutures in the last portion more oblique, causing the test to be produced on the outer periphery. The quartz sand-grains of which the test is composed are angular and fine, with a few black terrigenous particles and little cement. Aperture dorso-terminal.

Length, 0.3 mm.; greatest width, 0.2 mm.; thickness, 0.05 mm.

Observations.—The specimens from the present collections obviously fall into the species lately described by Wiesner from the Antarctic. We had already described these under another name, but owing to delays in publication of the present work Wiesner's name takes precedence. As Wiesner's account of the species is very brief we have deemed it advisable to include our description of this form.

From *Ammomarginulina cassis* (Parker) it is distinguished by the more discoidal form of the initial series. It is an arenaceous isomorph of some of the partially uncoiled planulate forms of *Lenticulina*.

Occurrence.—LXXXI, frequent; XCI, very rare; XCII, very rare.

SUB-FAMILY LITUOLINAE.

Genus *CYCLAMMINA* Brady 1876.

270. *CYCLAMMINA ACUTIDORSATA* (Hantken).

Haplophragmium acutidorsatum Hantken, 1868, p. 82, Pl. I, figs. 1a, b; 1881, p. 12, Pl. I, fig. 1. Chapman, 1892, p. 322, Pl. V, figs. 11a-c; 1894, p. 695.

Cyclammina acutidorsata (Hantken), de Amicis, 1895, p. 13.

Observations.—The specimen found here shows the same compressed, moderately sharp-edged test with umbilical depression as seen in Hantken's type-figure from the Oligocene of Hungary. The species was obtained by one of us (F.C.) in the Neocomian of Surrey, England, and this seems to be the earliest record in sedimentary rocks. De Amicis figures this species from the Pliocene of Sicily.

Occurrence.—LIX, very rare.

271. *CYCLAMMINA ORBICULARIS* Brady.

Cyclammina orbicularis Brady, 1881, p. 53; 1884, p. 353, Pl. XXXVII, figs. 17-19.

Cushman, 1910, p. 113, text-figs. 173a, b; 1920, p. 57, Pl. XI, figs. 7-9. Heron-Allen and Earland, 1922, p. 116.

Observations.—The examples are typical. This species appears to be little subject to variation. The records of the "Challenger" were from off the Antarctic Ice-Barrier, 1,675 fathoms, east coast of New Zealand, 1,100 fathoms, and east of Buenos Aires, 1,900 fathoms. The "Terra Nova" records were from six stations.

Occurrence.—LIX, very rare; LX, frequent; LXXX, rare; LXXXIII, very rare; LXXXIV, very rare; LXXXVIII, common; LXXXIX, rare; XC, very rare; XCII, very rare.

272. CYCLAMMINA PUSILLA *Brady*.

Cyclammina pusilla Brady, 1881, p. 53; 1884, p. 353, Pl. XXXVII, figs. 20-23.
Cushman, 1910, p. 111, text-fig. 172. Pearcey, 1914, p. 1009. Cushman,
1920, p. 56, Pl. XI, figs. 4-6. Heron-Allen and Earland, 1922, p. 115.

Observations.—All of the examples are typical. Those from Sample LXXXIII are exceptionally large. Brady, Pearcey, and Heron-Allen and Earland have recorded this species from numerous stations in the Antarctic.

Occurrence.—X, rare; XI, common; XIII, very rare; XXVI, very rare; XXVII, very rare; LX, common; LXXVIII, rare; LXXX, rare; LXXXII, rare; LXXXIII, very rare; LXXXIV, frequent; LXXXVI, rare; LXXXVII, frequent; LXXXVIII, common; XC, very rare; XCI, common; XCIII, common.

FAMILY PLACOPSILINIDAE.

SUB-FAMILY PLACOPSILININAE.

Genus PLACOPSILINA *d'Orbigny* 1850.

273. PLACOPSILINA CENOMANA *d'Orbigny*.

Placopsilina cenomana d'Orbigny, 1850, p. 185, No. 758.

Lituola (Placopsilina) cenomana (d'Orbigny) Carpenter, Parker and Jones, 1862, p. 143, Pl. XI, figs. 11-14.

Placopsilina cenomana d'Orb., Brady, 1884, p. 315, Pl. XXXVI, figs. 1-3. Heron-Allen and Earland, 1922, p. 103.

Observations.—The only specimen is from Sample XVIII, from lat. 65° 38' S.; long. 94° 28' E., 375 fathoms. This species is more at home in fairly shallow water in tropical and subtropical seas. In the "Terra Nova" dredgings it is noted from nine stations, three of which were in New Zealand waters. It is also found on the Victorian coast. D'Orbigny described it from the Cretaceous of France.

Occurrence.—XVIII, very rare.

FAMILY REOPHACIDAE.

Genus REOPHAX *Montfort* 1808.

274. REOPHAX ADUNCUS *Brady*.

Reophax adunca Brady, 1882, p. 715; 1884, p. 296, Pl. XXXI, figs. 23-26. Cushman, 1910, p. 89, text-fig. 125.

Reophax aduncus Brady, Cushman, 1920, p. 15, Pl. V, fig. 1.

Reophax adunca Brady, Heron-Allen and Earland, 1922, p. 96.

Observations.—As Heron-Allen and Earland have already noted, the Antarctic specimens differ from those of other localities in their minute size. According to Brady the length of examples of this species may be 2 mm. or more. The "Challenger" records of *R. aduncus* are from the Atlantic, Pacific and Southern Oceans, from depths of from 540 to 2,900 fathoms.

Occurrence.—LXXXVII; very rare.

275. *REOPHAX ADVENUS* Cushman.

Reophax advena Cushman, 1919, p. 599, Pl. LXXV, fig. 2. Heron-Allen and Earland, 1922, p. 94, Pl. III, figs. 6, 7.

Observations.—There is one example, from Sample LXI from lat. 65° 51' S.; long. 144° 19' E., 350 fathoms. It is composed of very large grains, firmly cemented, and the segmentation of the test as in the example figured by Cushman, is obscure. This species was described from off the Poor Knights Islands, lat. 35° 30' S.; long. 174° 43' E. It has been subsequently recorded by Heron-Allen and Earland from several Antarctic stations of the "Terra Nova," but it is doubtful whether their species is the same as that described by Cushman, as they note that the final chamber is very loosely constructed, without much cement, and is also labyrinthic.

Occurrence.—LXI, very rare.

276. *REOPHAX BACILLARIS* Brady.

Reophax bacillaris Brady, 1881, p. 49; 1884, p. 293, Pl. XXX, figs. 23, 24. Cushman, 1910, p. 86, text-fig. 120; 1920, p. 19, Pl. V, fig. 6. Heron-Allen and Earland, 1922, p. 94.

Observations.—The three examples found are not quite typical as they are straight, not curved, and the apertural end is truncated instead of being produced as in Brady's type-figures. Brady notes that this is a rare species. It was obtained from the North Atlantic, 1,750 fathoms, and also recorded by him, but not in its typical form, from south of Rockall Bank, 420 fathoms, and off the north coast of Papua, 1,070 fathoms.

Occurrence.—XXIV, frequent.

277. *REOPHAX CYLINDRICUS* Brady.

Reophax cylindrica Brady, 1884, p. 299, Pl. XXXII, figs. 7-9. Cushman, 1910, p. 91, text-figs. 129-131; 1920, p. 24, Pl. V, fig. 8. Heron-Allen and Earland, 1922, p. 97.

Observations.—Examples of this well characterised species are rare, but always typical. The type specimens of *Reophax cylindricus* were from south-west of Greenland, 1,750 fathoms. The only southern record of the "Challenger" was from Station 144,

between the Cape of Good Hope and Kerguelen, 1,570 fathoms, only a fragment being found. Heron-Allen and Earland had two specimens from "Terra-Nova" Station 45, lat. $76^{\circ} 56' S.$; long. $164^{\circ} 12' E.$; 160 fathoms.

Occurrence.—VII, very rare; XIII, common; LX, very rare; CIV, very rare; CXV, very rare.

278. *REOPHAX DENTALINIFORMIS* *Brady*.

Reophax dentaliniformis Brady, 1881, p. 49; 1884, p. 293, Pl. XXX, figs. 21, 22.

Cushman, 1910, p. 87, text-fig. 121. Chapman, 1917 (2), p. 63, Pl. III, fig. 17.

Cushman, 1920, p. 18, Pl. V, figs. 4, 5. Heron-Allen and Earland, 1922, p. 94.

Observations.—Typical examples occur. This species has already been recorded from the Ross Sea (F.C.) and from the Antarctic dredgings of the "Terra Nova." Except in high latitudes, this is a species of deep-water habitat.

Occurrence.—III, rare; VII, very rare; IX, very rare; X, very rare; XIII, very rare; XVII, very rare; XIX, common; XLVII, very rare; LIX, very rare; LXIX, rare; LXXI, very rare; LXXIV, very rare; LXXVII, frequent; LXXVIII, frequent; LXXXI, very rare; LXXXVII, very rare; XCI, very rare; XCIV, rare; CI, very rare; CIII, common; CIV, very rare; CVI, very rare; CVII, very common; CIX, rare; CX, very rare; CXI, very rare; CXV, very rare.

279. *REOPHAX DISTANS* *Brady*.

Reophax distans Brady, 1881, p. 50; 1884, p. 296, Pl. XXXI, figs. 18-22. Cushman,

1910, p. 85, text-fig. 119. Pearcey, 1914, p. 1007. Cushman, 1920, p. 12, Pl.

III, figs. 5, 6. Heron-Allen and Earland, 1922, p. 96.

Observations.—The examples found here are always in a fragmentary condition, but are otherwise typical. This species is characteristic of deep and cold waters.

Occurrence.—II, common; VII, very rare; XVIII, very rare; XIX, rare; XLVI, very rare; LX, very rare; LXXI, very rare; LXXX, very rare; LXXXI, rare; LXXXII, very rare; LXXXIV, rare; LXXXVII, very rare; CI, very rare; CII, rare; CIV, frequent; CVII, frequent; CX, very rare; CXV, rare.

280. *REOPHAX LONGISCATIFORMIS* *Chapman*. Plate X, fig. 40.

Reophax longiscatiformis Chapman, 1917 (2), p. 63, Pl. III, fig. 18. Heron-Allen and Earland, 1922, p. 95.

