SPONGES.

By Thomas Whitelegge.

Zoologist, Australian Museum.

MONAXONIDA, *Ridley and Dendy.*

Part I.

(Plates xliii.-xliv.)

The collection obtained during the brief cruise of H.M.C.S. "Thetis" proved to be exceptionally rich in sponges; over one hundred and fifty species were procured, and approximately fully one half are either rare or new species.

The present paper deals with a little less than half of the *Monaxonida*, and includes nineteen new species, a number of others of great interest—hitherto only obtained by H.M.S. "Challenger"—and many other forms originally described by Dr. R. von Lendenfeld. The latter have been treated at some length, and have formed the basis of comparison between the types in the Australian Museum collection and the fragments received from Prof. A. Dendy, which were selected from the Lendenfeldian collection now in the British Museum. The material obtained enabled the writer to amend some of the descriptions and also the nomenclature of many of the exhibited specimens, as well as of those published in the "Catalogue of Sponges in the Australian Museum."

The new species herein described are as follows:—

Gellius reptans.
Rhaphisia ramosa.
Chondropsis syringianus.
Esperella ancorina.
,, *cylindrica.*
,, *textilis.*
Esperiopsis canaliculata.
,, *ferruginea.*
Cladorhiza waitei.
Phelloderma polypoides.
Desmacidon porifera.
,, *hispidosa.*
,, *stelligera.*
,, *conulissima.*
,, ? *arenosa.*
Dendoryx pumicea.
,, *fusca.*
Iotrochota arbuscula.
Yvesia commensalis.

Of species previously described the following are the most worthy of note :—

Siphonochalina annulata, Ridley and Dendy.
Arenochalina mirabilis, Lendenfeld.
Ceraochalina levis, Lendenfeld (with its so-called algal pseudomorph).
Esperella murrayi, Ridley and Dendy.
Esperiopsis cylindrica, Ridley and Dendy.
Pseudohalichondria fibrosa, Whitelegge.
Amphilectus ceratosus, Ridley and Dendy.
Desmacidon fruticosa, Bowerbank.
Rhizochalina putridosa, Lamarck.

MONAXONIDA, *Ridley and Dendy.*

Order HALICHONDRINA, *Vosmaer.*

Family HAPLOSCLERIDÆ, *Topsent.*

Subfamily CHALININÆ, *Schmidt.*

CHALINA, *Grant.*

CHALINA MACROPORA, *Lendenfeld.*

Euchalina macropora, Lendenfeld, Zool. Jahrb., ii., 1887, p. 818.

Station 53.

A single example is here, somewhat doubtfully, referred to this species. A comparison with a fragment from the British Museum has been made, and it agrees with the "Thetis" specimen in external and general characters, but the spicules differ slightly in dimensions.

Sponge with numerous slender, erect, cylindrical branches; the latter are dichotomous at their origin, but when mature the lobes are unequal, their diameter varies from 5 to 10 mm., and they attain to a height of 220 mm. The surface is even, harsh to the touch, and exhibits a rather distinct reticulation, with abundant small pores and numerous shallow oscula; the latter are from 1 to 3 mm. in diameter, from 2 to 5 mm apart.

The skeleton consists of an open network of fibre with the mesh mostly square, rarely oblong. The primary fibres are about 0·05 mm. in diameter and 0·2 to 0·3 mm. apart. The core of oxeote spicules is more or less plumosely arranged, with their basal ends approximated and their apices divergent; they vary

from three to six or more in a row. In the secondaries the spicules are fewer and more closely arranged, and in the connecting fibres the spicules occur sparingly, one or two to each, or they may be absent. The terminal ends of the fibres project at the surface, forming radiating tufts of spicules; the intervening spaces of the dermis also exhibit clusters of subradiate spicules.

Megascleres:—sharp pointed oxea 0·08 to 0·1 mm. by 0·0045 to 0·006 mm. Spicules from the British Museum fragment measure from 0·08 to 0·09 mm. by 0·003 to 0·004 mm.

PACHYCHALINA, *Schmidt.*

PACHYCHALINA RAMOSA, *Lendenfeld.*

Chalinissa ramosa, Lendenfeld, Zool. Jahrb., ii., 1887, p. 772, pl. xx., fig. 21.

Stations 41, 44, 48, 50.

This species is represented in the "Thetis" collection by sixteen specimens; they exhibit considerable variation in the diameter of the branches and also as to the size and number of the nodosities; the whole of the branches in some examples are strongly moniliform, in others they are subcylindrical with slight constrictions at distant intervals.

Sponge stipitate, much branched; the branches are mostly lateral, but frequently they are dichotomous, and often coalescent. In contour they vary from cylindric to strongly undulate or moniliform, and are from 5 to 15 mm. in diameter and from 200 to 400 mm. in length.

Surface smooth, dense, and very finely porous; internally the texture is rather open, with a more or less square mesh. Oscula numerous, pretty evenly distributed, slightly elevated, from 1·5 to 3 mm. in diameter, on an average about 10 mm. apart, and generally situated on the rounded elevations.

Primary fibres multispicular, about 0·05 mm. or more in diameter and 0·5 mm. apart. Secondary fibres 0·03 to 0·04, with an axial core of six to eight or more spicules; connecting fibres slender, with four or more spicules in a row. The choanosome is fairly sprinkled with spicules, and the dermal surface exhibits numerous tufts of projecting oxea in clusters of about twelve or more; the space between each bunch is about equal to the length of the spicule.

Megascleres:—sharp gradually pointed oxea 0·085 to 0·1 by 0·005 to 0·006 mm.

There is a fragment from the British Museum which agrees in appearance, texture, and spicular characters with *P. ramosa*, Ldf., as above described.

PACHYCHALINA PEDUNCULATA, *Lendenfeld*, sp.

Plachochalina pedunculata, Lendenfeld, Zool. Jahrb., ii., 1887, p. 791; Austr. Mus. Cat., xiii., Sponges, 1888, p. 90.

Cavochalina bilamellata (Lamk.), Carter, Ann. Mag. Nat. Hist., (5), xvi., 1885, p. 287.

Pachychalina bilamellata (Lamk. ?), Carter; Dendy, Proc. Roy. Soc. Vict., n.s., vii., 1895, p. 242.

Stations 4, 48.

The late Mr. H. J. Carter first described this species from Port Phillip. At the time he thought it was identical with *Spongia bilamellata*, Lamarck, and named it accordingly. Previous to this Ridley* had examined a fragment of Lamarck's "original type specimen," and redescribed the Lamarckian species as *Echinodictyum bilamellatum*.

Pachychalina pedunculata, Lendenfeld, was published as an ideal species consisting of three varieties, which prove to be identical with Carter's sponge, and since they can no longer be considered as *bilamellata*, Lamarck, Lendenfeld's name must stand; the three varieties may be enumerated as follows:—

(1) *P. pedunculata*, var. *dura*, Lendenfeld. This variety is by far the most common, and usually consists of a short, stout stem surmounted by a pair of flabellate expansions. The dermal surface is smooth, close and compact, with discernable pores on the inner aspect, but it requires a lens to see those on the exterior. The lamellæ are about 8 or 10 mm. in thickness, and are ornamented with concentric growths internally; the outer surface presents a series of meandering ridges and wart-like prominences from 2 to 10 or more mm. in height. The spicules are slightly curved sharp pointed oxea 0·06 to 0·065 by 0.004 mm.

(2) *P. pedunculata* var. *pocula*, Lendenfeld. This form is narrowly cup-shaped, with the walls of the cup from 1 to 4 mm. in thickness The external surface is furnished with warts and wavy ridges, but they are rarely more than 2 or 3 mm. high, and at the distal sixth they fade away. The spicules are curved oxea 0·06 to 0·07 by 0·004 mm.

(3) *P. pedunculata* var. *mollis*, Lendenfeld. This variety forms a very shallow cup with a well defined peduncle. The outer surface presents an irregular series of ripple or wave-like markings; the crests of the waves are generally acute and from

* Ridley—Journ. Linn. Soc., Zool., xv., 1881, p. 493, pl. xxviii., figs. 1-6.

2 to 10 mm. apart, with an indistinct concentric arrangement of the valleys between the ridges. The spicules are slightly curved oxea 0·06 to 0·07 by 0·004 mm.

This form, like many other species of the genus, is subject to great variation, and no doubt if a large series were secured it would be impossible to say where a definite line could be drawn, so as to warrant even a varietal name.

PACHYCHALINA AUSTRALIS, *Lendenfeld, sp.*

Euplacella australis, Lendenfeld, Zool. Jahrb., ii., 1887, p. 789

Euplacella frondosa, Lendenfeld, Zool. Jahrb., ii., 1887, p. 789, pl. xxi., fig. 36.

Stations 44, 47, 48.

