

AUSTRALASIAN ANTARCTIC EXPEDITION
1911-14.

UNDER THE LEADERSHIP OF SIR DOUGLAS MAWSON, D.Sc., B.E.

SCIENTIFIC REPORTS.
SERIES C.—ZOOLOGY AND BOTANY.
VOL. VI. PART 1.

CALCAREOUS SPONGES

BY

PROFESSOR ARTHUR DENDY, D.Sc., F.R.S.,
UNIVERSITY OF LONDON.

WITH ONE PLATE.

PRICE: TWO SHILLINGS.
TO SUBSCRIBERS: ONE SHILLING AND SIXPENCE.

Printed by William Applegate Gullick, Government Printer, Phillip-street, Sydney.—1918.

ISSUED 15th JUNE, 1918.

Series C.—REPORTS ALREADY ISSUED.

Vol.	Part.		Price.
			s. d.
III.	1.	FISHES. By Mr. EDGAR R. WAITE, F.L.S., South Australian Museum, Adelaide	8 6
III.	2.	PTEROBRANCHIA. By Dr. W. G. RIDWOOD, D.Sc., British Museum (Natural History) ...	2 6
IV.	1.	MOLLUSCA:—PELECYPODA AND GASTROPODA. By Mr. C. HEDLEY, F.L.S., Australian Museum, Sydney	8 6
IV.	2.	MOLLUSCA:—CEPHALOPODA. By Dr. S. STILLMAN BERRY, Redlands, Cal.	3 6
IV.	3.	BRACHIOPODA. By Dr. J. ALLAN THOMSON, M.A., D.Sc., Director Dominion Museum, Wellington, N.Z.	6 0
V.	1.	ARACHNIDA FROM MACQUARIE ISLAND. By Mr. W. J. RAINBOW, F.E.S., Australian Museum, Sydney	1 0
V.	2.	BRACHYURA. By Miss MARY J. RATHBUN, U.S. National Museum, Washington	1 0
V.	3.	COPEPODA. By Dr. G. STEWARDSON BRADY, F.R.S.	5 6
V.	4.	CLADOCERA AND HALOCYPRIDÆ. By Dr. G. STEWARDSON BRADY, F.R.S.	2 0
V.	5.	EUPHAUSIACEA AND MYSIDACEA. By Dr. W. M. TATTERSALL, D.Sc., Keeper University Museum, Manchester	1 6

AUSTRALASIAN ANTARCTIC EXPEDITION
1911-14.

UNDER THE LEADERSHIP OF SIR DOUGLAS MAWSON, D.Sc., B.E.

SCIENTIFIC REPORTS.
SERIES C.—ZOOLOGY AND BOTANY.
VOL. VI. PART I.

CALCAREOUS SPONGES

BY

PROFESSOR ARTHUR DENDY, D.Sc., F.R.S.,
UNIVERSITY OF LONDON.

WITH ONE PLATE.

PRICE: TWO SHILLINGS.
TO SUBSCRIBERS: ONE SHILLING AND SIXPENCE.

Printed by William Applegate Gullick, Government Printer, Phillip-street, Sydney.—1918.

20218—A Vol. VI, PART I.

CONTENTS.

	PAGE.
Introduction	5
<i>Leucosolenia</i>	5
<i>Leucetta</i>	8
<i>Grantia</i>	11
<i>Leucandra</i>	13
Literature	15
Description of Plates	16
Index	17

Plate I.

CALCAREOUS SPONGES.

By ARTHUR DENDY, D.Sc., F.R.S., Professor of Zoology in the University of London.
(King's College.)

(With plate I).

THE number of calcareous sponges in the collection is remarkably small, and of these the most conspicuous are a number of specimens of *Leucosolenia ventricosa*, obtained off Tasmania, while a large proportion of the remainder were collected on the shore at Macquarie Island, leaving very few which are really Antarctic. There is nothing strikingly novel in the collection, but three of the species have to be described as new. The classification adopted is that of Dendy and Row's "Classification and Phylogeny of the Calcareous Sponges," &c. [1913]. The dates in square brackets refer to the literature list at the end. In accordance with my usual practice, the specimens are numbered so that they can be referred to individually, the Roman numerals being the numbers which I myself attached to the jars as received by me, and the Arabic numerals referring to the specimens in the jars in cases where there were more than one. R.N. stands for register number.

LEUCOSOLENIA BOTRYOIDES (Ellis and Solander) var. MACQUARIENSIS NOV.

(Plate I, figs. 1, 6a-6e).

(For literature and synonymy of the species, *vide* Minchin [1905]).

There are in the collection four colonies, or fragments of colonies, of this sponge. The largest (fig. 1) is irregular in outline and measures about 27 mm. in length by 17 mm. in greatest breadth and 10 mm. in greatest thickness. The colonies are massive and have apparently been encrusting, with broad bases of attachment. Each consists of a close network of slender, contorted tubes, averaging about half a millimetre in diameter; forming a fairly compact mass, but with no pseudoderm. From the upper surface spring a few short oscular tubes of much greater width, which appear to be formed each by the junction of a number of the slender tubes. An oscular tube may give off a few blind diverticula from its lower portion, but these are in reality only parts of the basal network which have not yet anastomosed with one another or with the older portions. The oscular tubes are only about 2 mm. in length and they may be as much in diameter. The terminal vents have no fringe of projecting spicules and vary greatly in size. They are, of course, true oscula and not pseudoscular. The colour of the sponge in spirit is white.

The canal system is perfectly typical and requires no further description. The histological condition of the material makes it impossible to investigate satisfactorily

the position of the nuclei of the collared cells, which are in the long-drawn-out condition characteristic of asphyxiated calcarea (examined in R.N. T 10).

The skeleton arrangement and spiculation are very typical. The following description of the spicules is taken from R.N. T 11.