Observations.—This interesting isomorph of *Nodosaria longiscata* d'Orbigny occurred in five soundings; all in the Antarctic. This species was originally described from the Ross Sea, from depths of 360 and 462 fathoms. The "Terra Nova" records

were from two Antarctic stations, depths 268 and 140 fathoms. In the "Aurora" dredgings, it has occurred at depths of from 320 to 1,700 fathoms, the best examples being from 320 fathoms (Sample CI). An example from this sounding is figured.

Occurrence.—LXXVIII, frequent; LXXXII, very rare; LXXXIII, very rare; CI, very rare.

281. REOPHAX MAWSONI, *sp. nov.* Plate X, fig. 41.

Description.—Test elongate, subcylindrical, consisting of about seven chambers; proloculum depressed, globular, set obliquely to the line of chambers; chambers long-ovoid, constricted at the sutural line; oral region of last chamber prolonged into a narrow neck with a circular, slightly everted orifice. Wall composed of moderately fine sand-grains, with little cement; colour pale ochreous brown.

Dimensions.—Length, 6 mm.; greatest width, 0.76 mm.; diameter of proloculum, circ. 0.3 mm.; length of fourth chamber, 0.87 mm.

Observations.—The nearest related species to the above is perhaps *R. cylindricus*, which differs, however, in the absence of the marked constrictions at the sutures, in the shortest test, and in the less produced apertural neck.

Occurrence.—CIV, very rare.

282. REOPHAX NODULOSUS *Brady.*

Reophax nodulosa Brady, 1879, p. 52, Pl. IV, figs. 7-8; 1884, p. 294, Pl. XXXI, figs. 1-9. Cushman, 1910, p. 87, text-fig. 122. Pearcey, 1914, p. 1006. Cushman, 1920, p. 17, Pl. V, figs. 2, 3. Heron-Allen and Earland, 1922, p. 95.

Observations.—From the available records, this species is widely distributed, so it is remarkable that in the "Terra Nova" and "Aurora" dredgings, it is confined to the Antarctic. The present records are from 125 to 2,250 fathoms. The examples are typical, but usually broken. According to Brady *R. nodulosus* reaches its greatest development in the Antarctic. Pearcey also recorded specimens of over 1 inch in length from the same area.

Occurrence.—XI, very rare; XIX, common; XXI, rare; XXII, frequent; XXIV, rare; LIX, very rare; LX, very rare; LXIII, very rare; LXXVIII, frequent; LXXX, rare; LXXXI, common; LXXXIV, very rare; LXXXVII, very rare; LXXXVIII, very rare; XCI, very rare; XCVIII, very rare; CI, frequent; CIII, common; CVII, frequent.

283. REOPHAX PILULIFER *Brady*.

Reophax pilulifera Brady, 1884, p. 292, Pl. XXX, figs. 18-20. Cushman, 1910, p. 85, text-figs. 117, 118. Pearcey, 1914, p. 1007; Cushman, 1920, p. 7, Pl. II, fig. 1. Heron-Allen and Earland, 1922, p. 93.

Observations.—There is one example, composed of exceptionally large sand-grains, and less smoothly finished than usual. This species is already known from the Antarctic.

Occurrence.—X, rare.

284. REOPHAX SCORPIURUS *Montfort*.

Reophax scorpiurus Montfort, 1808, p. 330, 83^{me} genre. Brady, 1884, p. 291, Pl. XXX, figs. 12, 15-17 (*non* 13, 14). Cushman, 1910, p. 83, text-figs. 114-116. Pearcey, 1914, p. 1006. Cushman, 1920, p. 6, Pl. I, figs. 5-7. Heron-Allen and Earland, 1922, p. 93.

Observations.—The present records are all confined to moderately shallow water off the Antarctic Ice-Barrier, off the Shackleton Shelf, Wilke's Land and Queen Mary Land. The distribution of this species is governed more by the shallowness of the water, than by latitude, as it is a common form off the Australian coast.

Occurrence.—II, very common; III, frequent; VII, common; VIII, very rare; XIII, very rare; XVII, very rare; XVIII, rare; XIX, very common; XXIV, rare; CIV, frequent.

285. REOPHAX SPICULIFER *Brady*.

Reophax spiculifera Brady, 1879, p. 54, Pl. IV, figs. 10, 11; 1884, p. 295, Pl. XXXI, figs. 16, 17. Cushman, 1910, p. 92, text-figs. 132, 133. Chapman, 1917 (2), p. 62, Pl. III, fig. 16. Heron-Allen and Earland, 1922, p. 95.

Observations.—The examples are all typical, those from Sample CIII being particularly fine. Heron-Allen and Earland note that the only typical example of this species in the "Terra Nova" dredging were from the Antarctic. They consider that those recorded by them under this name from the New Zealand area do not represent a true species, but are spiculiferous isomorphs of various *Nodosariae* such as *N. filiformis*, *N. communis*, and *N. soluta*.

Occurrence.—II, very rare; V, very rare; XIX, frequent; XXX, very rare; XLVI, rare; XLVIII, very rare; LXXVII, very rare; CII, common; CIII, common; CIV, frequent.

SUB-FAMILY PROTEONININAE.

Genus PROTEONINA *Williamson* 1858.286. PROTEONINA BULBOSA, *sp. nov.* Plate X, fig. 42.

Description.—Test lageniform, chamber globose, terminating in a long and very slender neck. The test is composed of moderately coarse, subangular quartz grains, beautifully fitted together and with a minimum of cement. The material of the neck is finely arenaceous. Colour of test a pale reddish brown, due to the tint of the cementing substance.

Dimensions.—Length of test with neck, 0.54 mm.; diameter of chamber, 0.4 mm.; diameter of tubular neck, 0.027 mm.

Observations.—This remarkable little organism appears to be quite distinct from anything yet known. Its most distinctive feature is the very slender, finely arenaceous neck. There are four specimens, all from Sample CVII, from lat. 64° 44' S., long. 97° 29' E., depth 358 fathoms. It is a striking fact that with the exception of *Globigerina pachyderma* all of the species found in this sample have arenaceous tests.

Occurrence.—CVII, frequent.

287. PROTEONINA DIFFLUGIFORMIS (*Brady*).

Reophax diffflugiformis Brady, 1879, p. 51, Pl. IV, figs. 3a, b; 1884, p. 289, Pl. XXX, figs. 2-4 (*non*. 1, 5).

Proteonina diffflugiformis (*Brady*) Cushman, 1918, p. 47, Pl. XXI, figs. 1, 2.

Reophax diffflugiformis Brady, Heron-Allen and Earland, 1922, p. 92.

Observations.—This species is very generally distributed. The examples from Sample CIV are of a delicate elongate form. The oldest record of this species is that of the senior author from the Rhaetic of Wedmore. A very typical example has also been recorded by Hauesler from the Swiss Jurassic.

Occurrence.—II, frequent; III, frequent; VII, very rare; XI, very rare; XIII, very rare; XVIII, frequent; XIX, rare; XXII, very rare; XXXII, very rare; XLVII, rare; LXIII, rare; LXXII, very rare; LXXVI, very rare; LXXVII, common; LXXXII, very rare; XCI, very rare; XCII, very rare; XCIV, common; XCVIII, rare; CI, rare; CIII, common; CIV, rare.

288. PROTEONINA FUSIFORMIS *Williamson*.

Proteonina fusiformis Williamson, 1858, p. 1, Pl. I, fig. 1.

Reophax fusiformis (*Williamson*) Brady, 1884, p. 290, Pl. XXX, figs. 7-11. Heron-Allen and Earland, 1922, p. 93.

Observations.—The examples are typical. Williamson described this species from the English coast. The only "Challenger" record was from off the Philippines, 95 fathoms. Heron-Allen and Earland had it from nineteen "Terra Nova" stations.

Occurrence.—II, rare; XLVI, rare; LXIII, very rare.

FAMILY TEXTULARIIDAE.

SUB-FAMILY SPIROPLECTAMMININAE.

Genus SPIROPLECTAMMINA *Cushman* 1927.289. SPIROPLECTAMMINA BIFORMIS (*Parker and Jones*).

Textularia agglutinans d'Orbigny, var. *biformis* Parker and Jones, 1865, p. 370, Pl. XV, figs. 23, 24.

Spiroplecta biformis (P. and J.) Brady, 1884, p. 376, Pl. XLV, figs. 25-27. Heron-Allen and Earland, 1922, p. 122.

Spiroplectammina biformis (P. and J.) Cushman, 1927 (1), p. 23, Pl. V, fig. 1.

Observations.—One typical example. The types of this species were from off the Huide Islands, Davis Strait, 60-70 fathoms. The records show it to be characteristically a cold-water species, frequenting shallow water in high latitudes, but confined to deep water elsewhere.

Occurrence.—LXXVIII, very rare.

SUB-FAMILY TEXTULARIINAE.

Genus TEXTULARIA *Defrance* 1824.290. TEXTULARIA TENUISSIMA *Earland*. Plate X, fig. 43.

Textularia elegans Lacroix (*non Plecanium elegans* Hantken) 1932, p. 8, text-figs. 4 and 6 (*non* 5).

Textularia tenuissima Earland, 1933, p. 95, Pl. III, figs. 21-30; 1934, p. 115, Pl. X, fig. 22.

Description.—Test slender, compressed, tapering to a blunt aboral extremity, which is spirally enrolled; the spiral is excessively minute and is followed by a textularian series of about twenty-eight alternating chambers. Those of the earlier part of the textularian series are low, but gradually increase in height, becoming more inflated towards the apertural end. The arenaceous structure of the test is moderately coarse for so minute a shell. The colour of test is rusty brown, becoming whiter towards the oral extremity where the colourless sand grains are partly replaced by tiny black fragments. The aperture is a typical textularian slit.

Length, 0.68 mm.; greatest width, 0.17 mm.; diameter of spiral portion, 0.05 mm.

Observations.—There are four examples, all from the Antarctic. This species had been recognised by us as new, but owing to the delay in publication, Earland's species takes priority. We leave the above description as originally written by us.

Occurrence.—V, very rare; XI, very rare; LXXXVII, very rare; XCIV, very rare.

291. *TEXTULARIA AGGLUTINANS* d'Orbigny.