When writing the "Report on Sponges from the Coastal Beaches of N. S. Wales"* I gave a short description of this species. The "Thetis" collection contains seven fine examples. They are all more or less stipitate, and vary from flabellate to plate or narrow cup-shape. The outer surface is smooth, and exhibits numerous growth lines, the pores are very minute and cannot be seen clearly with the unaided eye. The inner surface is closely sprinkled with abundant oscula from 0·5 to 2 mm. in diameter, and from 1 to 5 mm. or more apart. In young examples the oscula are large and rather distant. A few scattered oscula are invariably present on the external surface of the pedicle. The dermal reticulation on the outer surface is much finer than that on the inner. The skeleton consists of a rather dense plexus of broad ill-defined fibres, the mesh varies considerably, but is usually more or less oblong. The horny matter of the fibres is well developed and furnished with abundant oxeote spicules, especially in the central region; at the surface, however, the horny matter is scanty, and the spicules are disposed in one or two rows. The choanosome in dried examples is moderately charged with scattered spicules similar to those of the fibres. The spicules from a British Museum specimen of *P. australis*, Ldf., measure 0·075 by 0·004 mm., and those of *P. frondosa*, Ldf., 0·06 to 0·07 by 0·0037 mm. Spicules from the "Thetis" examples are rather larger and measure from 0·07 to 0·1 by 0·005 to 0·006 mm.; they appear to vary in size according to age, and are smallest in large specimens.

---

* Whitelegge—Rec. Austr. Mus., iv., No. 2, 1901, p. 55.

PACHYCHALINA PAUCISPINA, *Lendenfeld.*

Pachychalina paucispina, Lendenfeld, Zool. Jahrb., ii., 1887, p. 776.

Sponge digitate, shortly stipitate, with numerous irregular, main, cylindrical branches; the lateral branches are given off at right angles, and the sponge in consequence tends to become wide above the pendnncle. The upper part consists of slightly nodose, subcylindrical branches about 7mm. in diameter, with here and there a bifurcation; the longer branches attain to about 370mm. in length.

Texture rather soft and elastic. Surface smooth to the eye but harsh to the touch; the reticulation is very fine without any well-defined pores. Oscula few, shallow, and irregularly scattered, varying from 1 to 3 mm. in diameter. Colour in the dried example stone grey.

Skeleton with a rather wide mesh, oblong or subrectangular. The primary fibres are about 0·04 mm. in diameter and 0·44 mm. apart; the transverse secondaries are given off at intervals of about 0·5 mm.

The spicules are straight oxea, abruptly, but rather bluntly pointed. Size 0·1 by 0·002 to 0·003 mm.

The above-described specimen has been identified by comparison with a fragment from the British Museum, received under the name of *Dactylochalina paucispina*, Lendenfeld. I presume this is a m.s. name.

PACHYCHALINA PUNCTATA, *Ridley and Dendy.*

Pachychalina punctata, Ridley and Dendy, Chall. Rep., Zool., xx., 1887, p. 24, pl. vi., figs. 2, 2a, 2b, 2c, pl. xlvi., figs. 1-2; Lendenfeld, Zool. Jahrb., ii., 1887, p. 776; Whitelegge, Rec. Austr. Mus., iv., 1901, p. 69.

Station 8.

A single specimen was obtained; it assumes a folded, incomplete cup-like shape, with a semi-circular expansion at the base.

PACHYCHALINA COMMUNIS, *Lendenfeld, sp.*

Chalinissa communis, Lendenfeld, Zool. Jahrb., ii., 1887, p. 772; *Id.*, Austr. Mus. Cat., xiii., Sponges, 1888, p. 87, pl. vii.

Pachychalina communis, Whitelegge, Rec. Austr. Mus., iv., 1901, p. 20.

In the above paper Dr. R. v. Lendenfeld described under the generic name of *Chalinissa* eleven species and two varieties.

The "Thetis" collection contains a large series of fine specimens of *P. communis*, and these, together with the rich material in the Museum, afford ample examples for study. In addition there are several fragments—taken from Lendenfeld's collection now in the British Museum—which have been compared with the rest of the material at my disposal.

The result of the examination is a conviction that *P. communis*, Ldf.—with its two varieties *flabellum* and *digitata*—*P. elegans*, Ldf., *P. elongata*, Ldf., *P. tenuifibris*, Ldf., and *P. serpens*, Ldf., are forms of one extremely variable species. They differ slightly in habit, density, and in the relative size and distribution of the oscula. These characters are extremely variable according to the habitat in which the sponge has grown, and the same remark applies both to the fibrous skeleton and the spicules, There is one feature they have in common, and that is the appearance and structure of the dermal surface. These peculiar epidermal characters can also be seen in *P. punctata*, Ridley and Dendy, *P. pedunculata*, Ldf., and, judging from the description, in *Chalina monilata*, Ridley.

The dermal surface when well preserved is glabrous, velvet-like in appearance, and coated with a thin crust of oxeote spicules; the latter are very closely arranged, and partly conceal the dermal network as well as the pores, which are scarcely visible to the unaided eye. The spicular measurements are as follows:—*Pachychalina communis*, Ldf., "type," 0·06 to 0·08 by 0·0045 to 0·006 mm. In the choanosome there are a few 0·06 by 0·002 mm. *P. communis* var. *digitata*, Ldf., 0·06 to 0·07 by 0·006 mm. *P. communis* var. *flabellum*, Ldf., 0·06 by 0·006 mm. *P. elongata*, Ldf., 0·06 to 0·07 by 0·006 mm. *P. elegans*, Ldf., 0·065 by 0·0055 to 0·006 mm. *P. serpens*, Ldf., 0·06 to 0·08 by 0·0065 mm. in choanosome, and 0·06 to 0·07 by 0·0045 mm. in skeleton fibres. *P. tenuifibris*, Ldf., 0·06 to 0·07 by 0·0055 to 0·006 mm.

SIPHONOCHALINA, *Schmidt.*

SIPHONOCHALINA ANNULATA, *Ridley and Dendy.*

Siphonochalina annulata, Ridley and Dendy, Chall. Rep., Zool., xx., p. 31, pl. vii., fig. 2.

Station 48.

A single example of this species is present in the "Thetis" collection. The habit of the specimen is different from that of the figured type. The form is more compact, and on one side the whole of the branches exhibit coalescence for at least half or a third of their length. The specimen is 224 mm. high, 140 mm. in

larger, and about 100 mm. in its smaller diameter. The peduncle is 75 mm. long and from 7 to 10 mm. in diameter. Megascleres oxea 0·1 mm. by 0·0065 mm.

ARENOCHALINA, *Lendenfeld.*

ARENOCHALINA MIRABILIS, *Lendenfeld.*

Arenochalina mirabilis, Lendenfeld, Zool. Jahrb., ii., 1887, p. 821, pl. xx., fig. 70; *Id.*, Aust. Mus. Cat., xiii., Sponges, 1888, p. 103; Whitelegge, Rec. Austr. Mus., iv., No. 2, 1901, p. 76, and No. 5, 1902, p. 213.

Station 50.

Five examples of this species were obtained at the above-mentioned station; all were evidently dead when caught in the trawl. One exhibits a little sarcode, but it does not reveal any additional characters to those already described. The stylote spicules of the fibres and choanosome have been carefully measured, and are as follows:—0·15 to 0·19 by 0·004 to 0·0045 mm.

CERAOCHALINA, *Keller.*

CERAOCHALINA LEVIS, *Lendenfeld.*

Ceraochalina levis, Lendenfeld, Zool. Jahrb., ii., 1887, p. 782, pl. xix., fig. 19.

Sponge with a well defined base and short peduncle, 35 mm. long and 15 mm. in its shorter and 30 mm. in its greater diameter. The peduncle gives rise to a series of angular or compressed primary branches without any anastomozation, about one-third of which consists of short subcylindrical branches with round apices; their length is about 150 or 200 mm. and their diameter 10 to 12 mm. The remaining two-thirds of the branches are from 400 to 550 mm. in length, subcylindrical, and about 10 mm. in diameter. The longer branches exhibit two or three bifurcations. Dermal surface smooth in appearance to the unaided eye, but harsh to the touch. Pores minute, scarcely visible without a lens. Vents numerous, with thin elevated margins, pretty evenly distributed, 2 mm. or less in diameter, and on an average about 8 mm. apart. Colour in the dried condition yellowish-stone.

Skeleton rather wide-meshed, the main fibres curve gracefully from the centre outwards and terminate in small tufts of spicules at the surface; these tufts, with other scattered spicules, project

at least half their length through the dermal membrane. The primary fibres are about 0·01 to 0·15 mm. in diameter and 0·5 mm. apart; the spicular core consists of a thin undulating line of ill-arranged oxea; these are either multiserial, or, in the slender parts, five or six in a row. The transverse connecting fibres are given off at pretty regular intervals; they are 0·04 to 0·05 mm. in diameter and about 0·6 mm. apart. The spicules are uniserial, and frequently separated by a space equal to their length; there are about four spicules in each fibre. The mesh of the fine dermal network is very irregular, and the inhalent pores are from 0·1 to 0·15 mm. in diameter.

The spicules are sharp-pointed oxea 0·035 to 0·04 by 0·0015 to 0·002 mm.

The specimen described has been identified by comparison with a fragment from the Lendenfeldian collection now in the British Museum. The example referred to was labelled "*Ceraochalina levis*, Lendenfeld, Torres Straits." Both the "Thetis" and the British Museum specimens agree with the description and figure.