Spicules :—

- (1) Triradiates (fig. 6a); with wide oral angle, frequently approaching 180° ; rays approximately straight, fairly stout, fairly gradually and sharply pointed; paired rays commonly measuring about 0.098 by 0.009 mm. when fully grown; basal ray usually shorter to a varying extent and often more slender.
- (2) Quadriradiates (figs. 6b, 6c); similar to the triradiates but with the addition of an apical ray, which is moderately well developed, fairly stout but not very long, sharply pointed and commonly gently curved.
- (3) Oxea (figs. 6d, 6e). There is only one kind of 'oxeote' or monaxon spicule present, though they vary considerably in size, some of them being small enough to be classed as "microxea." The spicule is considerably flattened and slightly curved in the plane of the flattening (fig. 6d). It is fairly gradually and sharply pointed at the proximal end, which is apt to be bent somewhat sharply to one side in a plane at right angles to the flattening (fig. 6e). The distal end is hastate, sharply marked off from the remainder of the spicule by a slight annular thickening situate at about one-twelfth of the length of the spicule from the extremity. A typical example measured about 0.14 by 0.006 mm. A smaller specimen measured 0.09 by 0.005 mm. The largest I have seen measured only 0.17 mm. in length.

These monaxon spicules exhibit marked differences in shape and refringency according to the position in which they are viewed. When lying on edge (fig. 6e) they are narrower and much more highly refringent, the outlines appearing thicker and blacker than when lying flat (fig. 6d).

Professor Minchin, in his very elaborate memoir on "The characters and synonymy of the British Species of Sponges of the genus *Leucosolenia*" [1905], has fallen into a very curious error with regard to these spicules, in which he has been followed by Jenkin [1908]. He says (*op. cit.*, p. 359): "A remarkable point with reference to the monaxons of *Leucosolenia*, which I have found to hold good, not only with regard to the species described in this memoir, but also for all other species that I have examined, is that the monaxons can be separated more or less easily into two varieties, distinguished by the fact that one kind appears very refringent, the other, by comparison, pale, under the microscope. The refringent monaxons are always scarcer than the pale ones, but their peculiar optical property makes it very easy to find them, especially under low powers (Zeiss, Oc. II, Obj. B). In form the two kinds of monaxons may not differ essentially, but the refringent ones, always show certain characteristics which may be summed up by saying that they tend to be straighter, more slender, and sharper than the others, and their distal barb is less distinct or absent,"

&c. As regards refringency, he concludes "that the difference between the two types is due to a difference in the rotation of the axis of crystallization to the form of the spicule."

It seems almost incredible that so careful an observer as Professor Minchin should have fallen into so simple a trap. It never seems to have occurred to him that he was merely looking at the same spicule in two different positions. The mistake is just the same that Bowerbank made many years ago with regard to his "bi-dentate" and "tri-dentate anchorates," and is the more surprising in that the triradiates and quadri-radiates of *Leucosolenia* show exactly the same difference in refringency according to whether they are viewed flat or edgewise, as do the monaxons.

To any one who has seen these monaxon spicules and performed the simple experiment of rolling one over under the microscope, as I have done, observing how the form and the refringency change according to the position of the spicule, it must seem hardly necessary to give further proof of the correctness of this explanation of the supposed-existence-of two kinds of monaxons in species of *Leucosolenia*. I would point out, however, that everything which Professor Minchin himself says on the subject supports this conclusion. Their occurrence in all species examined by him* is in itself extremely suggestive, so also is the fact that the "refringent" individuals are less numerous than the "pale" ones, for it is less likely that the spicule will lie on its edge than that it will lie flat. The differences in shape are also just such as would be expected. A precisely similar condition is seen in the microxea of *Leucetta macquariensis*, described in this report (cf. figs 8c, 8d), and in the oxea of *Grantia tenuis* also found in the collection.

Leucosolenia botryoides var. *macquariensis* approaches more nearly in its characters to *Leucosolenia variabilis* than to the typical European form of *L. botryoides* as described by Minchin (*op. cit.*), while perhaps differing from both in the very strong development of the basal network of tubes and the relative shortness and scarcity of the oscular tubes.

Minchin himself points out that the difference between *L. variabilis* and *L. botryoides* is "purely one of degree in every respect," and I prefer to follow those authorities who consider *L. variabilis* as a mere variety of *L. botryoides*. It is interesting to find a variety of this common European species in so remote a locality as the Macquarie Islands.

Register Nos., Locality, &c.—I. 10-13. Macquarie Island. Picked up on beaches after storm, West Coast.

LEUCOSOLENIA VENTRICOSA (*Carter*).

Clathrina ventricosa Carter [1886].

Leucosolenia ventricosa Dendy [1891].

Leucosolenia ventricosa Dendy and Row [1913].

Several specimens of this common and easily recognisable species occur in the collection. It is unnecessary to add anything to the full description which I gave in

* Although he himself points out this fact Minchin nevertheless actually gives the presence of the supposed two kinds of monaxæ as a diagnostic character of *Leucosolenia variabilis*.

1891. The locality from which the specimens were obtained (off Tasmania) adds but little to our knowledge of the distribution of the species; which has hitherto been obtained, so far as I am aware, only in the neighbourhood of Port Phillip.

Register Nos., Locality, &c.—VII, 1, 2, &c., off Tasmania.

LEUCOSOLENIA *spp.*

There are in the collection a few very small, simple, tubular *Leucosolenias* which I refrain from naming, as the material is insufficient to enable me to make a satisfactory investigation. Two of them (R.N. II, 1, 2) were in a separate tube labelled "Calcareous sponges, C. Bay, *14-12-13, D. 45-50 fath." Another was attached to the surface of *Leucetta antarctica* (R.N. VI), from Station XII.