Textularia agglutinans d'Orbigny, 1839 (1), p. 136, Pl. I, figs. 17, 18. 32-34.

Cushman, 1922 (1), p. 22, Pl. I, fig. 6.

Observations.—There is one typical example. This species was described by d'Orbigny from the shore sand of Cuba; it also occurs in the Pacific, usually in warmer waters than those from which it is now recorded.

Occurrence.—XXV, very rare.

292. *TEXTULARIA ARENACEA* (Heron-Allen and Earland).

Bolivina punctata d'Orbigny, var. *arenacea* Heron-Allen and Earland, 1922, p. 133,

Pl. IV, figs. 21, 22.

Observations.—The original specimens of Heron-Allen and Earland were recorded from ten stations in the Antarctic. Our examples, like those of the former, are all microspheric.

Textularia arenacea closely resembles the form of a typical *Bolivina*, but we here refer it to *Textularia* in accordance with the accepted taxonomy of the Foraminifera.

Occurrence.—II, very rare; CII, very rare.

293. *TEXTULARIA CONICA* d'Orb., var. *HORRIDA* Egger.

Textularia horrida Egger, 1893, p. 270, Pl. VI, figs. 11, 12.

Textularia conica, var. *horrida* Egger; Heron-Allen and Earland, 1922, p. 121, Pl. IV, figs. 3, 4.

Observations.—There is one example of this variety, which is distinguished from the typical form by the spinous margin of the test. Egger's types were from coral reef, Mauritius, 137 metres. This form occurred with typical *Textularia conica* in the "Terra Nova" dredgings off New Zealand.

Occurrence.—XLVII, very rare.

294. *TEXTULARIA HETEROSTOMA* Fornasini.

Textularia heterostoma Fornasini, 1896, p. 7, Pl. —, figs. 6, 12, 13.

Textularia concava Karrer, var. *heterostoma* Forn., Millett, 1899, p. 560, Pl. VII, figs. 6, 7. Heron-Allen and Earland, 1922, p. 117.

Observations.—Fossil specimens recorded by Fornasini were from the Pliocene of Ponticello di Savena, near Bologna. Millett has described and figured it from dredgings in the Malay Archipelago. The present specimens are from deep water, southwest of Tasmania; the test is finely arenaceous, of dazzling whiteness, and with a slight twist in the contour.

Occurrence.—CXIV, rare.

295. *TEXTULARIA MILLETTI* Cushman.

Textularia milletti Cushman, 1911, p. 13, text-figs. 18a, b, 19.

Observations.—There are two specimens which, except in length, agree with Cushman's figures of this species, that he recorded from four "Nero" stations in the North Pacific. He notes that apparently the Recent form figured by Millett from the Malay Archipelago under the name of *Textularia sagittula*, var. *jugosa* Millett (1899, p. 561, Pl. VII, fig. 5) is identical with *T. milletti*, but we are unable to agree with this supposition.

Occurrence.—XLI, rare.

296. *TEXTULARIA PORRECTA* Brady.

Textularia agglutinans d'Orb., var. *porrecta*, Brady, 1884, p. 364, Pl. XLIII, fig. 4.

Textularia porrecta Brady, Egger, 1893, p. 269, Pl. VI, figs. 17, 18.

Observations.—One typical specimen was met with. In the "Terra Nova" dredgings this species was confined to the New Zealand area. The specimen figured by Brady was from Bass Strait.

T. porrecta is also found in the Miocene limestone of Batesford, Victoria.

Occurrence.—XXXIII, very rare.

297. *TEXTULARIA PSEUDOGRAMEN*, *sp. nov.*

Textularia gramen Brady (*non* d'Orbigny), 1884, p. 365, Pl. XLIII, figs. 9, 10.

Cushman, 1924 (1), p. 15, Pl. I, figs. 7, 8.

Description.—Test slightly longer than wide, thick, subconical, increasing rapidly in diameter, with acute margins; chambers broad and low, up to fourteen in number; sutures indistinct in the early portion of the test; wall arenaceous, sometimes rough; aperture elongate, slit-like, at the base of the last formed chamber, sometimes with a lip-like border.

Length, 1 to 1.5 mm.

Observations.—This is a common form on the Australian coast. It has generally been recorded as *Textularia gramen* d'Orb., a species described from the Vienna Basin. *T. gramen* has fewer chambers which are set on more obliquely and the apertural end of the shell is rounded, not obliquely truncated as in our species.

The specimens figured by Brady as *T. gramen* in the "Challenger" Report were from the Pacific, fig. 9 being from Bass Strait and fig. 10 from off Honolulu. Cushman (1924, p. 15, Pl. I, figs. 7, 8) has figured what is clearly the present species from Samoa, with a note that it is questionable whether the Samoan form is really the same as d'Orbigny's species.

Occurrence.—XLVII, very rare.

298. *TEXTULARIA SAGITTULA* *Defrance.*

Textularia sagittula Defrance, 1824, p. 177; Atlas Conch., Pl. XIII, fig. 5.

Observations.—Several examples. This species is common on the Australian coast and also occurred in the New Zealand dredgings of the "Terra Nova."

Occurrence.—XLV, very rare; XLVI, very rare.

FAMILY VERNEUILINIDAE.

Genus VERNEUILINA *d'Orbigny* 1840.

299. *VERNEUILINA BRADYI* *Cushman.*

Verneuilina pygmaea Brady, 1884 (*non Bulimina pygmaea* Egger), p. 385, Pl. XLVII, figs. 4-7.

Verneuilina bradyi Cushman, 1911, p. 54, text-figs. 87a, b.

Verneuilina pygmaea Heron-Allen and Earland, 1922 (*non Bulimina pygmaea* Egger), p. 125.

Observations.—Some of the specimens are very finely arenaceous and at first sight were regarded as hyaline. This species is a common deep-water foraminifer.

Occurrence.—XXV, rare; XLVII, very rare; XLVIII, frequent; LII, very rare; LXV, very rare; LXXXI, very rare; LXXXVII, very rare; XCI, very rare; CIII, very rare; CVII, very rare; CVIII, rare; CXIV, frequent.

300. *VERNEUILINA PROPINQUA* *Brady.*

Verneuilina propinqua Brady, 1884, p. 387, Pl. XLVII, figs. 8-12 (*non* 13, 14).
Cushman, 1911, p. 53, text-figs. 86a, b. Heron-Allen and Earland, 1922, p. 125.

Observations.—One specimen. It is difficult to distinguish this species from *Verneuilina bradyi*; the principal differences being the much larger size and thick walls of *V. propinqua*. The "Terra Nova" records were from three stations.

Occurrence.—XI, very rare.

301. VERNEUILINA TRIQUETRA (*Münster*).

Textularia triquetra Münster, in Roemer, 1838, p. 384, Pl. III, fig. 19.

Verneuilina triquetra (Münster) Brady, 1884, p. 383, Pl. XLVII, figs. 18-20.
Heron-Allen and Earland, 1922, p. 124.

Observations.—One of our specimens, from Sample XXXVIII, is in all respects comparable with the Cretaceous examples figured by Reuss, and also with the Recent form figured by Brady (Pl. XLVII, figs. 19, 20) from Fiji. On the other hand the specimen from Sample LXXVIII resembles the Recent form figured by Brady (Pl. XLVII, fig. 18) from Culebra Island, West Indies, so that the variation of this species is seen to be considerable.

Occurrence.—XXXVIII, very rare; LXXVIII, very rare.

Genus GLOBOTEXTULARIA *Eimer and Fickert* 1899.302. GLOBOTEXTULARIA ANCEPS (*Brady*).

Haplophragmium anceps Brady, 1884, p. 313, Pl. XXXV, figs. 12-15.

Globotextularia anceps (Brady) Cushman, 1910, p. 125, text-fig. 196. Pearcey, 1914, p. 1011.

Observations.—There are two small specimens of this interesting form. According to Brady it is always associated with *Trochammina globigeriniformis* and *Verneuilina propinqua*. He describes it as having the earlier growth of the shell arranged in a bi- or tri-serial manner.

Occurrence.—LIX, rare.

Genus GAUDRYINA *d'Orbigny* 1839.303. GAUDRYINA BACCATA *Schwager*.

Gaudryina baccata Schwager, 1866, p. 200, Pl. IV, fig. 12. Brady, 1884, p. 379, Pl. XLVI, figs. 8-11.

Observations.—This wild-growing modification of *Gaudryina bradyi* was described from the Pliocene of Kar Nicobar in the Andaman Islands. Like its congener, it is, in the living condition, a deep-water foraminifer, and is known from all the great oceans.

Occurrence.—XLII, rare.

304. GAUDRYINA BRADYI *Cushman*.

Gaudryina pupoides Brady (*non Gaudryina pupoides* d'Orbigny), 1884, p. 378, Pl. XLVI, figs. 1-4.

Gaudryina bradyi Cushman, 1911, p. 67, text-figs. 107a-c.

Gaudryina pupoides Heron-Allen and Earland (*non Gaudryina pupoides* d'Orb.), 1922, p. 122.

Observations.—This species is generally recorded under the name of *Gaudryina pupoides* d'Orb., a species described from the Cretaceous of France, but we are in agreement with Dr. Cushman in regarding the Recent form as being distinct. *G. bradyi* was recorded by Heron-Allen and Earland (as *G. pupoides*) from four "Terra Nova" stations.

Occurrence.—II, rare; XI, common; XIII, very rare; XVI, very rare; XXVI, very rare; XXIX, very rare; XXXII, very rare; XLVII, common; XLVIII, rare.

305. GAUDRYINA CHILOSTOMA (*Reuss*).

Textilaria chilostoma Reuss, 1852, p. 18, figs. a, b (in text).

Gaudryina chilostoma (Reuss) Reuss, 1866, p. 120, Pl. I, fig. 5.

Gaudryina pupoides d'Orb., var. *chilostoma* (Reuss) Brady, 1884, p. 379, Pl. XLVI, figs. 5, 6.

Observations.—There is one example which agrees with Brady's figure of this species. The specimens of Reuss were from the Pliocene of Antwerp and the Oligocene of Germany. In the "Challenger" dredgings it occurred in soundings off Prince Edward Island, 50-150 fathoms; north of Juan Fernandez, 1,375 fathoms; and in the South Atlantic, mid-ocean, 1,425 fathoms. It was not recorded from the "Terra Nova" soundings.