There is, however, a second fragment received from the British Museum, which, although labelled *Ceraochalina levis*, Lendenfeld, appears to be quite distinct, and apparently has no resemblance or character by which it could be associated with *C. levis*, Ldf., except that they both possess oxeote spicules, but very different in dimensions. The sponge in question appears to be the one referred to in Lendenfeld's description of *C. levis* as an "algal pseudomorph" from Port Chalmers, New Zealand. I have examined many specimens of this form, in which an alga and a sponge are thoroughly united; there are numerous examples in the Australian Museum from West Australia, New Caledonia, New Hebrides, and Torres Straits. From the data at my disposal I am inclined to the opinion that the true *C. levis*, Ldf., is from Port Chalmers, and that the "algal pseudomorph" is from Torres Straits; at least, it appears so from the distribution of the algal form as given above; all the well-authenticated specimens come from coral regions.

The following is a description of the algal pseudomorph drawn from well-preserved spirit and also dried specimens:—Pseudomorph usually consisting of a series of more or less interlaced, decumbent, and often coalesced branches, which vary from lamellate to cylindric; the latter are usually about 10 mm. in diameter. The surface is smooth, porous, and exhibits numerous scattered oscula from 1 to 1·5 mm. in diameter. In section the algal portion presents an irregular reticulation of filaments. I failed to find any indication of spongin or fibres, but the spicules form a loose and ill-arranged sheath around the delicate branches of the alga. Here and there a few spicules occur in the mesh of the network,

and irregular tufts project at the external surface of the nodes. In every part of the organism the spicules are irregularly disposed and apparently devoid of any trace of spongin. The slender, slightly curved oxeote spicules measure 0·15 mm. in length and are 0·006 mm. in diameter; their size is very different from those of *Ceraochalina levis*, Ldf., derived from the fragment of the type, which are 0·35 to 0·04 mm. in length and 0·0015 to 0·002 mm. in diameter.

Whilst on the subject of the so-called algal pseudomorph, it may be well to state that the colour of *Echinoclathria macropora*, Ldf., described as "a bright madder brown," is due to the presence of a red filamentous alga which ramifies through the whole sponge, including the fibres.

Subfamily RENIERINÆ, *Schmidt.*

RENIERA, *Nardo.*

RENIERA DENDYI, *Whitelegge.*

Reniera dendyi, Whitelegge, Rec. Austr. Mus., iv., No. 2, 1901, p. 67, pl. x., fig. 1.

Station 15.

A small example was obtained off Norah Head in 32-48 fathoms.

GELLIUS, *Gray.*

GELLIUS REPTANS, *sp. nov.*

Station 54.

Sponge encrusting, about 10 mm. in height, and indefinite in extent, growing on a papyraceous worm tube. Surface covered with a delicate reticulated epidermis, with numerous small pores and a few scattered oscula about 0·5 mm. in diameter. Colour dirty cream. Texture bread-like and friable.

Skeleton composed of loosely arranged whisps of spicules, without perceptible spongin. The bundles of spicules in the denser part of the sponge may have about twelve or more in an irregular row. At the surface the spicules are ill-arranged, but in some parts there is a tendency towards more definite order, forming a subquadrate or a triangular mesh, the size of the latter being governed by the length of the spicules.

Megascleres :—straight or rarely curved strongyla with evenly rounded ends, perfectly cylindrical, and devoid of any tendency to an oxeote character. Size 0·16 mm. by 0·006 mm.

Microscleres :—simple C-shaped bodies about 0·014 mm. long ; they are few in number and difficult to find.

This species differs from other members of the genus in its peculiar spicular characters both as regards shape and size.

RAPHISIA, *Topsent.*

RHAPHISIA RAMOSA, *sp. nov.*

(Plate xliii., fig. 4.)

Station 44.

Sponge consisting of a number of coalescent branches with from three to four longitudinal grooves. The branches are somewhat contorted and vary considerably in length ; the longest are about 70 mm. and the shortest 50 mm. The diameter of the branches ranges from 5 to 10 mm. Each branch exhibits several longitudinal grooves in which are situated a few irregular oscula (?) from 2 to 5 mm. in diameter, and the surface generally is more or less finely porous.

The skeleton is somewhat complicated and difficult to diagnose, inasmuch as the real arrangement of the spicules is obscured by a peculiar cellular covering which resembles some of the unions between an alga and a sponge.

In sections mounted in glycerine the sponge presents features which are like those of the sponge and the alga combined, yet the latter is so indefinite that it is difficult to say whether it is part of the sponge or an alga.

On the other hand, in sections mounted in Canada balsam the algal features are obscured and the spicular characters are rendered distinct, but the cellular elements present—in the form of the cell walls—tend to the impression that there are irregularly shaped microscleres scattered throughout the body of the sponge.

Thin longitudinal sections mounted in glycerine present a subcontinuous surface, with here and there dense cellular looking fibres which form a close but irregular network of primary and connecting branches, the inclosed spicules being barely visible except where they are exserted. Similar sections mounted in Canada balsam exhibit the disposition of the spicules ; they form loose whispy bundles which run more or less longitudinally with rather indefinite connecting branches and an abundant supply of scattered spicules throughout the ground substance.

The spicular fibres are about 0·1 mm. in diameter and from 0·1 to 0·2 mm. or more apart. The mesh of the network is generally oblong, but very indistinct.

Megascleres:—oxea of two sizes—(1) 0·4 to 0·5 mm. by 0·01 mm., (2) 0·1 by 0·004 mm. Both forms are straight and abruptly sharp pointed.

Microscleres:—fine trichodragmata about 0·15 to 0·2 mm. in length; they are chiefly arranged in bundles.

Subfamily GELLIODINÆ.

GELLIODES, *Ridley.*

GELLIODES POCULUM, *Ridley and Dendy.*

Gelliodes poculum, Ridley and Dendy, Chall. Rep., Zool., xx., 1887, p. 48, pl. x.; Lendenfeld, Austr. Mus. Cat. xiii., Sponges, 1888, p. 189.

Station 44.

A single example of this species was obtained off Coogee, at a depth of 49-50 fathoms.

CHONDROPSIS, *Carter.*

CHONDROPSIS SYRINGIANUS, *sp. nov.*

(Plate xliii., fig. 1.)

Station 53.

Sponge consisting of a short thick peduncle and a series of tubular branches from 50 to 250 mm. in length and from 10 to 40 mm. in diameter, total height nearly 300 mm., larger diameter 190 mm., smaller about 100 mm. Externally the surface is somewhat uneven, the branches exhibit from four to six rounded nodes and a few low blunt elevations. Internally the tubes are lined with numerous oscula from 2 to 3 mm. in diameter. The tubes commence immediately above the peduncle and gradually increase in diameter to within a short distance of the somewhat contracted summits; the latter are bordered by a delicate membraneous margin which in the living sponge was probably highly contractile; their diameter is usually about 25 mm. General surface closely reticulate, finely porous, and minutely conulose. The mesh of the dermis varies from 0·5 to 1 mm. in diameter, and the fibres of the network are rather coarse and plainly visible to the unaided eye.

Texture rather tough and somewhat elastic. Colour yellowish grey.

Skeleton consisting of an intricate network of stoutish primary and secondary fibres, charged with foreign spicules and a few sand grains. The connecting fibres are somewhat ill-defined, being composed of spicules proper to the sponge. The dermal, subdermal and choanosomal regions are also amply provided with strongylote spicules manufactured by the sponge.

Primary fibres 0·2 to 0·25 mm. in diameter; secondaries from 0·05 to 0·1 mm., and the slender connecting fibres vary from 0·001 to 0·02 mm. The mesh of the network is generally oval or oblong and is usually about 0·5 in the shorter diameter. The spicules consist of strongyla 0·13 to 0·15 mm. in length by 0·0055 mm. Sigmata and chelæ of various kinds have been observed, but I failed to find any microscleres that could be regarded as proper to the sponge. This species undoubtedly presents features which link it with the genus *Chondropsis*, yet it appears to have lost its microscleres or to have selected such a quantity of foreign ones that the spicules of its own make are undistinguishable from those of other sponges. C- and S-shaped microscleres are present on the dermal surface as well as in the body of the sponge, but these are so irregular in shape and disposition that I cannot regard them as spicules secreted by the sponge.

CHONDROPSIS LAMELLA, *Lendenfeld, sp.*

Phoriospongia lamella, Lendenfeld, Austr. Mus. Cat. xiii., Sponges, 1888, p. 194.

Station 53.

One fine example off Crookhaven River, at a depth of 23 fathoms.

CHONDROPSIS KIRKII, *Carter, sp.*

Dysidea kirkii, Carter, Ann. and Mag. Nat. Hist., (5), vii., p. 374.

Sigmatella australis, Lendenfeld, Austr. Mus. Cat., xiii., Sponges, 1888, p. 195.

Sigmatella corticata, Lendenfeld, Austr. Mus. Cat., xiii., Sponges, 1888, pp. 195-199; *Id.*, Mon. Horny Sponges, 1889, pp. 613 and 618.

Stations 48, 59.