There were also small fragments of a branched, probably reticulate *Leucosolenia*, associated with the specimens of *Grantia cirrata* var. *auroræ* and *Grantia tenuis* from Station II (?).

LEUCETTA ANTARCTICA *n. sp.*

(Plate I, figs. 2, 7.)

The single specimen in the collection (fig. 2) is an irregularly turbinate sponge, broadest above, where there is a large, irregular depression (not shown in the figure), making the sponge almost cup-shaped, and narrowing below to a short stalk. The cup-shaped depression is probably not a normal character, and may be due to inhibition of growth by a mass of Polyzoa attached to the surface of the sponge in the middle of the hollow. There are several large, compound vents, each consisting of a shallow depression bounded by a thin, prominent margin, and bearing the numerous apertures of the exhalant canals lying close together in its floor. These vents lie on or near the broadly-rounded margin of the cup-shaped depression, two of them are shown in the figure, and at least two others are present. The margins of all are somewhat sunk beneath the general level of the surface. The surface is smooth and covered by a thin dermal membrane, pierced by numerous small inhalant pores arranged in close-set groups. The total height of the specimen is 50 mm., and the maximum breadth 55 mm. The colour in spirit is pale yellowish-brown, and the texture rather soft and compressible, but resilient.

The ectosome is very feebly developed, being represented by the thin dermal membrane, and there is a thin gastral cortex surrounding the principal exhalant canals.

The canal system is of the ordinary leuconoid type. The dermal pores lead direct into wide inhalant lacunæ, which penetrate deeply into the choansome, and there break up into smaller lacunæ between which the flagellate chambers are thickly scattered in the feebly-developed mesoglœa. The flagellate chambers are much distorted by

* Commonwealth Bay.

shrinkage, but they are evidently oval or subspherical in form and about 0.14 mm. in diameter. They have numerous prosopyles as usual. The exhalant lacunæ lead into wide, exhalant canals which converge to open side by side in the floor of the vents.

Histologically the specimen is so badly preserved that it is impossible to say anything definite about the position of the nuclei of the collared cells, but it seems safe to assume that it is basal.

The skeleton consists of regular or subregular triradiates, lying tangentially in the dermal and gastral membranes and irregularly scattered in the choanosome, but, in the latter case, in such a way that, as seen in sections, they tend to enclose hexagonal areas more or less free from spicules. The choansomal skeleton is not very dense. There appear to be no sagittal spicules round the margins of the vents.

Spicules :—

Regular or subregular triradiates (fig. 7), with approximately equal rays and angles. Rays straight, conical, rather long and slender, fairly sharply pointed, varying greatly in size up to about 0.36 by 0.035 mm., but such large ones are extremely rare.

This species might very well fall within the wide circle of forms embraced by Haeckel's *Leucetta primigenia*, but, as I have already pointed out [1913] in describing my *Leucetta pyriformis*, it is hardly possible to disentangle all these forms from one another. Moreover, none of them seemed to resemble *Leucetta antarctica* at all closely as regards external features, which are probably sufficiently characteristic to distinguish the species from any previously described.

Register No., Locality, &c.—VI, Station XII (Lat. S. 64° 32'; long. E. 97° 20'), 110 fathoms, 31st January, 1914.

LEUCETTA MACQUARIENSIS *n. sp.*

(Plate I, figs. 3a-3d, 8a-8d).

There are eleven specimens of this species, all from the beach at Macquarie Island. The characteristic external form is massive, cushion-shaped, with convex upper surface and flattened base (figs. 3a-3c). Large specimens tend to become cavernous by the enclosure of external spaces in the process of growth. The upper surface is thrown into a network of irregular ridges and valleys, like a miniature mountain range, the summits being represented by small mammiform projections each bearing a small vent. Usually these projections are but slightly prominent, but in R.N., V. 2 (fig. 3d), which differs considerably in appearance from the other specimens, they may attain a height of 8 mm. The vents range up to about 2 mm. in diameter, but are usually much smaller, and sometimes they are arranged in more or less definite rows. Their margins are usually naked, without conspicuous collar or fringe. When viewed under a pocket lens the surface of the sponge has a minutely granular appearance. The largest specimen (R.N. I. 1), which may be taken as the type, measures about 40 mm. in length by 25 mm. in breadth, and 20 mm. in height. The smallest (R.N. I. 9) measures

only 10 mm. in maximum diameter and has but a simple vent. The colour in spirit is dirty white; the texture firm and compact, albeit somewhat cavernous at times.

The canal system is leuconoid and quite typical. There is a rather thin and ill-defined ectosome, pierced above by the thickly scattered dermal pores and partially penetrated from below by the large, irregular sub-dermal cavities, if one may so term them. From the dermal pores short canals lead through the outer part of the ectosome into the sub-dermal cavities, many opening into each. The subdermal cavities pass down into the choanosome as large inhalant lacunæ, breaking up into smaller lacunæ as they go. The flagellate chambers are very thickly scattered through the choanosome; they are oval or nearly spherical, and measure about 0.086 mm. in diameter. The exhalant lacunæ are similar to the inhalant, the principal ones leading into large oscular tubes which terminate at the vents. The oscular tubes are lined by a thin and rather ill-defined gastral cortex.