Occurrence.—XLVII, rare.

Genus CLAVULINA d'Orbigny 1826.

306. CLAVULINA COMMUNIS d'Orbigny.

Clavulina communis d'Orbigny, 1826, p. 268, No. 4. Fornasini, 1903, p. 312, Pl. O, fig. 20. Heron-Allen and Earland, 1922, p. 126.

Observations.—The examples agree with the deep-water specimens described by Heron-Allen and Earland (*op. cit.*). These are built of very fine mineral grains, with a good deal of cement and are white in colour. The surface of the test is smooth, and the chambers are not visible. The Adriatic examples figured by Fornasini are also very similar.

Occurrence.—XXXI, rare; XXXV, frequent; XLVII, very rare; LXXXIV, frequent; LXXXVI, very rare; LXXXVII, very rare; LXXXVIII, common; XCI, rare; XCII, very rare; XCIII, very rare.

307. CLAVULINA OBSCURA *Chaster*.

Clavulina obscura Chaster, 1892, p. 58, Pl. I, fig. 4. Heron-Allen and Earland, 1913 (2), p. 59, Pl. IV, fig. 6. Cushman, 1922 (2), p. 89, Pl. XVI, fig. 6. Heron-Allen and Earland, 1922, p. 126.

Observations.—One typical example. This species is already known from the Antarctic and off New Zealand (Heron-Allen and Earland). All other records are from around the British Isles. Our specimen is in some respects like a weak example of *Clavulina communis*, but is much smaller, and the segmentation of the test is obscure.

Occurrence.—XLVI, very rare.

FAMILY VALVULINIDAE.

Genus VALVULINA *d'Orbigny* 1826.

308. VALVULINA FUSCA (*Williamson*).

Rotalina fusca Williamson, 1858, p. 55, Pl. V, figs. 114, 115.

Valvulina fusca (Williamson) Brady, 1884, p. 392, Pl. XLIX, figs. 13, 14. Heron-Allen and Earland, 1922, p. 125.

Observations.—One example from each station. Free and attached specimens of this species were recorded by Heron-Allen and Earland from Station 6 of the "Terra Nova," off North Cape, New Zealand. It also occurs off the coast of New South Wales.

Occurrence.—XLV, very rare; LX, very rare.

FAMILY TROCHAMMINIDAE.

SUB-FAMILY TROCHAMMININAE.

Genus TROCHAMMINA *Parker and Jones* 1860.

309. TROCHAMMINA GLOBIGERINIFORMIS (*Parker and Jones*).

Lituola nautiloudea, var. *globigeriniformis* Parker and Jones, 1865, p. 407, Pl. XV, figs. 46, 47.

Haplophragmium globigeriniforme (P. and J.) Brady, 1884, p. 312, Pl. XXXV, figs. 10, 11.

Trochammina globigeriniformis (P. and J.) Cushman, 1910, p. 24, text-figs. 193-195.

Observations.—This species is common and widely distributed in deep, cold waters.

Occurrence.—VII, rare; XIII, very rare; XIX, frequent; XXXV, common; XLV, very rare; XLVII, rare; LX, frequent; XCII, rare; XCIV, rare; CI, rare; CII, rare; CIII, frequent; CXV, rare.

310. *TROCHAMMINA MAWSONI*, *sp. nov.* Plate X, figs. 44a, b.

Description.—Test of a dark olive green colour, finely arenaceous. The chambers are long and narrow, irregularly tubular, and arranged in a depressed helicoid spiral. Upper surface convex, lower planate to concave. The chambers lie obliquely to one another, producing a coiled effect on the whorls; the latter number about $3\frac{1}{2}$.

Dimensions.—Diameter of test, 0.4 mm.; height, 0.2 mm.; width of chambers in last whorl, 0.05 mm.

Comparison.—The nearest allied species appears to be *Trochammina inflata* (Montagu), from which *T. mawsoni* may be distinguished by its irregular inferior surface.

Occurrence.—LXXXIV, very rare. (Found in surface net laid all night, at lat. $65^{\circ} 30' S.$, long. $120^{\circ} 40' E.$)

311. *TROCHAMMINA NANA* (*Brady*).

Haplophragmium nanum Brady, 1881 (1), p. 50; 1881 (2), p. 99, Pl. II, figs. 1a-c; 1884, p. 311, Pl. XXXV, figs. 6-8.

Trochammina nana (Brady) Cushman, 1910, p. 123, text-figs. 190-192. Pearcey, 1914, p. 1010.

Haplophragmium nanum Brady, Heron-Allen and Earland, 1922, p. 101.

Observations.—This species is characteristic of cold water areas. It has already been recorded from the Antarctic by Heron-Allen and Earland.

Occurrence.—IX, very rare; X, very rare; XIII, rare; XV, very rare; XVII, rare; XXII, rare; XXIV, common; LXXI, rare; LXXVII, rare; LXXVIII, very rare; XCVIII, common; XCIX, rare; CI, common; CII, common; CIV, very common; CVI, very rare; CVII, common.

312. *TROCHAMMINA PLANOCONVEXA*, *sp. nov.* Plate X, fig. 45.

Description.—Test small, subcircular, rotaliform; nearly flat on superior face, strongly convex on inferior. Convolution on superior face of about two and a half turns, the last whorl with about six narrow, moderately inflated segments. Segments of inferior face inflated. The structure of the test is coarsely arenaceous as compared with *Trochammina nana*, and the chambers are not so inflated. Colour, usually a rich reddish-brown near the centre, passing to straw colour and white in the later portion.

Dimensions.—Greater diameter, 0.4 mm.; thickness, 0.23 mm.

Observations.—This species is related to *Trochammina nana*, but differs in the characters noted above. In the specimens here figured as type the central area of each chamber is occupied by a larger sand-grain than usual. The distribution of this species is interesting, for it is restricted to the area off the Shackleton Shelf, from 250–358 fathoms.

Occurrence.—CII, frequent; CIII, common; CIV, frequent; CVII, very rare.

SUB-FAMILY AMMOSPHAEROIDININAE.

Genus AMMOSPHAEROIDINA Cushman 1910.

313. AMMOSPHAEROIDINA SPHAEROIDINIFORMIS (Brady).

Haplophragmium sphaeroidiniforme Brady, 1884, p. 313. Chapman, 1907, p. 24, Pl. III, figs. 50, 51.

Ammosphaeroidina sphaeroidiniformis (Brady) Cushman, 1910, p. 128, text-fig. 202.

Haplophragmium sphaeroidiniforme Brady, Heron-Allen and Earland, 1922, p. 102.

Observations.—Typical examples are common in Sample LX. Brady described this species from the Mediterranean, 70–120 fathoms. Other Recent records are from off Funafuti (Chapman), off the eastern coast of United States and in the North Pacific (Cushman), and in the Antarctic (Heron-Allen and Earland). It is also known from the Older Tertiary of Victoria (Howchin, Chapman).

Occurrence.—III, very rare; LX, common; LXXXIV, very rare; LXXXVI, very rare.

Genus CYSTAMMINA Neumayr 1889.

314. CYSTAMMINA PAUCILOCULATA (Brady).

Trochammina pauciloculata Brady, 1879, p. 58, Pl. V, figs. 13, 14; 1884, p. 344, Pl. XLI, figs. 1, 2.

Ammochilostoma pauciloculata (Brady) Cushman, 1910, p. 126, text-fig. 197. Pearcey, 1914, p. 1011.

Trochammina pauciloculata Brady, Heron-Allen and Earland, 1922, p. 114.

Cystammina pauciloculata (Brady) Earland, 1934, p. 106.

Observations.—The specimens are exceptionally good. This is also a widely distributed species in deep cold waters. Previous records from the Antarctic are by Pearcey, and by Heron-Allen and Earland.

Occurrence.—XVIII, rare; XIX, common; CI, rare; CII, frequent.

FAMILY NOURIIDAE.

Genus NOURIA Heron-Allen and Earland 1914.

315. NOURIA POLYMORPHINOIDES Heron-Allen and Earland.

Nouria polymorphinoides Heron-Allen and Earland, 1914, p. 376, Pl. XXXVII, figs. 1-15. Cushman, 1919, p. 601, Pl. LXXV, figs. 4, 5. Heron-Allen and Earland, 1922, p. 103.

Observations.—There is one typical example, from Sample XLVII, from off the east coast of Tasmania, 1,320 fathoms. The records of this interesting species are from round the Kerimba Archipelago, from shallow water, and from off the Poor Knights Islands, off New Zealand, 60 fathoms. We have other examples from a dredging made off Gabo Island, Victoria.

Observations.—XLVII, very rare.

FAMILY SACCAMMINIDAE.

SUB-FAMILY PSAMMOSPHAERINAE.

Genus PSAMMOSPHAERA F. E. Schulte 1875.

316. PSAMMOSPHAERA FUSCA Schulte.

Psammospaera fusca Schulte, 1875, p. 113, Pl. II, fig. 8. Cushman, 1910, p. 35, figs. 25-28 (in text). Heron-Allen and Earland, 1922, p. 83, Pl. I, fig. 18.

Observations.—Although this species was not recognised in the Shackleton collection from the Antarctic, it is a fairly common and well distributed form in the present series. It is also well represented in the "Terra Nova" collection, from which it was recorded by Messrs. Heron-Allen and Earland, as being almost universally distributed and showing a wide range of variations. Our examples comprise tests varying from globose to irregularly spheroidal, and composed of moderately fine to coarse sand grains.

Occurrence.—XI, common; XIII, common; XVI, common; XVII, frequent; XIX, common; XXII, common; XXIII, rare; XXIV, frequent; LX, rare; LXXVIII, rare; LXXX, frequent; LXXXI, very rare; LXXXII, very rare; LXXXIII, very rare; LXXXIV, common; LXXXVII, very rare; LXXXVIII, very rare; XC, very rare; XCI, frequent; XCII, rare; XCVIII, common; XCIX, rare; CI, rare; CIII, rare; CVI, rare; CVII, frequent; CXI, very rare.