Two specimens were obtained, one off Wollongong and the other off Narrabine. Depth 30 to 56 fathoms.

Subfamily PHLŒODICTYINÆ, *Carter.*

RHIZOCHALINA, *Schmidt.*

RHIZOCHALINA PUTRIDOSA (? *Lamarck*).

? *Alcyonium putridosum*, Lamarck, Mem. Mus. Hist. Nat. Paris., i., p. 168.

Rhizochalina putridosa, Ridley and Dendy, Chall. Rep., Zool., xx., p. 33, pl. viii., figs. 5-5*a*, pl. ix, figs. 1, 7.

Station 34.

A single example of this species was obtained off Port Jackson in about 39 fathoms. The specimen is subglobose and measures 100 mm. All the fistula when perfect are rounded at the summit and minutely porous. The fitulose processes vary from 5 to 70 mm. or more in height. The surface generally is more or less obscured by growths of Bryozoa, Gorgonia, Hydroid Zoophytes and other sponges. The spicules consist of slightly curved oxea Size about 0·195 by 0·014 mm.

Family POECILOSCLERIDÆ, *Topsent.*

Subfamily ESPERELLINÆ, *Ridley and Dendy.*

ESPERELLA, *Vosmaer.*

ESPERELLA ANCORINA, *sp. nov.*

(Plate xliii., fig. 3.)

Station 36.

Sponge palmo-digitate with a well defined stalk and numerous irregular branches; the latter vary from 30 to 230 mm. in length and from 15 to 25 mm. in diameter: they are compressed in their proximal half and subcylindrical distally; the summits are either rounded or obliquely truncated. The surface generally is minutely wrinkled and slightly wavy; towards the apices of the branches there are numerous small conuli about 0·5 to 1 mm. in height; the tips of the branches exhibit a few shallow depressions. The dermal surface is finely porous; the oscula are scattered, substellate—about 1·5 or 2 mm. in diameter—and mostly confined to one side of the sponge; a few are indicated on the longest branch on the right hand side of the figure.

Texture firm and fairly resilient. Colour dull dark cream.

The skeleton consists of a rather open network of dense spicular fibres with very little visible spongin. The mesh varies in shape from subcircular to oblong, and usually measures, between the primary fibres, from 0·8 to 1 mm. in diameter. The main fibres are densely packed with stylote spicules and are from 0·2 to 0·4 mm. in thickness; the secondary and connecting fibres consist of whispy bundles from 0·5 to 1 mm. in diameter; there are also many spicules in the ground substance and also echinating the fibres, but in a most irregular manner.

Megascleres:—styli very variable in thickness, but usually about 0·4 mm. in length; they are subfusiform and gradually sharp-pointed.

Microscleres:—consist of three sizes of anisochelæ, two of which are arranged in rosettes. The larger clusters are about 0·25 mm. or more in diameter and the smaller 0·1. The individual spicules of the former have three grapnel-like teeth, a curved shaft with a peculiar grooved head. The shape and general contour is exactly like a spicule figured by Bowerbank from West Australia.* The smaller rosette spicules are similar in shape to larger kind, but the teeth are either absent or rudimentary.

The third kind of anisochelæ is somewhat like a C about 0·02 mm. long with a short hook at the apex and a slightly longer one at the base; the latter is almost straight, with its apex pointing towards the upper part of the C. These peculiar spicules are scattered throughout the body of the sponge.

ESPERELLA CYLINDRICA, *sp. nov.*

(Plate xliii., fig. 8.)

Station 44.

Sponge consisting of a cylindrical stem 300 mm. in length and from 10 to 20 mm. in diameter. The specimen is a washed-out example denuded of its epidermis and retaining but little of its sarcode. The external surface is minutely conulose, rather openly reticulate, and presents a series of depressions about 5 mm. deep and 15 mm. apart; these appear to be the oscular areas. Texture resilient, rather tough. Colour light-sponge. The skeleton has a radiate appearance when viewed by transmitted light, the central fibres of the axis can be traced for a considerable distance and finally they terminate in tufts at the surface.

* Bowerbank—Mon. British Spongidæ, i., 1864, p. 249, pl. vi., fig. 135.

The primary fibres consist of compact bundles of spicules imbedded in a moderate amount of pale spongin; usually they are about 0·1 mm. in diameter; the secondaries are multispicular, and measure from 0·05 to 0·07 mm.; the connecting fibres and those of the surface are slender, with two or three spicules in a row, and vary from 0·02 to 0·04 mm. in thickness. Mesh rather open, either oblong or subrectangular, and usually about 0·5 to 0·8 mm. in width.

Megascleres:—straight, styli cylindrical to within about 2 diameters of the not very acute extremity; size 0·2 by 0·0075 mm.

Microscleres:—palmate anisochelæ, 0·032 mm. long and 0·01 mm. wide; the lateral processes at both ends of the spicule are well developed, and generally they closely resemble the anisochelæ of *Esperella lapidiformis*, Ridley and Dendy.* One example obtained off Coogee, 49-50 fathoms.

ESPERELLA TEXTILIS, *sp. nov.*

(Plate xliii., fig. 2).

Station 44.

The single example forms a subflabellate expansion 200 mm. high and 120 mm. wide, and from 30 mm. to 40 mm. in thickness. The sponge consists of a very open network of densely spicular fibres, with little obvious spongin; the primaries give off a series of secondaries at pretty regular intervals of about 5 mm., these are united here and there with the somewhat irregularly disposed connecting fibres; the whole forming a loosely arranged network, the mesh of which is usually square or slightly oblong. The dermal surface presents a beautiful appearance to the unaided eye, like that of some delicate network or textile fabric. The specimen is a dried one and does not exhibit anything definite in the way of distinct pores or oscula. The main fibres consist of compactly-arranged spicules, and vary from 0·5 to 1 mm. in diameter; the branches are about 0·25 mm., and the dermal and connecting fibres range from 0·05 to 0·1 mm., whilst some of the finer cross fibres consist of one or two spicules in a row. The texture of the specimen is rather brittle and the colour white or grey.

Megascleres:—subtylostyli, with fusiform shaft, acutely pointed at the base and evenly rounded at the apex, with a perceptible constriction about two diameters below the summit. Size 0·55 mm. by 0·01 to 0·014 mm.

---

* Ridley and Dendy.—Chall. Rep., Zool., xx., 1887, pl. xv., fig. 10-10a.

Microscleres:—palmate anisochelæ, always arranged in rosettes about 0·11 mm. in diameter; the individual chelæ measure 0·05 mm. in length and 0·015 mm. in breadth. The teeth on the upper part are fairly distinct; the lower blade, however, has its apices truncated, the shaft has a clear space of about 0·015 mm. in length. There are a few C-like spicules about 0·15 mm. in length, and abundant smaller ones which measure 0·015 mm.

ESPERELLA MURRAYI, *Ridley and Dendy.*

Esperella murrayi, Ridley and Dendy, Chall. Rep., Zool., xx., 1887, p. 67, pl. xiii., figs. 11, 13, 14, 16, 17, 18, pl. xiv., figs. 1-1*a*.

Station 34, 36.

The "Thetis" collection contains six examples of this interesting species obtained off Port Jackson and Botany in from 20 to 39 fathoms.

Five of the specimens are pretty equal in size and measure 100 mm. in height and from 30 to 40 mm. in diameter. The largest example is nearly 200 mm. in height and 130 mm. broad, and from 25 to 40 mm. in thickness. In shape it is subflabellate, with one surface concave and the other convex; the latter exhibits traces of four coalescent lobes which are more marked at the apical border. Judging from the appearance of the specimens, it appears that the outer surface—in the living sponge—is highly contractile. The surface generally presents a series of scale-like plates, which evidently play an important part in the inhalent currents taken in by the sponge.

The action of these plates appears to be valvular; each plate is margined by a thin membraneous edge which, when drawn down tight, effectually closes the so-called cracks or grooves. On the other hand, when the plates contract, the membraneous margins are elevated, and expose to view a series of fine thread-like fibres, connected by a neatly perforated membraneous web. Beneath this intricate trellis structure there exists a complicated series of canals with numerous pores from 0·5 to 1 mm. in diameter. In addition there are many larger openings from 2 to 3 mm. in diameter, and 4 or 5 mm. apart. These are in keeping with the size of the oscula, and I feel inclined to regard them as such, rather than inhalent pores. It will thus be seen that the various scale or plate-like bodies on the surface have the power by contraction to close the whole of the inhalent system at will, and if the larger openings are oscular in function the exhalent currents are also under control by the contractility of the peculiar epidermal layer. The summit of the sponge in the large specimen presents about forty oscula, all of which are closed by contraction

each one forms a distinct cone about 3 or 4mm. in height, the sides exhibit a series of puckered ridges, indicating that the sponge possessed great powers of contraction, especially as far as the dermal surface is concerned. In the smaller examples the surface does not exhibit many grooves or plates; in fact, in one or two cases the epidermal layer is quite smooth, and exhibits only the faintest trace of a groove here and there. The oscula are practically invisible to the unaided eye, and can only be demonstrated by partially drying and then immersing in spirit; the oscula can then be located by the bubbles which issue from them.