The main skeleton of the sponge, that of the choanosome or chamber layer, consists of thickly scattered triradiates arranged without any order. There is a well-defined dermal skeleton consisting of the following parts:—(1) In the outermost part of the ectosome a thin layer of triradiates arranged tangentially. (2) Again in the outermost part of the ectosome, a layer of microxea, arranged radially with slightly projecting outer ends. (These spicules appear to be almost, if not quite, absent in some specimens, though very numerous in the type). (3) Numerous, relatively large, more or less club-shaped oxea, arranged radially with the thick ends projecting from the surface and the thin ends penetrating through the ectosome and for a short distance into the choanosome. (4) Occasional bundles of very slender, hair-like trichoxea, arranged radially in the ectosome. (The extent to which these spicules are developed varies greatly in different specimens; in R.N. V, 1, they form fringes round the margins of the very minute vents, but this appears to be quite exceptional). The skeleton of the gastral cortex consists of a fairly thick layer of sagittal triradiates, with the paired rays turned towards the vent and much more strongly developed than the basal ray. Occasionally these spicules possess a short apical ray, the number of quadriradiates thus formed varying greatly in different specimens; they are very rare in the type, but numerous in R.N. V. 1.

Spicules:—

- (1) Triradiates (fig. 8a); perhaps always more or less sagittal, with the oral angle wider than the paired angles, but ranging from forms in which the difference between the angles is but slight and the rays are of approximately equal length, to very strongly sagittal forms with the oral rays extended almost in a straight line and much longer and stouter than the basal ray (characteristic of the gastral cortex). The rays are fairly gradually and sharply pointed, and it is usual for the oral rays to be slightly curved or crooked while the basal ray is almost or quite straight. In a full-grown spicule with approximately equal rays the latter measure about 0.197 by 0.0184 mm.
- (2) Quadriradiates; formed by the addition of a short apical ray to triradiates of the gastral cortex.

- (3) Large oxea (fig. 8*b*); usually more or less club-shaped; stout, usually strongly curved, the bend being nearer to the distal end. Proximal portion usually nearly straight, gradually and sharply pointed. Distal portion irregular, usually crooked, ranging from gradually sharp-pointed to broadly rounded off at the end. Size about 0.43 by 0.034 mm.
- (4) Microxea (figs. 8*c*, 8*d*); flattened, slightly curved, chiefly in the plane of flattening, divided into proximal and distal portions by a sharp annular ridge, about one quarter of the length from the distal end; both ends fairly gradually and sharply pointed; size about 0.082 by 0.006 mm. (at the ridge-like thickening). These spicules show very distinctly the differences in appearance, according to whether they are viewed lying flat or edgewise, which led Minchin to believe in the existence of two kinds of oxea in the genus *Leucosolenia**. In the former case (fig. 8*c*) they appear very pale, with weak outlines, in the latter (fig. 8*d*) darker, much more refringent, and narrower.
- (5) Trichoxea; about 0.39 mm. long and of hair-like thinness.

The unusually strong tendency of the triradiates to assume a sagittal character prevents us from regarding this species as a perfectly typical *Leucetta*, but the nuclei of the collared cells are distinctly basal and there are no vestiges of an articulate tubar skeleton. The large oxea recall those of *Leucascus clavatus* Dendy [1892], both as regards form and arrangement, and the entire organisation suggests the close relationship of *Leucascus* and *Leucetta* assumed by Dendy and Row [1913]. There appears to be no species of *Leucetta* hitherto described with both large oxea and microxea, though they occur together in an unpublished species of Row's (*L. expansa*).

Register Nos., Locality, &c.—I, 1-9, Macquarie Is. Picked up on beaches after storm, West Coast; V, 1, 2, beach, Macquarie Island.

GRANTIA CIRRATA *Jenkin* var. *AURORÆ nov.*

(Plate I, figs. 4, 9*a*-9*d*.)

Leucandra cirrata *Jenkin* [1908].

There are several specimens or fragments of specimens of this variety in the collection, a complete individual being represented in fig. 4. The sponge is elongately cylindrical, or more or less compressed (? artificially); slender; of pretty uniform diameter for the greater part of its length but narrowing gradually above to the naked, terminal vent, and below to the point of attachment. The specimens are more or less curved in their present condition. The largest (R.N. IV, 2) measures about 18 mm. in length by 3 mm. in maximum diameter. The surface, when viewed under a pocket lens, appears, to use *Jenkin's* expression, as if covered with short, curling hair, owing to the large projecting oxea, but this character is hardly visible to the naked eye. The colour in spirit should evidently be nearly white, but is actually deeply tinged with green by copper dissolved in the spirit.

* See under *Leucosolenia botryoides* var. *macquariensis*.

The canal system is syconoid, or perhaps somewhat "syllleibid" with large, glove-finger-shaped chambers; but the preservation is not sufficiently good to afford satisfactory details.

The skeleton arrangement is that of a typical *Grantia*. The cortical skeleton is rather strongly developed on both dermal and gastral surfaces, consisting of several layers of tangentially disposed radiates. The gastral surface is abundantly echinated by the short, stout, apical rays of the gastral quadriradiates, and the dermal surface by the outer portions of the large, crooked oxea, whose inner portions penetrate at right angles through the chamber layer, sometimes even to the gastral cortex. The articulate tubar skeleton is well developed, consisting of several "joints," and the basal rays of the subgastral sagittal triradiates may extend through almost the entire thickness of the chamber layer.

The only important respect in which the spiculation (figs. 9a-9d) seems to differ from that of the type of the species concerns the form of the large, crooked oxea (fig. 9d), whose outer ends are commonly broadly rounded off, or even knobbed (but not hastate) at the extremity, a character which seems to occur only in the short peristomial oxea of the type. They may be bluntly and asymmetrically pointed, but never seem to show the long, slender tapering which characterizes the type. Their inner ends, on the other hand, taper very gradually to fine points.

I have examined the original preparations of Jenkin's *Leucandra cirrata*, from the Antarctic, now in the British Museum (Natural History), and have come to the conclusion that it is not a typical *Leucandra* but referable rather to the genus *Grantia*, the flagellate chambers being large and glove-finger-shaped. The large subdermal cavities mentioned by Jenkin are probably due, at least partly, to shrinkage.