317. PSAMMOSPHAERA PARVA Flint.

Psammospaera parva Flint, 1899, p. 268, Pl. IX, fig. 1. Rhumbler, 1903, p. 242, fig. 77 (in text). Cushman, 1910, p. 36, figs. 29, 30 (in text). Heron-Allen and Earland, 1922, p. 83.

Observations.—This delicate little species was originally described from off the coast of Brazil, 1,019 fathoms. Heron-Allen and Earland record it from Antarctic soundings, mainly from deep water.

Occurrence.—III, very rare; V, rare; LXIX, common; LXXIII, very rare; LXXIV, rare; LXXVIII, rare.

318. *PSAMMOSPHAERA RUSTICA* Heron-Allen and Earland.

Psammospaera rustica Heron-Allen and Earland, 1912, p. 383, Pl. V, figs. 3, 4; Pl. VI, figs. 2-4; 1922, p. 84.

Observations.—In the "Terra Nova" Report, this rare species was recorded by Heron-Allen and Earland from five stations, three of which were off New Zealand. They note that the New Zealand specimens are of rougher construction than the British in many cases sand grains being utilised almost as much as spicules.

In the present soundings the species is represented by two specimens from Sample XIX. In these the projecting "scaffold" spicules are very prominent as in the original figures of Heron-Allen and Earland, and sand grains are also incorporated in the test.

Occurrence.—XIX, rare.

SUB-FAMILY SACCAMMININAE.

Genus SACCAMMINA: *M. Sars* 1869.

319. *SACCAMMINA SPHAERICA* G. O. Sars.

Saccammina sphaerica G. O. Sars, 1872, p. 250. Brady, 1884, p. 253, Pl. XVIII, figs. 11-17. Cushman, 1910, p. 39, text-figs. 33-36. Chapman, 1917 (2), p. 61, Pl. II, fig. 12. Heron-Allen and Earland, 1922, p. 85, Pl. I, fig. 16.

Observations.—This species was recorded by the senior author from soundings in the Ross Sea (Shackleton Expedition), it having previously been found by the "Challenger" off the Antarctic Ice-Barrier. Since then, Heron-Allen and Earland had it from nine stations (Scott Expedition) and it here occurs sparingly off Wilke's and Adelic Land. The specimens are small, and one from Station LX is ovoid in shape.

Occurrence.—LX, very rare; LXXX, rare; LXXXI, very rare.

Genus THURAMMINA *Brady* 1879.

320. *THURAMMINA PAPILLATA* Brady.

Thurammina papillata Brady, 1879, p. 45, Pl. V, figs. 4-8; 1884, p. 321, Pl. XXXVI, figs. 7-18. Heron-Allen and Earland, 1922, p. 107.

Observations.—This species has previously been recorded from the Antarctic by Pearcey. It was not met with, in its typical form, in the "Terra Nova" dredgings from the Antarctic.

The geological history of *Thurammia papillata* dates from the Jurassic, from strata of which age in Switzerland it was recorded by Hauesler. It also occurs in the Post-tertiary "Soapstone" of Fiji.

Occurrence.—XVII, frequent; LXXVII, rare; LXXXVI, very rare; CVII, very rare.

321. THURAMMINA ALBICANS *Brady*.

Thurammia albicans Brady, 1879, p. 46; 1884, p. 323, Pl. XXXVII, figs. 2-7.

Pearcey, 1914, p. 1003. Cushman, 1918, p. 71, Pl. XXVIII, figs. 4-8.

Thurammia papillata, var. *albicans* Brady. Heron-Allen and Earland, 1922, p. 108.

Observations.—In Sample LVII, this form is common. One specimen was originally adherent, and others are pyriform with apertures at the "stalk" end.

Occurrence.—XXXV, very rare; LVII, common; CXII, very rare.

SUB-FAMILY PELOSININAE.

Genus PELOSINA *H. B. Brady* 1879.

322. PELOSINA CYLINDRICA *Brady*.

Pelosina cylindrica Brady, 1884, p. 236, Pl. XXVI, figs. 1-6. Egger, 1893, p. 253,

Pl. IV, figs. 1, 2. Cushman, 1910, p. 46, figs. 50, 51 (in text). Chapman,

1917 (2), p. 60, Pl. II, fig. 10. Heron-Allen and Earland, 1922, p. 77.

Observations.—This is a fairly well distributed species in the Mawson Collection. The longest specimens, from No. CIII, somewhat flexed, measure 19 mm. in length. Those from No. CXI are minute in comparison, the longest being only 1.75 mm.

Pelosina cylindrica has been found in both the Scott and Shackleton collections.

Occurrence.—II, frequent; XIV, very rare; XIX, very rare; XLVI, very rare; XLVII, rare; LX, very rare; LXIX, very rare; LXXI, very rare; LXXIV, frequent; CIII, common; CXI, frequent.

323. PELOSINA ROTUNDATA *Brady*.

Pelosina rotundata Brady, 1879, p. 31, Pl. III, figs. 4, 5; 1884, p. 236, Pl. XXV, figs. 18-20. Heron-Allen and Earland, 1922, p. 77.

Observations.—The "Challenger" records of this rare species were from the North Atlantic, the South Atlantic, and the North Pacific Oceans. It is noteworthy that the species did not occur in the rich dredgings made by the "Terra Nova" off New Zealand, although it was found in the Antarctic.

Occurrence.—III, rare; VII, frequent; IX, frequent.

324. PELOSINA VARIABILIS *Brady*.

Pelosina variabilis Brady, 1879, p. 30, Pl. III, figs. 1-3; 1884, p. 235, Pl. XXVI, figs. 7-9. Cushman, 1910, p. 17; text-fig. 52. Heron-Allen and Earland, 1922, p. 77.

Observations.—Some large specimens, with abundant pelitic material are referred to this species. They are irregular in form, but easily distinguished from the smaller, spicular tests, of the preceding species.

Occurrence.—VII, frequent; XIV, very rare; XVII, rare; LXXXV (from tow net), very rare; CXI, frequent.

Genus TECHNITELLA *Norman* 1878.325. TECHNITELLA HYSTRIX, *sp. nov.* Plate X, fig. 46.

Description.—Test cylindrico-ovate as in some examples of *Technitella legumen*, but with the spicules set at varying angles from the body, producing an echinate appearance. Aperture at wider end. Material of test mainly spicular, possibly set in a little chitinous mud.

Dimensions.—Length, 1.14 mm.; greatest width, 0.4 mm.

Occurrence.—LXXX, very rare.

326. TECHNITELLA MELO *Norman*.

Technitella melo Norman, 1878, p. 280, Pl. XVI, figs. 5, 6. Brady, 1884, p. 246, Pl. XXV, figs. 7a, b. Cushman, 1910, p. 48, figs. 54a, b (in text).

Observations.—This a small example, of an ovoid contour, and approaching *Pelosina spiculifera* in size and composition of the test. It occurs in the terrigenous muds of the Davis Sea.

Occurrence.—XVII, very rare.

SUB-FAMILY WEBBINELLINÆ.

Genus IRIDIA Heron-Allen and Earland 1914.

327. IRIDIA DIAPHANA Heron-Allen and Earland.

Iridia diaphana Heron-Allen and Earland, 1914, p. 371, Pl. XXXVI²; 1915, p. 607.
Cushman, 1918, p. 41. Heron-Allen and Earland, 1922, pp. 75, 233.

Observations.—There is one typical example from Sample LXXIV. The species was originally described from shallow water around the Kerimba Archipelago, off the coast of Portuguese East Africa. Subsequent records are from off the British Isles, New Zealand, and the Antarctic, and as a fossil, from the Eocene of Biarritz.

Occurrence.—LXXIV, very rare.

Genus THOLOSINA Rhumbler 1895.

328. THOLOSINA BULLA (Brady).

Placopsilina bulla Brady, 1881 (1), p. 51; 1884, p. 315, Pl. XXXV, figs. 16, 17.

Tholosina bulla (Brady) Rhumbler, 1895, p. 82. Cushman, 1918, p. 63, Pl. XXV, fig. 6. Heron-Allen and Earland, 1922, p. 104.

Observations.—There is one specimen from each sample. This species is usually attached to other arenaceous Foraminifera. Brady's records were from the South Atlantic, 1,900 fathoms, and the North Atlantic, and the South Pacific, 2,160 fathoms.

Occurrence.—XV, very rare; XC, very rare; CI, very rare; CIV, very rare.

FAMILY RHIZAMMINIDÆ.

Genus RHIZAMMINA H. B. Brady 1879.

329. RHIZAMMINA ALGAEFORMIS Brady.

Rhizammina algaeformis Brady, 1879, p. 39, Pl. IV, figs. 16, 17; 1884, p. 274, Pl. XXVIII, figs. 1-11. Flint, 1899, p. 272, Pl. XV, fig. 1. Cushman, 1910, p. 33, text-fig. 23; 1918, p. 31, Pl. XI, figs. 2, 3. Heron-Allen and Earland, 1922, p. 92.

Observations.—A very variable form, usually with a flexible or chitinous tube, sometimes flattened.

Occurrence.—XIV, rare; XVII, rare; XIX, very rare; XLVII, very rare; LXXI, very rare; LXXXI, common; XCIV, rare; CIX, very rare.

330. RHIZAMMINA HORRIDA, *sp. nov.* Plate X, fig. 47.

Description.—Test tubular, often tapering at both ends. Surface clothed with spicules, built in at right angles. Portions of the tube may be denuded, or the whole covered with the spicular coat.

Length of figured specimen (holotype), 9.75 mm. Diameter of thickest part of tube, 0.88 mm.

Occurrence.—XCI, very common; XCII, very rare; CII, very rare.

331. RHIZAMMINA INDIVISA *H. B. Brady*.

Rhizammina indivisa Brady, 1884, p. 277, Pl. XXIX, figs. 5-7. Cushman, 1910, p. 34, text-fig. 24; 1918, p. 32, Pl. XII, figs. 7-10; 1921, p. 45, Pl. II, fig. 6.

Observations.—The test is a shelly undivided tube, sometimes slightly spicular. The present occurrences are well separated, being off Queen Mary Land, off Wilke's Land and south of Tasmania.

Occurrence.—XIX, very rare; LXV, very rare; LXXXI, common.

Genus MARSIPELLA *Norman 1878*.332. MARSIPELLA CYLINDRICA *H. B. Brady*.