The spicular characters agree with those given by Ridley and Dendy. I have failed to find other megascleres than those described in the type of *E. murrayi* by Ridley and Dendy. Tylostyles and subtylostyles are apparently absent. Carter's *Esperia placoides* was obtained in 345 fathoms off the Shetland Islands.

Topsent* records the same species from Newfoundland from a depth of about 600 fathoms.

Judging by the spicular characters and the difference in depth at which *E. murrayi* and *E. placoides* occur I regard them as quite distinct species, and they might be so regarded until a comparison of the types has been made.

ESPERIOPSIS, *Carter.*

ESPERIOPSIS CYLINDRICA, *Ridley and Dendy.*

(Plate xliii., fig. 6).

Esperiopsis cylindrica, Ridley and Dendy, Chall. Rep., Zool., xx., 1887, p. 79, pl. xix., fig. 2, 2*a*, 2*b*.

Stations 41 and 48.

About twenty specimens of this species were obtained off Wata Mooli and Wollongong in from 52 to 71 fathoms. The larger examples measure about 300 mm. in height and about 200 mm. in diameter; the main peduncle varies from 50 to 100 mm. in length, and is usually about 10 mm. in diameter. The megascleres agree with the original diagnosis; the microscleres are represented by abundant toxa, varying greatly in size and curvature; they range from 0·5 to 1 mm. in length. The chelæ are fairly scattered throughout the sponge, and rarely exceed 0·014 in length.

---

* Topsent—Résultats Campagnes Sci. Albert 1er, Monaco, Fas. ii., 1892, p. 89.

ESPERIOPSIS CANALICULATA, *sp. nov.*

(Plate xliii., fig. 7).

Stations 41, 47, 48.

Sponge stipitate, much branched, and here and there coalescent. The branches are subcylindric or slightly compressed proximally in the plane of branching, and the distal two-thirds of each exhibits a very distinct longitudinal groove which terminates at the summit.

The surface generally is covered with a tough leathery-looking epidermis without any visible pores. The oscula, if present, are closable and situated at the apices of the grooves; there are several branches which exhibit a slightly puckered depression at the summit, but no distinct opening that might be termed a vent. In worn examples the channels in the branches exhibit a series of subdermal pores about 1mm. or less in diameter. Texture firm, somewhat resilient; colour yellowish-grey.

The skeleton when denuded presents a *Raspailia*-like surface, but the network is reticulated. The mesh is generally oblong or oval, and the axial region is occupied by several stout multispicular fibres; the latter give off numerous secondaries which are rather peculiar in shape; they are broad at their origin, contracted in the middle, and expanded at their extremities, forming a kind of rosette-like structure, which supports the epidermis; when the latter is removed the projecting ends of the fibres give the surface a peculiar bristly or villose aspect. The thickened epidermal layer is furnished with numerous closely-arranged radiating spicules; when viewed from above many very small pores can be seen between the tufts of surface spicules.

The primary and secondary fibres consist of dense bundles of spicules about 0·2 mm. thick; they are closely packed in a thin layer of pale yellow spongin; the connecting fibres are very indefinite and consist of whispy masses of spicules, which extend from the stouter fibres. The mesh measures from 0·5 to 1 mm. in length, and is usually about 0·2 or 0·3 mm. in diameter. The dense layer of epidermal spicules is 0·25 mm. in thickness.

Megascleres:—straight smooth styli, variable in length and diameter, the largest 0·5 by 0·001 mm., medium stouter kind 0·35 by 0·0018 mm.; styli of the epidermis 0·15 by 0·006 mm. Some are subtylostyli with a very slight oval head.

Microscleres:—minute isochelæ 0·0014 mm. long, and toxa with a well marked median bend about 0·02 mm. long. There are also a number of straight toxodragmata present.

ESPERIOPSIS FERRUGINEA, *sp. nov.*

(Plate xlv., fig. 26.)

Station 48.

Sponge consisting of a series of angular coalescent branches, about 5mm. in diameter, forming a clathrate mass with an open subhoneycombed surface. Texture tender, brittle and inelastic. Colour like rusty iron, with the tips of the minute conuli white or grey. The conulose ridges are low, irregular, and enclose a series of variously shaped lacunæ from 0·5 to 1·5 mm. or more in diameter, the edges of which are fringed with a few small conuli.

The main fibres consist of bundles of loosely arranged spicules about 0·15 mm. in diameter. The secondaries and connecting fibres are very indefinite, embracing a few ill arranged whispy lines of spicules, disposed in multi- or unispicular rows; the mesh is coincident with the length of the spicules, and is more or less rectangular, but somewhat obscured by the numbers of scattered spicules in the choanosome.

Megascleres:—straight styli or subtylostyli of various sizes from 0·2 to 0·35mm. in length and from 0·008 to 0·015 mm. in diameter.

Microscleres :—rather stout isochelæ with a curved shaft and three well developed teeth on each end; length about 0·03 mm.

PSEUDOHALICHONDRIA, *Carter.*

PSEUDOHALICHONDRIA FIBROSA, *Whitelegge.*

Pseudohalichondria fibrosa, Whitelegge, Rec. Austr. Mus., iv., pt. 2, 1901, pp. 78 and 117, pl. x., fig. 8.

Station 53.

A fine specimen of this species was obtained off Crookhaven River in 23 fathoms. The example measures nearly 300 mm. in height and has five main branches, all of which are more or less coalescent; the stem is 80 mm. long and 10 mm. in diameter. The branches are flattened—in the plane of branching—and each presents one or more well marked longitudinal grooves; on the lateral branches the grooves are continued from the base of the peduncle to the much compressed and somewhat dilated apices.

Epidermal surface glossy, with conical projections about one or two mm. apart. The grooved areas are depressed, and have microscopic transverse corrugations—these are probably due to the contractile nature of the dermal membrane—overlaying the well defined grooves. Pores, if present, are so contracted as to be

invisible even with the aid of a lens ; here and there oscula-like apertures are present, but it is difficult to say whether they are true oscula or accidental perforations ; the tips of the branches are provided with vents, but it is only by cutting sections that they can be demonstrated.

AMPHILECTUS, *Vosmaer.*

AMPHILECTUS CERATOSUS, *Ridley and Dendy.*

Amphilectus ceratosus, Ridley and Dendy, Chall. Rep., Zool., xx., 1887, p. 125, pl. xix., fig. 10-10*a*, pl. xxv., fig. 2, pl. xlvii., fig. 2.

Station 36.

A single example of this interesting species was obtained off Botany Bay at a depth of 23 fathoms. The specimen is subflabellate and attached to the stem of a Gorgonia. It measures 50 mm. in height, 35 mm. in breadth, and from 15 to 20 mm. in thickness. The dermal surface is smooth and very finely porous, the pores being confined to certain areas, and are pretty evenly distributed. Vents numerous, scattered, about 1 mm. or less in diameter.

The skeleton agrees with Ridley and Dendy's description, and it may be added that in the sections examined some of the stouter fibres are dilated and form a kind of trellis, and have scattered sand grains both in the fibres and enclosed in the mesh of the reticulation. The presence of sand grains in the main fibres lends support to the idea—suggested in the remarks following the description—that the horny skeleton is that of a *Euspongia* over which the spicule-bearing sponge has grown.

The spicules agree with those of the type.

CLADORHIZA, *Sars.*

CLADORHIZA WAITEI, *sp. nov.*

(Plate xliv., figs. 13, 13*a*.)

Stations 36, 44.

Some eight or ten examples of this interesting form are in the collection, and in most cases they are on the stems of dead Gorgonias; in some specimens they form a coating around a long simple stem, in others they cover a series of complicated branches. The space between the branches is frequently bridged over by more or less

continuous sponge substance. The surface generally is furnished with abundant conuli about 5 mm. high and from 2 to 3 mm. apart. The conuli are more or less connected by narrow ridges; the depressions between are deeply concave and are often triangular in outline, with a tendency here and there to form interrupted longitudinal grooves. The dermal surface is slightly rugose, finely porous, with a few scattered oscula which are generally situated in the depressions.

Skeleton consisting of a series of densely packed cylindrical fibres of stylote spicules. The diameter of the main fibres ranges from 0·2 to 0·3 mm.; the secondaries are about 0·1 mm., whilst the connecting fibres are diffused and consist of bands of ill arranged spicules. The mesh is more or less rectangular and usually about 0·5 mm. or more in diameter. The primary and secondary fibres terminate at the surface in numerous aculeations. Each fibre is invested with scattered C-shaped spicules, and the latter, together with the anisochelæ and styli, are abundant in the choanosome and also in the dermal membrane.

Megascleres:—fusiform styli with occasionally a few subtylostyli 0·35 to 0·4 mm. long by 0·015 mm. in diameter in the centre of the spicule.

Microscleres:—sigmata either contort or C-shaped, usually the latter are the most noticeable; size 0·15 by 0·08 mm. Anisochelæ 0·045 mm. in length; the flukes are about 0·025 by 0·01 mm. and the shaft 0·015 mm. long.

PHELLODERMA, *Ridley and Dendy.*

PHELLODERMA POLYPOIDES, *sp. nov.*

(Plate xliv., fig. 12).