Unfortunately I am in considerable doubt, owing to inadequate labelling, as to the locality from which the specimens in the "Aurora" collection were obtained. They reached me in a glass tube containing two labels. One, apparently the original, had "No. 1" on one side and "Porifera" on the other. This label had a copper or brass eyelet ring, the corrosion of which had stained both label and specimens green. The second label was evidently of more recent date and bore the words "Porifera No. II," all on the same side. It seems possible that the "No. II" refers to the Station. The type of the species was obtained at the Winter Quarters of the "Discovery" Expedition.

Register Nos., Locality, &c.—IV, 1, 2, 8, 10-14 (some merely fragments).
? Station II. (lat. S. 66° 55'; long., E. 195° 21').

GRANTIA TENUIS *Urban* [1908, 1909].

Some fragmentary specimens of this species were found in the same tube with those of *Grantia cirrata* var. *Aurora*, with which I at first thought that they were specifically identical. They can, however, be distinguished quite readily by the form of the large oxea, which are shorter and much less crooked, with the short distal portion often separated from the long proximal one by an annular thickening; also by the

numerous very slender oxea (trichoxea) arranged radially in bundles in the chamber layer and sometimes projecting from the surface. One fragment shows a fair number of microxea, not impossibly derived from a *Leucosolenia* in the same tube, or possibly young forms of the large oxea (?). Microxea seem to be absent from the type. The large oxea are very distinctly flattened and show very clearly the difference in refringence, according to the point of view, to which I have referred in the case of *Leucosolenia botryoides* var. *macquariensis* and *Leucetta macquariensis*.

The same uncertainty exists as to the locality of these specimens as in the case of *Grantia cirrata* var. *aurora*. The type of the species was obtained at Kerguelen.)

Register Nos., Locality, &c.—IV, 5-7, ? Station II (lat., S. 66° 55'; long., E. 195° 21').

LEUCANDRA MAWSONI n. sp.

(Plate I, figs. 5, 10a-10d).

The single specimen in the collection (fig. 5) is an elongated sac-shaped sponge, strongly compressed laterally and with a single terminal vent. The shape is somewhat irregular, the lateral margins growing out here and there into lobose projections which look like incipient buds, but there is only one vent, and the sponge may be regarded as consisting of a single leucon individual. It is contracted below to an ill-defined, stout, but compressed stalk, whereby it is attached to a pebble; it also diminishes gradually in breadth upwards to the wide vent. The dermal surface is smooth but slightly uneven, and appears very minutely reticulate under a pocket lens. The vent is naked, without any distinct collar but with a very narrow, thin margin. The specimen is large for a solitary calcareous sponge, measuring about 87 mm. in height, with a maximum breadth of about 27 mm. (where one of the marginal lobes comes off) and a thickness of only about 3 to 4 mm. The vent measures about 6 mm. in long diameter and leads into a wide central gastral cavity. The walls of this cavity are only about 1.5 to 2 mm. in thickness and almost touch one another, being in fact bolted together here and there by trabeculae formed from the lining of the gastral cavity. The gastral surface is smooth but uneven, with the rather wide openings of the exhalant canals sparsely scattered over it. The colour in spirit is pale yellowish-grey, the texture firm but flexible.

The skeleton is rather feebly developed, owing to the fact that the spicules, though very numerous, are slender-rayed. That of the chamber layer consists of regular triradiates, with long and very slender rays, quite irregularly scattered between the flagellate chambers. That of the thin gastral cortex consists of similar spicules lying tangentially and rarely with a feebly developed apical ray. The dermal cortex is also thin, but its skeleton is fairly dense and consists of somewhat stouter triradiates, lying tangentially; occasionally the spicule is turned so that one ray dips down into the chamber layer, but I do not think that any importance need be attributed to this condition.

Spicules :—

- (1) Regular triradiates of the chamber layer and gastral cortex (fig. 10a). Equiangular and equiradiate, with long, slender rays all lying approximately in the same plane. Rays nearly cylindrical and rather abruptly pointed, often very slightly crooked, or irregular in thickness; measuring about 0.2 by 0.005 mm.
- (2) Quadriradiates of the gastral cortex (fig. 10d); very similar to the triradiates just described, but with a feebly developed apical ray, usually represented by nothing more than a small knob.
- (3) Regular triradiates of the dermal cortex (figs. 10b, 10c), with the rays bent in such a way that the centre of the spicule is lifted up considerably above the plane in which the three apices lie. Rays conical, fairly gradually but not very sharply pointed; stouter than those of the radiates above described; measuring, say, about 0.12 mm. in length by 0.012 mm. in diameter at the base, but, of course, variable. In boiled-out preparations, these spicules are usually found resting on two of the rays, with the third tilted up and commonly broken off short, as shown in fig. 10c.

The canal system is "syllleibid" in type, the flagellate chambers being large and irregularly sac-shaped, measuring about 0.26 mm. in maximum diameter. The inhalant pores are thickly scattered over the outer surface and lead through the dermal cortex into the large, irregular, inhalant lacunæ. Similar, but larger, exhalant lacunæ, formed by the union of smaller ones, open on the gastral surface.

The specimen is badly preserved histologically and I have not been able to determine the position of the nuclei in the collared cells.

As regards canal system, this species resembles *Leucandra australiensis*, as figured by myself (1893), but it differs in the absence of oxea, as well as in other respects. Of previously fully described species the one which, perhaps, comes nearest to it seems to be *Leucandra telum*, which Lendenfeld (1891) referred to his genus *Polejna*, characterized by the "Syllleibid" canal system combined with the absence of oxea; but the two differ widely in external form, as well as in skeletal features.

Three Antarctic species described by Jenkin (1908), viz.—*Leucandra frigida*, *L. brumalis*, and *L. gelatinosa*, belong to the same section of the genus, but their canal system is very imperfectly known, and in any case they seem to be quite distinct from *L. mawsoni*.