Marsipella cylindrica Brady, 1882, p. 714; 1884, p. 265, Pl. XXIV, figs. 20-22. Heron-Allen and Earland, 1912, p. 388, Pl. V, figs. 8, 9; Pl. VI, figs. 8, 9. Chapman, 1917 (2), p. 62, Pl. II, fig. 15.

Observations.—The form ascribed to the above species from the Ross Sea, described and figured by the senior author as *Marsipella cylindrica* has been referred doubtfully to a new species, *M. chapmani*, by Messrs. Heron-Allen and Earland, 1922, p. 90. These authors distinguish *M. chapmani* from *M. cylindrica* by the tapering test and ragged extremities, as well as in the twisted texture of the spicular mat forming the test. Chapman's figured example referred to is, however, a typical *M. cylindrica*.

In the present soundings two distinct localities, both off Adelie Land, have afforded specimens of *M. cylindrica*. The diameter of a large specimen previously noted from the Ross Sea (*op. cit.*, p. 62), should read 1.3 mm. The length of the same specimen is 12.5 mm.

Occurrence.—LX, very rare; LXI, very rare.

333. MARSIPELLA DEXTROSPIRALIS *sp. nov.* Plate X, fig. 48.

Description.—Test generally cylindrical and tubular, somewhat curved, tapering slightly towards the extremities. Structure of test consisting of a layer of broken sponge spicules lying closely together and with a decided dextral twist. The colour of the test is usually brown, and there appears to be little cement, which is probably of a chitinous nature.

Dimensions.—Length of type, 1.45 mm.; greatest width, 0.136 mm.

Observations.—In our remarks on *M. cylindrica* we have noted the fact that the example from the Ross Sea, figured by one of us (F.C.) is typical. It may be further noted that Heron-Allen and Earland's *M. chapmani* (*op. cit.*, 1922) appears to be identical with their previously described species, *M. spiralis*, from the North Sea, for both have the character of a sinistrally wound, spicular test. Fragments of *Dendronina* may be easily mistaken for the above species, but differ in being elongately conical.

Occurrence.—XLV, frequent.

334. MARSIPELLA ELONGATA *Norman.*

Marsipella elongata Norman, 1878, p. 281, Pl. XVI, fig. 7. Brady, 1884, p. 265, Pl. XXIV, figs. 10-19. Cushman, 1918, p. 23, Pl. VIII, figs. 2, 3. Heron-Allen and Earland, 1922, p. 90, Pl. III, figs. 10-12.

Observations.—There is one fragmentary example, constructed principally of sponge spicules. Although Brady states this is essentially a North Atlantic species, it is not uncommon off the east coast of Australia. The "Terra Nova" examples were from off New Zealand.

Occurrence.—XLV; very rare.

Genus BATHYSIPHON *M. Sars* 1872.335. BATHYSIPHON ARGENTEUS *Heron-Allen and Earland.*

Bathysiphon argenteus Heron-Allen and Earland, 1913 (2), p. 38, Pl. III, figs. 1-3. Cushman, 1918, p. 30, Pl. XII, figs. 1-3. Heron-Allen and Earland, 1922, p. 82.

Observations.—There is one typical example. The only records of this species are those of Messrs. Heron-Allen and Earland, from Killary Bay, on the west coast of Ireland; off the coast of Scotland, in the North Sea; and from the "Terra Nova" soundings, one off New Zealand, and the remainder in the Antarctic.

Occurrence.—IX, very rare.

FAMILY ASTRORHIZIDAE.

Genus *ASTRORHIZA* Sandahl 1857.336. *ASTRORHIZA ARENARIA* Norman.

Astrorhiza arenaria Norman, 1876, p. 213. Brady, 1884, p. 232, Pl. XIX, figs. 5-10.
Pearcey, 1914, p. 997. Cushman, 1918, p. 9, Pl. II, figs. 1-3; Pl. III, fig. 1.

Observations.—There is one very large example. This species appears to be rare in the southern hemisphere, the only records being those of Brady from off the Cape of Good Hope, 150 fathoms, and Pearcey, from two deep-water stations in the Antarctic. It is common in the North Atlantic.

Occurrence.—XIX, very rare.

337. *ASTRORHIZA CRASSATINA* Brady.

Astrorhiza crassatina Brady, 1881, p. 46; 1884, p. 233, Pl. XX, figs. 1-9. Cushman, 1910, p. 22, fig. 6 (in text). Pearcey, 1914, p. 997.

Observations.—Excepting those noted by Pearcey and by Wiesner, the previously recorded examples of this species by Brady, Goës, Flint, Kiaer and Rhumbler have all been from the North Atlantic or North Pacific, in areas influenced by Arctic currents. Our specimens are from off Wilke's Land. The test is typical in structure, and somewhat fusiform in shape.

Occurrence.—LXXXII, very rare.

Genus *RHABDAMMINA* Carpenter, 1869.338. *RHABDAMMINA ABYSSORUM* Carpenter.

Rhabdammina abyssorum M. Sars, 1869, p. 248 (*nomen nudum*). Carpenter, 1869, Ann. Mag. Nat. Hist, ser. 4, vol. IV, p. 288. Brady, 1884, p. 266, Pl. XXI, figs. 1-13. Cushman, 1910, pp. 24, 25; text-figs. 8-10. Heron-Allen and Earland (*Rhabdammina abyssorum* M. Sars), 1922, p. 91.

Observations.—A few recognisable fragments were met with. Although this species was named by M. Sars, it was a *nomen nudum*, and Carpenter who first described it should, in accordance with the International Rules, be quoted as its author.

Occurrence.—XIII, very rare; LIX, rare; LXV, very rare; LXXI, frequent.

339. RHABDAMMINA CORNUTA (*H. B. Brady*).

Astrorhiza cornuta Brady, 1879, p. 43, Pl. IV, figs. 14, 15.

Rhabdammina cornuta Brady, 1884, p. 270, Pl. XXII, figs. 11-13. Pearcey, 1914, p. 998.

Observations.—This species appears to have few records. The original series ("Challenger") includes New Zealand and Pernambuco. Several tests of this type, with a coarse sandy texture, and with irregular outgrowths are found here.

Occurrence.—II, very rare; XIX, very rare; LXXX, very rare; LXXXI, very rare.

340. RHABDAMMINA DISCRETA *Brady*.

Rhabdammina discreta Brady, 1881, p. 48; 1884, p. 268, Pl. XXI, figs. 7-10.

Cushman, 1910, pp. 27, 28, text-fig. 13. Heron-Allen and Earland, 1922, p. 91.

Observations.—The outstanding feature of this species is its abundance and wide distribution in the present collections, whilst in that of the "Terra Nova" there is recorded only a single very large specimen. It is practically confined to the Ice Barrier and ranges from Kaiser Wilhelm Land to South Victoria Land. Unlike the "Terra Nova" specimen found by Heron-Allen and Earland, which utilised sponge spicules in its test, the "Aurora" examples have the tests mainly constructed of small sharp quartz grains. The colour of the tests varies from cream to chestnut brown, the latter prevailing. The examples from Station CVII are very typical.

Occurrence.—III, very rare; IX, frequent; X, common; XI, common; XII, rare; XIII, very rare; XVI, frequent; XVIII, very rare; XIX, common; XXI, very rare; XXII, rare; XXIV, rare; LXIX, frequent; LXXVI, common; LXXVII, rare; LXXVIII, rare; LXXIX, very common; LXXX, very rare; LXXXII, very rare; LXXXIII, very rare; LXXXIV, frequent; LXXXVII, very common; XC, very rare; XCI, rare; XCV, rare; XCVIII, frequent; CII, common; CIII, common; CIV, very common; CVII, common; CIX, very rare; CXI, very rare.

341. RHABDAMMINA IRREGULARIS *Carpenter*.

Rhabdammina irregularis Carpenter, 1869, Proc. Roy. Soc. London, vol. XVIII, p. 60.

Brady, 1884, p. 268, Pl. XXI fig. 9. Cushman, 1918, p. 17, Pl. VIII, fig. 1.

Observations.—There is here one example of this branching form. The species was described by Carpenter from material dredged in the North Atlantic, and has also been recorded by Cushman from the North Pacific.

Occurrence.—LXXX, very rare.

342. RHABDAMMINA LINEARIS *Brady*.

Rhabdammina linearis Brady, 1879, p. 37, Pl. III. figs. 10, 11; 1884, p. 269, Pl. XXII. figs. 1-6. Cushman, 1910, p. 28, text-figs. 14*a-f*; 1918, p. 19, pl. VII, figs. 2-5; 1921, p. 40, Pl. I, fig. 4.

Observations.—This species appears to be more typical in northern seas, but has occurred in the West Indies, off the coast of South America and east of New Zealand. In the present series it is commonest off the Antarctic Barrier. It was not recorded from the Scott Expedition ("Terra Nova"). Examples from Sample II have exceptionally coarse arenaceous tests.

Occurrence.—II, very common; VII, very common; X, common; XVIII, very common; LXXX, frequent; LXXXI, very rare; LXXXII, very rare; LXXXIV, very rare; LXXXVII, frequent; XCII, very rare; XCVIII, common; XCIX, very rare; CI, rare; CII, rare; CIV, rare; CVII, frequent.

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VII.—EXPLANATION OF PLATES.

The holotype of each new species has been figured. The holotypes and other figured specimens (*plesiotypes*) have been deposited in the Australian Museum, Sydney.

PLATE VII.

- Fig. 1. *Spirillina helenae* sp. nov.: *a*, lateral aspect; *b*, oral aspect. Sample XXXVIII. 2610 fms. \times 205.
2. *Spirillina spinulosa* sp. nov. Lateral aspect. Sample XXII. 120 fms. \times 100.
3. *Lenticulina albatrossi* (Cushman). Lateral aspect. Sample CIII. 250 fms. \times 18.
4. *Nodosaria substriatula* Cushman. Lateral aspect of a segment. Sample XLV. 675 fms. \times 88.
5. *Lagena acuta* (Reuss). Lateral aspect. Sample LII. 1900 fms. \times 176.
6. *Lagena pseudocatenulata* sp. nov. Lateral aspect. Sample XXII. 125 fms. \times 88.
7. *Lagena distoma* Parker and Jones. Lateral aspect. Sample XXXIII. 2570 fms. \times 37.
8. *Lagena fimbriata* Brady, var. *polita* var. nov. Lateral aspect. Sample XXIX. 706 fms. \times 74.
9. *Lagena multicineta* sp. nov. Lateral aspect. Sample XLVII. 1320 fms. \times 132.
10. *Sigmomorphina subulata* sp. nov.: *a*, lateral aspect; *b*, opposite side. Sample XXII. 125 fms. \times 24.
11. *Ceratobulimina tenuis* sp. nov.: *a*, superior aspect; *b*, inferior aspect. Sample XLVII. 1320 fms. \times 88.