Station 36.

Sponge with a short broad stem attached to fragments of shells; the distal third or half presents a series of five finger-like processes from 30 to 50 mm. long and 5 or 10 mm. in diameter; the larger branches are somewhat flattened and taper gradually to subacute points, which are apparently osculiferous.

Dermal surface somewhat rugose and furnished with numerous minute dome-shaped elevations; the latter give the sponge an appearance like that of an Alcyonarian coral with retracted polyps. The elevations are darker in colour than the ground, and are about 0·5 mm. in diameter and 1·0 mm. or more apart.

Texture close, hard, and rather tough. Colour mottled-brown.

The skeleton consists of wavy, radiating bundles of spicules from 0·2 to 0·4 mm. in diameter. The main fibres are longitudinally arranged and give off a series of secondaries which terminate in whispy clusters near the surface. The areas of elevation are surrounded by a vast number of spicules, which are disposed in a radiate manner, and probably act like a valvular arrangement for closing or opening the apical pore.

The dermal membrane is supported by the radiating pillars of spicules, and has many others irregularly scattered in the choanosome. The epidermis is about 0·5mm. in thickness and is densely packed with isochelæ, many of which are in contact with, or even overlap each other; they are rarely more than their length apart.

Megascleres:—straight, smooth, slightly fusiform styli, with acute points and a well rounded, but tapering base; size, 0·6 to 0·7 mm. long by 0·0065 to 0 007 mm. in diameter.

Microscleres:—these consist of strongly bent isochelæ, each end with three subequal teeth; they are extremely abundant in the dermis, and either in tracts or scattered rather sparsely in the choanosome; size from 0·025 to 0·03 mm. This species differs in many characters from the type of the genus, viz., in habit, and the larger spicules, which are quite smooth, without any tendency to become polytylote.

DESMACIDON, *Bowerbank.*

DESMACIDON PORIFERA, *sp. nov.*

(Plate xliii., fig. 5.)

Stations 34, 44, 36.

Sponge stipitate, much branched, and here and there coalescent. The branching is mostly lateral, rarely dichotomous. Main peduncle 10 mm. in diameter and from 60 to 90 mm. in length; it exhibits numerous short, more or less prominent angles arranged longitudinally. The branches are angular and subparallel, they are from 5 to 8 mm. in diameter and from 90 to 200 mm. or more in length; at or near their origin they are abruptly curved upwards. The surface generally is very porous, the pores varying in size from 0·1 to 0·2 mm. in diameter. Oscula numerous, prominent, and usually surmounting the angles on the peduncle and branches. Their diameter varies from 1 to 2 mm., and they are from 4 to 6 mm. apart. Skeleton composed of a rather open reticulation of fibres; the primaries traverse the central axial region and give off numerous secondaries, which curve outwards,

and terminate at the surface in a complex network. The main fibres are composed of loosely arranged spicules—about 8 or 12 in a row—and are held together by a small amount of horny matter; they are about 0·05 mm. in diameter and 0·25 to 0·3 or more apart. The secondaries have three or four spicules in a row, and the connecting fibres are mostly unispicular.

The mesh is square or oblong; near the surface it becomes somewhat irregular, and the mesh is regulated by the length of the spicules. The latter consist of oxea of two sizes, 0·14 by 0·013 mm., 0·11 by 0·004 mm. Slightly curved bidentate chelæ are present in moderate quantities; size 0·016 mm.

DESMACIDON HISPIDOSA, *sp. nov.*

(Plate xliv., fig. 17.)

Station 44.

Sponge with a well developed attachment base; the main axis is 140 mm. high and gives off three or four lateral branches, some of which are coalescent; all are more or less compressed in the plane of branching, except at the tips, and measure about 5 or 10 mm. in their greater and from 3 to 7 mm. in their lesser diameter. The primaries give rise to a series of secondary branchlets which are in various stages of development. General surface—where the ectoderm is intact—porous and minutely conulose, elsewhere with a strongly hispid aspect and a rather loose or open network of stoutish fibres. Texture firm, tough and scarcely compressible. Colour greyish-brown.

Skeleton consisting of a series of somewhat stoutish primary fibres, which are centrally plexoid, and give off at irregular intervals many secondaries, and as the surface is approached they terminate in subradiating tufts of fine fibres in the ectosome and form some of the minute conuli as well as giving the denuded surface its hispid appearance; the connecting fibres are very slender, numerous, and render the description of the network or mesh difficult; disregarding the finer fibres, the mesh may be described as rhomboidal, oblong, or elongate, each space being occupied by a miniature spider-like web of slender fibres.

Megascleres:—straight or slightly curved oxea, cylindrical to within about three or four diameters of the acute points; these spicules are densely packed in the main fibres; in the secondaries they are biserial, and in the finer fibres mostly uniserial or absent. Size from 0·18 to 0·2 mm. by 0·008 mm. to 0·01 mm.

Microscleres:—sigmata very variable in size and shape, ranging from 0·015 to 0·12 mm. in length; they are abundant throughout the sponge. Chelæ have not been observed.

DESMACIDON STELLIGERA, *sp. nov.*

(Plate xliv., fig. 11.)

Station 53.

Sponge flabellate, about 270 mm. high, 130 mm. broad, and from 5 to 10 mm. in thickness. The frond is divided into two portions; the larger is lanceolate and lobate on the margins, especially near the summit; the smaller portion is ligulate and about 35 mm. wide. Both originate from a slightly thickened and highly conulose stem about 30 or 40 mm. in diameter and 30 mm. high. The base of attachment is flat and well defined, but not enlarged. The surface presents in the depressions a smooth non-porous dermis, but where this is eroded it is closely covered with more or less oblong pores about 0·5 mm. in width and 1 or 2 mm. in length; they have a tendency to become radiate, and give the surface an appearance quite peculiar and characteristic of the species. The elevations vary from 2 to 8 mm. in height, and consist of a series of oscula openings in groups of three or more. The latter are surrounded by numerous radiating grooves which extend to a distance of 10 mm. or more from the central oscular bearing elevations, some of which on the unabraded parts are covered with membrane, and it appears probable that this would be valvular in its action and to some extent regulate both the inflow and outflow of water. Texture hard and tough, scarcely compressible between the fingers. Colour dull yellowish-grey.

Skeleton consisting of a complicated network of stout fibres with usually a more or less rounded mesh. The main fibres are enveloped in a fair amount of spongin, and their diameter is usually about 0·25 to 0·3 mm. The core consists of a dense mass of chiefly broken spicule fragments, probably of foreign origin; the latter appear to be ensheathed with proper oxeote spicules, many of which are embedded in the fibres by their basal third and stand out nearly at right angles to the fibre, so as to appear as echinating spicules; their oxeote form, however, appears to preclude such being the case. The secondaries are 0·1 mm. in diameter and consist of closely packed oxea; the connecting fibres are composed of a few diffuse spicules, and rarely exceed 0·5 mm. in diameter.

Megascleres:—straight or but slightly fusiform oxea with moderately sharp points. Size in the fibres 0·17 by 0·001 mm.; the dermal spicules are somewhat shorter and a little stouter.

Microscleres:—sigmata both simple and contort. Size from 0·05 to 0·07 mm. long.

Small isochelæ 0·013 mm. long. Both kinds of spicules are fairly abundant.

This species closely resembles *Desmacidon* (*Homœodictya*) *grandis*, Ridley and Dendy,* but differs in most of its internal characters from the African species.

DESMACIDON (?) ARENOSA, *sp. nov.*

(Plate xliv., fig. 10.)

Station 54.

Sponge massive and bread-like in appearance, growing between the roots of a seaweed (*Ecklonia radiata*, J. Ag.). The specimen measures 70 mm. by 45 mm. and is about 30 mm. in height. Surface covered with numerous small pores from 0·05 to 0·1 mm. in diameter. The apparent oscula are irregularly scattered over the sponge, and are usually 2 or 3 mm. across. A number of larger apertures are also present, but these I regard as the work of a boring Isopod. Texture firm but brittle. Colour when fresh light terra-cotta ; in spirit or dried, yellowish-grey.

Skeleton consisting of an intricate network of colourless fibres, charged with sand grains and fragments of the spicules of other sponges. The foreign materials in the fibres have a peculiar feature, inasmuch as they are usually quadrate or slightly oblong with sharp angles. The main fibres are about 0·15 mm. or 0·2 mm in diameter, but here and there they are irregular, somewhat nodose, and contracted or expanded according to the position in the network. The secondaries and connecting fibres are very indefinite and rarely exceed about 0·5 or 1 mm. in diameter.

Megascleres :—probably absent; one or two tylota were observed, but they might be of foreign origin.

Microscleres :—small isochelæ, with the shaft straight or rarely curved, and each end is provided with three or more teeth. Size about 0·015 mm. When viewed from above the spicules appear to be like those of *Iotrochota*, but when seen from the side the teeth are evidently confined to one side of the axis. *Desmacidon chaliniformis*, Carter, has microscleres of the same kind, but they are somewhat smaller, and the horny matter of the fibres is much more abundant.