Altogether *Leucandra mawsoni* appears to be a very well characterised species, easily recognised by its external form and by the peculiar, almost tripod-like dermal triradiates.

I have much pleasure in dedicating this species to the distinguished leader of the Expedition, Sir Douglas Mawson.

Register No., *Locality*, &c., III, Station VII (lat. S. 65° 92', long. E. 92° 10'), 60 fathoms, 21-1-14.

LIST OF LITERATURE REFERRED TO.

1886. CARTER, H. J.—Descriptions of Sponges from the Neighbourhood of Port Phillip Heads, &c. (Annals and Magazine of Natural History, vol. XVII, pp. 502-516).
1891. DENDY, A.—A Monograph of the Victorian Sponges, Part I. The Organisation and Classification of the Calcarea Homocœla, with descriptions of the Victorian species. (Transactions of the Royal Society of Victoria. Vol. III, Part 1.)
1892. *Id.*—Synopsis of the Australian Calcarea Heterocœla, with a Proposed Classification of the Group and Descriptions of some new Genera and Species. (Proceedings of the Royal Society of Victoria. N.S. Vol. V, pp. 69-116).
1893. *Id.*—Studies on the Comparative Anatomy of Sponges. V. Observations on the Structure and Classification of the Calcarea Heterocœla. (Quarterly Journal of Microscopical Science, N.S. Vol. XXXV, pp. 159-257).
1913. *Id.*—Report on the Calcareous Sponges collected by H.M.S. "Sealark" in the Indian Ocean. (Transactions of the Linnean Society of London. Sér. 2. Zoology. Vol. XVI, pp. 1-29).
1913. DENDY, A. and Row, R. W. H.—The Classification and Phylogeny of the Calcareous Sponges, with a Reference List of all the described species, systematically arranged. (Proceedings of the Zoological Society of London. 1913, pp. 704-813).
1908. JENKIN, C. F.—Calcarea. (National Antarctic Expedition. Natural History. Vol. IV.)
1891. LENDENFELD, R. VON.—Die Spongien der Adria. I. Die Kalkschwämme. (Zeitschrift für wissenschaftliche Zoologie. Bd. LIII, pp. 185-321 and 361-433).
1905. MINCHIN, E. A.—The Characters and Synonymy of the British species of Sponges of the Genus Leucosolenia. (Proceedings of the Zoological Society of London, 1904, Vol. II, pp. 349-396).
1908. URBAN, F.—Die Kalkschwämme der deutschen Tiefsee-Expedition. (Zoologischer Anzeiger, Bd. XXXIII, pp. 247-252).
1909. *Id.*—Die Calcarea. (Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition (Valdivia). Bd. XIX).

DESCRIPTION OF PLATES.

Fig. 1.—*Leucosolenia botryoides* (Ellis and Solander) var. *Macquariensis* nov., R.N. I, 11, \times about $1\frac{2}{3}$.

Fig. 2.—*Leucetta antarctica* n. sp. R.N. VI, about natural size.

Figs. 3a–3d. *Leucetta macquariensis* n. sp., about natural size.

3a, R.N. I. 1; 3b, R.N. I. 2; 3c, R.N. I. 3; 3d, R.N. V. 2.

Fig. 4. *Grantia cirrata* Jenkin var. *auroræ* nov. R.N. IV, 2, \times about $1\frac{2}{3}$.

Fig. 5.—*Leucandra mawsoni* n.sp. R.N. III, about natural size.

Figs. 6a–6e.—*Leucosolenia botryoides* (Ellis and Solander) var. *macquariensis* nov. R.N. I. 11. Spicules, \times 280. 6a, triradiates; 6b, quadriradiates, facial view; 6c, quadriradiates, side view; 6d, oxea, lying on flat side; 6e, oxea, lying on edge.

Fig. 7.—*Leucetta antarctica* n.sp. R.N. VI, Spicules, \times 120.

Figs. 8a–8d.—*Leucetta macquariensis* n.sp. R.N. I. 1. 8a, triradiates, \times 120; 8b, large oxea, \times 120; 8c, microxea, lying on flat side, \times 455; 8d, microxea, lying on edge, \times 455.