PLATE VIII.

- Fig. 12. *Cassidulina subglobosa* Brady, var. *producta* var. nov. Oral aspect. Sample XLVI. 1180 fms. \times 74.
13. *Bulimina brevitrigona* sp. nov. Lateral and oral aspect. Sample XXII. 125 fms. \times 88.
14. *Bulimina buchana* d'Orb., var. *gutta* var. nov. Lateral and oral aspect. Sample XLVII. 1320 fms. \times 88.
15. *Vergulina davisi* sp. nov. Lateral and oral aspect. Sample XI. 930 fms. \times 88.
16. *Bolivina punctata* d'Orb. Lateral aspect of test, showing internal tube. Sample XXX. 1475 fms. \times 88.

- Fig. 17. *Bolivina seminuda* Cushman. Lateral aspect of a microspheric form. Sample XLVIII. 1300 fms. \times 88.
18. *Bolivina sphenoides* sp. nov. Lateral aspect. Sample XXX. 1475 fms. \times 100.
19. *Uvigerina pigmea* d'Orb. Hispid variety. Lateral aspect. Sample CXV. 1800 fms. \times 88.
20. *Angulogerina angulosa* (Williamson), var. *asperrima*, var. nov. Lateral aspect. Sample XCVIII. 328 fms. \times 58.
21. *Ellipsolagena cucullata* sp. nov. : *a*, oral aspect; *b*, dorsal aspect. Sample XXIV. 220 fms. \times 88.
22. *Discorbis margariteus* sp. nov. : *a*, superior aspect; *b*, inferior aspect; *c*, peripheral aspect. Sample XCVIII. 328 fms. \times 150.
23. *Discorbis williamsoni* nom. nov. Superior aspect. Sample XLVII. 1320 fms. \times 132.

PLATE IX.

- Fig. 24. *Globorotalia hirsuta* (d'Orb.). Superior aspect. Sample XLVIII. 1300 fms. \times 37.
25. *Globorotalia pseudocrassa* sp. nov. : *a*, superior aspect; *b*, peripheral aspect. Sample LXV. 2400 fms. \times 88.
26. *Anomalina colligera* sp. nov. Superior aspect. Sample XLVI. 1180 fms. \times 176.
27. *Anomalina globulosa* sp. nov. Superior aspect. Sample XLV. 675 fms. \times 88.
28. *Laticarinina pauperata* (Parker and Jones). Superior aspect. Sample XCII. 1660 fms. \times 37.
29. *Hyperammia elongata* Brady. A well developed example of fine texture. Sample XXIX. 706 fms. \times 18.
30. *Hyperammia elongata* Brady. A small example with coarse shell-wall. Sample CVII. 358 fms. \times 37.
31. *Dendronina arborescens* Heron-Allen and Earland. Fragment of test. Sample LXI. 350 fms. \times 15.
32. *Cornuspira involvens* (Reuss), var. *corticata*, var. nov. Lateral aspect. Sample XXII. 125 fms. \times 22.
33. *Sigmoilina edwardsi* Schlumberger, var. *acuta*, var. nov. Lateral aspect. Sample XLVI. 1180 fms. \times 50.
34. *Récurvoïdes contortus* Earland : *a*, lateral aspect; *b*, oral aspect. Sample XIX. 500 fms. \times 37.
35. *Haplophragmoides canariensis* (d'Orb.); var. *variabilis* (Heron-Allen and Earland). Superior aspect. Sample VII. 230 fms. \times 37.

PLATE X.

- Fig. 36. *Haplophragmoides silex* (Egger). Lateral aspect. Sample XC. 870 fms.
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37. *Ammobaculites agglutinans* (d'Orb.). Lateral aspect. Sample LXXXIX.
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38. *Ammomarginulina ensis* Wiesner. Lateral aspect. Sample LXXXI.
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39. *Ammobaculites pseudospiralis* (Williamson). Lateral aspect. Sample
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40. *Reophax longiscatiformis* Chapman. Lateral aspect. Sample CI. 302 fms.
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42. *Protonina bulbosa* sp. nov. Lateral aspect. Sample CVII. 358 fms.
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48. *Marsipella dextrospiralis* sp. nov. Lateral aspect. Sample XLV. 675 fms.
× 37.

INDEX.

In this Index reference is made only to genera and species here recognised as valid. The trivial name of each species is followed by the genus in which it is placed, and the number attached is that of the serial number in the text. The reference to a genus is followed by the serial numbers of the species represented in that genus.