---

* Ridley and Dendy—Chall. Rep., Zool., xx., 1887, p. 111, pl. xxii., pl. xxix., figs. 7-7*a*.

DESMACIDON FRUTICOSA, *Montagu*, sp.

(Plate xliv., fig. 14.)

Stations 44, 48, 53.

Spongia fruticosa, Montagu, Mem. Wern. Soc. Edinb., ii., 1818, p. 112, pl. xiv., figs. 3, 4.

Halichondria fruticosa, Johnson, British Sponges, 1842, p. 103.

Desmacidion fruticosa, Bowerbank, Mon. British Spongidæ, i., 1864, p. 200.

Desmacidon fruticosa, Ridley and Dendy, Chall. Rep., Zool., xx., 1887, p. 104, pl. xxiii., figs. 10, 10*a*, 10*b*, 10*c*, 10*d*, pl. xxx., fig. 1.

The figured specimen measures over 200 mm. in height and is about 140 mm. in diameter. The branches are very numerous, and every branch on the frontal aspect presents a deep, well marked groove extending from base to summit. The grooves are from 5 to 10 mm. in width and about the same in depth; their inner surfaces are pretty fairly sprinkled with pores, generally about 2 or 3 mm. in diameter, but often larger. Ridley and Dendy* appear to be doubtful as to the nature of the grooves and wonder whether "these grooves are natural or whether they have been caused by the sponge growing up against some cylindrical branching organisms."

Judging from the specimen, the grooves in life were covered by a perforated membrane, as in many other deeply grooved sponges.

DESMACIDON CONULISSIMA, *sp. nov.*

(Plate xliv., fig. 16.)

Station 53.

Sponge usually consisting of a more or less fused mass of angular branches; each branch exhibits numerous elongate, shallow depressions. The latter are bounded by acute ridges, which are longitudinally disposed and terminate in one or more slender conuli from 5 to 10 mm. in height; occasionally the conuli are much divided at the apices. The specimen figured is a waterworn example, and exhibits fewer conuli than many other examples obtained at Coogee, Maroubra and Long Bay.

---

* Ridley and Dendy—Chall. Rep., Zool., xx., 1887, p. 104.

Texture resilient, fairly tough. Colour yellowish-grey. In washed out specimens the fibres have a silk-like appearance.

The dermal surface is unfortunately denuded in all the examples available; subdermally it is highly porous throughout and exhibits numerous oscula having a series of circular apertures—about 1 mm. in diameter— arranged in clusters of three or more, with radiating grooves in which are situated a number of pores of various sizes.

Skeleton consisting of a series of well developed horny fibres; the primaries are arranged longitudinally and are provided with four or more spicules in a row; as they approach the surface they increase in diameter and converge to form the clusters of conuli; here the axial spicules become very numerous and occupy the whole of the fibre. The secondaries are mostly unispicular, whilst the connecting fibres are generally free from spicules. The main fibres measure about 0·15 mm. in diameter, the secondaries 0·5 mm., and the connecting 0·015 to 0·02 mm. The mesh is subquadrangular or oblong and generally about 0·25 mm. wide. The main reticulation is often obscured by numerous slender fibres which are extremely irregular in their arrangement.

Megascleres:—straight or slightly curved oxea, gradually tapering from the middle to acute points. Size 0·17 by 0·01 mm.

Microscleres:—sigmata very variable in shape and size; some are simple, others contort; many examples are C- or U-shaped, with acute ends, which are sharply bent inwards. Size from 0·025 mm. to 0·1 mm. Owing to the washed out condition I have failed to find any chelæ that I could safely say belonged to this form.

This species is allied to *Desmacidon carnosa*, Carter. It is, however, quite distinct, as I have compared the species here described with Carter's type.

Subfamily DENDORICINÆ, *Topsent.*

DENDORYX, *Gray.*

DENDORYX PUMICEA, *sp. nov.*

(Plate xliv., fig. 15.)

Station 47.

Sponge flabellate, growing on the stem of a Gorgonia. The general contour is evidently in keeping with its support; the height is 225 mm., the breadth 140 mm., and the thickness from

5 to 10 mm. The frond-like expansion exhibits a series of lobes and incisions; the former probably indicate the terminal branches of the Gorgonia.

On the basal portion of the sponge the surface is somewhat smooth, with numerous minute pores and a few larger scattered ones which vary from 0·5 to 1 mm. or more in diameter. The upper four-fifths of the surface is ornamented with an immense number of circular or subcircular pores from 0·5 to 3 mm. wide; the pores are seated, as a rule, in well marked grooves and frequently in pairs. The intervening ridges are subradiate, and may be narrow and continuous or occasionally broad and somewhat interrupted by a series of apical pores. Here and there a few oscula-like openings are present, but they are very irregular and appear like the borings of the common Isopod *Cymodoce*. Size of apertures 3-5 mm. Texture hard and rather brittle. Colour yellowish-white, with a slight sheen on the more perfect dermal surface.

Skeleton stellately reticulate, with the blunt ends of the spicules overlapping and forming peculiar nodes like the knots in network. The mesh is more or less triangular in consequence of the star-like arrangement of the spicules. There is no evident spongin present; at least it is quite transparent and undistinguishable with the microscope.*

Megascleres:—straight or but little curved styli wholly spined to within one diameter of the summit; the latter is smooth and usually very acute. Size about 0·2 to 0·22 mm. by 0·01 to 0·04 mm. Fusiform smooth oxea confined to the ectosome and rather scarce. Size 0·18 mm. by 0·07 to 0·08 mm.

Microscleres:—sigmata 0·05 mm., both simple and contort. Tridentate isochelæ 0·025 mm. Both kinds of microsclera are fairly abundant in the membranes surrounding the pores.

DENDORYX FUSCA, *sp. nov.*

(Plate xlv., fig. 20.)

Station 44.

Sponge either massive or consisting of a series of short branches which are often coalescent and form a tangled mass of branchlets; the whole surface is minutely honeycombed, the trabeculæ are interwoven and the apical margins are minutely conulate. The depressions are furnished with deep oval or round pores, from

* See Bowerbank's figure of *Diplodemia vesicicla*, Mon. Brit. Spongidæ, i., 1864, fig, 273.

1 to 3mm. in diameter. Texture when wet very compressible, but in the dried state brittle. Colour brown with a grey tint on the trabeculæ.

Skeleton :—the primary fibres are from 0·5 to 0·1 mm. in diameter, having about twelve or more spicules in a row; the fibres are arranged in a zig-zag manner and are separated by a space equal to the length of the styli; the main fibres present a series of nodes which indicate the origin of the secondary and connecting fibres. The disposition of the spicules at the nodes of the network is very characteristic; the spiny basal portion of each spicule is imbedded in the spongin at every node, and the acutely pointed ends are so arranged as to give a stellate or substellate appearance. The mesh of the sponge between the stouter fibres is usually rectangular, but the reticulation is often obscured by scattered spicules.

Megascleres :—spined styli of two kinds and tornata or bluntly pointed oxea.

(i) Stout spiny styli; the shaft is straight cylindric, with an acute point, spiny base, and a few incipient spines here and there; size 0·2 mm. or under, by 0·01 mm.

(ii) Slender styli; either smooth or with a few spines on the slightly bent base; size 0·2 mm. by 0·006 mm.

(iii) Tornata; size 0·18 to 0·2 mm. by 0·004 to 0·006 mm.

Microscleres :—sigmata both simple and contort; size 0·015 to 0·025 mm. long. Isochelæ rather stout; size 0·022 mm. long.

IOTROCHOTA, *Ridley.*

IOTROCHOTA ARBUSCULA, *sp. nov.*

(Plate xliv., fig. 18.)

Station 41.

Sponge stipitate; stem 75 mm. in length and 10 to 15 mm. in diameter. The base is dilated, subcircular, and about 30 mm. across; the apex gives off a series of five main branches; these at a height of 30 mm. or more bifurcate, and at a distance of from 40 to 80 mm. they again divide. The longer branches measure 240 mm.; at the base they exhibit slight coalescence, and distally they are dichotomously divided, at least three or four times; they are mostly cylindric, but are sometimes compressed, especially in the basal third; the diameter rarely exceeds about 7 or 8 mm.

Dermal surface finely reticulated and porous; the oscula are level with the surface, or in some cases slightly depressed; they consist of circular apertures about 1 or 1·5 mm. in diameter, each of which exhibits a series of six or more sieve-like pores.

Texture hard, tough, and when waterworn resilient. Colour grey, and in appearance very like some species of *Chalinopsilla*.

Skeleton consisting of a rather open network of strongly developed horny fibre; the primaries are about 0·1 to 0·15 mm. in diameter and from 0·25 to 0·5 mm. apart; their course is generally longitudinal, but they are very irregular in outline; this irregularity is probably due to secondary fibres, which are usually short, stout, and about 0·8 to 0·1 mm. in diameter; the slender connecting fibres are not very evident even near the surface. Subdermally the fibres are stoutish and support a highly sandy ectoderm about 0·5 mm. in thickness.