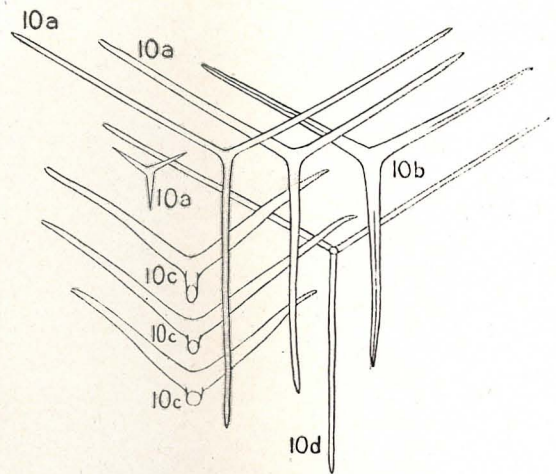
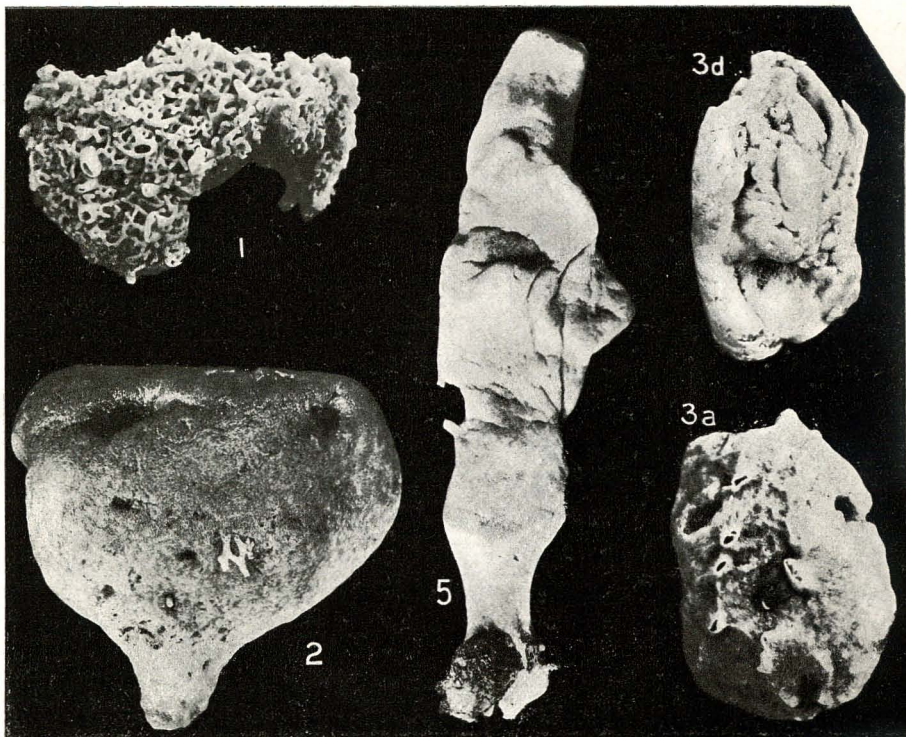
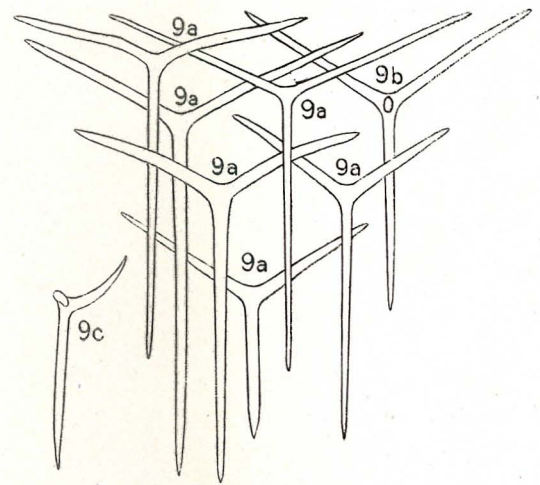
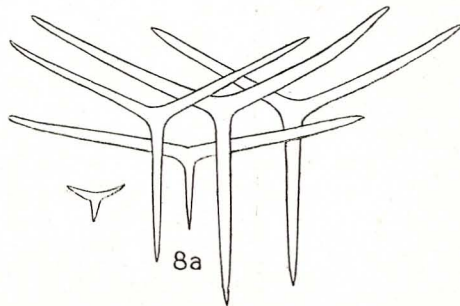
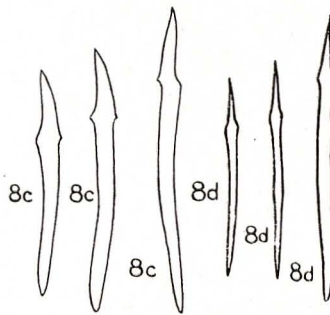
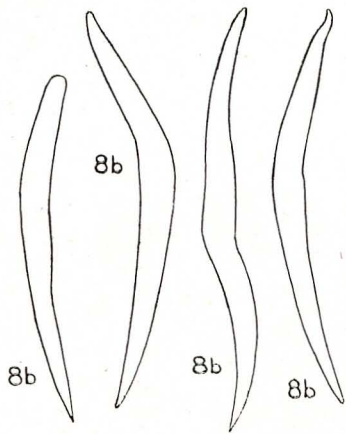
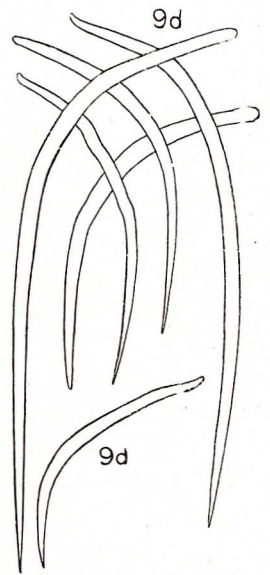
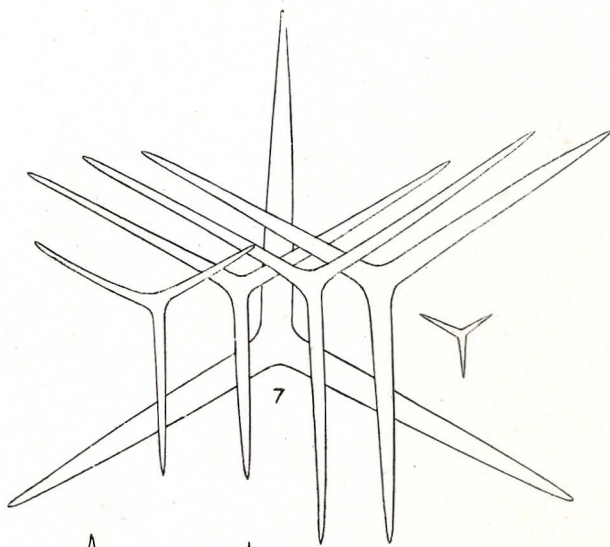
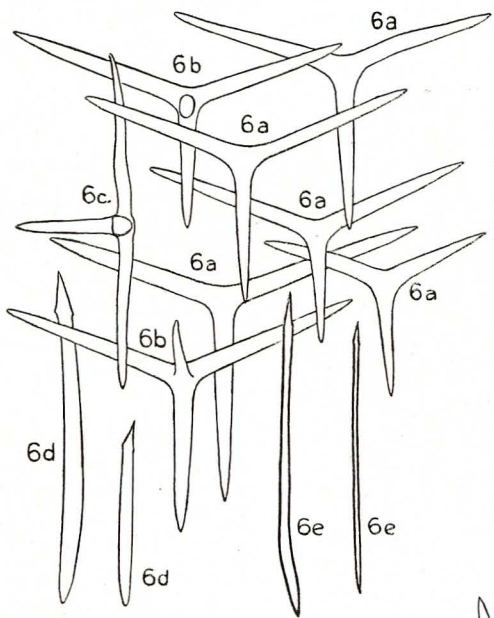
Figs. 9a–9d.—*Grantia cirrata* Jenkin var. *auroræ* nov. R.N. IV. 1, Spicules.