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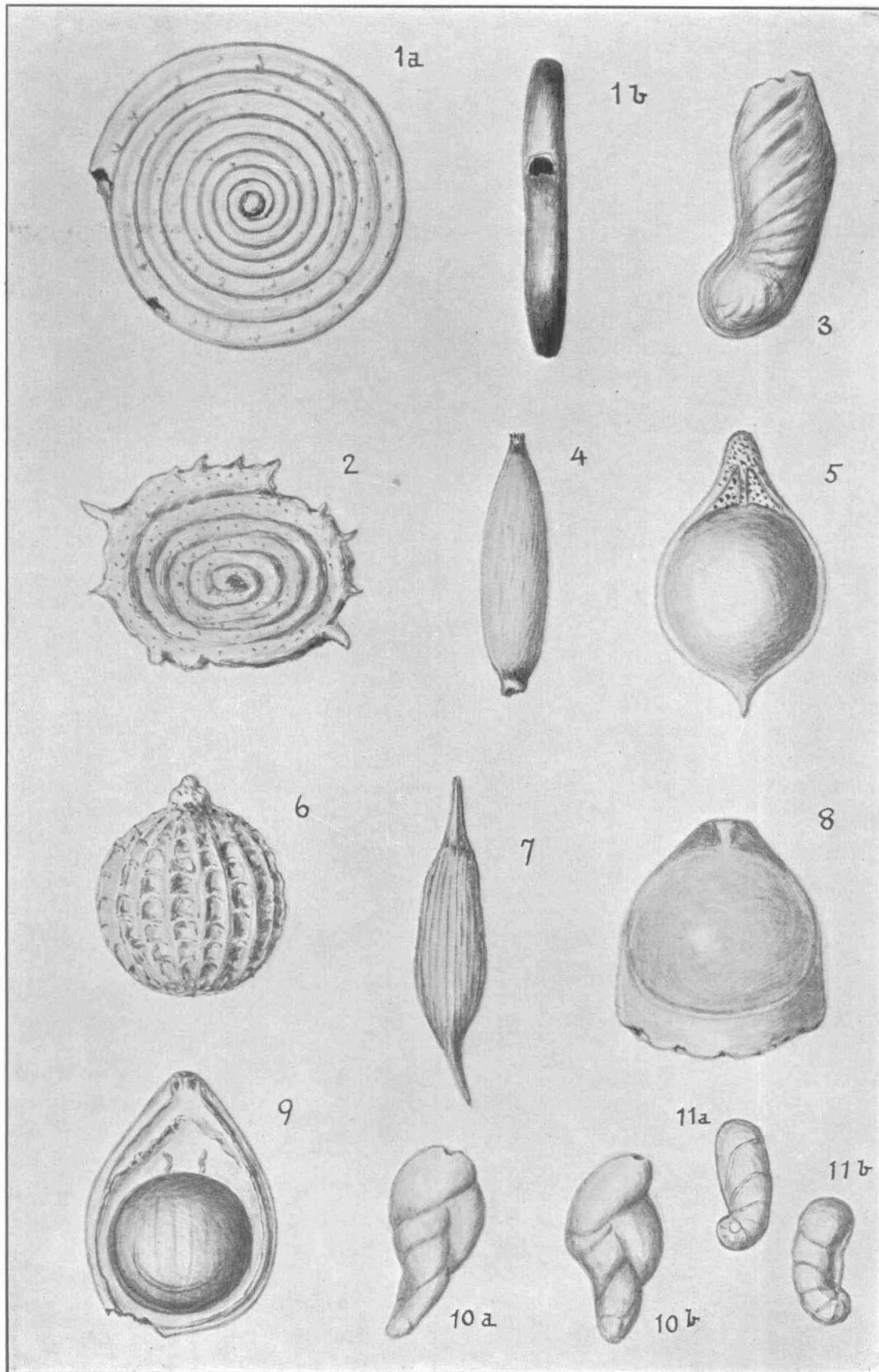
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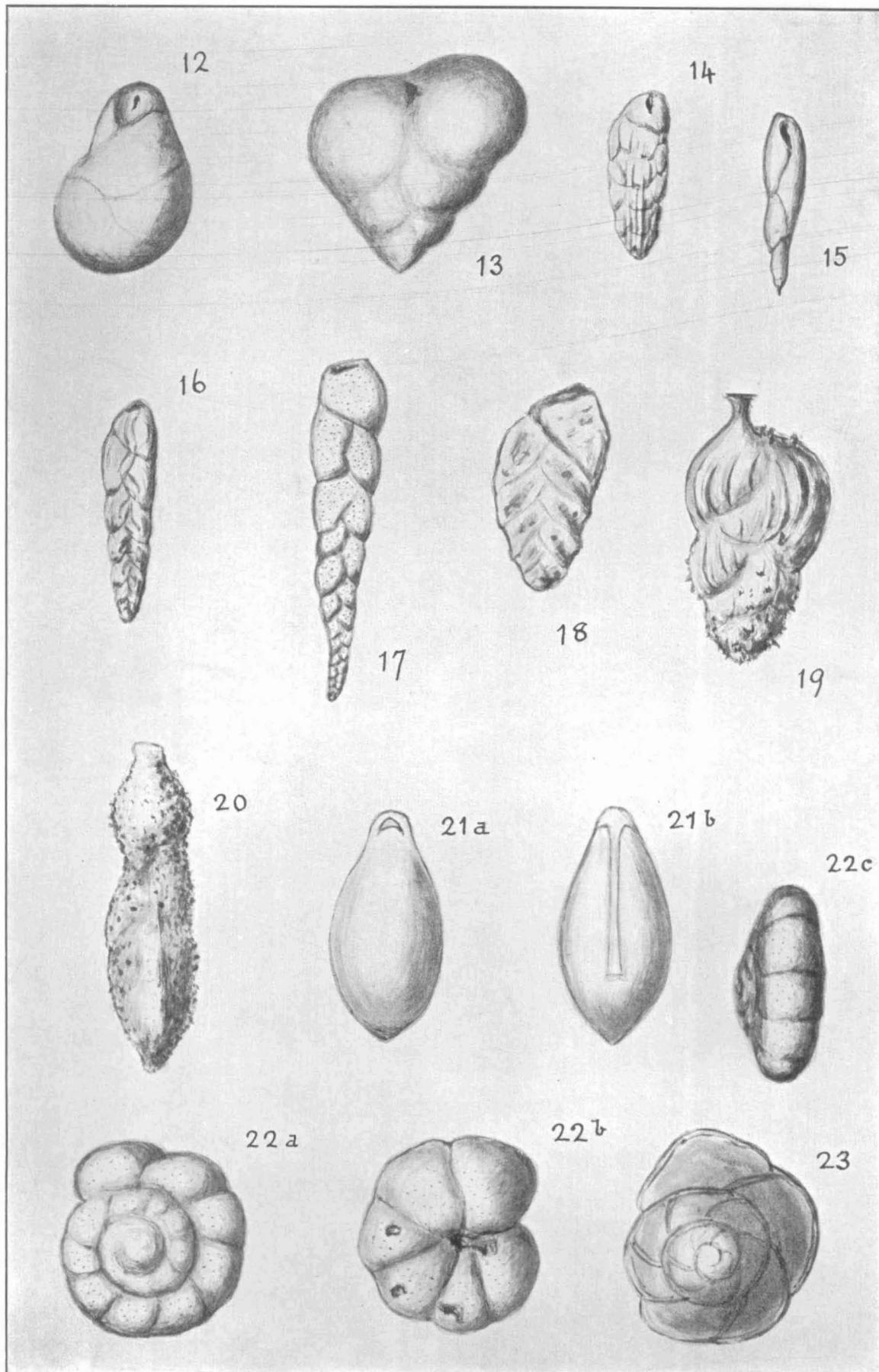
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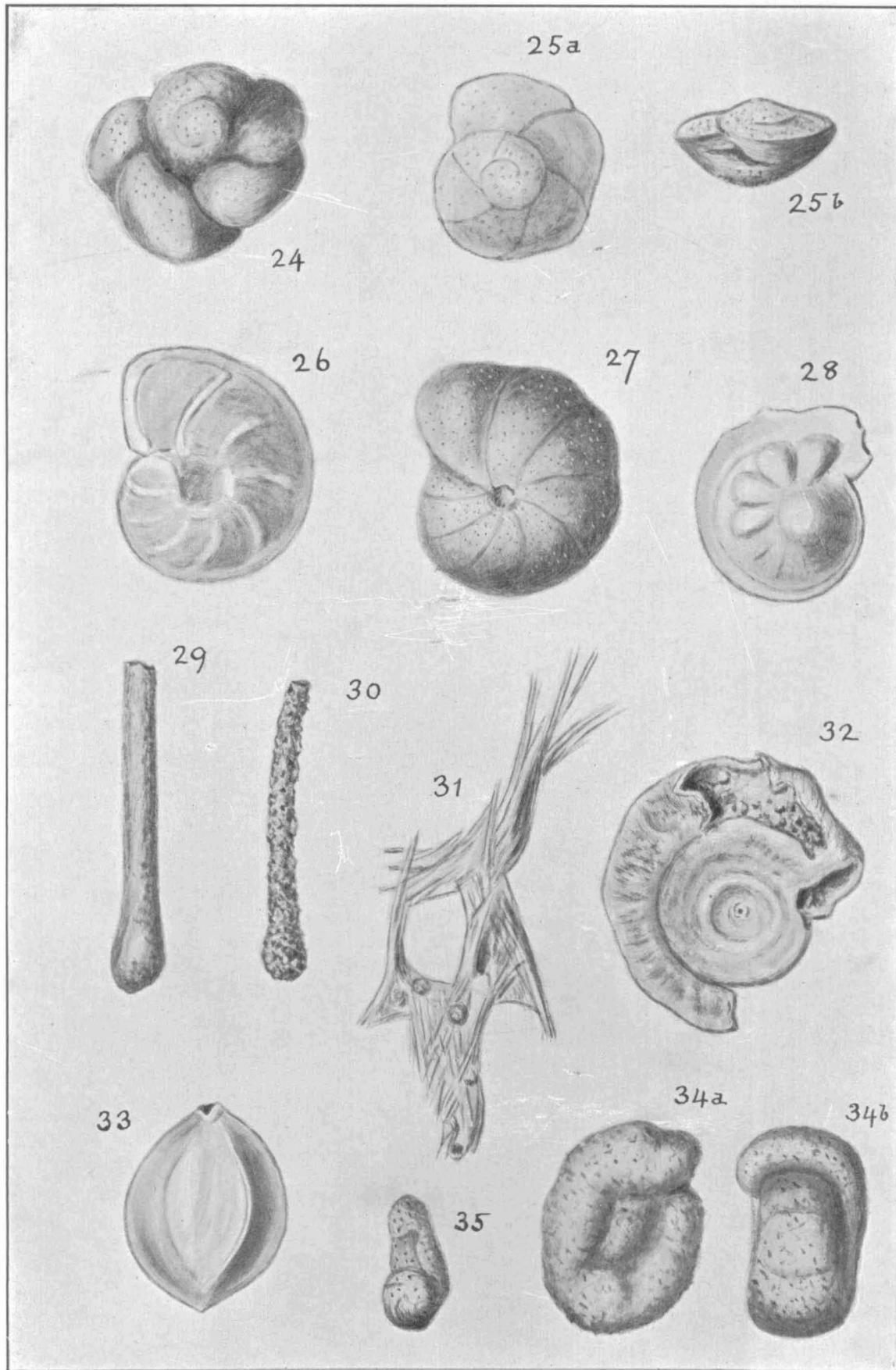
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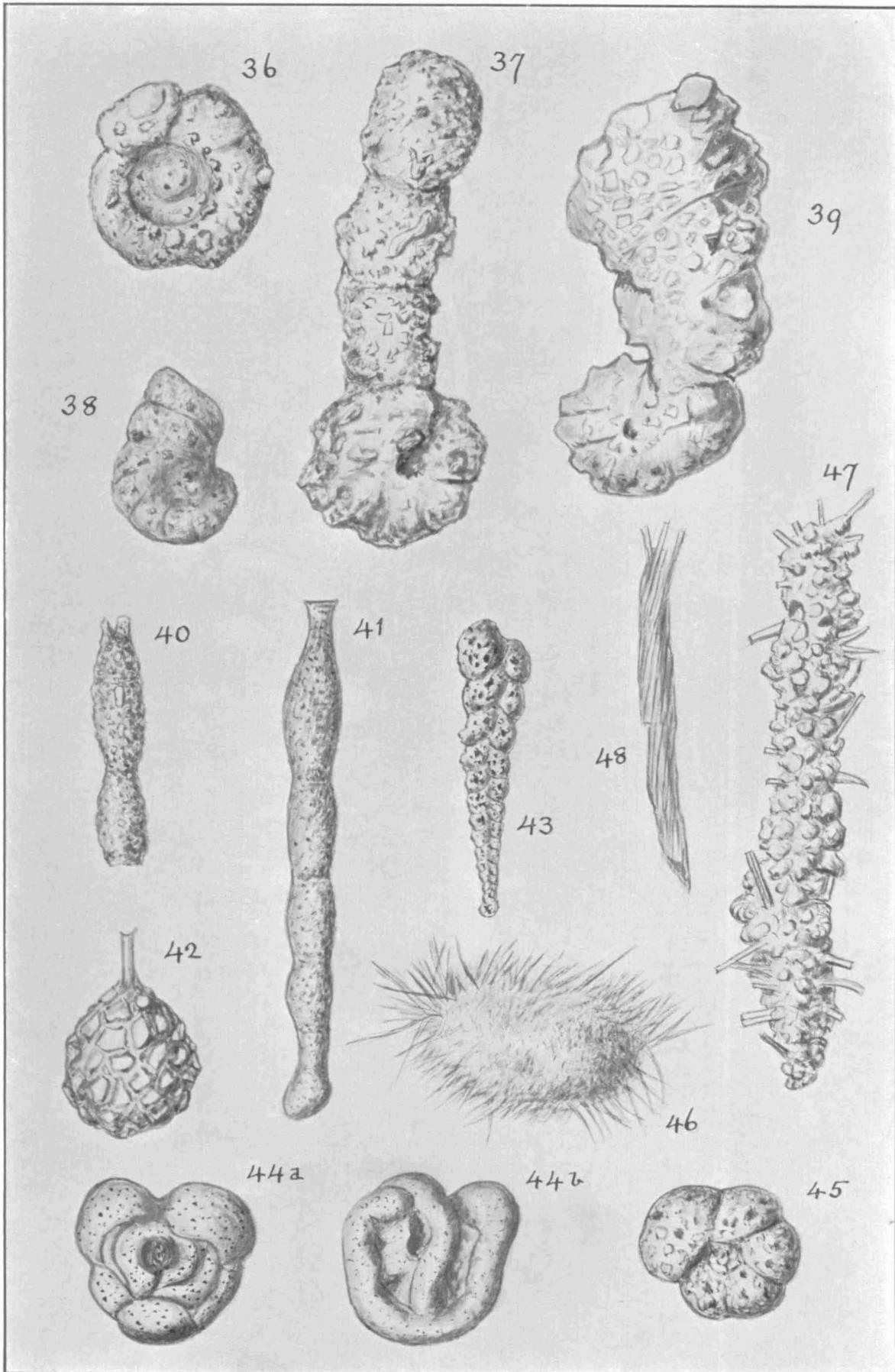
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