Megascleres:—absent (?); the whole of the fibres are more or less charged with spicule fragments and small sand grains; the materials, probably all of foreign origin, are very loosely arranged, yet they occupy nearly the whole of the fibres. If proper spicules exist they are obscured by the abundance and scattered nature of the sand grains and spicule fragments present.

Microscleres:—birotulates with a straight shaft and equal dentate ends. Size 0·02 mm. long. They are abundantly scattered along the fibres and also throughout the soft parts of the sponge.

YVESIA, *Topsent.*

YVESIA COMMENSALIS, *sp. nov.*

(Plate xliv., fig. 9).

Station 48.

Sponge incrusting, forming a dense blackish-brown villous covering over the whole surface of a Gorgonia (*Parisis australis*, Wright and Studer). The latter authors in describing the Gorgonia state that "they are, however, unfortunately in a very bad state for description, owing to their being overrun by an incrusting sponge, the projecting silicious spicules of which give a roughened appearance to the colony."*

The union between the two forms is so complete that it is difficult to determine either satisfactorily. There are probably

* Wright and Studer—Chall. Rep., Zool., xxxi., 1889, p. 183, pl. xli., fig. 3 (spicules only).

some three hundred examples in the Museum collection obtained at various times, but chiefly by the "Thetis" Expedition, and in every instance the Gorgonoid characters are obscured by the sponge.

Surface reticulated with a series of shallow depressions and low subconulose echinated ridges which have a tendency to form short lines and then to terminate in radiating tufts of spiny styli. The subdermal and internal substance is densely charged with straight cylindric oxea, the extremities of which taper to rather blunt points. Numerous short, sharply bent chelæ, with large flukes nearly meeting in the middle, are present in the choanosome.

Megascleres:—straight or slightly curved spined styli; the apical portion is smooth and very acute; the basal two-thirds bears a series of more or less recurved spines; the base is somewhat truncate and spiny. Size about 0·25-0·3 mm. by 0·015 mm. Oxea 0·19 mm. long by 0·0065 mm.

Microscleres:—short stout isochelæ, 0·015 to 0·02 mm. in length.

EXPLANATION OF PLATE XLIII.

Fig. 1.—*Chondropsis syringianus*, Whitelegge.
Fig. 2.—*Esperella textilis*, Whitelegge.
Fig. 3.— ,, *ancorina*, Whitelegge.
Fig. 4.—*Rhaphisia ramosa*, Whitelegge.
Fig. 5.—*Desmacidon porifera*, Whitelegge.
Fig. 6.—*Esperiopsis cylindrica*, Ridley and Dendy.
Fig. 7.— ,, *canaliculata*, Whitelegge.
Fig. 8.—*Esperella cylindrica*, Whitelegge.

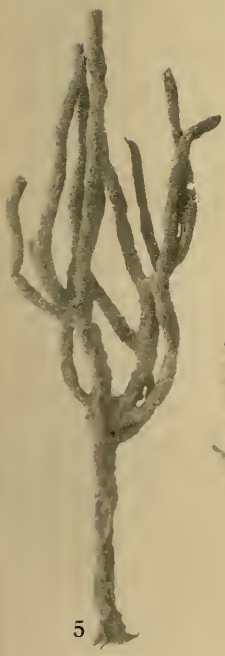
(All the figures are about one-third natural size.)

1

3

2

4



5

6

7

8

EXPLANATION OF PLATE XLIV.

Fig. 9.—*Yvesia commensalis*, Whitelegge.
Fig. 10.—*Desmacidon* (?) *arenosa*, Whitelegge.
Fig. 11.— ,, *stelligera*, Whitelegge.
Fig. 12.—*Phelloderma polypoides*, Whitelegge.
Figs. 13-13*a*.—*Cladorhiza waitei*, Whitelegge.
Fig. 14.—*Desmacidon fruticosa*, Bowerbank.
Fig. 15.—*Dendoryx pumicea*, Whitelegge.
Fig. 16.—*Desmacidon conulissima*, Whitelegge.
Fig. 17.— ,, *hispidosa*, Whitelegge.
Fig. 18.—*Iotrochota arbuscula*, Whitelegge.

(All the figures are about one-third natural size.)

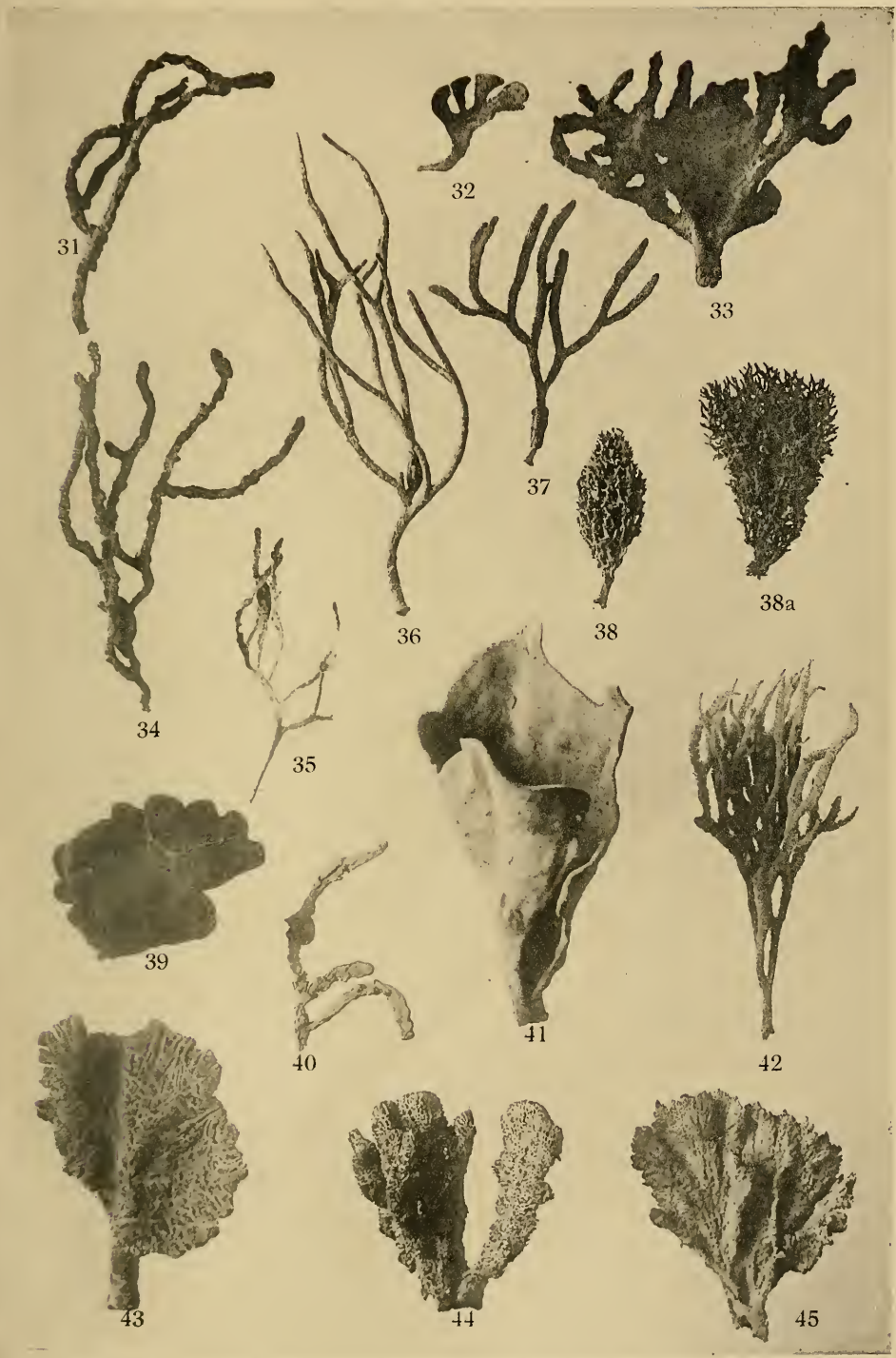

9
10
11
12
13
14
13a
15
16
17
18

T. WHITELEGGE, Photo.

EXPLANATION OF PLATE XLVI.

Fig. 31.—*Desmacidon porifera*, Whitelegge.
Fig. 32.—*Axinella frondula*, Whitelegge.
Fig. 33.— ,, *symbiotica*, Whitelegge.
Fig. 34.—*Clathria calopora*, Whitelegge.
Fig. 35.—*Raspailia*, *sp.*
Fig. 36.— ,, *dichotoma*, Whitelegge.
Fig. 37.— ,, *echinata*, Whitelegge.
Fig. 38, 38a.—*Microciona clathrata*, Whitelegge
Fig. 39.—*Sigmaxinella mammillata*, Whitelegge.
Fig. 40.—*Amphilectus munitus*, Whitelegge.
Fig. 41.—*Phakellia multiformis*, Whitelegge.
Fig. 42.—*Sigmaxinella dendroides*, Whitelegge.
Fig. 43.—*Axinella vermiculata*, Whitelegge.
Fig. 44.—*Higginsia scabra*, Whitelegge.
Fig. 45.—*Spongosorites variabilis*, Whitelegge.

(All the figures are about one-third natural size.)



T. WHITELEGGE, Photo.