9a, Triradiates, \times 160; 9b, quadriradiates, facial view, \times 160; 9c, quadriradiates, side view, with the two oral rays broken off, \times 160; 9d, oxea, \times 105.

Figs. 10a–10d.—*Leucandra mawsoni* n.sp. R.N. III, Spicules, \times 160. 10a, ordinary triradiates; 10b, dermal triradiates, resting on the apices of the three-cornered rays; 10c, dermal triradiates lying on two rays, with the third tilted up and broken off; 10d, quadriradiate.

INDEX.

	PAGE.
<i>antarctica</i> , LEUCETTA	8
<i>botryoides</i> , LEUCOSOLENIA	5
<i>cirrata</i> , GRANTIA	11
GRANTIA <i>tenuis</i>	12
LEUCANDRA <i>Mawsoni</i>	13
LEUCETTA <i>antarctica</i>	8
LEUCETTA <i>macquariensis</i>	9
LEUCOSOLENIA <i>botryoides</i>	5
LEUCOSOLENIA <i>ventricosa</i>	7
LEUCOSOLENIA <i>spp.</i>	8
<i>macquariensis</i> LEUCETTA	9
<i>mawsoni</i> , LEUCANDRA	13
<i>tenuis</i> , GRANTIA	12
<i>ventricosa</i> , LEUCOSOLENIA	7



Series C.—REPORTS IN COURSE OF PREPARATION.

ZOOLOGY.

FORAMINIFERA	Mr. F. CHAPMAN, A.L.S., F.R.M.S., National Museum, Melbourne.
MONAXONID SPONGES AND TETRAXONID SPONGES.	Mr. E. F. HALLMANN, B.Sc., University, Sydney.
HEXACTINELLID SPONGES	Prof. I. IJIMA, College of Science, Tokyo, Japan.
CALCAREOUS SPONGES	Prof. A. S. DENDY, F.R.S., D.Sc., F.Z.S., King's College, London.
HYDROZOA	Mr. E. A. BRIGGS, B.Sc., Australian Museum, Sydney.
ACTINOZOA	Prof. J. ARTHUR THOMSON, F.R.S., University, Aberdeen.
TREMATODES	Dr. S. J. JOHNSTON, University, Sydney.
CESTODES	Dr. T. HARVEY JOHNSTON, University, Brisbane.
NEMATODES (FREE)	Dr. N. A. COBB, Bureau of Plant Industry, Washington, U.S.A.
CHÆTOGNATHA AND ACANTHOCEPHALA...	Dr. T. HARVEY JOHNSTON, University, Brisbane.
ROTIFERA AND TARDIGRADA	Mr. J. SHEPHARD, Melbourne.
ECHINOIDEA	Prof. R. KOEHLER, Université, Lyon, France.
ASTEROIDEA AND OPHIUROIDEA	Prof. R. KOEHLER, Université, Lyon, France.
CRINOIDEA AND HOLOTHUROIDEA	Prof. M. VANEY, Université, Lyon, France.
ANNULATA (EXCEPT LEECHES)	Prof. W. B. BENHAM, M.A., D.Sc., F.R.S., University of Otago, Dunedin, New Zealand.
LEECHES	CHAS. BADHAM, B.Sc., University of Sydney.
CRUSTACEA CUMACEA	Dr. W. T. CALMAN, British Museum, London.
CRUSTACEA AMPHIPODA AND C. ISOPODA	Prof. C. CHILTON, M.A., D.Sc., F.L.S., Canterbury College, Christchurch, New Zealand.
CRUSTACEA MACRURA AND C. CIRRIPEDA	Miss F. BAGE, M.Sc., F.L.S., University, Brisbane.
MALLOPHAGA	Dr. T. HARVEY JOHNSTON, University, Brisbane, and Mr. L. HARRISON, B.Sc., Sydney.
TICKS	Mr. L. HARRISON, B.Sc., Sydney.
PYCNOGONIDA	Prof. T. T. FLYNN, B.Sc., University of Tasmania, Hobart.
TUNICATES	Prof. W. A. HERDMAN, F.R.S., University, Liverpool, England.
BIRDS	Mr. H. HAMILTON, Dominion Museum, Wellington, N.Z., and Mr. R. BASSET HULL, Sydney.
MAMMALS	Mr. H. HAMILTON, Dominion Museum, Wellington, N.Z.

BOTANY.

MOSESSES.	Rev. W. W. WATTS, Sydney.
PHYTOPLANKTON AND FRESH-WATER ALGÆ.	Prof. F. E. FRITSCH, University of London.
LICHENS AND FUNGI	Mr. E. CHEEL, Botanic Gardens, Sydney.
MARINE ALGÆ	Mr. A. H. S. LUCAS, M.A., B.Sc., Grammar School, Sydney.
VASCULAR PLANTS	Mr. T. F. CHEESEMAN, F.L.S., F.Z.S., Auckland Museum, N.Z.